Business Mathematics, Logical Reasoning & Statistics

CA VINOD REDDY

Chapter 1

RATIO | PROPORTION LOGS & INDICES

CA VINOD REDDY

1. What is Ratio?

2. Find simplest form of 3.50 : 8.75.

3. 5:7 can also be written as :

4.

Ratio	It's	Answer
5:7	Duplicate Ratio	
8:3	Triplicate Ratio	
11: 19	Inverse Ratio	
64:625	Sub-Duplicate Ratio	
125:27	Sub-Triplicate Ratio	

5. 5:7 can also be written as :

6. 3 : 8 : 9 : 11 is a

My Notes :

7. Ratio of 3 or more terms is known as

8. Ratio is unit free.

9. First term of the ratio =
Second term of the ratio =

10. Find the ratio of 3kg : 35,000 grams

11. a:b can also be written as (ak : bk) or $\left(\frac{a}{k}:\frac{b}{k}\right)$ provided $k \neq 0$

12. The order of the terms in a ratio is important.

13. Find simplest form of $2\frac{1}{3} : 3\frac{2}{3}$

14.

In the Ratio	then a:b is called as
a:b If	
a > b	
a < b	
a = b	

15. Ratio exists only when 2 or more quantities are of same kind.

16. Find simplest form of $\frac{1}{3}:\frac{1}{8}:\frac{1}{10}$

17. Find simplest form of $\frac{3}{5}:\frac{2}{3}:\frac{8}{5}$

My Notes :

18. Ratios are unit - free

19.

If a:b = 2:3
b:c = 4:7
c:d = 8:1
Find a:b:c:d, a:d, b:d

20. If Quantity increase or decreases in the ratio a:b then new quantity = b of original quantity = a

$$\therefore \text{ New quantity} = \left(\begin{matrix}\text{original}\\ \text{quantity}\end{matrix} \times \begin{matrix}\text{mutiplying}\\ \text{ratio}\end{matrix}\right)$$

$$\text{where multiplying ratio} = \left(\begin{matrix}\text{Reciprocal of given}\\ \text{ratio}\end{matrix}\right)$$

$$\text{original quantity} = \left(\begin{matrix}\text{new}\\ \text{quantity}\end{matrix} \times \begin{matrix}\text{Given}\\ \text{ratio}\end{matrix}\right)$$

21. Population of a city is x then it changes in the ratio of p:q then find new population

22.

Inverse ratio of Inverse ratio of a:b is =
Duplicate ratio of sub duplicate ratio of p:q is =
Triplicate ratio of sub triplicate ratio of m:n is =
Sub triplicate ratio Triplicate ratio of x:y is =
Sub duplicate ratio of duplicate ratio of u:v =

23. Find Duplicate ratio of Inverse ratio of 5:7

24. Find Triplicate ratio of sub duplicate ratio of 25:49

My Notes :

25. Find compounded ratio of Duplicate ratio of 2:3, Triplicate ratio of 9:4, Sub duplicate ratio of 81:64, sub duplicate ratio of 512:27

26. When 4 quantities a,b,c,d are said to be in proportion?

27. When 4 quantities a,b,c,d are said to be in continued proportion?

28.

4 Quantities	Whether 4 Quantities are in	
	Continued Proportion?	Proportion?
2,6,18,54		
3,8,12,32		
8,24,96,288		
8,5,80,45		
4,6,9,13.50		

29. When 3 quantities a,b,c are said to be in proportion?

My Notes :

30. If a,b,c,d are in proportion i.e. $\frac{a}{b} = \frac{c}{d}$ then

Invertendo :	**Alternendo :**
Componendo :	**Addendo :**
Dividendo :	**Subtrahendo :**

Componendo and Dividendo :

31. If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{g}{h} = \frac{i}{j} = k$, then

As per addendo k =

As per subtrahendo k =

32. If $\frac{a}{3} = \frac{b}{4} = \frac{c}{7}$ then, Find value of $\left(\frac{4a + 2b - 3c}{5b}\right)$

33. Find Fourth Proportional to 8, 12, 20

34. Find mean proportional to 9, 25

35.

4 Quantities in Proportion	Value of k = ?
8, 9, k, 63	
58, -3k, 28, 85	
36, 60, 2k, 98	
-3k, 86, 25, 63	

36. Rules of Indices

1. $a^m \times a^n =$
2. $\frac{a^m}{a^n} =$
3. $(a^m)^n =$
4. $a^{-m} =$
5. $(a.b)^m =$
6. $\left(\frac{a}{b}\right)^m =$
7. $a^{1/m} =$
8. $[(a^m)^n]^p =$
9. $(a^{m/n}) =$
10. If $a^x = a^y$; then
11. If $a^m = b^m$; then

37. $2x^{1/2} \times 3x^{-1} = ?$ If $x = 4$

38. $\frac{6ab^2c^3}{2a^2bc^8} =$

39. $\frac{64 \times \sqrt[3]{128}}{\sqrt[5]{512}} =$

40. $\left(\frac{4x^{-1}}{x^{-1/3}}\right) =$

41. $\frac{2a^{1/2} \times a^{2/3} \times a^{-7/3}}{9a^{-5/3} \times a^{3/2}} = ?$ If $a = 4$

42. $\dfrac{(a^m \times a^n \times a^p)}{a^x} =$

43. $\sqrt[6]{a^{4b} \cdot x^6}\ (a^{2/3} \cdot x^{-1})^{-b} = ?$

44. $(\sqrt{9})^7 \times (\sqrt{3})^{-5} = 3^k$ then $k = ?$

45. $\dfrac{2^5}{2^5} =$

46. $\left(\dfrac{81x^4}{y^{-8}}\right)^{1/4} =$

47. $\left\{\dfrac{(3^3)^2 \times (4^2)^3 \times (5^3)^2}{(3^2)^3 \times (4^3)^2 \times (5^2)^3}\right\} =$

48. $y^{a-b} \cdot y^{b-c} \cdot y^{c-a} = ?$

49. $\left[1-\left\{1-(1-x^2)^{-1}\right\}^{-1}\right]^{-1/2} =$

My Notes :

50. $\left[(x^n)^{n - \frac{1}{n}} \right]^{\frac{1}{n+1}}$

51. If $a^x = b$, $b^y = c$, $c^z = a$ then xyz = ?

52. $\left(\frac{x^a}{x^b}\right)^{(a^2+ab+b^2)} \cdot \left(\frac{x^b}{x^c}\right)^{(b^2+bc+c^2)} \cdot \left(\frac{x^c}{x^a}\right)^{(c^2+ac+a^2)}$ = ?

53. Log of number consist of 2 parts

Integer Part =

Fractional Part =

My Notes :

54. Log x = characteristic of x + Mantissa of x

$\log b^{a} =$

$\log m^{(ab)} =$

$\log_m (a/b) =$

If $\log_b a = k$; then

If $x^y = z$; then

$\log (a)^{-b} =$

$\log (ab/c)$

$A.\log (\log x) =$

$\log (A.\log x) =$

$\log_a a =$

$\log_b a \times \log_c b =$

$\log_{10} 10 =$

$\log_{10} 100 =$

$\log_{10} 1000 =$

$\log_m abc =$

55. $\dfrac{\log_3 8}{\log_9 16 \times \log_4 10} =$

56.

Log x (where x > 0)

Characteristic of x + Mantissa of x

If $x \geq 1$: (No. of digits before decimal point − 1)

$1 > x > 0$: (No. of zeros immediately after decimal point + 1) BAR

My Notes :

57.

x	Characteristic of x
56.81	
583.2	
81.93	
5.81	
13	
0.008126	
0.5826	
8.5926	

58. How to find Log x on calculator?

59. How to find A.log y on calculator?

60. How to find a^b on calculator? (Particularly when b is in fractions)

61.

Common base of Logs is :

Natural base of Logs is :

62. $\text{Log}_{\sqrt{2}} 64 =$

63. $\log_2 \log_2 \log_2 16 =$

64. $\log_9 (1/3) =$

65. $\log_{16} 32^{-8} =$

66. Log x = (m + n) ; Log y = (m - n); then

$\log \left(\frac{10x}{y^2}\right) =$

67. 2 Log 5 + Log 8 - (1/2) Log 4 =

68. $\sqrt[4]{729} \times \sqrt[3]{9^{-1} \times 27^{-4/3}} = ?$

69. $\log_{2\sqrt{2}} 64 = ?$

70. Find 4^{th} proportional to 2/3, 3/7, 4.

71. If $2^x = 3^y = 6^{-z}$; then (1/x) + (1/y) + (1/z) = ?

72. Find in what ratio will the total wages of the workers of a factory be increased or decreased if there is reduction in no. of workers in the ratio of 17:12 and increment in wage rate per worker in the ratio of 24:29

73. What least number must be added to each one of 6, 14, 18, 38 to make them in proportion

a. 5 b. 3 c. 2 d. 4

74. The incomes of X and Y are in the ratio of 3:2 and their expenditures are in the ratio of 5:3. If each saves ₹ 1500 then incomes of X and Y resp. are :

75. In a sugar solution of 300 gms, the proportion of sugar is 40%. How much sugar should be added to make it 50%

76. A mixture contains milk and water in the ratio of 5:1. On adding 5 litres of water, the ratio of milk to water becomes 5:2. The quantity of milk in the original mixture is :

77. If the denominator of a fraction exceed the numerator by 8. If numerator and denominator are both increased by 5, then fraction becomes 3/5. Find the original fraction.

78. If $\text{Log}_{3/2} x = 3$, Find value of x

79. $\text{Log}_{(1/9)} 243 = x$. Find x

80. $\text{Log } x^3 - 2 \text{ Log } x - 2 = 0$. Find x

81. $\text{Log}_a 3 = 2$, $\text{Log}_b 8 = 3$ then $\text{Log}_b a = ?$

My Notes :

82. If $2 \log a + 3 \log b - 2 = 0$ then $a^2b^3 = ?$

83. $\log_2 [\log_2 \{\log_3 (\log_3 27^3)\}]$

84. 2 numbers are in the ratio of 3:4. If 6 is added to each term then the new ratio will be 4:5 then the numbers are

85. The sub-duplicate ratio of 1250:50 is :

86. Dhrish earns ₹ 2,780 in 7 hrs and Vinod earns ₹ 990 in 12 hrs. Ratio of their earning per hour is :

87. P, Q, R are 3 cities. The ratio of avg. temp. of P, Q is 11:12 and that of P, R is 9:8. Find the ratio of avg temp. of Q:R.

88. If 2s : 3t is the duplicate ratio of (2s-p) : (3t-p) then

a. $p^2 = 6st$ b. $p = 6st$ c. $2p = 3st$ d. None of these

89. If A = B/2 = C/5; then A:B:C is :

90. Log5 = 0.6990, Log 3 = 0.4771 then Log (50/300) = ?

91. Log 2 = x; Log 3 = y; then Log 60 = ?

92. Log (1/81) to the base 9 is equal to :

93. $\overline{4}.5671 + 7.8253 = ?$

94. $\sqrt[(a+b)]{\frac{x^{a^2}}{x^{b^2}}} \cdot \sqrt[(b+c)]{\frac{x^{b^2}}{x^{c^2}}} \cdot \sqrt[(c+a)]{\frac{x^{c^2}}{x^{a^2}}}$

95. What is a commensurable ratio and incommensurable ratio?

96. A Dealer mixes tea costing ₹ 6.92 per kg with tea costing ₹ 7.77 per kg and sells the mixture at ₹ 8.80 per kg and earns profit of 17 1/2 % on sales price. In what proportion does he mix them ?

a. 2 : 3 : 2 5 : 2 d. None of these

97. If $x : y = z : w = 8 : 7$; then $\left(\frac{x + z}{y + w}\right) = ?$

98. If $\left(\frac{5x - 3y}{5y - 3x}\right) = \frac{3}{4}$ then $x : y = ?$

99. Find value of x if $x^{2}\sqrt{x} = (x\sqrt{x})^{x}$

100. $$\frac{(3^{3})^{2} \times (4^{2})^{3} \times (5^{3})^{2}}{(3^{2})^{3} \times (4^{3})^{2} \times (5^{2})^{3}} =$$

101. Log 5 = 0.6990, Log = 0.4771 Find $\text{Log}\left(\frac{500}{0.003}\right)$

102. Log 2 = x , Log 3 = y Find Log (2.40)

Calculator Tricks

1. How to find a^b on calculator. (Mainly when b is a fractions)

Enter 'a'
√ 12 times
Deduct 1
Multiply by 'b'
Add 1
'x=' 12 times

Find -

1. $12^{0.35}$ =
2. $286^{1.3528}$ =
3. $1.0296^{0.3}$ =
4. $878^{1.2896}$ =
5. $\sqrt[5]{100} = 100^{1/5} = 100^{0.20}$ =

2. How to find Log x on calculator

Enter 'x'
√ 15 times
Deduct 1
Multiply by 14230.9635

Find -

1. Log 35 =
2. Log 896.8 =
3. Log 0.008671 =

3. How to find A.Log y on calculator

Enter 'y'
Divide by 14230.9635
Add 1
'x=' 15 times

Find -

1. A.Log 2.8935 =
2. A.Log 0.08613 =
3. A.Log 5.8863 =
4. A. Log 1.2287 =

4.

1.0686^{90} =	1.0686 x = till step count comes 91
1.0296^{56} =	1.0296 x = till step count comes 57
1.0811^{61} =	1.0811 x = till step count comes 62

5. How to find discounting factor on calculator?

1 ÷ (1+r) then '=' n times

6. How to find annuity factor on calculator?

1 ÷ (1+r) then '=' n times and GT

7. 8, 15, 22, 29..... Find t_{28}, t_{38}

8.

5^2 =

15^2 =

28^2 =

9.

$\frac{1}{2 \times 2}$ =

$\frac{1}{20}$ =

$\frac{1}{5 \times 28}$ =

$\frac{1}{25 \times 4}$ =

10.

3 + 5 =

8 + 5 =

9 + 5 =

10 + 5 =

100 + 5 =

2086 + 5 =

3 + 5 =
then 8 =
9 =
10 =
100 =
2086 =

11.

100 - 3 =

208 - 3 =

98 - 3 =

63 - 3 =

238 - 3 =

100 - 3 =
then 208 =
98 =
63 =
238 =

12.

13 x 3 =

13 x 5 =

13 x 8 =

13 x 11 =

13 x 20 =

13 x 3 =
then 5 =
8 =
11 =
20 =

13.

a. (1.20 x 5.36) + (28.96 + 15.92) + (28.11 x 18.63)
=

b. (15.92 x 21.83) + (28.66 x 11.193) - (5.06 x 18.193)
=

14. $5^2 + 8^2 + 9^2 + 13^2 + 16^2 =$

15. $(5 \times 9) + (33 \times 18) + (28 \times 93) - (16 \times 6) + 13^2 =$

My Notes :

EXERCISE

1. Log 28.96 =

2. A.Log 2.8592 =

3. 1.20868592^{28} =

4. $883.9281^{1.5625}$ =

5. 68, 74, 80, 86..... Find t_{28}, t_{32}

t_{28} =

t_{32} =

6.

x	y	x^2	y^2	xy	x^2y	xy^2
1.20	8.53					
9.63	2.58					
10.61	11.93					
Total						

7. $\sqrt{\frac{63581}{8} - 56^2}$ =

8. $\sqrt{(86 \times 93) + (59 \times 81) + (29 \times 63)}$ = ?

9. $\sqrt[10]{58263}$ =

10. $\sqrt[15]{56298193} =$

11. $\dfrac{8}{\frac{1}{2}+\frac{1}{3}+\frac{1}{9}+\frac{1}{13}+\frac{1}{16}+\frac{1}{18}} =$

12.

$\sqrt[8]{93} =$

$\sqrt[4]{124} =$

$\sqrt[16]{28963} =$

$\sqrt[32]{58231} =$

$\sqrt[64]{28,63,588} =$

$\sqrt[11]{52,93,211} =$

$\sqrt[20]{5,85,93,288} =$

13.

100 x 18% =

100 + 18% =

200 + 16% =

300 + 12% =

1050 + 16% =

283 + 3.53% =

18 + 2% =

200 - 3% =

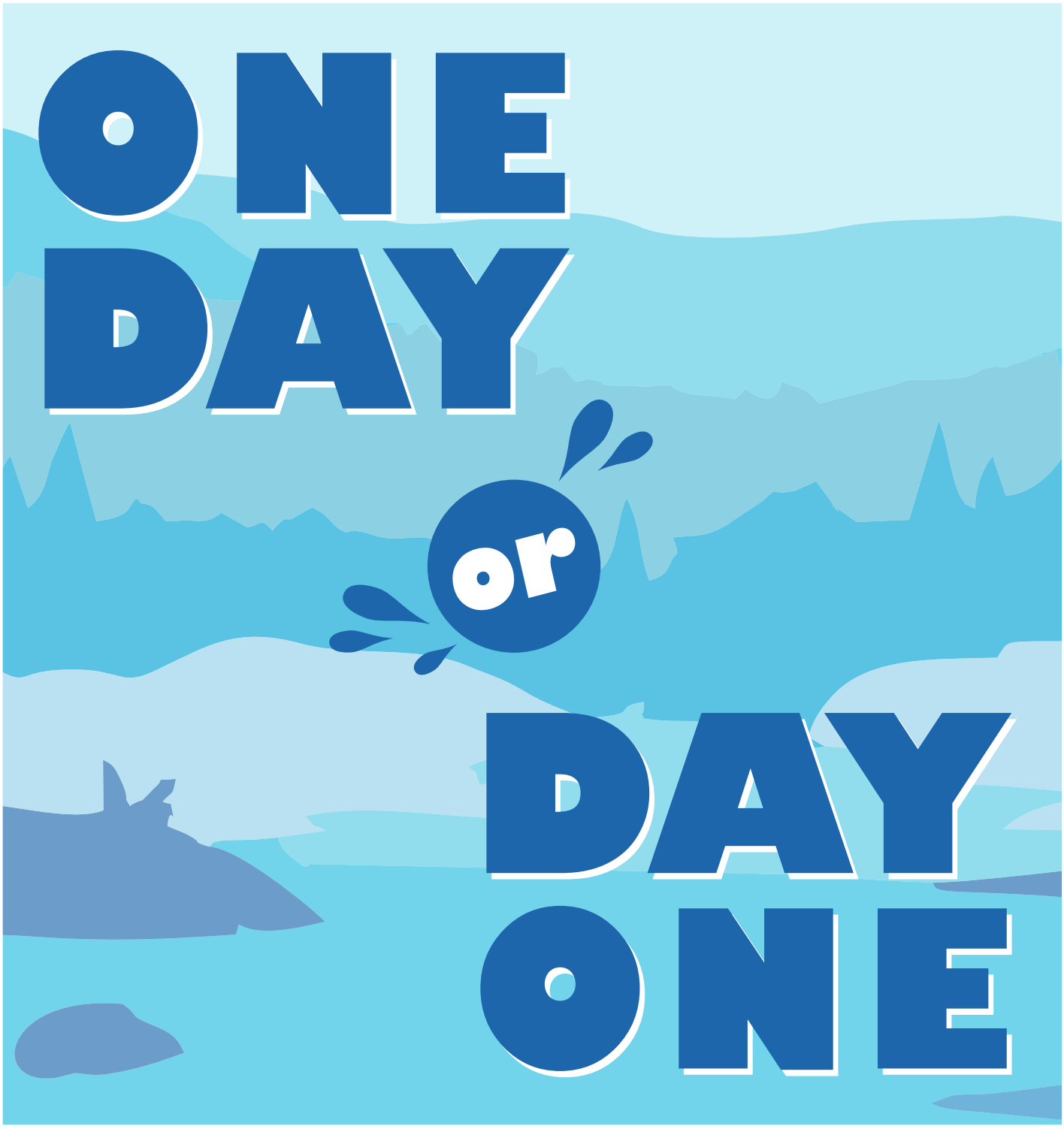
300 - 2% =

14. $\left(\dfrac{3}{5}+\dfrac{8}{7}+\dfrac{11}{9}+\dfrac{25}{8}\right) =$

15. $15^2 + 8^3 + 3^4 + 18^2 + 2.82^3 + 9.53^4 =$

16. $\frac{16}{(2/5)} + \frac{18}{(3/8)} + \frac{19}{(5/7)} + \frac{28}{(3/11)} =$

My Notes :



YOU DECIDE.

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You can LEARN soemthing NEW Everyday, if you LISTEN!

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IN THE END

WE ONLY REGRET THE CHANCES WE DIDN'T TAKE

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HEROS ARE MADE BY
THE PATH THEY CHOOSE
NOT THE POWER
THEY ARE GRACED WITH!

Chapter 2

TIME VALUE OF MONEY

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1.

Amount = Principle + Interest

Principle = Amount - Interest

Interest = Amount - Principle

2. Why is interest paid?

1. Time Value of Money
2. Opportunity Cost
3. Inflation
4. Liquidity Preference
5. Risk Factor

3.

Simple Interest =

Amount = P + Simple Interest

=

4.

Compound Interest =

Amount =

5. With Simple Interest

Amount Invested	Amount at the end of years						
	5	10	15	20	25	30	35
P	2P						
P	3P						

6. With Compound Interest

Amount Invested	Amount at the end of years					
	7	14	21	28	35	42
P	2P					
P	3P					
P	4P					

7. A = 50,00,000; r = 12% p.a.S.I; P = ?; n = 10 years

My Notes :

8. A = 50,50,000; r = 13.50% p.a.S.I; P = 20,00,000 ; n = ____ years

9. A = ?; r = 18% p.a.S.I; P = 25,000 ; n = 8 years 3 months

10. A sum of money doubles itself with compound interest in 10 years. How many times it will become after 40 years?

11. Find the future value of ₹ 50,000 after 25 years @ 22% p.a.C.I

12. Find present value of ₹ 20,00,000 receivable after 25 years if money is 18.50% effective.

13. A = ?; r = 14% p.a.C.Q; P = 20,00,000 ; n = 3 years 9 months

14. A = 80,00,000; r = 18.50% p.a.C.semiannually; P = ? ; n = 8 years 6 months

15.

Compounded	No. of conversion periods in a year
Annually	
Semi-annually	
Monthly	
Quarterly	
Weekly	
Daily	
Fortnightly	

16. P = 20,000; r = 20% p.q.c.w; n = 3 months; A = ?

My Notes :

17. A = 2,00,000; r = 18% p.a.C.Q; P = 80,000 ; n = _____ years

18. A = 20,00,000; r = _____% p.a.C.Q ; P = 5,00,000 ; n = 8 years

19.

1.01^{35} = _____

1.1025^{38} = _____

1.10285^{45} = _____

1.1826^{90} = _____

20.

$A = P (1+r)^n$

A = Amount

P =

r =

n =

21.

Discounting Factor =

Present Value = (Future Value x Discounting Factor)

How to find discounting factor on calculator?

22. Simple Annuity is a series of payment / receipts where

23. Effective rate of interest = $\left(1 + \frac{r}{n}\right)^{n} - 1$ where r =
n =

24.

Nominal Rate of Interest	Effective Rate of Interest
12% p.a.c.q	
14.50% p.a.c.m	
18% p.a.c.semiannually	
26.26% p.a.c.weekly	
22% p.a.c.monthly	

25.

Effective Rate of Interest	Nominal Rate of Interest
18%	_____% p.a.c.q
20%	____% p.a.c.monthly
28.56%	____% p.a.c. half yearly

My Notes :

26. 18.50% p.a.c.monthly is equivalent to _____ % p.a.c.q

27. 20.86% p.a.c.q is equivalent to _____ % p.a.c. half yearly.

28.

a. Future Value of annuity regular =

b. Future Value of annuity due =

29.

Annuity Regular ↓

Annuity Due / Immediate ↓

30. Present Value of Annuity Regular = (Periodical Amount x Annuity Factor)

31. Present Value of Annuity Due = (Periodical Amount x Annuity Factor) x (1+r)

32. Mr. A invested ₹ 500 at the end of each year for 30 years. Find amount to be received at the end of 30 years, if money is 16% effective.

33. A loan of ₹ 8,00,000 is to be repaid in 10 annual installments. Find amount of installment if interest rate is 12% p.a.

34. A person desires to create a sinking fund to be invested @12% p.a.c.l. by saving some amount at the end of each year for 30 years to buy house worth ₹ 30,00,000. Find amount to be saved at the end of each year.

35. Rahul invested ₹ 70,000 in a bank at the rate of 6.50% p.a.S.I. he received ₹ 85,925 at the end of term. Find out the period for which the sum was invested by Rahul.

My Notes :

36. Kapil deposited some amount in a bank for $7\frac{1}{2}$ years @ 6%p.a.S.I. Kapil received ₹ 1,01,500 at the end of term. Compute initial deposit of Kapil.

37. A sum of ₹ 46,875 was lent out at simple interest and at the end of 1 year and 8 months the total amount was ₹ 50,000. Find rate of interest p.a.

38. What sum of money will produce ₹ 28,600 as an interest in 3 years and 3 months @2.50% p.a.S.I.

39. The sum required to earn monthly interest of ₹ 1,200 at 18% p.a.S.I is :

40. Compute the compound interest on ₹ 40,000 for 1.5 years @10% p.a. compounded half yearly.

41. What rate of interest p.a. doubles the investment in 7 years at compounded interest?

42. In what time will ₹ 8,000 amount to ₹ 8,820 at 10% p.a. compounded half yearly?

43. A certain sum invested at 4% p.a. compounded semi-annually amounts to ₹ 78,030 at the end of one year. Find the sum.

44. The population of a town increases every year by 2%. The number of years by which the total increase in population be 40% is

a. 7 years b. 10 years c. 17 years (approx.) d. None

45. The difference between simple interest & compound interest on a certain sum of money invested for 3 years at 6% p.a. is ₹ 110.16. The principle is -

a. 3,000 b. 3,700 c. 12,000 d. 10,000 e. None

46. The compound interest on ₹ 40,000 at 10% p.a. for 3 years when interest is payable quarterly is -

47. Use calculator and find answers for the following questions :

$(1.0135)^{28}$ =

$(1.20635)^{48}$ =

$(1.10935)^{72}$ =

$(1.089123)^{66}$ =

48.

Present Value of Annuity Regular $= P.A \times \left[\frac{(1+r)^n - 1}{r}\right] \times \frac{1}{(1+r)^n}$

$= \frac{P.A}{r} \times \left[1 - \frac{1}{(1+r)^n}\right]$ $= \frac{P.A}{r} \times \left[1 - (1+r)^{-n}\right]$

49. What is perpetuity?

Perpetuity is an annuity in which the periodic payments or receipts begin on a fixed date and continue indefinitely or perpetually.

50. The present value of annuity of ₹ 3,000 for 15 years @4.50% p.a.c.i is

51. A loan of ₹ 10,000 is to be paid back in 30 installments. The amount of each installment to cover principle and 4% p.a.c.i. is

a. 587.87 b. 587 c. 587.30 d. None of these

52. A person invests ₹ 500 at the end of each year @10% p.a. The amount standing to his credit one year after he has made his yearly investment for 12th time is:

a. 11,761.36 b. 10,000 c. 12,000 d. None of these

53. A person bought a house paying ₹ 20,000 cash down & ₹ 4,000 at the end of each year for 25 years, at 5% p.a.c.i. The cash down price of house is :

a. ₹ 75,000 b. ₹ 76,000 c. ₹ 76,376 d. None of these

54. The difference between simple interest and compound interest at 5% p.a. for 4 years on ₹ 20,000 is _____

55. The compound interest on half yearly rests on ₹ 10,000, if rate for 1st and 2nd year being 6% and for third year being 9% p.a. is ₹ _____

a. 2,200 b. 2,287 c. 2,285 d. None of these

56. Vinod borrows ₹ 6 lakhs housing loan at 6% p.a. repayable in 20 annual equal installments commencing at the end of first year. How much annual payment is necessary.

a. ₹ 52,420 b. ₹ 52,400 c. ₹ 52,310 d. None of these

57. Raja aged 40 years wishes his wife Rani to have ₹ 40 lakhs at his death. If expectation of life is another 30 years & he starts making equal annual investments commencing now at 3% c.i.p.a. How much should he invest annually?

a. 88,448 b. 84,450 c. 84,449 d. 84,080

My Notes :

58. A TV can be purchased by paying ₹ 10,000 now and ₹ 20,000, ₹ 50,000, ₹ 90,000, ₹ 80,000 at the end of years 1,2,3,4 respectively. Find cash down price of TV if money is 12% effective.

a. ₹ 1,83,816 b. ₹ 1,82,618 c. ₹ 1,86,218 d. ₹ 1,62,861

59. Effective rate of 21.94% is equivalent to _____ % p.a.c.monthly

a. 21.94% b. 20% c. 20.66% d. 22.77%

60. Out of certain money $(1/3)^{rd}$ is invested at 3% , $(1/6)^{th}$ is invested at 6% and rest at 8% for 2 years. Simple Interest from all these investments is ₹ 600. The original sum is :

a. ₹ 3,500 b. ₹ 4,000 c. ₹ 5,000 d. ₹ 4,500

My Notes :

61. Population of a village is 10,000. If it increases at 10% p.a. What will be its population after 3 years?

a. 13,310 b. 14,220 c. 17,908 d. 13,000

62. On a certain sum simple interest at the end of 6.25 years become $(3/8)^{th}$ of sum. The rate of interest is _____

a. 7% b. 9% c. 5% d. 6%

63. The amount of certain sum of money with simple interest at certain rate of interest is ₹ 2,660 in 3 years and ₹ 3,100 in 5 years. The rate of interest is :

a. 12% b. 11% c. ₹ 13% d. 10%

My Notes :

64. At what rate of compound interest money will amount to 8 times in 20 years?

a. 12.75% b. 11.22% c. 10.96% d. None of these

65. At what rate of simple interest money will become 8 times in 20 years?

a. 35% b. 40% c. 30% d. None of these

66. In what time ₹ 1,00,000 will become ₹ 8,00,000, If rate of interest is 10% p.a.s.i

a. 77 years b. 7 years c. 70 years d. 17 years

67. A sum of money triples itself with compound interest in 9 years. How many times it will become after 81 years?

a. 27 times b. 6,561 times c. 81 times d. 19,683 times

My Notes :

68. A machine costs ₹ 5,20,000 with an estimated life of 25 years. A sinking fund is created to replace it by a new model at 25% higher cost after 25 years with a scrap value of realisation of ₹ 25,000. What amount should be set aside every year if money is 3.50% effective?

a. ₹ 16,000 b. ₹ 16,564 c. ₹ 16,046 d. ₹ 16,005

69. A sum of ₹ 80,000 invested in a bank @10% p.a.s.i. for 5 years. Find amount, simple interest.

Year	Opening Balance (₹)	Interest (₹)	Closing Balance (₹)
1			
2			
3			
4			
5			

Amount receivable at the end of 5 years =

Simple interest for 5 years =

My Notes :

70. Mr. A deposited ₹ 80,000 in a bank @10% p.a.c.i. for 5 years. Find amount receivable after 5 years and compound interest.

Year	Opening Balance (₹)	Interest (₹)	Closing Balance (₹)
1			
2			
3			
4			
5			

Amount receivable at the end of 5 years =

Compound Interest =

71. P = ₹ 1,00,000; r = 12% p.a.c.q; n = 2 years, A = ?

	Opening Balance (₹)	Interest (₹)	Closing Balance (₹)
Year 1 Q1			
Q2			
Q3			
Q4			
Year 2 Q1			
Q2			
Q3			
Q4			

Amount to be received after 2 years =

My Notes :

72. You require ₹ 32,00,000 at the end of 9 years from now. Find the amount you should keep aside at the end of every year, if money is 14% effective

a. ₹ 2,20,819 b. ₹ 3,00,000 c. ₹ 3,55,556 d. None of these

73. Simple interest on ₹ 25,00,000 for 8 years and 4 months @ 19.25% p.a.s.i is

74. A sum of ₹ 12,000 deposited at compound interest becomes double after 5 years. After 20 years it will become :

a. ₹ 1,44,000 b. ₹ 2,40,000 c. ₹ 1,92,000 d. None of these

75. A man deposits ₹ 2,000 @ 4% p.a. and ₹ 3,000 @ 14% p.a. Find average rate of return he is earning on whole sum?

a. 10% b. 5% c. 14% d. None of these

My Notes :

LIFE IS...

10%

WHAT HAPPENS TO US

& 90%

HOW YOU REACT TO IT !

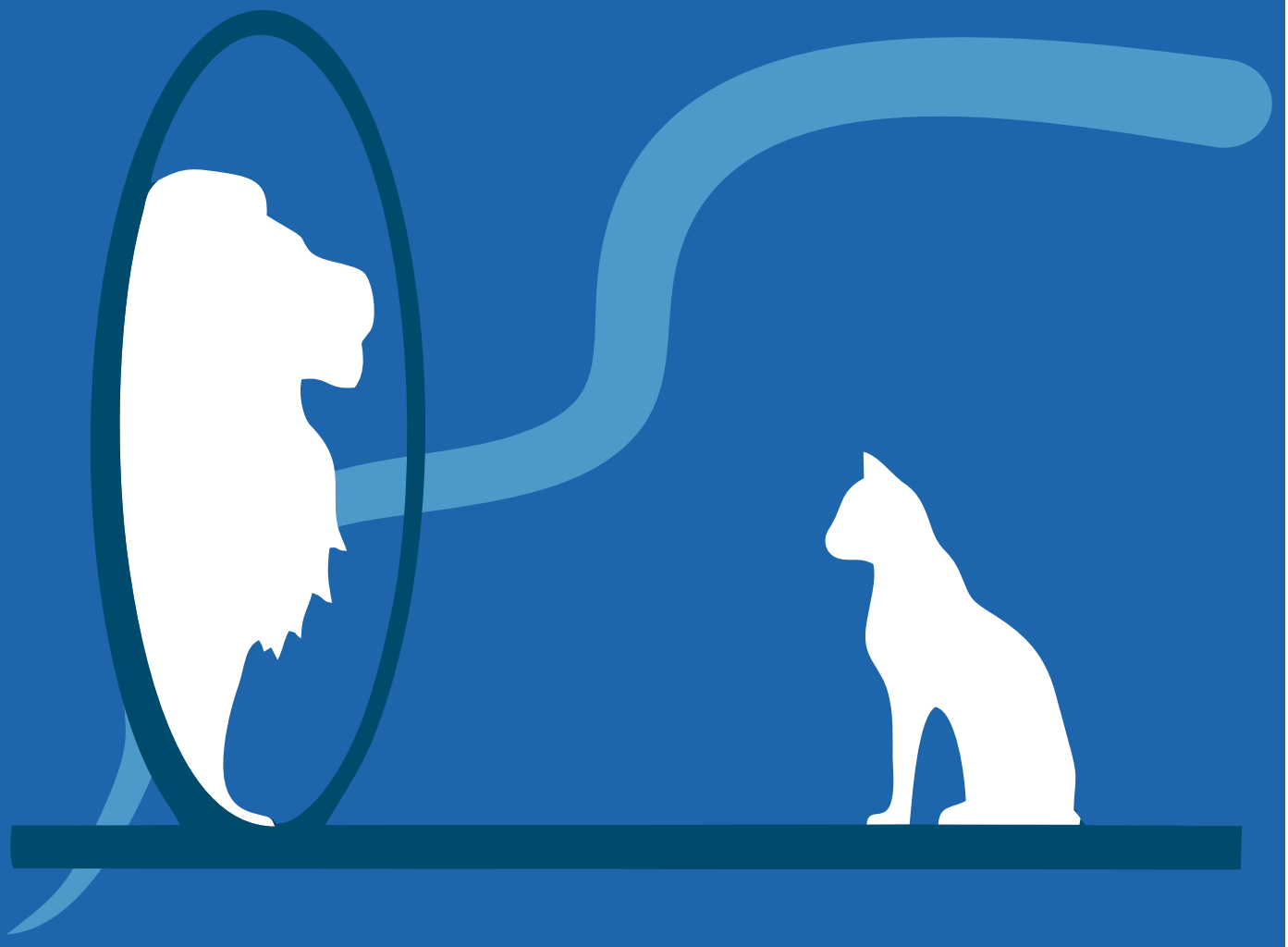
- CA VINOD REDDY -

MINDSET IS EVERYTHING

- CA VINOD REDDY -

MINDSET IS EVERYTHING

- CA VINOD REDDY -



Chapter 3

SEQUENCE & SERIES

CA VINOD REDDY

1.

Terms a, b, c, d, e, f, g are said to be in

AP, If

GP, If

HP, If

2.

Progression	AP/GP/HP/None of these
8, 16, 32, 64, 128	
80, 70, 60, 50, 40	
2, 8, 32, 128	
0.50, 0.25, 0.1666666, 0.125	
$\frac{1}{8}, \frac{1}{10}, \frac{1}{12}, \frac{1}{14}, \frac{1}{18}$	
100, 97, 94, 91	
4, 6, 9, 13.50	
10,80,150,220	
10,0,-10,-20,-30	

3.

For	t_n	S_n
AP		
GP		

4. 80, 87, 94, 101, ... Find t_{30}, t_{80},t_{125}, S_{45}, S_{100},S_{125}

5. 5, 10, 20, 40, ... Find t_{12}, t_{10}, S_{16}, S_{22}

6. 1. Sum of infinite terms of G.P. where r > 1 =
2. Sum of infinite terms of G.P. where 0< r < 1 =

7. 10 + 20 + 40 + 80 + ... ∞ terms = ?

8. 200 + 100 + 50 + 25 + ... ∞ terms = ?

9. For AP $t_5 = 80$, $t_{15} = 580$ Find a, d, t_{80}, t_{100}, S_{80}

10. For AP $t_3 = 15$, $S_3 = 30$
Find first term, common difference, S_{40}, S_{100}, t_{30}

My Notes :

11. For AP $t_n = (3n+5)$. Find S_n

12. For AP t_n = ?, if $S_n = (8n^2 - 3n)$ t_n = ?

13. For AP - Please Remember

1. If $S_m = S_n$, then S_{m+n} = zero
2. If $t_m = n$, and $t_n = m$, then t_{m+n} = zero
3. If $m \times t_m = n \times t_n$, then t_{m+n} = zero

14.

For 2 observations x,y

AM = GM = HM =

15.

For 2 observations relation between AM, GM, HM is

For any no. of observations relation between AM, GM, HM is

16. For 2 observations if GM = 10 and AM = 12, HM = ?

17. Insert 2 A.means between -200 and 1600

18. Insert 3 A.means between 5000 and 8520.

19. Insert one A.means between 100 and 250.

20. Insert 5 G.means between 500 and 8,000.

21.

a. Sum of first 'n' natural numbers =

b. Sum of first 'n' odd numbers =

c. Sum of squares of first 'n' natural numbers =

d. Sum of cubes of first 'n' natural numbers =

e. Sum of first 'n' even numbers =

22. $19^2 + 20^2 + 21^2 + 22^2 + \ldots\ldots\ldots\ldots + 105^2$

23. $28^3 + 29^3 + 30^3 + \ldots\ldots\ldots\ldots + 62^3$

24. $1 + 3 + 5 + 7 + \ldots\ldots\ldots\ldots\ldots\ldots + 989 = ?$

25. $4484 + 4488 + 4492 + \ldots\ldots\ldots\ldots + 16880 = ?$

26. n^{th} term of sequence 1, 3, 5, 7, ... is

27. $\sum_{i=4}^{i=7} \sqrt{2i-1}$ =

28. If $S_n = 2n^2 + 8n$, first 3 terms of AP are :

29. For AP $t_1 = -4$, $t_n = 146$, $S_n = 7171$. The number of terms is :

30. $3\frac{1}{2} + 7 + 10\frac{1}{2} + 14 + \ldots\ldots\ldots$ Find S_{17}

31. 4 A.means between -2 & 23 are

32. Find x such that 8x + 4, 6x - 2, 2x + 7, are in A.P

33. Find k such that (10k+8), (18k-19), (22k-81) are in A.P.

34. 4 A.means between -20 and 880 are

My Notes :

35. Insert 3 G.means between $\frac{1}{9}$ and 9.

36. 3 + 33 + 333 + ... n terms = ?

37. 6, 12, 24, 48, ... Find t_{10}, S_{12}

38. For GP $t_2 = 24$, $t_5 = 81$ then find common ratio.

39. Sum of first 20 terms of G.P. is equal to 244 times of sum of first 10 terms of G.P. then common ratio = ?

40. 1 + 2 + 4 + 8 + ... = 8191.
How many terms are there in the above G.P.?

41. 4 G.Means between 4 and 972 are :

42. For G.P., Find $t_4 = x$, $t_{10} = y$, $t_{16} = z$ then $y^2 = xz$. True / False

43. Find sum of all odd numbers divisible by 9 between 5,000 and 15,000.

44. Find sum of all numbers divisible by 7 between 800 and 8000.

45. $1.03 + 1.03^2 + 1.03^3 + \ldots\ldots\ldots\ldots\ldots$ Find S_{11}

46. The n^{th} element of the sequence -1, 2, -4, 8 ..... is

a. $(-1)^n \times 2^{n-1}$ b. 2^{n-1} c. 2^n d. None of these

My Notes :

47. $\sum_{i=4}^{7}\sqrt{2i-1}$ can be written as :

a. $\sqrt{7}+\sqrt{9}+\sqrt{11}+\sqrt{13}$

b. $2\sqrt{7}+2\sqrt{9}+2\sqrt{11}+2\sqrt{13}$

c. $\sqrt{7+9+11+13}$

d. None of these

48. Which term of AP -1, -3, -5, ...is -39

a. 21^{st} b. 20^{th} c. 19^{th} d. None of these

49. For AP $t_m = n$, $t_n = m$ then t_r = ?

a. m+n+r b. m+n-2r c. (m+n+r)/2 d. m+n-r

50. $10 + 9\frac{2}{3} + 9\frac{1}{3} + 9 + 8\frac{2}{3} + \ldots$.....Find S_{30}

a. 155 b. 551 c. 1010 d. 305

51. 2 A.means between terms -6 and 14 are

a. 2/3, 1/3 b. 2/3, 22/3 c. -2/3, -22/3 d. None of these

52. The number of numbers between 74 and 25,556 divisible by 5 are:

a. 5090 b. 5097 c. 5095 d. None of these

53. The 4 arithmetic means between -2 and 23 are :

a. 3, 13, 8, 18 b. 18, 3, 8, 13 c. 3, 8, 13, 18 d. None of these

54. $t_1 = -4$ and $t_n = 146$, $S_n = 7171$. Find n

a. 101 b. 100 c. 99 d. None of these

My Notes :

55. $x^2, x, 1 \ldots\ldots\ldots t_{31} = ?$

a. x^{28} b. $1/x$ c. $1/x^{28}$ d. $1/x^{35}$

56. For G.P. $t_2 = 24$, $t_5 = 81$. The series is,

a. 16, 36, 24, 54..... b. 24, 36, 53..... c. 16, 24, 36, 54..... d. None of these

57. The sum of 3 numbers in G.P. is 39 and their product is 729. The numbers are :

a. 3, 9, 27 b. 27, 9, 3 c. Both (a) & (b) d. None of these

58. In a G.P, product of first 3 terms is 27/8. The middle term is

a. 2/3 b. 3/2 c. 9/8 d. None of these

My Notes :

59. If you have 1 paise today, 2 paise next day, 4 paise succeeding day and so on. Total saving in 2 weeks will be :

a. ₹ 163 b. ₹ 183 c. ₹ 163.83 d. None of these

60. Sum of first 20 terms of G.P. is 244 times of sum of its first ten terms. The common ratio is :

a. $\sqrt{3}$ b. 3 c. $1/\sqrt{3}$ d. None of these

61. The sum of the series 1 + 2 + 4 + 8 + ... + n terms is

a. 2^n-1 b. 2n - 1 c. $(1/2^n) - 1$ d. None of these

62. The number of terms to be taken so that 1 + 2 + 4 + 8 + ... will be 8191 is :

a. 10 b. 13 c. 12 d. None of these

My Notes :

63. Four Geometric means between 4 and 972 are

a. 12,36,108,324 b. 12,24,108,320 c. 10,36,108,320 d. None of these

64. $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots\ldots \infty$ terms = ?

a. 0.75 b. 1.50 c. ∞ d. None of these

65. If p, q, r are in AP and x, y, z are in GP then $x^{q-r} \times y^{r-p} \times z^{p-q}$ =?

a. zero b. 1 c. -1 d. None of these

66. For G.P, $t_4 = x$, $t_{10} = y$, $t_{16} = z$. Then

a. $x^2 = y.z$ b. $z^2 = x.y$ c. $y^2 = x.z$ d. None of these

My Notes :

67. A person saved ₹ 16,500 in 10 years. In each year after first year he saved ₹ 100 more than he did in preceeding year. The amount of money he saved in first year was

a. ₹ 1,000 b. ₹ 1,500 c. ₹ 1,200 d. None of these

68. Sum of first 30 even natural numbers is :

a. 930 b. 465 c. 900 d. None of these

69. t_n for AP is (8n + 3). Find S_n

a. $7n^2+7n$ b. $7n^2+4n$ c. $4n^2+7n$ d. $2n^2+7n$

70. $101^3 + 102^3 + 103^3 + \ldots\ldots\ldots\ldots\ldots + 123^3 = ?$

a. 3,23,11,450 b. 3,26,53,376 c.3,15,45,295 d. None

My Notes :

71. For A.P $t_9 = 40$ and $t_{40} = 9$ then $t_{49} = ?$

a. 49 b. ₹ -98 c. zero d. None of these

72. If Loga, Logb, Logc are in AP, then

a. a, b, c are in G.P b. a^2, b^2, c^2 are in G.P c. Both of these d. None of these

73. For 2 positive observations G.M. is G.M of AM & HM

a. True b. False

74. For AP First term = common difference then ratio of m^{th} term to n^{th} term is -

a. m:n b. n:m c. $m^2:n^2$ d. None

My Notes :

75. $a^{1/x} = b^{1/y} = c^{1/z}$ and a, b, c are in G.P, then x, y , z are in

a. A.P b. G.P c. Both d. H.P

76. $x = 1 + \frac{1}{3} + \frac{1}{3^2} + \ldots\ldots\infty$ terms, $y = 1 + \frac{1}{4} + \frac{1}{4^2} + \ldots\ldots\infty$ terms. Find (x·y).

a. 2 b. 1 c. 8/9 d. 1/2

77. For AP if $t_7 : t_{10} = 5:7$, then $t_8 : t_{11} = ?$

a. 13:16 b. 17:23 c. 14:17 d. 15:19

78. If G is GM of a, b then, $\frac{1}{G^2 - a^2} \cdot + \frac{1}{G^2 - b^2} \cdot = ?$

a. G^2 b. $3G^2$ c. $1/G^2$ d. $2/G^2$

My Notes :

79. Find the product of $243 \times 243^{1/6} \times 243^{1/36} \times \ldots\ldots\ldots$

a. 1024 b. 27 c. 729 d. 246

80. GM of $P, P^2, P^3, P^4, \ldots\ldots\ldots P^n$ will be

a. P^{n+1} b. $P^{(n+1)/2}$ c. $P^{n(n+1)/2}$ d. None of these

81. Find the numbers whose AM is 12.50 and GM is 10 :

a. 20,5 b. 10,5 c. 5,4 d. None of these

82. t_5 of GP = $3^{1/3}$ then product of the first 9 terms of GP is :

a. 8 b. 27 c. 243 d. 9

83. For AP $t_3 + t_9 = 8$. Find S_{11} for AP

a. 44 b. 22 c. 19 d. 11

84. t_8 for AP is 15 then S_{15} = ?

a. 15 b. 0 c. 225 d. 225/2

85. Find first term of GP if second term is 2 and sum of infinite terms is 8.

a. 6 b. 3 c. 4 d. 1

86. If sum of 4th term and 12th term of AP is 8, what is the sum of first 15 terms?

a. 60 b. 120 c. 110 d. 150

87. In GP, $t_6 = 729$; $r = 3$, First term = ?

a. 2 b. 3 c. 4 d. 7

88. For AP $S_{13} = 143$, $t_3 = 5$, find first term.

a. 4 b. 7 c. 9 d. 2

89. If GM of a, b, c, d is 3 then GM of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ is "

a. 1/3 b. 3 c. 81 d. 1/81

90. Find common difference of AP, if a = 200 and sum of first 6 terms exceeds twice the sum of first 4 terms by 50

a. -10 b. -15 c. 150 d. None of these

91. 59 + 63 + 67 + 71 + ... + 107 = ?

a. 972 b. 1079 c. 1083 d. None of these

92. If one AM 'A' and 2 G. means G_1 & G_2 are inserted between any 2 numbers then $(G_1^3+G_2^3)$ = ?

a. $2AG_1G_2$ b. $2G_1G_2$ c. $2AG_1$ d. 2A

93. If a, b, c are in G.P. a, x, b and b, y, c both are in A.P, then (a/x) + (c/y) = ?

a. 1 b. 0 c. 2 d. None of these

94. For AP $(t_7 / t_3) = (12/5)$. Find (t_{13}/t_4) =?

a. 8:5 b. 9:4 c. 7:3 d. 10:3

95. 4^{th} term of AP is equal to 3 times of first term and 7^{th} term exceeds twice of third term by 1. Find first term.

a. 3 b. 5 c. 7 d. 9

96. $t_n = 1/243$. For $3, \sqrt{3}, 1$ ..... then n = ?

a. 12 b. 13 c. 14 d. 15

97. For GP $S_n = 4095$, $r = 2$, $t_n = 2048$. Find n

a. 10 b. 11 c. 12 d. 15

My Notes :

98. Which term of AP 64, 60, 56, 52, ... is zero

a. 18^{th} b. 17^{th} c. 14^{th} d. 15^{th}

99. Sum of all 2 digit natural numbers is

a. 4955 b. 4890 c. 3776 d. None of these

100. 1, y, 9 are in A.P, then value of y is

a. 3 b. -3 c. Either (a) or (b) d. None of these

101. a, b, c are in AP as well as GP, then

a. a = b = c b. a ≠ b = c c. a ≠ b ≠ c d. Wrong qs.

My Notes :

102. a,b,c,d,e,f are in AP then (e-c) = ?

a. 2 (c-a) b. 2 (f-d) c. 2(d-c) d. (d-c)

103. The sum of first '2n' terms of AP 2, 5, 8 ..... is equal to sum of first 'n' terms of AP 57, 59, 61, ... then n = ?

a. 10 b. 12 c. 11 d. 13

104. If $a^x = b^y = c^z$ and x, y, z are in GP then loga, logb, logc are in

a. A.P b. G.P c. Both d. None of these

105. (4x+5), (5x+7), (8x-1) are in A.P. then x = ?

a. 5 b. 6 c. 7 d. 4

106. 3 numbers are in G.P. If we double the middle term, we get an A.P. then common ratio of G.P. is equal to

a. $2 \pm \sqrt{3}$ b. $3 \pm \sqrt{2}$ c. $3 \pm \sqrt{5}$ d. $5 \pm \sqrt{3}$

107. $2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots\ldots = ?$

a. 17/8 b. 9/2 c. 7/2 d. 4

108. In AP a,b,c,d,e,f,g,h common difference = k; then in A.P. a,c,e,g common diff. = ?

a. 2k b. k^2 c. k d. None of these

109. In G.P. a,b,c,d,e,f,g,h common ratio = m; then in G.P. a,c,e,g common ratio = ?

a. m b. 2m c. m^2 d. None of these

My Notes :

110. Shall we stop here for the day?

a. Yes b. No

111. 8,8,8,8,8 are in

a. A.P b. G.P c. H.P d. All of these

112. $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \frac{1}{12}$ are in

a. A.P b. G.P c. H.P d. All of these

113. $\frac{1}{8}, \frac{1}{m}, \frac{1}{18}$ are in H.P. then m = ?

a. 1/13 b. 13 c. 1/12 d. 144

114. 3 , $\sqrt{m}$, 10 are in G.P.; then m = ?

a. $\sqrt{30}$ b. 30 c. 13 d. 13/3

115. If a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q are in G.P with r as common ratio; then a,d,g,j,m,p are in GP. with common ratio = ?

a. r b. r^2 c. r^3 d. None of these

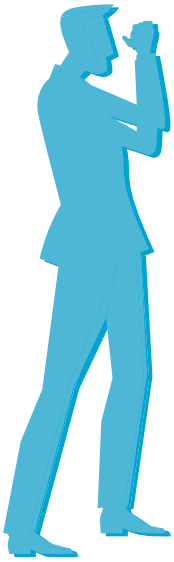
DON'T CHASE PEOPLE

CHASE

" DREAMS "

- CA VINOD REDDY -

AND STILL RISE

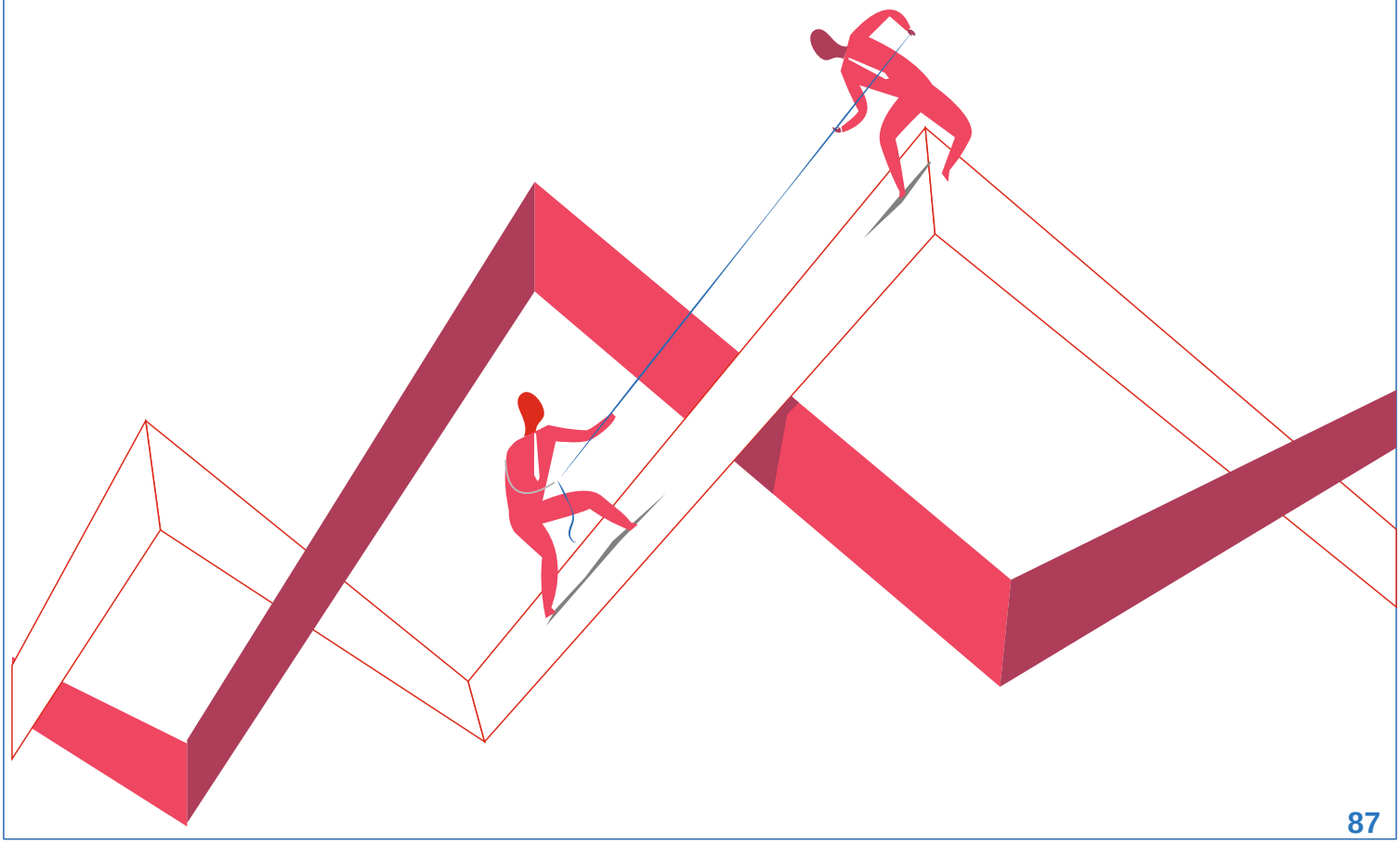


- CA VINOD REDDY -

Chapter 4

INEQUALITIES & EQUATIONS

CA VINOD REDDY



1.

Locations	Points	Inequalities / Equations
1st Quadrant		
2nd Quadrant		
3rd Quadrant		
4th Quadrant		
X - Axis		
Y - Axis		
Origin		

2. The standard format of a linear equation is :

3. Graphical Presentation of a straight line is known as

4. Line is a set / collection of

5. Slope of the line $ax + by + c = 0$ is

6.

Equation of line	Slope of Line
8x + 3y = 93	
3x - 11y = 51	
-33x -16 y = -25	
3x = 83	
8y = 65	
px - qy = 80	
2x + 6063y = 81	
y = 8x + 13	
y = -15x + 65	

7.

Equation of X-axis is : _____

Equation of Y-axis is : _____

Equation of || line to X-axis is : _____

Equation of || line to Y-axis is : _____

Slope of X-axis and all the lines || to X-axis is : _____

Slope of Y-axis and all the lines || to Y-axis is : _____

8. Equation of the line passing through points (x_1,y_1) and (x_2,y_2) is :

9. Slope of the line passing through points (x_1,y_1) and (x_2,y_2) is :

10. On solving 2 linear equations simultaneously if we get x=p and y=q, then

11.

Equation	Number of roots
Linear	
Quadratic	
Cubic	

12. $\frac{x+4}{4} + \frac{x-5}{3} = 11;$ $x = ?$

13. $\frac{y+11}{6} - \frac{y+1}{9} = \frac{y+7}{4}$ then $y = ?$

14. $\frac{12x+1}{4} = \frac{15x-1}{5} + \frac{2x-5}{3x-1}$; then $x = ?$

15. $\frac{x+24}{5} = 4 + \frac{x}{4}$; then $x = ?$

16. Find solution for $3x + 4y = 7$, $4x - y = 3$

17. $x + 5y = 36$, $\frac{x+y}{x-y} = \frac{5}{3}$; then (x,y) = ?

18. $\frac{3}{x+y} + \frac{2}{x-y} = 3$ & $\frac{2}{x+y} + \frac{3}{x-y} = 3\frac{2}{3}$; then (x,y) = ?

19. Monthly income of 2 persons is in the ratio of 4:5 and their monthly exp. are in the ratio of 7:9. If each saves ₹ 50 p.m. Find their monthly incomes.

20. Standard format of a quadratic equation is :

21. Find the roots of $x^2 - 9x + 20 = 0$

22.

First root of quadratic equation =

2nd root of quadratic equation =

Sum of roots =

Product of roots =

23. Find roots of quadratic equation $3x^2 - 7x - 20 = 0$. Also find sum and product of roots.

24.

Quadratic Equations	Sum of roots	Product of roots
$3x^2 + 2x + 11 = 0$		
$5x^2 - 19x - 13 = 0$		
$2kx^2 - 13px + 8p - 19 = 0$		
$8x^2 - x - 63k + 25 = 0$		
$2x^2 = 25$		
$8x^2 - 13x = 0$		

25.

$(a+b)^2 =$

$(a-b)^2 =$

$(a^2+b^2) =$

$(a+b)^3 =$

$(a-b)^3 =$

$(a^3+b^3) =$

$(a^2-b^2) =$

$(a+b+c)^2 =$

$a^3+b^3 =$

$(a-b)^2 =$

26. If α & β are roots of the quadratic equation $3x^2 + 7x + 12 = 0$, then

$\alpha\beta =$

$\alpha+\beta =$

$\alpha^2+\beta^2 =$

$\alpha^3+\beta^3 =$

$(\alpha-\beta)^2 =$

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha} =$

$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} =$

$\alpha^2\beta + \beta^2\alpha =$

27.

If $b^2 - 4ac =$	Nature of roots
zero	
Negative	
Positive (perfect square)	
Positive (not a perfect square)	

28.

Value of $b^2 - 4ac =$	Nature of roots
28	
25	
-100	
0	
35	
64	
729	
-35	
-0	

29.

If roots of quadratic equation are	then
Equal	
Equal but opposite in sign	
Reciprocals of each other	

30. If α & β are roots of the quadratic equation $x^2 + 7x + 12 = 0$, then quadratic equation whose roots are $(\alpha^2 + \beta^2)$ and $(\alpha - \beta)^2$ is

31. If α,β are roots of the Qequation $2x^2 - 4x - 1 = 0$ then find values of

$\alpha+\beta =$

$\alpha\beta =$

$\alpha^2+\beta^2 =$

$\alpha^3+\beta^3 =$

$(\alpha-\beta)^2 =$

$\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} =$

$\frac{\alpha}{\beta} + \frac{\beta}{\alpha} =$

32. Intercept form of Equation of Line is -

33. Length of segment drawn between points (x_1,y_1) and (x_2, y_2) is

34.

If m_1 is slope of one line and m_2 is slope of other lines then lines are said to be

|| to each other if $\perp$ to each other, if Oblique, if

35. The standard format of a quadratic equation is $ax^2 + bx + c = 0$, where $a \neq 0$ dividing by 'a' on both sides

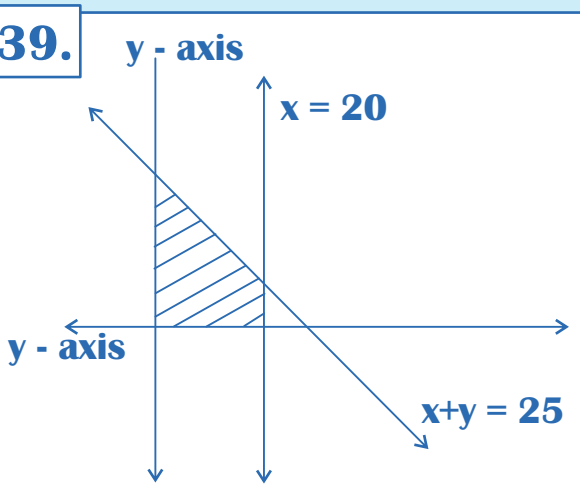
36. Find quadratic equation whose roots are 5, 8.

37.

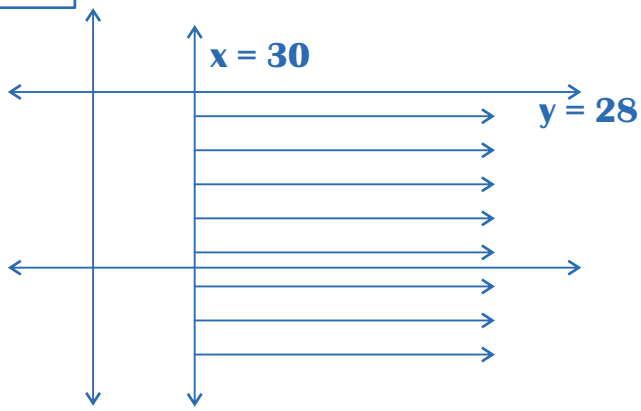
equation	Quadratic Equation
8, 11	
-19, 16	
2, 20	
3/8, 5/8	
2/7, 5/2	
$(5+\sqrt{3}), (5-\sqrt{3})$	
$(8+\sqrt{10}), (8-\sqrt{10})$	

38.

For	Sum of roots	Product of roots
Quadratic Equation		
Cubic Equation		

39. 

Inequalities representing shaded area are :

40. 

Inequalities representing shaded area are :

41. Sum of 2 numbers is 52 and their difference is 2. The numbers are :

a. 17, 15 b. 12, 10 c. 27, 25 d. None of these

42. Diagonal of a rectangle is 5 cms and one of the sides is 4 cms. Its area is ____ sq.cms

a. 20 b. 10 c. 12 d. None of these

43. 4^{th} part of a number exceeds sixth part by 4. The number is :

a. 84 b. 44 c. 48 d. None of these

44. Ten years ago, age of father was 4 times of his son's age. Ten years hence age of the father will be twice that of his son. The present ages of father, son are :

a. 50,20 b. 60,20 c. 55,25 d. None of these

45. The number of which the half is greater than $(1/5)^{th}$ of the number by 15. The number is.

a. 50 b. 40 c. 80 d. None of these

46. $1.5x + 2.4y = 1.8$ and $2.5(x + 1) = 7y$ have solution as :

a. 0.50,0.40 b. 0.40, 0.50 c. 1/2,1/5 d. None of these

47. A 2 digit number is 5 times its sum of digits. If 9 is added digits are reversed. Find the number :

a. 54 b. 53 c. 45 d. 55

My Notes :

48. Wages of 8 men and 6 boys amount to ₹ 33. If 4 men earn ₹ 4.50 more than 5 boys. Determine wages of each man and boy.

a. ₹ 1.50, ₹ 3 b. ₹ 3, ₹ 1.50 c. ₹ 2.50, ₹ 2 d. ₹ 2, ₹ 2.50

49. Of 2 numbers $(1/5)^{th}$ of the greater number is equal to $(1/3)^{rd}$ of the smaller & their sum is 16. The numbers are :

a. 6,10 b. 9,7 c. 12,4 d. 11,5

50. y is older than x by 7 years. 15 years back x's age was $(3/4)^{th}$ of y's age. The present ages are :

a. 36,43 b. 50,43 c. 43,50 d. 40,47

51. 2 numbers are such that twice the greater number exceeds twice the smaller number by 18, & $(1/3)^{rd}$ of smaller number & $(1/5)^{th}$ of greater number are together 21. The numbers are

a. 36,45 b. 45,36 c. 50,41 d. 55,46

My Notes :

52.

Quadratic Equations	Value of (b^2-4ac)	Nature of roots
$x^2 - 8x + 16 = 0$		
$3x^2 - 8x + 4 = 0$		
$5x^2 - 4x + 2 = 0$		
$2x^2 - 6x - 3 = 0$		

53. If α,β are roots of the quadratic equation $2x^2-4x-1=0$. Find the value of $\frac{\alpha}{\beta}^2 + \frac{\beta}{\alpha}^2$

54. $4^x - 3 \times 2^{(x+2)} + 32 = 0$; then x = ?

a. 2 b. 3 c. 2 or 3 d. None of these

55. $2^{(x-2)} + 2^{(3-x)} = 3$; then x = ?

a. 2 b. 3 c. 2 or 3 d. None of these

56. Find the quadratic equation whose one root is $(8+\sqrt{7})$

57. If one root of $5x^2+13x+p=0$ be reciprocal of other; then value of p is

a. -5 b. 5 c. 1/5 d. -1/5

58. If p,q are roots of $x^2+2x+1=0$; then find (p^3+q^3)

a. 2 b. -2 c. 4 d. None of these

59. If one root of the equation is $x^2 - 8x + m = 0$; exceeds the other by 4. m = ?

a. 10 b. 11 c. 9 d. 12

60. Five times of a positive whole number is 3 less than twice the square of the number. The number is :

a. 3 b. 4 c. -3 d. 2

61. Two squares have sides p cms and (p+5) cms respectively. The sum of their squares is 625 sq. cms. The sides of the squares are :

a. 10 cms, 30 cms b. 12 cms, 25 cms

c. 15 cms, 20 cms d. None of these

62. $x + y = 50$ and $(1/x) + (1/y) = (1/12)$; then x,y are

a. 24, 26 b. 28, 22 c. 27, 23 d. 20, 30

63. The hypotenuse of a right angled triangle is 20 cms. The diff. between other 2 sides is 4 cms. The sides are :

a. 11 cms, 15 cms b. 12 cms, 16 cms

c. 20 cms, 24 cms d. None of these

64. The sum of 2 numbers is 45 and mean proportional between them is 18. The numbers are

a. 15,30 b. 32,13 c. 36,9 d. 25,20

65. The sum of 2 irrational numbers multiplied by the larger one is 70 and their diff is multiplied by smaller one is 12; 2 numbers are :

a. $3\sqrt{2}, 2\sqrt{3}$ b. $5\sqrt{2}, 3\sqrt{5}$ c. $2\sqrt{2}, 5\sqrt{2}$ d. None of these

My Notes :

66. The solution of a cubic equation $x^3 - 6x^2 + 11x - 6 = 0$ is given by

a. (-1,1,-2) b. (1, 2, 3) c. (-2,2,3) d. (0,4,-5)

67. The cubic equation $x^3 + 2x^2 - x - 2 = 0$ has 3 roots namely.

a. 1, -1, 2 b. (-1, 1, -2) c. (-1, 2, -2) d. None of these

68. The roots of cubic equation $x^3 + 7x^2 - 21x - 27 = 0$ are :

a. (-3,-9,-1) b. (3,-9,-1) c. (3,9,1) d. (-3,9,1)

69. If $4x^3 + 8x^2 - x - 2 = 0$; then $(2x+3) = ?$

a. 4,-1,2 b. -4,2,1 c. 2,-4,-1 d. None of these

70. $x, y \geq 0$ is known as _____ will restrict the feasible region in _____ quadrant.

My Notes :

71. Find feasible area for $(3x-y) \leq 6$

72. Find feasible area for $2x + 9y \leq 54$

73. Find feasible area for $3x - 2y \geq 30$

74. Find common feasible area for $x+2y \leq 100$; $x,y \geq 0$

My Notes :

75. Find common feasible area for $x+y \leq 50$, $x \leq 20$, $x,y \geq 0$

76.

$8x+3y = 24$
$x=81$
$3x-5y=63$
$8y = \left(\frac{-81}{5}\right)$
$3x-22y=635$

} Linear Equations Or Linear Equalities

$3x+2y \leq 50$
$8x-y \geq 60$
$x+y < 90$
$2x-y > 65$
$y > 90$
$x < 35$
$x \leq 35$

} Linear Inequations Or Linear Inequalities

77. Point of intersection of lines $5x+3y = 150$ and $3x+5y= 350$ lie in _____ quadrant,

a. 1st b. 2nd c. 3rd d. 4th

78. One of the point on line $2x + 5y = 100$ is

a. (20,30) b. (60,-4) c. (8,12) d. All of these

79. Point of intersection of lines $(3x+5y=120)$ and $(3x+2y=10)$ is

a. (-30,90) b. (-90,30) c. (90,-30) d. None of these

80. The point (0,60), (0,90), (0,-80), (0,-66) lie on

a. X-Axis b. Y-axis c. Origin d. Can't say

81. The inequalities representing second quadrant are :

a. $x>0, y>0$ b. $x<0, y>0$ c. Both d. None

82. The line y = 80 is parallel to

a. X-Axis b. Y-axis c. Origin d. Can't say

83. In number 78,534 place value of 8 is

a. 8 b. 8,000 c. 800 d. 80,000

84. The lines (2x+3y) = 60 and (10x+15y) = 238 have

a. No solution b. Unique solution c. 2 solution d. None of these

85. Factors of quadratic equation $(x^2-5x-6) = 0$ are

a. (x-3) (x-2) b. (x+6) (x-1) c. (x-3) (x+2) d. (x-6) (x+1)

86. Formulae to remember -

$(a+b)^2 =$

$(a+b)^3 =$

$(a-b)^2 =$

$(a-b)^3 =$

$(a^2-b^2) =$

$(a^3-b^3) =$

$(a^3+b^3) =$

$(a+b+c)^2 =$

$(a-b+c)^2 =$

$(a-b-c)^2 =$

$(a^2+b^2) =$

$(a-b)^2 =$

$(a+b)^2 + (a-b)^2 =$

87. $(1/5)^{th}$ of one half of a number is 11. The number is

a. 11 b. 55 c. 22 d. 110

88. Find the quadratic equation whose roots are (-2/3) and (5/17)

a. $15x^2+19x+10=0$ b. $15x^2+19x-10=0$ c. $51x^2+19x-10=0$ d. None of these

My Notes :

89. If p,q are roots of quadratic equation $10x^2-x-7=0$. Find the quadratic equation whose roots are (p+q), pq

a. $10x^2+6x-7=0$ b. $100x^2+60x+7=0$ c. $100x^2+60x-7=0$ d. None of these

90. If p,q are roots of quadratic equation $3x^2-19x-1=0$. Find the quadratic equation whose roots are (p/q), (q/p)

a. $3x^2-19x-1=0$ b. $3x^2+367x+3=0$ c. $3x^2+367x-3=0$ d. None of these

91. Equation of Y-Axis is

a. x=0 b. y=0 c. x.y=0 d. x/y=0

92. Cubic Equation whose roots are p, q, r is

My Notes :

93.

Roots of quadratic equation	Factors of Quadratic Equation
3, -2	
-8, -9	
	(2x + 3) (7x - 8)
$\frac{3}{8}, \frac{-9}{17}$	
	(7x + 10) (8x - 11)
$\frac{-2}{3}, \frac{8}{13}$	
1, -1	
$1, \frac{-8}{27}$	
	(x - 33) (8x + 31)
$\frac{1}{2}, \frac{-1}{2}$	

94. Roots of quadratic eq" $3kx^2 - 2x^2 + 19x - 3k + 63 = 0$ are reciprocals of each other. Find k.

a. 7/13 b. 65/6 c. 21 d. None of these

95. Roots of quadratic eq" $3x^2 - 2kx + 21x - 35 = 0$ are equal but opposite in sign. Find k.

a. 21/2 b. 35/3 c. 2/21 d. None of these

96. Y = Total cost, x = No. of units produced. Fixed Cost = ₹ 3,80,000 & Variable cost p.u. = ₹ 10; then

a. y = 10x - 3,80,000
b. y = 3,80,000 + 10x
c. y = 3,80,000x + 10
d. None of these

97. If p,q are roots of quadratic equation $x^2+2x+1=0$ then quadratic equation whose roots are (1/p), (1/q) is :

a. $x^2-2x-1=0$ b. $x^2+2x+1=0$ c. $x^2-2x+1=0$ d. None of these

98. $a^2+b^2 = 45$ and $ab = 18$; then $(1/a) + (1/b) = ?$

a. 1/3 b. 2/3 c. 1/2 d. None of these

99. $\left(\frac{0.7214 \times 20.37}{69.80}\right)^{1/3} = ?$

a. 1.5948 b. 0.5949 c. 0.2348 d. None of these

100. Find average of first 30 multiples of 5

a. 77.50 b. 87.50 c. 75 d. None of these

101. A cricketer scored 180, 258 runs in first & second test respectively. How many runs he should score in third test so that his average score of 3 tests would be 230.

a. 219 b. 242 c. 252 d. 334

102. A number is added to another number, the total becomes 150% of second number. What is the ratio of first and second number?

a. 1:2 b. 1:3 c. 2:3 d. None of these

103. Calculate the number such that it is equal to 3 times its difference from 56.

a. 14 b. 28 c. 42 d. 178

104. $kx + 2y = 5$ and $3x + y = 21$ have unique solution if :

a. $k = 6$ b. $k \neq 6$ c. $k = \pm 6$ d. None of these

105. For what value of k, the equation $9x + 4y = 9$ and $7x + ky = 5$ has no solution.

a. 28/9 b. 36/7 c. 23/9 d. 7

106. If $b^2 > 4ac$ then roots of quadratic equation are

a. imaginary b. Real, unequal c. Real, Rational d. None

My Notes :

107. For what value of k the equation $x^2+4kx+k+2 = 0$ has one root as zero

a. 2 b. 4 c. -2 d. -1/2

108. If equation $x^2 - (p+4)x + 2p + 5 = 0$ has equal roots then p = ?

a. ± 1 b. ± 2 c. 2 d. -2

109. If total cost of 10 units, 20 units is ₹ 15,000 and ₹ 20,000 respectively. Find total cost of 30 units?

a. ₹ 30,000 b. ₹ 35,000 c. ₹ 25,000 d. None of these

110. Find the quadratic equation whose roots are 5, -5

a. $x^2 + 10x + 25 = 0$ b. $x^2 - 10x + 25 = 0$ c. $x^2 - 5 = 0$ d. $x^2 - 25 = 0$

111. If p,q are roots of quadratic equation $3x^2 + 6x + 9 = 0$ then value of $(p^2 + q^2 + 2pq)$ is :

a. 4 b. -4 c. 3 d. 9

112. If roots of quadratic equation (x^2 - px + 8p - 15 = 0) are equal then p = ?

a. 3 or 5 b. 2 or 5 c. 2 or 30 d. None of these

113. Out of 3 numbers, sum of first and second is 24. Sum of second & third is 30, sum of first and third is 26. The smallest number is :

a. 18 b. 14 c. 16 d. 10

114. Find slope of the line ⊥ to the line 2x + 78y = 1234

a. -2/78 b. 2/78 c. 39 d. -39

115. The point (-2, -1/3) lie in _____ quadrant.

a. 1st b. 2nd c. 3rd d. 4th

ACTION

is the real measure of

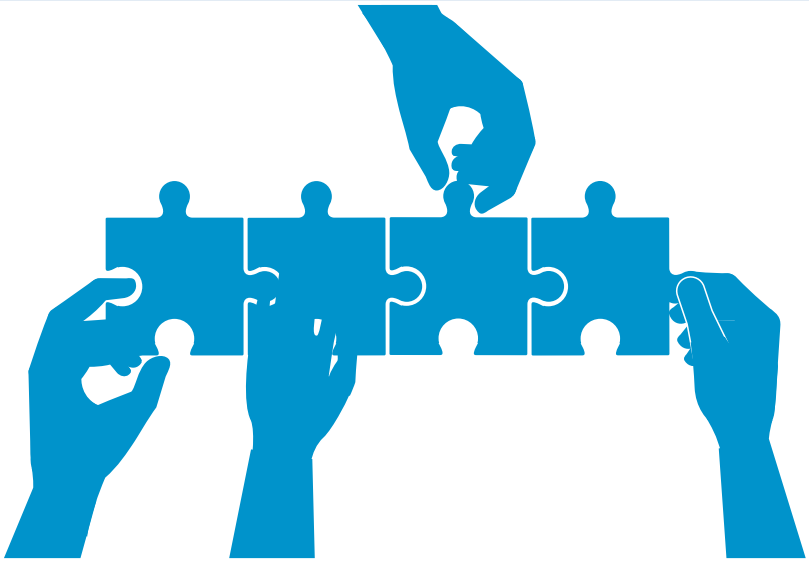
INTELLIGENCE

- CA VINOD REDDY -

In the name of SMART-WORK Don't invent intelligent ways to escape HARD-WORK

- CA VINOD REDDY -

Chapter 5



Permutations & Combinations

CA VINOD REDDY

1.

Permutation =

Combination =

2.

0! =

1! =

2! =

3! =

4! =

5! =

6! =

7! =

8! =

9! =

10! =

11! =

12! =

a. $\frac{19!}{18!}$ =

b. $\frac{16!}{14!3!}$ =

c. $\frac{x!}{(x-1)!}$ =

d. $\frac{(x+3)!}{(x+2)!}$ =

e. $\frac{(x-3)!}{(x-1)!}$ =

3. In how many ways 3 students can stand in a line for a photograph?

4. In how many ways 4 students can stand in a line for a photograph?

5. There are 5 students A, B, C, D, E in how many ways 2 of them can be

Selected — Arranged

6. ${}^{n}P_{r} = \frac{n!}{(n-r)!}$ where n = positive integer & $n \geq r \geq 0$

${}^{n}P_{r} = n(n-1)(n-2) \ldots\ldots\ldots$ r tems

${}^{n}P_{0} =$

${}^{n}P_{1} =$

${}^{n}P_{2} =$

${}^{n}P_{3} =$

${}^{n}P_{4} =$

${}^{n}P_{5} =$

${}^{n}P_{n} =$

${}^{18}P_{3} =$

${}^{100}P_{2} =$

${}^{50}P_{4} =$

${}^{25}P_{1} =$

${}^{20}P_{5} =$

${}^{24}P_{8} =$

7. $\frac{{}^{18}P_{3} \times {}^{16}P_{3}}{{}^{19}P_{4} \times {}^{17}P_{2}} =$

8. $\frac{9!}{6!2!} \times {}^{5}P_{2} =$

9.

AND ⟹ Multiply

OR ⟹ Add

10.

n! can also be written as

11. How many different words can be formed by using letters of word :

SQUARE :

HEXAGON :

MISSISSIPPI :

BOSTON :

MANAGEMENT :

PERMUTATION :

BANANA :

My Notes :

12. How many different words can be formed by using letters of word if all vowels should be kept together.

BANANA :

PERCEPTION :

JAYARAMAN :

STATISTICS :

COMPUTER :

CALCULATOR :

TATED :

13. In how many ways 'n' students can stand in a line for a photograph if r of them

Want to be always together?

Want to be never together?

14. In how many ways 3 letter words can be formed by using letters of the word

SQUARE HEXAGON COMPUTER

15. In how many ways 12 students can stand in a line for a photograph if

2 of the want to be always together?

2 of them want to be never together?

16. If $6 \times {}^{n}P_3 = 7 \times {}^{(n-1)}P_3$. Find n.

17. If ${}^{n}P_4 = 12 \times {}^{n}P_2$. then n = ?

18. ${}^{n}P_3 : {}^{n}P_2 = 3:1$; then n = ?

19. ${}^{5}P_{r} = 60$; then r = ?

20. The no. of ways in which letters of word 'TRIANGLE' can be arranged if word 'ANGLE' is always present.

21. In how many ways 5 students can form a

- Line
- Circle

22. In how many different ways 12 students can form a

- Line
- Circle

23. In how many ways _____ of 7 students can be formed out of 12 students

- Line
- Circle

In how many ways _____ of r students can be formed out of n students

- Line
- Circle

24. The no. of ways in which 'n' diamonds can form a necklace.

25. The number of ways of arranging 'n' persons along a round table so that no person has the same 2 neighbours

26. No. of different necklaces can be formed with 'n' beads of different colours = ?

27. Permutation of 'n' distinct things taken 'r' at a time when a particular object is

- Always there?
- Never there?

28. How many 4 digit numbers can be formed by using 0,1,2,3,4,5 if repetition of digits is

- Allowed
- Not allowed

My Notes :

29. How many even numbers of 5 digits can be formed by using 2,3,4,5,6,7,8 if repetition of digits is

Not allowed

Allowed

30. How many 5 digit numbers greater than 23,000 can be formed by using 1,2,3,5,8,9

31. How many 4 digit numbers greater than 4700 can be formed by using 2,3,4,5,8 if repetition of digits is

Allowed

Not allowed

32. ${}^{n}C_{r} =$

My Notes :

33. Formulae on combinations

${}^nC_r =$	${}^nC_3 =$
${}^nC_r =$	${}^nC_4 =$
${}^nC_0 =$	${}^nC_n =$
${}^nC_1 =$	${}^nC_{n-r} =$
${}^nC_2 =$	

${}^nC_r + {}^nC_{r-1} =$

${}^nC_0 + {}^nC_1 + {}^nC_2 + \ldots\ldots\ldots + {}^nC_n =$

${}^nC_1 + {}^nC_2 + {}^nC_3 + \ldots\ldots\ldots + {}^nC_n =$

34. ${}^{18}C_r = {}^{18}C_{r+2}$ then r = ?

35. ${}^{45}C_x = {}^{45}C_y$ then

36. ${}^{15}C_{11} =$

${}^{15}C_4 =$

37. In how many ways 52 cards can be equally divided in 4 groups?

38. In how many different ways 10 mangoes can be divided among 3 people such that they will get 2,3,5 mangoes

39.

$\frac{{}^{n}P_r}{{}^{n}C_r} =$

${}^{5}P_r =$

${}^{5}C_r =$

$\frac{{}^{n}C_r}{{}^{n}P_r} =$

$\therefore \frac{{}^{5}P_r}{{}^{5}C_r} =$

40.

P (8, 3) =

C (12, 4) =

41. $\frac{{}^{18}P_3 \times {}^{17}C_2}{{}^{19}P_2 \times {}^{18}C_2} =$

My Notes :

42. $\dfrac{{}^{20}P_3 \times {}^{21}P_4 \times {}^{22}C_4}{{}^{23}C_3 \times {}^{22}P_3 \times {}^{21}P_2} =$

43. In a party of x people if everyone hand shakes with other. How many handshakes will take place

44. How many diagonal can be drawn in a polygon having :

7 sides

8 sides

10 sides

45. In a group of 100 people, if everyone sends a greeting to other, How many cards will be used in total?

46. In a plane of 20 non-collinear points

How many different straight lines can be drawn?

How many different triangles can be obtained?

47. In a plane there are 30 points out of which 8 are collinear

- How many different straight lines can be drawn?
- How many different triangles can be obtained?

48. There are 4 parallel lines intersecting with another set of 5 parallel lines. How many parallelograms can be drawn?

49. 8 Red; 3 Pink; 6 White Balls -

How many different selections of 3 balls are possible with

- All Red balls
- 2 Red balls
- Atleast 2 white balls
- No pink balls

50. 4 CA's; 3 Engineers; 8 Doctors -

How many ways a commitee of 4 members cane be formed with

- Atleast 1 doctor
- Atleast 1 person of each profession

51. There are 8 males & 11 females. In how many ways a committee of 5 members can be formed with

- No restriction
- Atleast 4 Females
- Atmost 1 Female
- 3 Females

52. $^{n}P_{r} = {}^{n-1}P_{r} + r \cdot {}^{n-1}P_{r-1}$ a. True b. False

53. A supreme court bench consist of 7 judges. In how many ways majority decision can be taken?

54. A question paper has 8 questions. In how many ways atleast one question can be solved?

55. A question paper has 8 questions (each one has alternatives). In how many ways one or more questions can be solved?

56. No. of ways in which 9 things can be divided in 3 groups containing 2,3,4 things respectively.

57. Number of odd numbers greater than 500 can be formed by using 3, 1, 2, 8

58. $\frac{{}^{n}P_{r}}{{}^{n-1}P_{r-1}} =$

59. A man has 12 friends in how many ways he can invite _____ for dinner

- 2 of them
- Atleast 10 of them
- 5 of them
- Atleast one of them
- Atmost 10 of them

60. In a paper there are 2 sections A, B containing 5, 8 questions respectively. In how many ways total 5 questions can be solved with atmost 3 questions of any one of the section.

61. $\frac{{}^{x}P_2 \cdot {}^{x}P_3}{{}^{x}P_4 \cdot {}^{x}P_1} =$

62. $\frac{{}^{10}P_3 \times {}^{2}P_1}{{}^{11}P_4} =$

63. $\frac{{}^{18}P_2 \times {}^{20}P_3}{{}^{21}P_3 \times {}^{19}P_3} =$

64. In how many ways 10 students can be arranged in a line if 4 of them want to be always together?

65. There are 9 students, in how many ways they can stand in a line if 2 of them want to be never together?

66. In how many ways letters of word 'DAUGHTER' can be arranged if all vowels should always be together?

67. In how many ways letters of word 'CALCULATOR' can be arranged if all consonants should always be together?

68. How many 3 digit numbers can be formed by using 1,2,3,4,5 if repetition of digits is

- Allowed
- Not allowed

Please Note

If question is silent about whether repetition of digits is allowed or not then REPETITION OF DIGITS IS NOT ALLOWED

69. How many 4 digit numbers greater than 5000 can be formed by using 3,5,8,2,1 if repetition of digits is

- Not allowed
- Allowed

70. How many numbers greater than 8000 can be formed by using 1,2,7,8,9 if repetition of digits is

- Not allowed
- Allowed

71. How many 5 digit numbers divisible by 5 can be formed by using 0,2,3,4,5,8,9, if repetition of digits is

Not allowed

Allowed

72. How many 5 digit numbers greater than 34,000 can be formed by using 3,1,2,7,8,0

73. In how many ways 5 sisters & 6 brothers can stand in a line for a photograph if no 2 sisters or no 2 brothers should stand together?

74. How many 2 digit numbers can be formed with atleast one digit as 7?

My Notes :

75. In how many ways 11 players out of 16 players can be selected if -

There is No restriction?	2 Particular players must be included?	3 Particular players must be excluded?	2 Particular players must be excluded & 4 particular players must be included?

76. $\frac{{}^{20}P_2 \times {}^{21}C_3}{{}^{18}C_5 \times {}^{21}P_2} = ?$

a. $\frac{1805}{12852}$ b. $\frac{1826}{18562}$ c. $\frac{1528}{17882}$ d. None of these

77. There are 8 men and 7 women, in how many ways a committee of 4 members can be formed :

Without any restriction	With 2 Men	With Atleast 3 Men	With Atmost 1 Woman

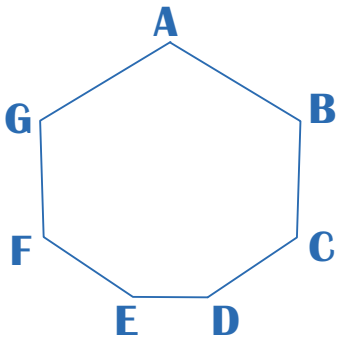
78. 8 Red, 3 White, 4 Pink Balls - How many different selections of 4 balls are possible with atleast one ball of each colour?

79. There are 'm' points in a plane out of which 'k' are collinear

- How many different straight lines can be drawn by joining them?
- How many different triangles can be obtained by joining them?

80. How many diagonals can be drawn in a Heptagon? (Heptagon = A polygon having 7 sides)

No. of diagonals that can be drawn in a heptagon



81. A man has 13 friends. In how many ways he can invite _____ for dinner

Atleast one of them	4 of them	4 or 7 of them	Atmost 11 of them

82. There are 4 papers in an exam. in how many ways student can pass the exam if passing in all papers is compulsory to pass the exam?

a. 1 b. 15 c. 16 d. None of these

83. There are 5 papers in an exam. in how many ways a student can pass the exam if student passes the exam if he passes in atleast one paper?

a. 32 b. 31 c. 1 d. None of these

84. There are 5 multiple choice questions with 4 options each. How many different sequences of answer are possible?

85. There are 6 multiple choice questions. First 4 questions have 4 options each and last two questions have 5 options each. How many different sequences of answer are possible?

86. There are 8 males and 5 females. In how many ways a committee of 5 members can be formed so that males are in majority?

87. No. of arrangements of 'n' different things taken 'r' at a time in which a particular thing

- Alway there
- Never there

88. No. of selections of 'n' different things taken 'r' at a time in which a particular thing

- Is alway there
- Is never there

89. Find sum of all 4 digit numbers formed by using 1,3,5,7

a. 1,06,656 b. 1,78,252 c. 1,78,282 d. None

90. $^{n}P_{r}$ can also be written as :

a. $\frac{n!}{r!}$ b. $\frac{\lfloor n}{\lfloor (n-r)}$ c. $\frac{\lfloor n}{\lfloor r \lfloor (n-r)}$ d. None

91. There are 6 Books on Eco, 3 on Maths, 2 on stats. In how many ways all books can be placed on a shelf if books on same subject are to be always together?

a. 1,06,656 b. 1,78,252 c. 1,78,282 d. 51,840

92. The number of ways in which 7 girls can form a ring is :

a. 700 b. 710 c. 720 d. 360

My Notes :

93. 3 Ladies and 3 gents are to be seated on a round table so that 2 and only 2 ladies should sit together. The number of arrangements are :

a. 70 b. 27 c. 72 d. None of these

94. In a group of boys the no. of arrangements of 4 boys is 12 times the number of arrangements of 2 boys. The no. of boys in the group is

a. 10 b. 8 c. 6 d. None of these

95. $\sum_{r=1}^{r=10} r \cdot {}^{r}P_{r} = ?$

a. ${}^{11}P_{11}$ b. ${}^{11}P_{11} - 1$ c. ${}^{11}P_{11} + 1$ d. None of these

96. There are 10 trains plying between Latur and Pune, The no. of ways in which a man can go from Latur to Pune and return by different train is

a. 99 b. 90 c. 80 d. 100

97. The number of ways in which six '+' and four '-' signs can be arranged in a line such that no '-' signs occur together is

a. 7!/3! b. (6! x 7!) / 3! c. 35 d. None of these

98. The number of ways in which letters of word 'MOBILE' be arranged so that consonants always occupy the odd places is :

a. 36 b. 63 c. 30 d. None of these

99. 5 persons are sitting along a round table in such a way that tallest person is always to the immediate right of shortest person. The no. of such arrangements are :

a. 6 b. 8 c. 24 d. None of these

100. In how many ways 17 balls can be arranged in a line if 7 of them are Black, 6 are Red and 4 are White?

101. The number of different words that can be formed with 12 consonants and 5 vowels by taking 4 consonants and 3 vowels in each word are

a. ${}^{12}C_4 \times {}^{5}C_3$ b. ${}^{17}C_7$ c. 4950 x 7! d. None of these

My Notes :

102. How many different words can be formed by using all letters of word 'ASSASSINATION' if all vowels should be together?

103. How many numbers greater than a million can be formed with the digits 0,4,4,5,5,5,3?

a. 420 b. 360 c. 7! d. None of these

104. $4 \times {}^{n}P_3 = 5 \times {}^{(n-1)}P_3$; then value of 'n' is

a. 12 b. 13 c. 14 d. 15

105. The number of ways in which 8 examination papers can be arranged so that best and worst paper never come together are :

a. 8! - 2!7! b. 8! - 7! c. 8! d. None of these

My Notes :

106. How many 6 digit numbers can be formed out of 4,5,6,7,8,9 if no digit being repeated?

a. 6!-5! b. 6! c. 6!+5! d. None of these

107. There are 50 stations on a railway line, How many different kinds of tickets to be printed to enable a passenger to travel from one station to another station?

a. 2500 b. 2450 c. 2400 d. None of these

108. In $^{n}P_{r}$, $^{n}C_{r}$; n is always

a. positive integer b. an integer c. zero d. None of these

109. If all permutations of word 'CHALK' are written in a dictionary sequence. the rank of word 'CHALK' is

a. 30 b. 31 c. 32 d. None of these

110. How many words can be formed by using letter A thrice, letter B twice. letter C once.

a. 60 b. 120 c. 90 d. 6

111. If different permutations of the word 'EXAMINATION' are listed in a dictionary, How many items are there in the list before the first word starting with E?

a. 9,06,200 b. 9,07,200 c. 9,08,200 d. 9,05,200

112. A letter lock consist of 3 rings marked with 5 different letters. Number of maximum unsuccessful attempts to open the lock is :

a. 124 b. 125 c. 120 d. 75

113. The number of 5 letter words that can be formed using letters of word 'DELHI' which begin and end with vowel, when repetitions are allowed is

a. 125 b. 625 c. 500 d. 1350

114. The number of ways in which 20 persons be seated along a round table if there are 7 seats is :

a. $^{20}P_7$ b. $^{20}P_7 / 7!$ c. $^{20}C_7$ d. $^{20}P_7 / 7$

115. $^nP_r = 120 \times {}^nC_r$, then r = ?

a. 5 b. 120 c. 24 d. 4

116. In how many ways letters of the word 'BALLOON' be arranged so that 2 L's do not come together is :

a. 900 b. 1200 c. 800 d. 600

117. $^{15}C_{11} / {}^{15}C_{10} = ?$

a. 15/11 b. 15/10 c. 5/10 d. None of these

118. How many even numbers greater than 300 can be formed with digits 1,2,3,4,5. No repetition being allowed

a. 112 b. 111 c. 113 d. 121

119. $^{43}C_{(r-6)} = {}^{43}C_{(3r+1),}$ then r = ?

a. 12 b. 8 c. 6 d. 10

120. A committee of 3 ladies and 4 gents to be formed out of 8 ladies and 7 gents. Mrs. X refuses to serve in a committee if Mr. Y is there. Number of such committees are :

a. 1530 b. 1500 c. 1520 d. 1540

121. What is rank of word 'TALK' if all words by using letters of word are arranged in a dictionary sequence ?

a. 20 b. 18 c. 19 d. None of these

122. How many 3 digit odd numbers can be formed by using 1,3,5, if repetition of digits is allowed?

a. 3^3 b. 3! c. (3x3x4) d. None of these

123. ${}^{56}P_{(r+6)} : {}^{54}P_{(r+3)} = 30,800 : 1$; then r = ?

a. 42 b. 41 c. 45 d. None of these

My Notes :

124. There are 6 questions in section A and 7 in section B. In how many ways 8 questions can be attempted with atmost 6 questions from any section are :

a. 360 b. 1281 c. 6 d. 42

125. How many words can be formed by using all letters of word 'REDDY'

a. 120 b. 60 c. 240 d. None of these

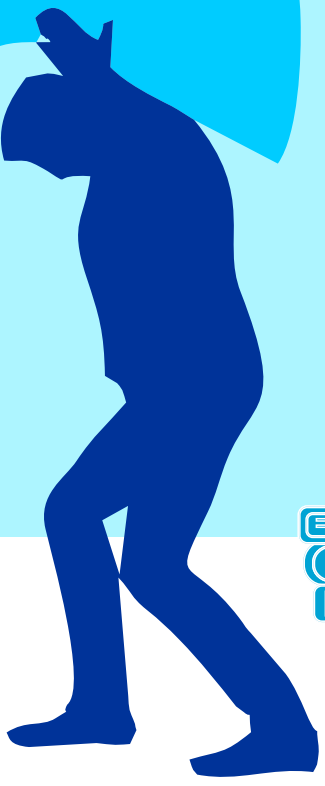
My Notes :

Before you

Work SMART

You must

Work HARD

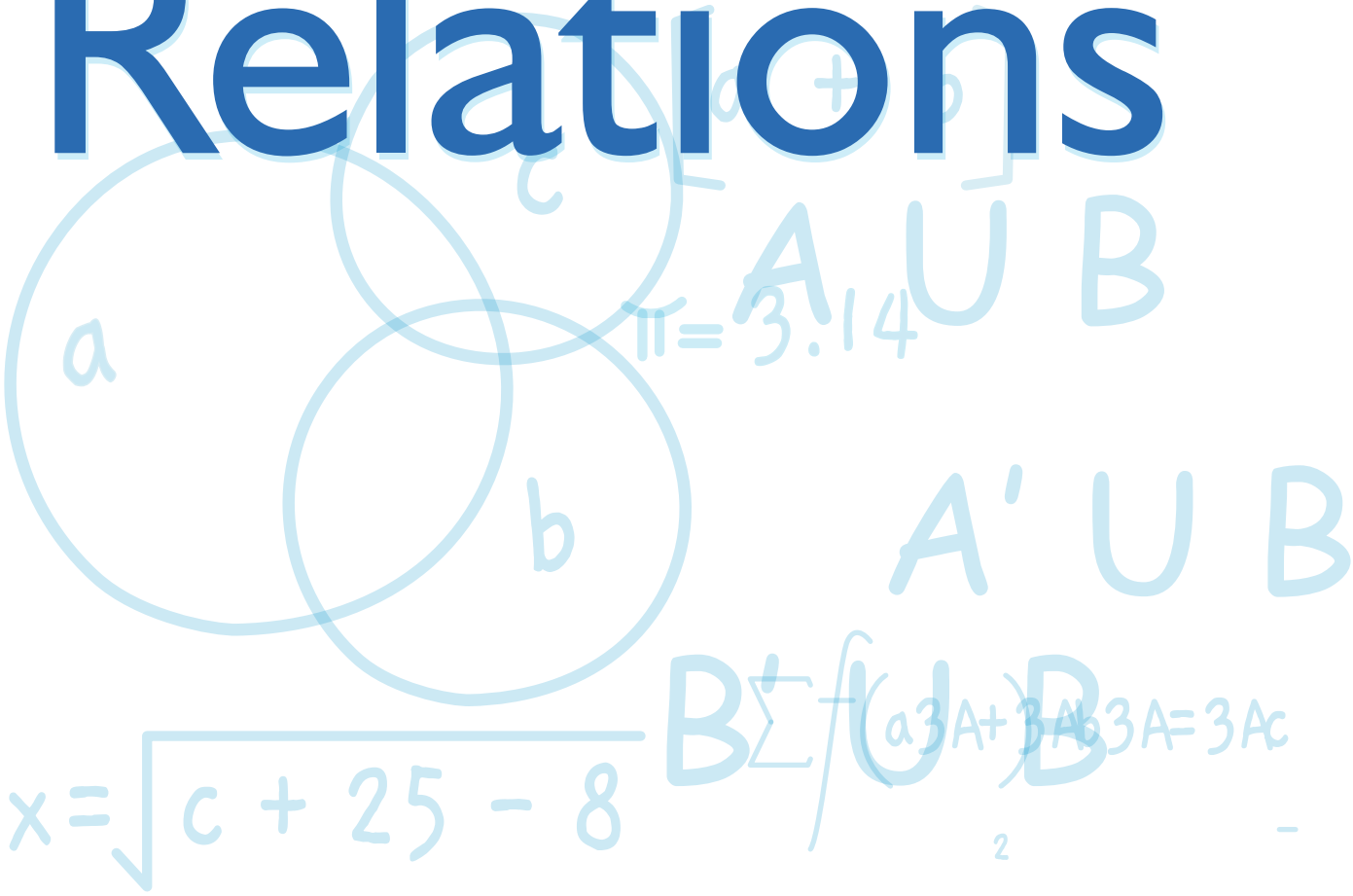


- CA VINOD REDDY -

YOU CANNOT BUILD A REPUTATION ON WHAT YOU ARE GOING TO DO

Chapter 6

Sets, Functions, Relations



CA VINOD REDDY

1.

Set is a collection of _____ and _____ objects

- Roster Form / Braces Form → A = {1,2,3,4,5,6,7,8,9,10}
- Algebric Form / Rule Form / Property Form / Set Builder Form → A is a set of first 10 natural numbers
  OR
  A = {x : where x ∈ N and x ≤ 10}

2.

In mathematics everything in this world whether living or non-living, is called as an

3. A = {5,8,9,10,13} Explain : ∈

4.

No. of distinct elements of a set is known as

5.

Types of sets on the basis of elements

6.

Generally name of the set

Order of object is

Repetition is of no use

A = {1,2,3,4,5} B = {5,4,4,5,1,2,2,3,4,5,4}
sets A and B are same sets

7. Equivalent sets :

8. Subset :

9. Superset :

10. Proper Subset :

11. Improper Subset :

12. Find all possible subsets of A = {5,7,8}

13. For set B = {a,b,c}

All possible subsets :

All possible proper subsets :

All possible improper subsets :

All possible empty subsets :

All possible non-empty subsets :

14. If cardinal value of a set = n; then

No. of subsets :

No. of proper subsets :

No. of improper subsets :

No. of empty subsets :

No. of non-empty subsets :

No. of non-empty proper subsets :

15. When 2 sets are said to be equivalent sets?

16. When 2 or more sets are said to be equal sets?

∴ All equal sets are equivalent but all equivalent sets are not necessarily equal sets.

17. Universal Set :

18. Complementary Set :

My Notes :

19. If A = {1,2,3,4,5} B = {3,4,6,8,9,10}

Find (A union B) =

Find (A intersection B) =

20. If A = {1,2,3,4} B = {2,4,8,10} U = {1,2,3,4,5,6,7,8,9,10}

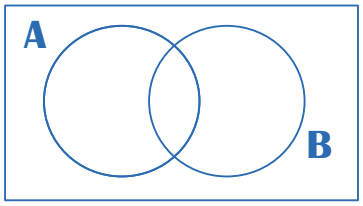
Find A′ =

B′ =

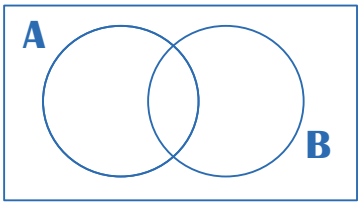
(A ∪ B) =

(A ∩B) =

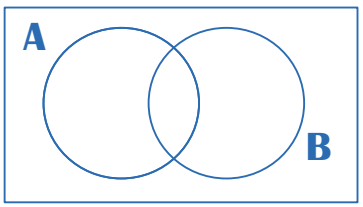
21. Find Set A



22. Find Set A′

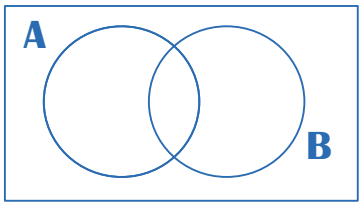


23. Find Set B

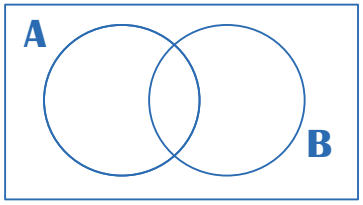


My Notes :

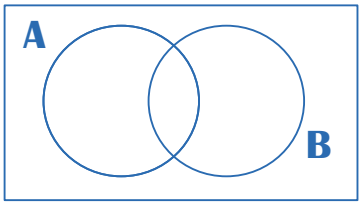
24. Find Set A'



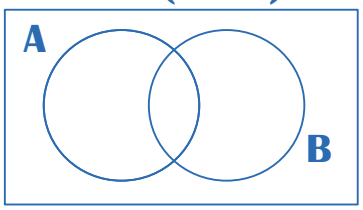
25. Find Set B'



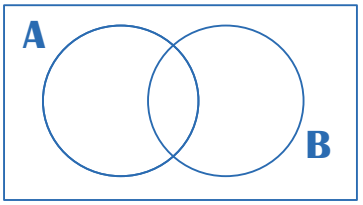
26. Find Set $(A \cup B)$



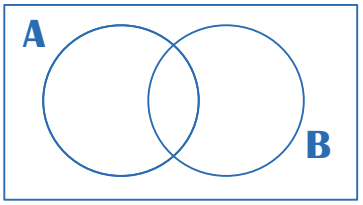
27. Find Set $(A \cap B)$



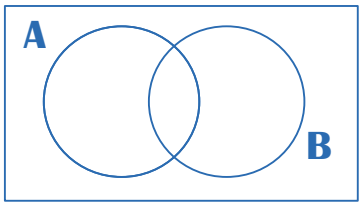
28. Find $(A-B) = (A \cap B')$



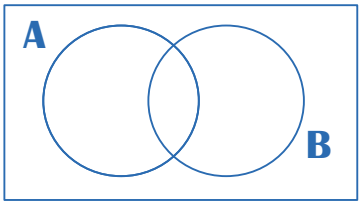
29. Find $(B-A) = (B \cap A')$



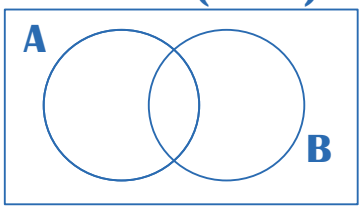
30. Find $(A' \cap B')$



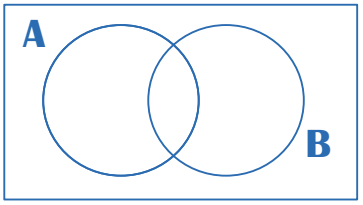
31. Find Set $(A' \cup B')$



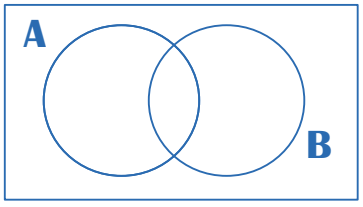
32. Find Set $(A \triangle B)$



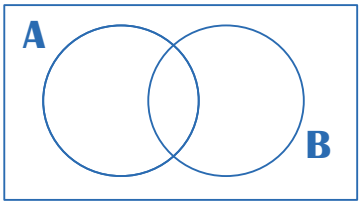
33. Find $(A \cup B \cup C)$



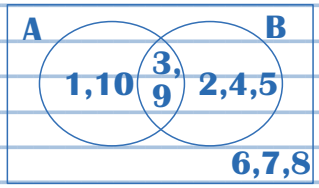
34. Find $(A \cup B')$



35. Find $(B \cup A')$



36.



Find A = { }

Find B = { }

Find A′ = { }

Find B′ = { }

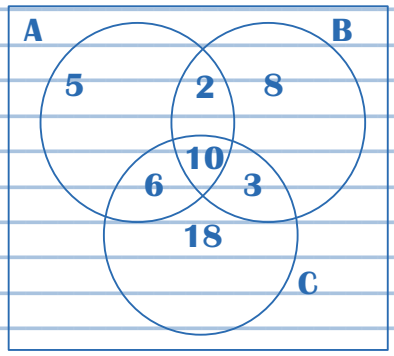
Find A ∪ B =	Find A ∪ B′ =
Find A ∩B =	Find A′ ∩B′ =
Find A - B =	Find A′ ∪ B′ =
Find B - A =	Find B ∪ A′ =

37.

Formulae of sets at one place

n(A′) =	n(A′ ∩B′) =
n(B′) =	n(A △ B) =
n(A∪B) =	n(A′∪ B′) =
n(A∩B) =	n(A ∪ B′) =
n(A - B) =	n(B ∪ A′) =
n(B - A) =	

38.



n(A ∪ B ∪ C) =

n(A) + n(B) + n(C) - n (A∩ B) - n(A ∩C) - n(B ∩C) + n(A∩B∩C) =

My Notes :

39. If A = {1,2,3} B = {8,9}

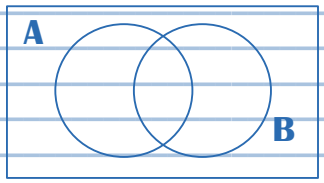
Find (A x B) =

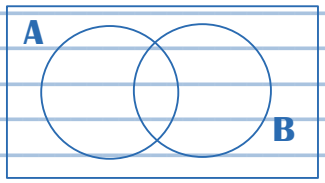
Find (B x A) =

40. A is a subset of B : Notation :

A is a proper subset of B : Notation :

41. Demorgan's Rules of Sets





42.

$A \cup A =$

$A \cap A =$

$A \cup \phi =$

$A \cap \phi =$

$A \cup A' =$

$A \cap A' =$

$A \cup U =$

$\phi' =$

$A \cup (A \cup B) =$

$(A \cup B) \cup (A \cap B) =$

$(A \cup B) \cup (A' \cap B') =$

$A \cup (A \triangle B) =$

$A \cup (A \cap B') =$

$(A \cap B') \cup (A \cap B) =$

$(A \triangle B) \cup (A \cap B) =$

$U' =$

43. Any subject of the product set X.Y is said to define a relation from X to Y, and any relation from X to Y in which no 2 different ordered pairs have the same first element is called as function.

In $f : A \longrightarrow B$

the element f(x) of B is called as image of x while x is called as pre-image of f(x).

44. There are 4 types of relations

1.

2.

3.

4.

45. If $f(x) = 3x^2+2x+1$

Find f(3), f(8), f(-9), f(10)

46. If f(x) = 8x+11; g(x) = 2x+9

Find f(3) =

g(8) =

g(p) =

g(y) =

f(-13) =

f(20) =

g(2k) =

47. If f(x) = 10x+15; g(x) = 7x - 13 Find f.g(x), g.f(x)

48. If $f(x) = 2x+11$ Find $f^{-1}(y)$, $f^{-1}(x)$, $f^{-1}(p)$

49. If $f(x) = \frac{2x+13}{8x-2}$; Find $f^{-1}(y)$, $f^{-1}(20)$, $f^{-1}(p)$, $f^{-1}(p+1)$

50. If $f(x) = \frac{1}{1-x}$; Find $f(10)$, $f(2)$, $f(13)$, $f(p)$

51. If $g(x) = \frac{x-1}{x}$; Find $g(-1/2)$

My Notes :

52. If f(2x+3) = 8x + 7. Find f(x), f(30)

53. Domain and Range of {(1,5),(2,8),(3,9),(4,18)}

54. $f(x-1) = x^2$. Find f(x), f(x+1)

55. When a relation is said to be

Symmetric

Reflexive

Transitive

56. Relation of Equivalence

57. 'Is perpendicular to' is a

58. 'Is the reciprocal of' is a

59. In a class of 100 students 60 like maths 50 like physics 25 like both subjects. Find how many students :

a. Like maths or physics

b. Like maths but not physics

c. Like physics but not maths

d. Neither like maths nor like physics

e. Not like atleast one of 2 subjects

f. Like one and only one subject

60. A = {5,8,9,10}; B = {8,5,9,10}; C = {a,b,c,d}

A, B are Equal Sets; Therefore Equivalent Also.

A, C are Equivalent Sets; but not Equal sets.

B, C are

61. Set of cubes of a natural numbers is _____ set

a. Finite b. Infinite c. Singleton d. Null

62. $\{x : [(1) - (-1)^x]\}$ for all integer values of x then x =

a. {0} b. {2} c. {0,2} d. None of these

63. E is a set of all even natural numbers and O is a set of all odd natural numbers then

$(E \cup O) =$

$(E \cap O) =$

64. If R is a set of positive rational numbers and E is a set of all real numbers then

a. $R \subseteq E$ b. $R \subset E$ c. $E \subseteq R$ d. $E \subset R$

65. If N is a set of all natural numbers and I is a set of positive integers then

a. $N = I$ b. $N \subset I$ c. $N \subseteq I$ d. $I \subseteq N$

66. If I is a set of all isosceles triangles and E is a set of all equilateral triangles, then

a. $I \subset E$ b. $E \subset I$ c. $E = I$ d. None of these

67. {[n(n+1)/2] where n is a positive integer} is a _____

a. Finite set b. Infinite set c. An empty set d. Singleton

68. If $A = \{1,2,3,4,5\}$ $B = \{x^2 : x \in A\}$ then -

a. $n(A) > n(B)$ b. $n(A) < n(B)$ c. $n(A) = n(B)$ d. None

69. Let $f : A \longrightarrow B$ then A is called as domain of f, while B is called as co-domain of f. Then set $f(A) = \{f(x) : x \in A\}$ is called as

Range of f

70. Let A = {1,2,3,4,5} B = {1,4,9,16,25,36,49}, we consider the rule $f(x) = x^2$

then f (1) = 1
f (2) = 4
f (3) = 9
f (4) = 16
f (5) = 25

Clearly each element of A has unique image in B so
$f : A \to B : f(x) = x^2$ is a function from A to B
where domain = {1,2,3,4,5}
Range = {1,4,9,16,25}

As in set A pre-image of 36,49 is not there it is 'INTO' function.

If each element of 'B' has atleast one pre-image in set A then function is said to be 'ONTO' function.

71. A one-one onto function is said to be bijective. A bijective function is also known as one to one correspondence.

Let f : A→B, defined in such a way that all elements in A have the same image in B, then f is said to be constant function

Two functions f and g are said to be equal written as f = g if they have the same domain and they satisfy the condition f(x) = g(x) for all values of x.

72. Inverse function is possible only when function is one to one onto

73. Inverse $h^{-1}(x)$ when $h(x) = \log_{10}x$ is :

a. $\log_{10}x$ b. 10^x c. $\log_{10}(1/x)$ d. None of these

74. For the function $h(x) = 10^{(1+x)}$ the domain of real values of x where $0 \le x \le 9$, the range is -

a. $10 \le h(x) \le 10^{10}$ b. $0 \le h(x) \le 10^{10}$ c. $0 \le h(x) \le 10$ d. None

75. Let S = {a,b,c, ... } be any set then the relation R is a subset of the product set (S x S)

1. If R contains all ordered pairs (a,a) in (S x S) then R is said to be

2. If (a,b) ∈ R, then (b,a) ∈ R. For every (a,b) ∈ S then R is said to be

3. If (a,b) ∈ R, and (b,c) ∈ R; then (a,c) ∈ R. For every a,b,c ∈ S then R is said to be

A relation which is reflexive symmetric as well as transitive is called as Equivalence relation OR Relation of Equivalence

76. In a class of 150 students 25 like physics, 75 like maths. 135 students dislike atleast one subject then find no. of students

1. Who like physics but not maths :

2. Who like maths but not physics :

3. Who like both subjects :

4. Who like neither maths nor physics :

5. Who like one and only one subject :

77. "Is smaller than" over the set of eggs in a box is :

a. Transitive b. Symmetric c. Reflexive d. Equivalence

78. A = {2,3,8,9,11} B = {3,10,13} C = {5,10,13,15,19} Find A x (B∩C)

79. A = {2,8} B = {2,8} Find (AxB), (BxA), [(AxB) ∪ (BxA)], [(AxB)∩(BxA)]

80. A town has total population of 80,000. Out of it 36,000 read TOI, 42,000 read IE, 5000 read both, then find no. of persons who read one and only one newspaper?

81. If $f(x) = 1/(1-x)$ the $f^{-1}(x) = ?$

a. (1-x) b. (x-1)/x c. x/(x-1) d. None of these

82. Null set is represented by

a. {ϕ} or 0 b. {} or ϕ c. ϕ or {0} d. None of these

83. If $f(x) = x^2$ then it is

a. Odd function b. Even function c. Both of these d. None of these

84. f(x) is said to be an

- Odd Function if
- Even Function if

85. If $f(x) = \text{Log}\left(\frac{1+x}{1-x}\right)$ then function f is said to be

a. Odd function b. Even function c. Both of these d. None of these

86. If $f(x) = 8x + 4$ the $f^{-1}(x) = ?$

a. $1/(8x+4)$ b. $(x-4)/8$ c. $(8x+4)/(4-8x)$ d. None of these

87. If $h(x) = \left(\frac{px-q}{qx-p}\right)$ then $x = ?$

a. $h(1/y)$ b. $h(-y)$ c. $h(y)$ d. None of these

88. A set of intelligent students in a class is _____

a. Null set

b. Singleton set

c. An infinite set

d. Not a well defined collection

89. If $f(x+1) = f(x-1)$ where $f(x) = x^2 - 2x + 3$ then $x = ?$

a. 1 b. 2 c. 3 d. None of these

90. If $f(x+1) = f(x+2)$ where $f(x) = 1 + x - x^2$ then $x = ?$

a. 2 b. 0 c. 1 d. -1

91. If $f(x) = 3x + 4$ then $f[(x-4)/3] = ?$

a. 1 b. x c. zero d. None of these

92. If $f(x+1) = 4x + 5$; find $f(x)$

a. 3x+4 b. 4x+1 c. 4x+3 d. None of these

93. If $f(x-1) = x^3$; find $f(x)$

a. $(x+1)^3$ b. $(x+1)^2$ c. x^3 d. $(x-1)^3$

94. $f(x) = 3x + 5$; $g(x) = 6x + 100$. Find $g[f(2x)] = ?$

a. $16x + 200$ b. $9x - 300$ c. $f(x)$ d. None of these

95. If $S = \{0,1,5,4,7,9,10\}$ then

No. of subsets =

No. of proper subsets =

No. of non empty subsets =

No. of non empty proper subsets =

96. If $A \subseteq B$ then

a. $A' \subseteq B'$ b. $A' = B'$ c. $B' \subseteq A'$ d. None of these

97. If 'A' is any set then

a. $A \cup A' = \phi$ b. $A \cap A' = \phi$ c. $A \cup \phi = A'$ d. None

98. $f(x-1) = 2x-2$ then $f(16)$ is

a. 16 b. 15 c. 32 d. Insufficient information

My Notes :

99. If A = {1,2,3,5,7}, B = {1,3,6,10,15} and universal set = U = {1,2,3,4,5,.....,15} then cardinal value of

(A∩B) =

(A∪B) =

(A - B) =

(B - A) =

(A′ ∩B′) =

(A △ B) =

(A ∪ B′) =

(B ∪ A′) =

(A′∪ B′) =

100. Null set don't have a proper subset

a. True b. False

101. Find All subsets of A = {5,8,9,12}

102. Find power set of A if A = {2,8,9}

103. If universal set U = {1,2,3,4,5,.....,25}; A= {2,6,8,10,12,.....,24} B = {4,8,10,14} then

a. (A ∩ B)′ = (A′ ∪ B′) b. (A∩B)′ = A′ ∩B′ c. A′ ∩B′ = A′ d. (A′ ∪ B′) = A′

104. P set has 3 elements, Q set has 4 elements then the set (PxQ) contains _____ elements

a. 34 b. 7 c. 1 d. 12

105. If $f(x) = 2^x$ then function is

a. one-one b. one-many c. many-one d. many-many

106. If $f(x) = e^x$ then f(p-q) is

a. f(p) + f(q) b. f(p) - f(q) c. f(p) x f(q) d. f(p) / f(q)

107. If A = {x : x < 1 and x > 1} then set A is

a. Null set b. Singleton set c. Infinite set d. Power set

108. Set of Even Prime natural numbers is

a. Null set b. Singleton set c. Infinite set d. Power set

109. In a class of 100 students 60 play Cricket, 50 play Hockey and 30 play both. Then no. of students who don't play atleast one of 2 games is :

a. 70 b. 50 c. 10 d. None of these

110. If $f(x) = (x+1) / (x-1)$; then $f^{-1}(30) = ?$

a. 23/12 b. 30/8 c. 31/29 d. None of these

111. $n(A) = 729$, $n(B) = 875$, $n(A \cap B) = 213$, $n(U) = 2000$. Find -

$n(A') =$	$n(A' \cap B') =$
$n(B') =$	$n(A \triangle B) =$
$n(A - B) =$	$n(A' \cup B') =$
$n(B - A) =$	$n(A \cup B') =$
	$n(B \cup A') =$

112. Out of 2000 employees in an office 48% preferred coffee (C) and 54% liked Tea (T) and 64% used to smoke (S) 28% used C & T. 32% used T & S. 30% preferred C & S. Only 6% did none of these. The number having all three is :

a. 360 b. 300 c. 380 d. None of these

113. P set has 11 elements & Q set has 12 elements then (P x Q) has _____ elements

a. 1 b. 23 c. 132 d. 11/12

My Notes :

114. If A = {5,7,8} B = {7,5,8} show that (AxB) = (BxA) = (AxB) ∪ (BxA) = (AxB) ∩ (BxA)

Therefore, (A x B) and (B x A) are equal as well as equivalent sets are.

115. If A = {5,7,8} B = {6}; Find (AxB), (BxA), whether (AxB) and (BxA) are equal sets? Equivalent sets?

116. In (AxB) = {(a,b) : where a ∈ , b ∈ }

If A = ϕ or B = ϕ then we defined

(AxB) or (BxA) as ϕ

117. If A = {12,10,16} B = {5,8,12,13} C = {8,11,10,25,16}

Find a. A x (B ∩ C)

b. B x (A ∩ C)

118. If f(x) = (x+1) / (x-1). Find f(-3/2), f(7/3)

119. If $g(x) = \left(\frac{2x+1}{3x+8}\right)$; $f(x) = 8x + 5$; Find f.g(10); g.f(-2); $g[f^{1}(5)]$

120. f(x) = 1/(1-x). Find f(-1)

a. 1 b. 1/2 c. Not defined d. 2

121. {(x,y) : x < y and x,y ∈ R} is

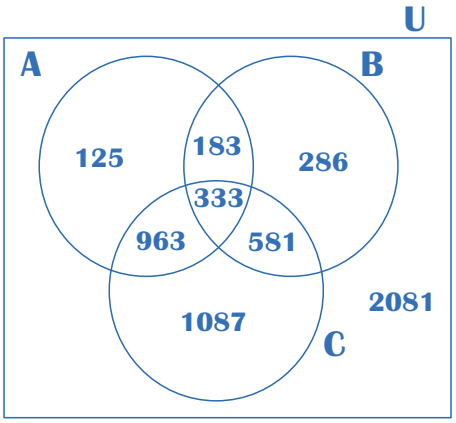
a. not a function b. a function c. one-one mapping d. None of these

122.

1. $A \cup A =$
2. $A \cup A' =$
3. $A \cap A' =$
4. $A \cup U =$
5. $A \cup \Phi =$
6. $A \cap \Phi =$
7. $\Phi \cup A' =$
8. $\Phi \cap U =$
9. $(A-B) \cap (B-A) =$
10. $(A \cup B) \cup (A \cap B) =$
11. $(A \cup B) \cap (A \cap B) =$
12. $(A \cup B) \cup A =$
13. $(A \cup B) \cap A =$
14. $(A \cap B) \cup A =$
15. $(A \cap B) \cap A =$
16. $(A \cup B) \cup A' =$
17. $(A \cup B) \cap (A' \cap B') =$
18. $(A \triangle B) \cup (A \cap B) =$
19. $(A' \cup B') \cup (A \cap B) =$
20. $(A-B) \cup (A \cap B) =$
21. $(B-A) \cup B =$
22. $(A \triangle B) \cup (A' \cap B') =$
23. $(A' \cap B') \cup (A \triangle B) =$
24. $(A \triangle B) \cup A =$

My Notes :

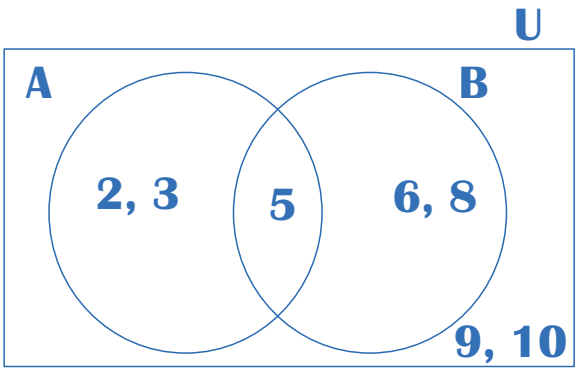
123.



1. n(A) =
2. n(B) =
3. n(C) =
4. n(A′) =
5. n(B′) =
6. n(C′) =
7. n(U) =
8. n(A ∩ B) =
9. n(B ∩ C) =
10. n(A ∩ C) =
11. n(A ∪ B) =
12. n(B ∪ C) =
13. n(A ∪ C) =
14. n(A-B) =
15. n(B-A) =
16. n(A-C) =
17. n(C-A) =
18. n(B-C) =
19. n(C-B) =
20. n(A′ ∩ B′) =
21. n(B′ ∩ C′) =
22. n(A′ ∩ C′) =
23. n(A △ B) =
24. n(B △ C) =
25. n(A △ C) =
26. n(A ∪ B′) =
27. n(B ∪ A′) =
28. n(A ∪ C′) =
29. n(C ∪ A′) =
30. n(B ∪ C′) =
31. n(C ∪ B′) =
32. n(A′ ∪ B′) =
33. n(B′ ∪ C′) =
34. n(A′ ∪ C′) =
35. n(A ∪ B ∪ C) =
36. n(A ∩ B ∩ C) =
37. n(A′ ∩ B′ ∩ C′) =
38. n(A ∩ B′ ∩ C′) =
39. n(A′ ∩ B ∩ C′) =
40. n(C ∩ A′ ∩ B′) =

My Notes :

124.



Find Sets :

1. A =
2. B =
3. (A ∩ B) =
4. (A ∪ B) =
5. (A ∩ B′) =
6. (B ∩ A′) =
7. (A′ ∩ B′) =
8. (A △ B) =
9. (A ∪ B′) =
10. (B ∪ A′) =
11. (A′ ∪ B′) =

125. B = {8,9,3,6,8,9,6,6,8,9,11,13,8,9,9,15}

Cardinal Value of Set B is

My Notes :

Your Only LIMIT Is Your MIND

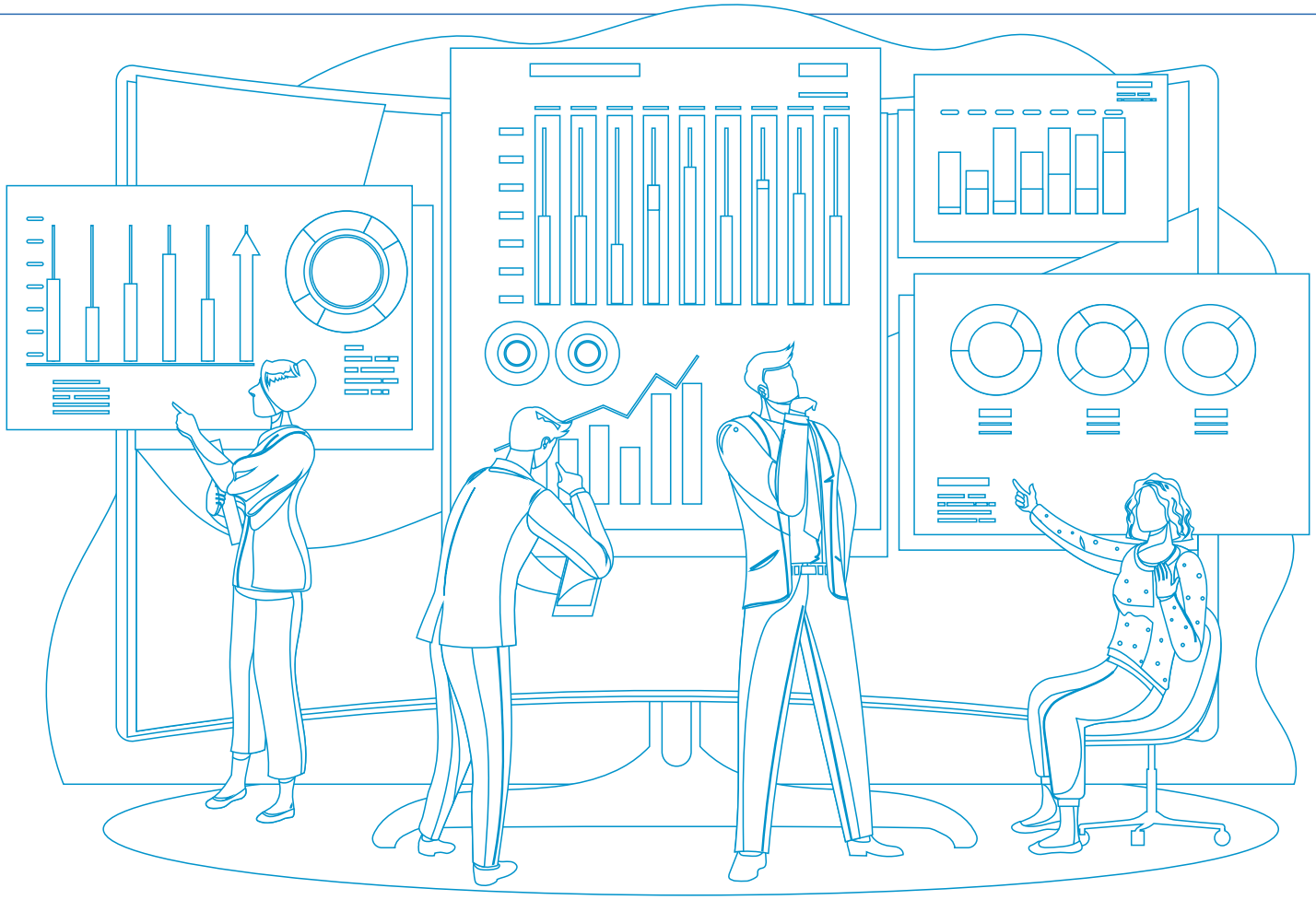
- CA VINOD REDDY -

- CA VINOD REDDY -

DO or DO NOT
There is NO TRY

" No One is Coming to
SAVE You.
This Life is 100%
YOUR RESPONSIBILITY "

- CA VINOD REDDY -



Statistical Description of Data

Chapter 7

CA VINOD REDDY

1. The word statistics is derived from :

Latin word Status
Italian word Statista
German word Statistik
French word Statistique

2. We may define statistics in singular and plural sense

3. Statistics is useful in -

4. 5 Steps in Statistics -

5.

Collection of Data

6. Following methods can be used for collection of primary data

1. Questionnaire Method
2. Mailed questionnaire Method
3. Interview Method
4. Observation Method

My Notes :

7. Sources of Secondary Method

1. International sources WHO, IMF, World Bank, etc.
2. Govt. Sources
3. Private Sources
4. Unpublished Data

8.

Checking the data for it _____ and _____ is known as scrutiny of data

9. Methods of Classification of Data

1.
2.
3.
4.
5.

10. Methods of Presentation of Data

1.
2.
3.

10. Methods of Presentation of Data

1.
2.
3.

11. Table No. 678 Course wise No. of students at PERCEPT (Year 2022)

Students / Course	Boys	Girls	Total
CA Foundation			
CA Inter			
CA Final			

12. The best method of data presentation is

13. The most attractive method of data presentation is

14. Stubs are :

15. Captions are :

16.

Diagrammatic Presentation

- Line Diagrams OR Histograms
- Bar Diagrams
- Pie Chart

17. Simple data on marks of 25 students :
6, 3, 8, 11, 19, 23, 24, 18, 11, 13, 16, 15, 19, 11, 20, 16, 8, 9, 2, 3, 5, 4, 9, 2, 13

C.I.	
0-5	
5-10	
10-15	
15-20	
20-25	

18. 8, 9, 8, 10, 8, 10, 10, 9, 10, 10, 9, 8, 8, 8, 10, 10, 10, 9, 8

19.

LCB =

UCB =

Relative Frequency =

Percentage Frequency =

Class Width =

Class-mark =

Frequency Density =

Less than type of cumulative frequency =

Greater than type of cumulative frequency =

20.

C.I.	Freq.	LCL	UCL	LCB	UCB	Relative Freq.	% Freq.	Freq. Density	Class Mark	Class Width	less than type c.f.	greater than type c.f.
10-20	5											
20-60	8											
60-80	7											
80-100	20											
100-120	3											
120-140	7											

21.

C.I.	Freq	LCL	UCL	LCB	UCB	Relative Freq.	% Freq.	Class Mark	Class Width	less than type c.f.	greater than type c.f.
10-18											
20-38											
40-98											
100-168											
170-218											
220-318											
320-398											

My Notes :

22. **Graphical Presentation**

- Area Diagrams OR Histograms
- Frequency Polygon
- Cumulative frequency curves OR Ogives

23. **Median can be**

Mode can be

24. **Frequency Curves**

1. Bell shaped curve
2. U-shaped curve
3. J-shaped curve
4. Mixed curve

25. **Data**

26. **Discrete Variable :**

Continuous Variable :

My Notes :

27.

Definition of Statistics

Plural sense	Singular sense
Quantitative and qualitative data collected usually with a view of having statistical analysis	Scientific method that is employed for collecting, analysing and presenting data leading finally to drawing statistical interferences.

28.

Limitation of Statistics

a. Deals with aggregate, an individual has no statistical significance.
b. Mostly concerned with quantitative data
c. Based on assumptions, so projections are likely to be inaccurate
d. Based on random sampling.

29. Methods of Collection of primary data

Interview Method	Mailed Questionnaire Method	Observation Method	Questionnaire filled and sent by enumeraters
a. Personal interview b. Indirect interview c. Telephonic interview			

30.

a. In personal interview investigator meets to the respondent directly and collects the information.

b. If there are some practical problems in reaching the respondents directly then we may go for indirect interview when investigator collects the information from the persons associated with the problem.

c. Telephonic interview is quick and non expensive method to collect primary data.

First 2 methods are inapplicable when there is large data. The amount of non-response is maximum for third method of data collection.

31.

Scrutiny of Data :

Since statistical analysis are made only on the basis of data, it is necessary to check whether the data under consideration are accurate and consistent.

No hard and fast rules can be applied for scrutiny of data. One must apply his intelligence, patience and experience while scrutinising the given information.

32.

Textual Presentation :

This method comprises presenting data with the help of paragraphs.

Advantage of this method lies in its simplicity, a layman can also present data under this method.

Textual presentation, however not preferred as it is Dull, Monotonous, Lengthy.

33. **Tabular Presentation :**

It may be defined as systematic presentation of data with the help of a statistical table having no. of rows, columns and complete ref. no., title, description of rows and columns, foot notes, if any.

a. Caption is the upper part of the table describing column and sub-columns.

b. Stubs are left part of table providing description of rows.

c. Body is the main part of the table that contains numerical figures.

34. **Diagrammatic Presentation of Data**

a. Another alternative and attractive method is with the help of charts, graphs, pictures, etc.

b. Any hidden trend can be understood with the help of this method.

c. However, as compared to tabulation, this method is less accurate. So if priority is accuracy of data, we have to recommend tabulation.

35. We are going to consider the following types of diagrams

a. Line diagram / histogram

b. Bar diagram

c. Pie chart / pie diagram / circle diagram.

36.

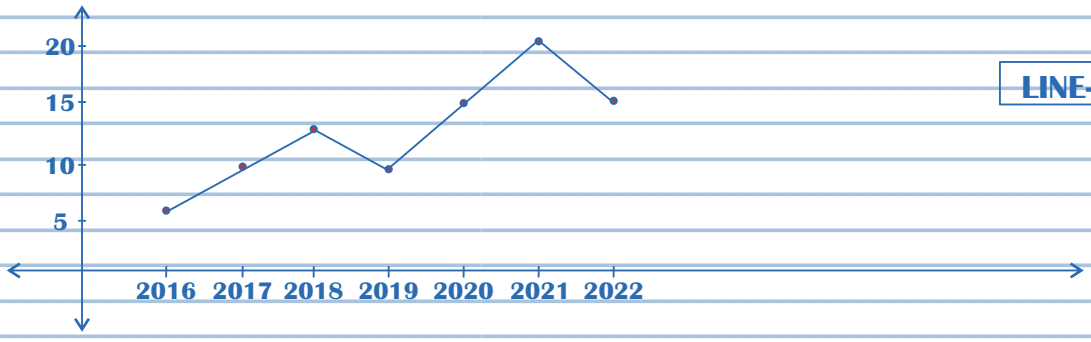
- Line diagram that uses logs is known as Ratio-chart.
- Multiple Line chart is used for representing 2 or more related time series data expressed in same unit.
- Multiple Axis chart in somewhat similar situations if variables are expressed in different units.

37.

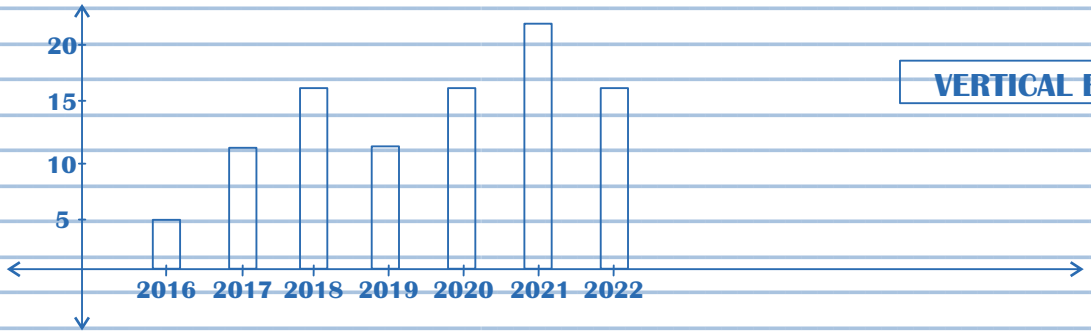
- Horizontal bar diagram issued for qualitative data.
- Vertical bar diagram is associated with quatitative data OR time series data

My Notes :

38.

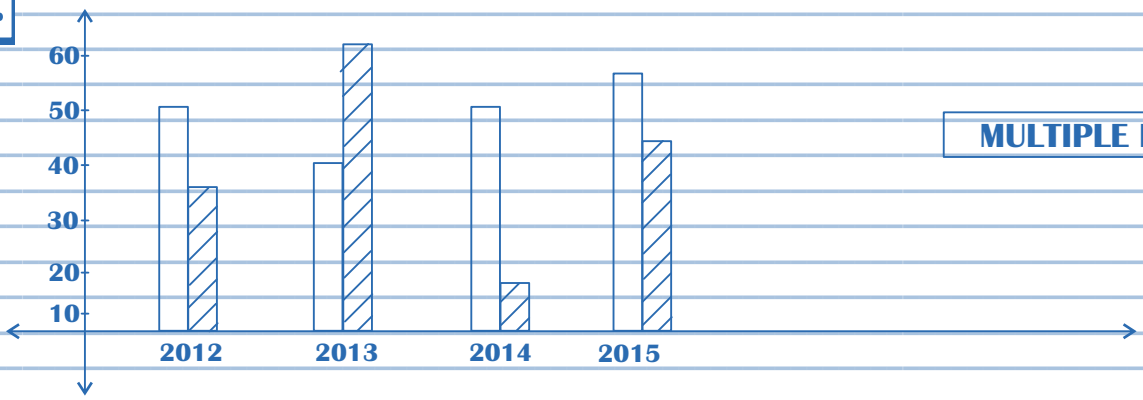


LINE-CHART



VERTICAL BAR-CHART

39.



MULTIPLE BAR-CHART

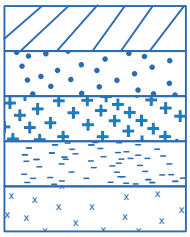
My Notes :

40. Draw the appropriate diagram for presentation the of following data :

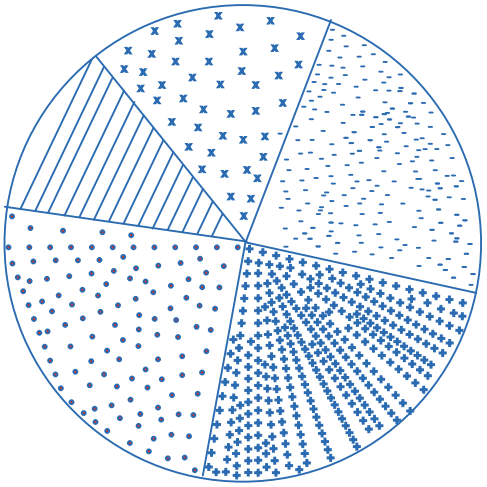
Source	Revenue in Millions (₹)
Customs	80
Excise	190
Income-Tax	160
Corporate Tax	75
Misc	35
Total	540

$\Rightarrow$

Source	Angle in Pie chart
Customs	(80/540) x 360 = 53° (approx.)
Excise	(190/540) x 360 = 127°
Income-Tax	(160/540) x 360 = 107°
Corporate Tax	(75/540) x 360 = 50°
Misc	(35/540) x 360 = 123°



Customs
Excise
Income-Tax
Corporate Tax
Misc



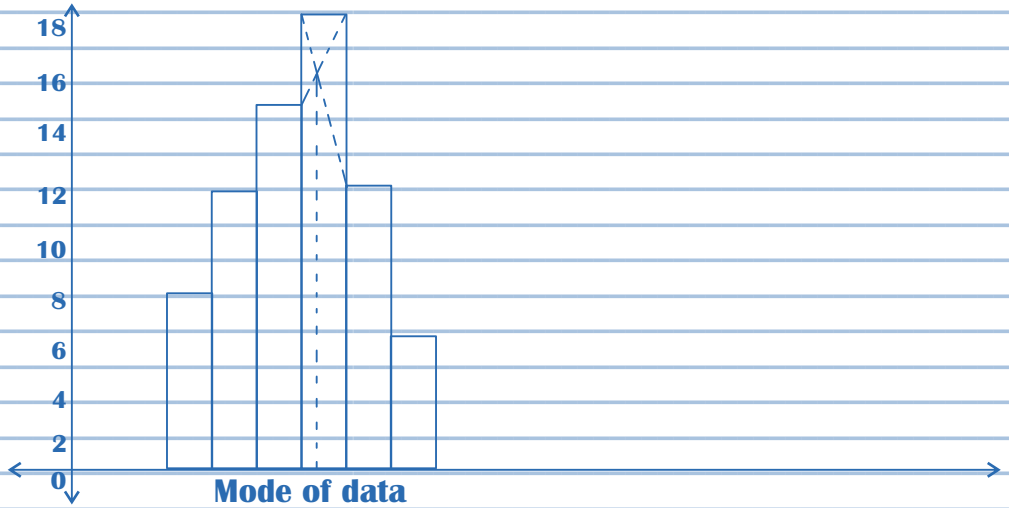
41.

Graphical Presentation of Frequency Distribution

- Area Diagrams OR Histograms
- Frequency Polygon
- Cumulative frequency curves OR Ogives

42.

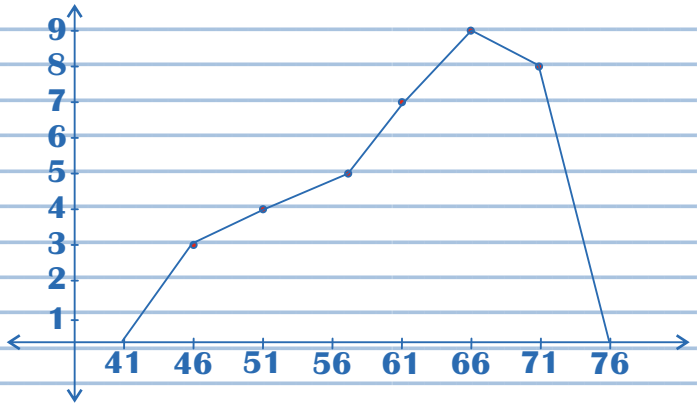
Histogram



43.

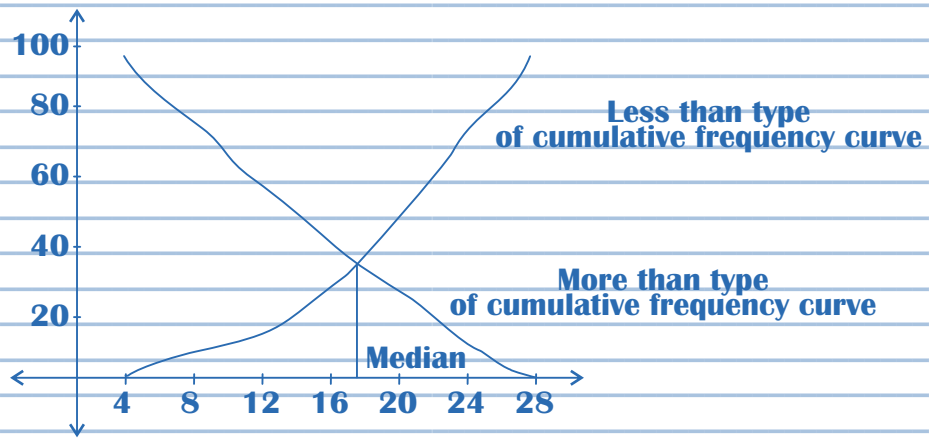
Frequency Polygon

Mid-points	46	51	56	61	66	71
No. of student	3	4	5	7	9	8



44.

Ogives OR Cumulative frequency curves



Median can be graphically obtained with the help of cumulative frequency curves / ogives

Mode can be graphically obtained with the help of histogram.

My Notes :

45. There are 4 types of frequency curves

Bell shaped curve	U shaped curve	J shaped curve	Mixed curve
Distribution of height, weight income generally belong this category. Freq. distribution starts with low becomes maximum at centre then gradually reaches to lowest value to other extremity.	Frequency distribution is minimum near the central part and freq. slowly and steadily reaches maximum at after two extremities.	It starts with the minimum frequency and then gradually reaches to maximum frequency at other extremity.	We may have combination of these frequency curves. No specific shape for mixed curve.

46. The primary data is collected by

a. Interview Method
b. Observation Method
c. Questionnaire Method
d. All of these

47. The quickest method to collect primary data is :

a. Personal Interview
b. Indirect Interview
c. Telephonic interview
d. Observation Method

48. In case of Rail accident, the appropriate method of data collection is by :

a. Personal Interview
b. Direct Interview
c. Indirect Interview
d. All of these

49. Which method of data collection covers widest area

a. Telephonic interview
b. Mailed Questionnaire Method
c. Direct Interview Method
d. All of these

50. The amount of non-responses are maximum in case of

a. Mailed Questionnaire Method
b. Interview Method
c. Observation Method
d. All of these

51. The accuracy and consistency of data can be verified by -

a. Internal checking
b. External checking
c. Scrutiny
d. None of these

52. The unit of measurement in tabulation is shown in the

a. Box Head
b. Body
c. Caption
d. Stub

53. In tabulation, source of the data if any is shown in the

a. Foot-Note
b. Body
c. Caption
d. Stub

54. Hidden trend, if any, in a data can be noticed by

a. Textual presentation
b. Tabulation
c. Diagrammatic Presentation
d. None of these

55. The most accurate (Best) method of data presentation is :

a. Diagrammatic Presentation
b. Tabulation
c. Textual presentation
d. None of these

56. The chart used logarithms of a variable is known as :

a. Line chart
b. Ratio chart
c. Multiple line chart
d. Pie chart

My Notes :

57. Pie diagram is used for?

a. Comparing diff. components and their relation to total
b. Representing qualitative data in a circle
c. Representing quantitative data in a circle
d. b or c

58. A frequency distribution

a. Arranges observations in increasing order
b. Arranges observations in number of groups
c. is for time pass
d. All of these

59. Frequency distribution of a continuous variable is known as

a. Grouped frequency distribution
b. Simple frequency distribution
c. a or b
d. a and b

60. The distribution of shares is an example of frequency distribution of :

a. A discrete variable
b. A continuous variable
c. An attribute
d. None of these

61. The distribution of profits of a blue chip company relates to :

a. A discrete variable
b. A continuous variable
c. An attribute
d. None of these

62. Mutually exclusive classification

a. Excludes both the class limits
b. Excludes UCL but includes LCL
c. Includes UCL and excludes LCL
d. None of these

My Notes :

63. Out of 1000 workers, 25% were industrial workers and rest were agricultural workers. 300 persons enjoyed world cup matches on T.V, 30% of people who had not watched world cup matches were industrial workers. What is agri. no. of workers who had enjoyed world cup matches on T.V.?

a. 260 b. 240 c. 230 d. 250

64. The number of accident for 7 days in a locality are given below :

No. of accidents	0	1	2	3	4	5	6
Frequency	15	19	22	31	9	3	2

What is no. of cases when 3 or less accidents occur?

a. 56 b. 6 c. 68 d. 87

65. The follow data relates to income :

Income	500 - 999	1000 - 1499	1500 - 1999	2000 - 2499
No. of persons	15	28	36	7

What is % of persons earning more than ₹ 1500?

a. 43% b. 50% c. 40% d. None of these

66. The following data relate to the marks of group of students :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of Students	15	38	65	84	100

How many students have marks more than 30?

a. 65 b. 184 c. 35 d. None of these

67. Find number of observations between 250 and 300 from the following data :

Value	More than 200	More than 250	More than 300	More than 350
No. of Observations	56	38	15	0

a. 56 b. 23 c. 15 d. 8

68. Cost of sugar in a month under the heads material, labour, expenses, overheads are ₹ 12,20,35,23 respectively. What is diff between central angles for the largest and smallest components of cost of sugar?

a. 72° b. 48° c. 56° d. 92°

69. The distribution of profits of a company generally follows :

a. J shaped freq. curve b. U-shaped frequency curve

c. Bell shaped freq. curve d. None of these

70. The distribution most commonly used is :

a. Mixed b. U-shaped c. Bell shaped d. None of these

71. Graph is a _____

a. Line diagram b. Bar-diagram c. Pie-diagram d. Pictogram

72. (Class frequency / class width) is defined as _____

a. Frequency density b. Frequency distribution c. Both d. None

72. Tally Marks determines

a. Class width b. Class boundary

c. Class limit d. Class Frequency

74. An area diagram is

a. Histogram
b. Frequency Polygon
c. Ogives
d. None

75. Ogive is a _____

a. Line diagram
b. Bar diagram
c. Both
d. None

76. Unequal width of classes in a frequency distribution do not cause any difficulty in construction of _____

a. Ogive
b. Frequency Polygon
c. Histogram
d. None of these

77. Graphical presentation of cumulative frequency distribution is called as _____

a. Histogram
b. Ogive
c. Both
d. None of these

78. The most common form of diagrammatic presentation of a grouped frequency distribution is

a. Ogive
b. Histogram
c. Frequency Polygon
d. None of these

79. Vertical Bar diagram may appear somewhat alike -

a. Histogram
b. Frequency Polygon
c. Ogive
d. None of these

80. Number of types of cumulative frequency is :

a. One
b. Two
c. Three
d. Four

My Notes :

81. A representative value of a class interval for the calculation of Mean, SD, MD, etc. is

a. Class interval
b. Class limit
c. Class mark
d. None

82. In all statistical calculations & diagrams involving end points of classes _____ are used.

a. Class Boundaries
b. Class Values
c. both
d. None

83. Upper boundary of a class coincide with Lower boundary of next class.

a. True
b. False
c. Both
d. None

84. The lower extreme point of a class is called as _____

a. Lower Class Limit
b. Lower Class Boundary
c. Both
d. None

85. When one end of the class is not specified, the class is called as _____

a. Open end class
b. Close end class
c. Both
d. None of these

86. When all classes have equal width, the heights of rectangles in histogram will be numerically equal to the _____ .

a. Class Frequencies
b. Class Boundaries
c. Both
d. None of these

87. To find 'Mode of data' graphically we use _____ .

a. Ogives
b. Frequency Polygon
c. Histogram
d. None of these

88. In representing simple frequency distributions of a discrete variable _____ is useful.

a. Ogives
b. Histogram
c. Frequency Polygon
d. None of these

89. Diagrammatic presentation of cumulative frequency distribution is _____ .

a. Frequency Polygon b. Ogives

c. Histogram d. None of these

90.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	8	15	6	4

For the class 20-30 cumulative frequency is :

a. 20 b. 13 c. 15 d. 28

91. Breadth of rectangle is equal to length of class interval in _____ .

a. Ogives b. Histogram c. Line diagram d. None

92. In Histogram classes are taken _____

a. Overlapping b. None Overlapping c. Both d. None

93. There are _____ methods of classification of data.

a. 4 b. 3 c. 2 d. 1

94. There are _____ methods of presentation of data.

a. 4 b. 3 c. 2 d. 1

95. For the overlapping classes 0-10, 10-20, 20-30, etc. the class mark of 0 - 10 is

a. 5 b. 4.50 c. 4 d. 10

96. For the classes 0-9, 10-19, 20-29, 30-39, the class mark of 10-19 is _____

a. 14.50 b. 15 c. 20 d. 16

97. Mutually inclusive classification is meant for _____

a. Discrete variable b. Continuous variable c. Both d. None

98. Mutually exclusive classification is meant for _____

a. Discrete variable b. Continuous variable c. Both d. None

99. LCB is _____

a. Latur Crime Branch

b. Lower Class Branch

c. Lower Class Boundary

d. a or c

100. Relative Frequency of a particular class

a. Lies between 0 and 1

b. Lies between -1 and 1

c. Lies between -1 and zero

d. None of these

101.

Characteristic	Discrete / Continuous Variable / Attribute
a. Income	
b. Profit	
c Blue-colour	
d. Honesty	
e. Nationality	
f. No. of shares	
g. Age	
h. No. of members	
i.Drinking habit	
j. Beauty	
k. Children in a family	
l. Love	
m. Batch size	

102.

Class - Interval	Frequency
0 - 10	5
10 - 20	8
20 - 40	9
40 - 60	10

Mutually Exclusive Classification

Class - Interval	Frequency
0 - 9	25
10 - 29	28
30 - 89	35
90 - 189	40

Mutually Inclusive Classification

My Notes :

Do Not Be Afraid

to give up 'GOOD'

to go for the 'GREAT'

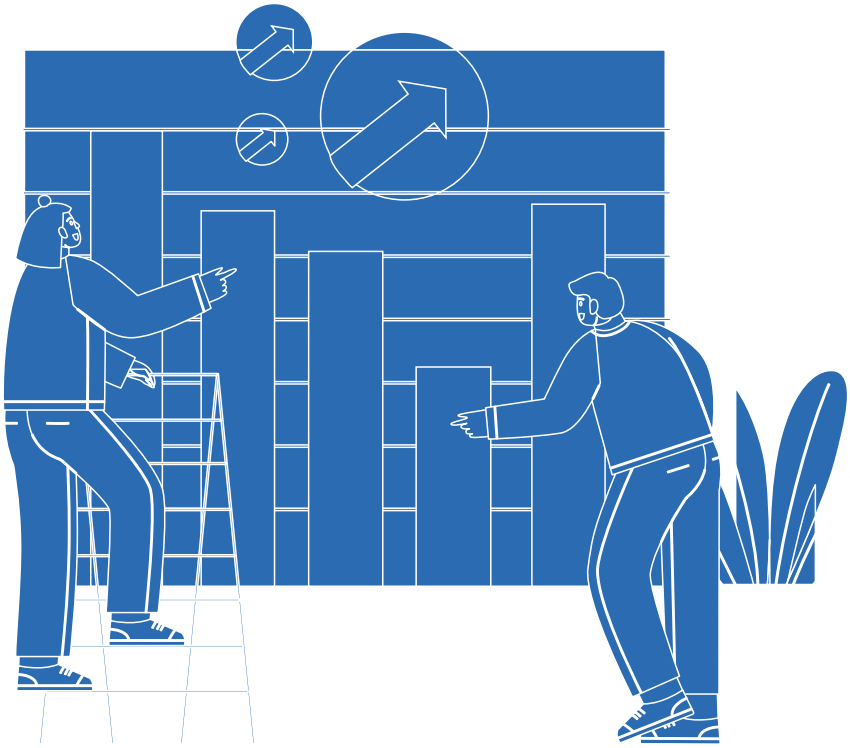
- CA VINOD REDDY -

YOUR INTELLIGENCE makes you really ATTRACTIVE

- CA VINOD REDDY -

Chapter 8

Measures of Central Tendency And Dispersion



CA VINOD REDDY

1. 5 Measures of Central Tendency are :

2.

AM of simple data =

AM of grouped data =

AM of grouped & classified data =

3. Find AM of : 80,63,90,101,65,73,88,100.

4. Find AM of

x	20	30	40	50	60
f	28	52	68	72	80

5. Find AM of

C.I	10-20	20-40	40-80	80-120
f	15	18	23	84

My Notes :

6. Find AM of

C.I	10-19	20-39	40-69
f	33	32	85

7. AM is magnitude-wise central number

Median is

Mode is

8. Find Median for 81,36,25,35,38,43,50

9. Find Median for 80,60,28,90,81,100,103,115

10.

Median - If No. of observations are

↓ Odd

↓ Even

11. Find Median, Mode for

C.I	10-20	20-30	30-40	40-60	60-100
f	15	18	33	22	16

12. Find AM, Median, Mode for
80, 60, 90, 90, 80, 90, 50, 90, 10, 5, 18, 16, 12, 16, 55

13. Empirical relation between Mean, Median, Mode

My Notes :

14.

Fractiles	Divides the data in ___ equal parts	No. of fractiles	Notations
Median			
Quartiles			
Deciles			
Percentiles			

15. For Simple data - Formulae

Median =

Q_1 =

Q_3 =

D_6 =

P_{71} =

16. For Grouped and Classified data

Median =

Q_3 =

D_2 =

P_{80} =

My Notes :

17. Find P_{85} for

C.I	10-18	20-38	40-98	100-168
f	28	36	56	28

18.

Measure	Simple Data	Grouped Data
AM		
GM		
HM		
Median		
Mode		
Q_1		
D_7		
P_{61}		

My Notes :

19. Find AM, GM, HM for - 2,6,8,9,3,13,20,18

20. Properties of AM

21. If $\bar{x}_1 = 80$, $\bar{x}_2 = 120$ and Combined AM = 103. Find $n_1 : n_2$

22.

Best Measure of Central Tendency =

For Open Class interval
Best Measure of Central Tendency =

23.

For n observations =

For n distinct observations =

For 2 Observations =

24.

Observations	AM	GM	HM
p,q			
a,b,c,d			
60,20,80			
5,10,20,0			

If one of the observation is zero then :
GM =
HM =

25. Find GM, HM, AM for

x	5	6	7	8
f	1	2	2	3

26.

For 2 Groups	
Combined AM =	
Combined GM =	
Combined HM =	

27.

For 3 Groups	
Combined AM =	
Combined GM =	
Combined HM =	

28. $n_1 = 30$; $n_2 = 20$; $S_1 = 3$; $S_2 = 4$; $\bar{x}_1 = 40$, $\bar{x}_2 = 50$. Find combined SD.

29. **Dispersion means :**

Measures of dispersion are used to measure :

30.

Measures of Dispersion

- **Absolute**
- **Relative**

31. **For simple data :**

Range =

M.D =

S.D =

Q.D =

32. Find Range, M.D, S.D, Q.D for - 20,28,35,40,48,60,65,68

33. For Grouped data :

Range =

M.D =

S.D =

Q.D =

34. Find Range, M.D, S.D, Q.D

CI	10-20	20-30	30-40	40-50
f	5	7	2	6

35. Find Missing Frequency if median = 32

CI	0-10	10-20	20-30	30-40	40-50	50-60
f	10	-	25	30	-	10

Total Frequency = 100

36. If Mode = 66. Find missing frequency

CI	30-40	40-50	50-60	60-70	70-80	80-90
f	8	16	22	28	-	12

37.

S.D of 2 Observations =

S.D of1st 'n' natural numbers =

38.

M.D about	Simple Data	Grouped Data
AM		
Median		
Mode		

My Notes :

39.

Q.D = Semi inter Quartile Range =

Coefficient of Quartile Deviation =

40.

If y = a + bx then

41.

	Old Data	If 15 is subtracted from each obs^{n}	If every observation is increased by 5	If every observation is mutliplied by 10	If every observation is divided by 20
AM	30				
Median	50				
Mode	60				
Range	70				
MD	28				
SD	36				
QD	55				

42. Impact on coefficient of variation :

If 20 is added to each observation	
If 30 is subtracted from each observation	
If every observation is multiplied by 80	
If every observation is divided by 100	

43.

	Runs of last 8 innings
Batsman A	80, 60, 65, 85, 75, 40, 35, 20
Batsman B	35, 25, 50, 25, 55, 60, 25, 15

Who is more consistent?

44.

Best measure of dispersion	
For comparison purpose	
For Open Class Intervals	

45. Find S.D, Variance, Coefficient of Variation for 18,19,20,28,35.

My Notes :

46.

Observations x,y,z

AM = GM = HM =

47. Find Range & Coefficient of range for : ₹ 90, ₹ 80, ₹ 60, ₹ 30, ₹ 10, ₹ 5, ₹ 65, ₹ 78

48. If 3x + 5y = 85; AM of x = 3; SD of x = 0.75. Find AM of y, S.D of y

49. Properties of Median

1. If y = a + bx, then (Median of y) = a + b(Median of x)

   If ax + by + c = 0; then a(median of x) + b(median of y) + c = 0

2. For a set of observations, the sum of absolute deviations is minimum when deviations are taken from median.

$$\Sigma|x\text{-median}| = \text{minimum}$$

50. For 2 Observations GM = 9; AM = 10. Find HM.

51. AM : a. is Best measure of central tendency.

b. is rigidly defined.

c. based on all observations

d. easy to comprehend, easy to calculate

e. amenable to mathematical properties.

However drawback of AM is - it is very much affected by sampling fluctuation and AM can't be calculated for data with open-end classification.

52. Median

a. Median is also rigidly defined.

b. Easy to comprehend and calculate.

c. It is positional average of data.

d. It is the central number when data is arranged is ascending or descending order of their magnitude.

e. Median is not based on all observations.

f. Most appropriate measure of central tendency for open-end classification.

54. Measures of central tendency for a given set of observations measures

a. Scatterness of Observations

b. Central location of observations

c. Both of these

d. None of these

55. While computing AM from a grouped frequency distribution, we assume that

a. The classes are of equal length

b. The classes have equal frequency

c. All the values of a class are equal to mid value of class.

d. None of these

56. Which of the following is true

a. Usually AM is Best measure of dispersion
b. Usually SD is Best measure of dispersion
c. Both of these
d. None of these

57. Which of the following is not uniquely defined

a. Mean b. Median c. Mode d. All of these

58. Weighted average are considered when

a. The data are not classified
b. The data are put in the form of grouped freq. distribution.
c. All observations are not of equal importance
d. All of these

59. Which of the following is correct for a set of 'n' district positive observations.

a. AM $\geq$ GM $\geq$ HM b. AM > GM > HM
c. GM < AM < HM d. None of these

60. When the firm registers both profits and losses then, which of the following measure of central tendency can not be considered?

a. AM b. GM c. Median d. Mode

61. Quartiles are the values dividing given set of observations into

a. 2 equal parts b. 4 parts c. 4 equal parts d. 3 parts

My Notes :

62. Quartiles can be determined graphically using

a. Histogram b. Freq. Polygon c. Ogives d. Pie-charts

63. Which of the following measure satisfy linear relationship between 2 variables.

a. AM b. Median c. Mode d. All of these

64. What is GM of 8, 24, 40

a. 24 b. 12 c. $8 \times \sqrt[3]{15}$ d. $\sqrt[5]{7680}$

65. H.M of 2, 3, 5 is

a. 2.00 b. 3.33 c. 2.90 d. $\sqrt[3]{30}$

66. AM and HM of 2 numbers are 5 and 3.20 resp. then GM will be

a. 16.00 b. 4.10 c. 4.05 d. 4.00

67. Find value of first/lower quartile for 15, 18, 10, 20, 23, 28, 12, 16

a. 17 b. 16 c. 12.75 d. None of these

68. Third decile for the numbers 15, 10, 20, 25, 18, 11, 9, 12 is

a. 13 b. 10.70 c. 11 d. 11.50

69. If average salary of unskilled workers is ₹ 10,000 and that of group of skilled workers is ₹ 12,000, what is the % of skilled workers?

a. 40% b. 50% c. 60% d. None of these

70. If there are 2 groups with 75, 65 as Harmonic Mean and containing 15,13 observations then combined HM is given by

a. 65 b. 70.36 c. 70.81 d. None of these

71. What is HM of 1, 1/2, 1/3, 1/4,.....1/n

a. n b. 2n c. 2/(n+1) d. n(n+1)/2

My Notes :

72. An aeroplane flies from A to B at a speed of 500 kms/hr and comes back from B to A at 700 kms/hr. The avg, speed of entire journey is :

a. 600 kms/hr b. 583.33 kms/hr c. $100\sqrt{35}$ kms/hr d. None

73. If the variable assumes the values 1,2,3,4,5 with frequencies 1,2,3,4,5 then what is AM?

a. 11/3 b. 5 c. 4 d. 4.50

74. GM of x is 10 and GM of y is 10 then GM of x.y is

a. 150 b. log10 x log15 c. log150 d. None of these

75. If AM and GM for 10 observations are both 15, then value of HM is :

a. Less than 15 b. More than 15 c. 15 d. None of these

76. Find Range of 65 cms, 20 cms, 100 cms, 90 cms, 81 cms

a. 80 cms b. 80 c. 66.66666cms d. 66.66666

My Notes :

77. Find Coefficient of Range for 65 cms, 20 cms, 100 cms, 90 cms, 81 cms

a. 80 cms b. 80 c. 66.66666cms d. 66.66666

78. Find S.D and Range for 80 cms, 20 cms.

79. Find S.D of first 25 natural numbers is :

80. Properties of SD

1. If all observations are same then SD is zero.
2. SD is unaffected by change of origin but affected by change in scale.
3. Combined SD = $\sqrt{\frac{n_1S_1^2 + n_2S_2^2 + n_1d_1^2 + n_2d_2^2}{n_1 + n_2}}$

72. If AM and coeffi. of variation of x are 10,40 resp. what is the variance of (15-2x)?

82. Range is quickest to compute. However range is based on only 2 observations and affected too much by presence of extreme observations.

83. If profit of the company remains the same for last 10 months then SD of profit would be

a. zero b. positive c. negative d. a or c

84. Which measure of dispersion is considered for finding a pooled measure of dispersion after combining several groups :

a. MD b. SD c. QD d. Range

85. If all observations are increased by 25 then

AM	
Median	
Mode	
Range	
MD	
SD	
QD	
Coeff. of Variation	

86. If all observations are multiplied by 10 then

AM	
Median	
Mode	
Range	
MD	
SD	
QD	
Coeff. of Variation	

My Notes :

87. If y = -8x+500 and Range of x = 45, Range of y = ?

88. If all observations are multiplied by -8 then Range becomes

a. -8 times b. 8 times c. $(1/8)^{th}$ d. None of these

89. Find coefficient of MD about AM for first 9 natural numbers.

a. 200/9 b. 80 c. 400/9 d. None of these

90. If 2x - 3y = -7; AM of x = 1; MD of x = 0.30. Find coeff. of MD about AM for y.

a. 12 b. 50 c. 4 d. None of these

91. Find MD about Mode for : 4/11, 6/11, 8/11, 9/11, 12/11, 8/11

a. 1/6 b. 1/11 c. 6/11 d. 5/11

92. What is standard deviation of 5, 5, 9, 9, 9, 10, 5, 10, 10

a. $\sqrt{14}$ b. $\sqrt{(42)}/3$ c. 4.50 d. None of these

93. AM and SD of x are a, b resp. then SD of [(x - a) / b] is

a. -1 b. 1 c. ab d. a/b

94. If quartiles of a variables are 45, 52, 65 resp. Find quartile deviation.

a. 10 b. 20 c. 25 d. 8.30

95. Standard Deviation of first 'n' natural number is 2 then find 'n'

a. 2 b. 7 c. 6 d. 5

96. If $n_1 = 30$, $n_2 = 20$, $\bar{x}_1 = 55$, $\bar{x}_2 = 60$, $S_1 = 4$, $S_2 = 5$; Find combined SD.

a. 5.00 b. 5.06 c. 5.23 d. 5.35

97. The mean and SD of sample of 100 observations were calculated as 40 and 5.10 respectively. one observation was taken as 50 instead of 40 by mistake. The correct SD is -

a. 4.90 b. 5.00 c. 4.88 d. 4.85

98. The words "mean" or "average" only refers to

a. AM b. GM c. HM d. None of these

99. Mean is of _____ types.

a. 5 b. 4 c. 3 d. None of these

100. AM is never less than GM.

a. True b. False

101. AM is always more than HM.

a. True b. False

102. GM of set of 'n' observations is the _____ root of their product.

a. $(n/2)^{th}$ b. $(n/4)^{th}$ c. n^{th} d. $(n-1)^{th}$

103. GM of 8, 4, 2 is

a. 4 b. 2 c. 8 d. None of these

104. Median is unaffected by extreme values.

a. True b. False

105. When all observations occur with equal frequency _____ does not exist.

a. AM b. Median c. Mode d. HM

106. Find Mode of 8, 8, 3, 3, 8, 3, 8, 8, 8, 3, 3, 3

a. 8 b. 3 c. 8 & 3 d. No mode for this data

107. Find Mode of 8,8,3,3,8,3,8,8,8,3,3,3,10 is

a. 8 b. 3 c. 8 & 3 d. No mode for this data

108. Simple average is sometimes called as

a. Weighted Avg. b. Unweighted Avg. c. Both d. None

109. Multiplying the values of the variables by their corresponding weights and then dividing the sum by sum of weights is _____

a. Simple Avg. b. Weighted Avg. c. Both d. None

110. Simple and Weighted Average are equal when all weights are equal.

a. True b. False

111. Frequencies are generally used as

a. Range b. Weights c. Mean d. None

112. The values of all items are taken into consideration in calculation of

a. AM b. Median c. Mode d. None of these

113. GM can be calculated only when all observations have same sign & none is zero.

a. True b. False

114. HM is defined when No observation is

a. 3 b. 2 c. 1 d. zero

115. The class in which 'mode' belongs is known as :

a. Median Class b. Mean Class c. Modal Class d. Backward Class

116. For calculation of _____ we need to find cumulative frequency.

a. AM b. Median c. Mode d. None of these

117. When distribution is symmetrical mean, median, mode

a. Coincide b. Do not coincide c. Both d. None

118. The no. of observations smaller than _____ is equal to no. of observations larger than it.

a. Median b. Mode c. Mean d. None of these

119. _____ quartile is known as upper quartile.

a. First b. Second c. Third d. Fourth

120. Second quartile is also known as

a. Lower quartile b. Upper quartile c. Median d. Mode

121. Median = 2^{nd} quartile = 5^{th} Decile = 50^{th} Percentile

a. True b. False

122. 10^{th} Percentile = ?

a. 1^{st} Decile b. 1^{st} Quartile c. Median d. None

123. 25^{th} Percentile = ?

a. Q_1 b. D_{25} c. Q_3 d. Median

124. In ogive, abscissa corresponding to ordinate (N/2) is

a. Median b. 1st Quartile c. 3rd Quartile d. None

125. In ogive, abscissa corresponding to ordinate (3N/4) is

a. Median b. 1st Quartile c. 3rd Quartile d. None

126. For 600, 300, 500, 300, 800, 200, 300, 550, 450, 350 rank of median is

a. 5 b. 5.50 c. 5.05 d. 600

127. For 81,23,51,93,103,28,36 rank of 1st Quartile is

a. 3 b. 1 c. 2 d. 7

128. Standard deviation is denoted by

a. $\bar{x}$ b. σ c. σ^2 d. None of these

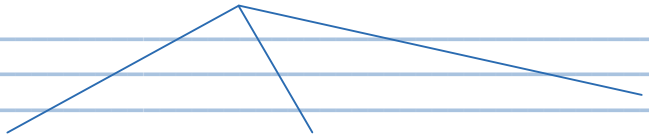
129. The square of SD is known as _____ .

a. Variance b. MD c. QD d. Square Man

130. $\frac{\sigma}{\bar{x}} \times 100 = ?$

a. AM b. MD c. QD d. Co-efficient of Variation

131. Find AM, GM, HM, for the data : a,b,c,d,e,f,g



My Notes :

132. For Observations : 18,18,18,18,18,18

AM =

HM =

GM =

Median =

Mode =

Range =

MD =

SD =

QD =

My Notes :

OPEN YOUR 'MIND' BEFORE YOUR MOUTH

WHAT CONSUMES YOUR 'MIND' CONTROLS YOUR 'LIFE'

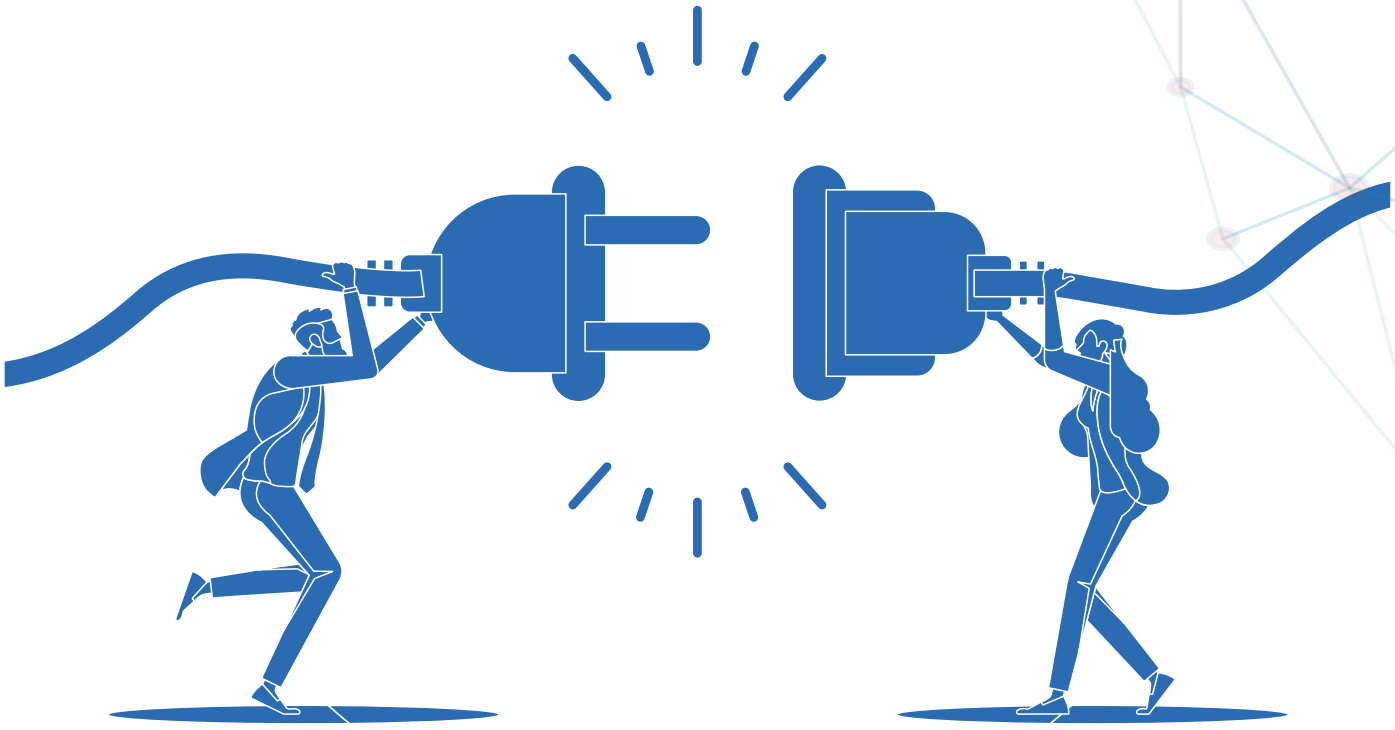
- CA VINOD REDDY -

Die with MEMORIES not DREAMS !

- CA·VINOD REDDY -

Chapter 9

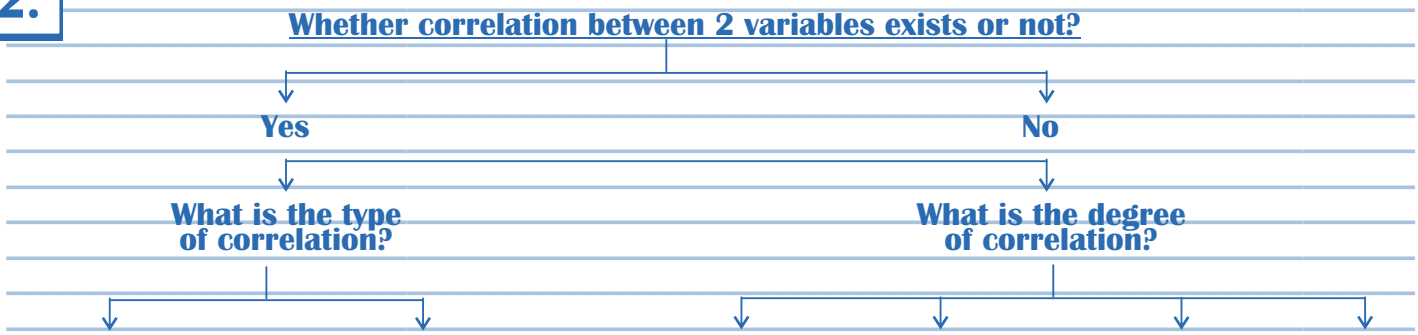
CORRELATION AND REGRESSION ANALYSIS



CA VINOD REDDY

1. What is correlation and what is regression?

2.



3. Methods to measure correlation between 2 variables :

a.
b.
c.
d.

My Notes :

4. Scatter diagram showing

1.

2.

3.

4.

5.

Scatter diagrams can give an idea about type of correlation but it can't give exact degree of correlation.

5. Find Spearman's rank correlation coefficient.

x	30	80	45	63	91	28	222
y	101	111	93	123	86	65	79

6. Find Spearman's rank correlation coefficient.

x	58	92	63	63	65	65	63	58
y	20	25	28	25	28	25	30	38

7.

Spearman's Rank Correlation Coefficient.

8. Find Coefficient of Concurrent Deviation for -

x	60	90	28	36	51	58	90	95	101	63
y	28	111	93	28	63	78	53	28	99	100

In the product column : No. of positive signs = x

No. of negative signs = y

x > y	r is positive
x < y	r is negative
x = y	r = 0

9. Find Karl Pearson's _____

x	8	3	11	9	6
y	5	8	13	20	28

10. Covariance of (x,y) =

SD_x =

SD_y =

My Notes :

11.

r	Type of Correlation
r = 1.00	
0.30 < r < 0.80	
0.80 < r <1.00	
r = 0	
r = -1.00	
-1.00 < r < -0.80	
-0.80 < r < -0.30	
0 < r < 0.30	
-0.30 < r < 0	

12. If v = 3x+8; u = 8y-19; r_{xy} = 0.80

r_{uv} =

Correlation coefficient is unaffected by change / shift of origin as well as by change in scale.

13. If u = -3x+53; v = -18y+99; r_{xy} = 0.70

r_{uv} =

14. If u = -18x+55; v = 16y+100; r_{xy} = 0.85

r_{uv} =

15. If u = -8x+19; v = -16y-33; r_{xy} = -0.56

r_{uv} =

My Notes :

16. Find Karl Pearson's Coefficient for -

x	30	60	90	50
y	20	30	40	80

17.

x	100	80
y	30	60

Find r by Karl Pearson's Method :

My Notes :

18.

Regression Analysis

After studying correlation between 2 variables, the process of estimating the value of one variable on the basis of other is known as regression analysis

x = Given y = ?	y = Given x = ?

r, b_{yx}, b_{xy} all are unit-free

Reg line of y on x is :

Reg line of x on y is :

Reg coefficient of y on x is = b_{yx} =

Reg coefficient of x on y is = b_{xy} =

My Notes :

19. If $\bar{x} = 30$, $\bar{y} = 90$, $\sigma_x = 5$, $\sigma_y = 8$, $r = 0.80$

Find a. Reg line of x on y

b. Reg line of y on x

c. If x =25, y =?

d. If y =85, x =?

$$b_{yx} = r.\frac{\sigma_y}{\sigma_x}$$

$$b_{xy} = r.\frac{\sigma_x}{\sigma_y}$$

Therefore, $b_{yx} . b_{xy}$

$$= r.\frac{\sigma_y}{\sigma_x} \times r.\frac{\sigma_x}{\sigma_y}$$

$$= r^2$$

$$r = \sqrt{b_{yx} . b_{xy}}$$

$$r^2 = b_{yx} . b_{xy}$$

Square of correlation coefficient is equal to product of 2 regression coefficients.

Correlation coefficient 'r' is G.M. of 2 regression coefficients b_{yx} . b_{xy}

My Notes :

20.

b_{yx} =

b_{xy} =

$b_{yx} \cdot b_{xy}$ =

Therefore 'r' is G.M. of

r	b_{yx}	b_{xy}
0	0	0
+	+	+
-	-	-

21.

If Reg. line of y on x is written in the form of

If Reg. line of y on x is 3x+5y=83. Find b_{yx}

22.

If Reg. line of x on y is written in the form of

If Reg. line of x on y is 2x-3y=95. Find b_{xy}

23. On solving 2 regression lines simultameously. If we get x = 50 and y = 90, then

My Notes :

24.

$$\text{Probable Error} = 0.674 \times \frac{(1 - r^2)}{\sqrt{N}}$$

$$\text{Standard Error} = \frac{(1 - r^2)}{\sqrt{N}}$$

Coefficient of determination =

Coefficient of Non-determination =

25. 2 regression lines become identical i.e. they coincide when r = -1 or r = 1.

26. If r = 0; then regression lines are ⊥ to each other.

When there is no correlation between 2 variables then regression lines will be ⊥ to each other.

27.

Particulars	Maths (x)	Stats (y)
AM	88	92
SD	10	12
r	0.75	

Find 1. Reg. line of y on x
2. Reg. line of x on y
3. If x = 95, y = ?
4. If y = 90, x = ?

28.

$1.00 \geq r \geq -1.00$

$\geq r^2 \geq$

$\geq (b_{yx}.b_{xy}) \geq$

29. If $b_{yx} > 0$; then $b_{xy} < 0$

30. If $b_{yx} = 2.50$, $r = 0.80$, $b_{xy} = ?$

31. If $b_{xy} = -1.56$, $b_{yx} = -0.20$, $r = ?$

32. If $b_{xy} = -1.5281$, $b_{yx} = 0.2381$, $r = ?$

33. If $b_{yx} = 1.82$, $b_{xy} = 0.90$, $r = ?$

34. If $\bar{x} = 90$, $\bar{y} = 80$, $r = -0.85$, $\sigma_x = 10$, $\sigma_y = 18$

1. If $x = 35$, $y = ?$

2. If $y = 98.70$, $x = ?$

35. If r = 0.75. Find coefficient of determination and coefficient of non-determination.

36.

x	y
35	480
28	410

Find 'r'

37.

x	y
200	500
180	600

x	y
200	800
250	703

38. If C = 5, m = 11. Find coefficient of concurrent deviation.

39.

If cov (x,y) = 0, then r =

If cov (x,y) = positive, then ⟹ $1.00 \geq r > 0$

If cov (x,y) = negative, then ⟹ $-1.00 \leq r < 0$

$$\text{As } r = \frac{\text{covariance of (x,y)}}{SD_x \times SD_y}$$

40. Karl Pearson's product moment correlation coefficient is the ratio of cov (x,y) to product of standard deviations of x & y

41. **Prepare a bi-variate frequency table for the following data relating to marks in stats (x) and maths (y).**
(12,18) (2,16) (12,3) (19,12) (5,8) (8,2) (13,14)
(2,6) (13,19) (6,10) (2,12) (14,2) (18,5) (20,1)

x \ y		Marks in Maths (y)		Total
		0-10	10-20	
Marks in Stats (x)	0-10			
	10-20			
	Total			

Find Marginal Distribution of x :

Find Marginal Distribution of y :

Find conditional Distribution of x when y is 10-20:

Find conditional Distribution of y when x is 0-10:

42. **'Marginal Distribution' is the frequency distribution of one variable (x or y) across the other variable's full range of values.**

'Conditional Distribution' is the frequency distribution of one variable (x or y) across the particular sub-population of other variable.

My Notes :

41.

x \ y	0-10	10-20	20-30	30-40	40-50	Total
0-10	5	20	22	23	25	95
10-20	8	30	26	28	42	134
20-30	9	20	29	38	48	144
30-40	13	50	36	39	56	194
40-50	26	60	28	19	26	159
Total	61	180	141	147	197	726

Find Marginal Distribution of x :

Find Marginal Distribution of y :_

Find conditional Distribution of x when y is 30-40:

Find conditional Distribution of y when x is 20-30:

42.

If 2 variables move in same direction i.e. an increase on the part variable introduces an increase on the part of other variable and

Decrease on the part of one variable introduces decrease on the part of other variable also, then 2 variables are known to be

My Notes :

46. 2 variables are known to be . . . . . if movement on the part of one variable does not produce any measureable movement on the part of other variable.

47.
1. Correlation coefficient (r) is unit free.
2. Correlation coefficient remains same in value, not necessarily in sign after shift of origin and change in scale.
3. Correlation coefficient lies between -1 and 1, including both limiting values.

48. For a group of 8 students, the sum of squares of diff. in ranks for maths & stats marks was found to be 50. What is the value of rank correlation coefficient?

49. For a number of towns, correlation coefficient between people living below poverty line and increase of population is 0.50. If sum of squares of diff. in rank awarded to these factors are 82.50. Find number of towns.

50. While computing rank correlation coefficient between profit and investments for 10 years of a firm, the diff of rank of one observation was taken as 7 instead of 5 and rank correlation coefficient was 0.80. What is correct value of rank correlation coefficient?

a. 0.95 b. 0.78 c. -0.80 d. None of these

51. Regression equations are derived from method of least squares.

52. Regression coefficient remain unchanged by shift of origin but affected due to change in scale.

a. If $u = 3 + x$, $v = y - 18$ } then $b_{vu} = b_{yx}$ and $b_{uv} = b_{xy}$

b. If $u = x + 17$, $v = y + 30$ } then $b_{vu} =$ $b_{uv} =$

c. If $u = 3x + 18$, $v = 8y - 19$ } then $b_{vu} =$ $b_{uv} =$

d. If $u = 18x + 17$, $v = 2y - 20$ } then $b_{vu} =$ $b_{uv} =$

53. Two regression lines i.e. $(y - \bar{y}) = b_{yx} (x - \bar{x})$ and $(x-\bar{x}) = b_{xy} (y - \bar{y})$ intersect at point $(\bar{x},\bar{y})$

54.

r	b_{yx}	b_{xy}
0.80	5.80	
0.75	0.20	
-0.60		-1.36
	-0.80	-1.10
0.2819	1.23619	

55. There are some cases when we may find a correlation between 2 variables although 2 variables are not casually related. This is due to existence of third variable which is related to both the variables under consideration, such a correlation is known as

55. Bi-variate data are data collected for :
a. 2 variables.
b. More than 2 variables.
c. 2 variables at same point of time.
d. 2 variables at diff. point of time.

57. If plotted paints in a scatter diagram lie from

Upper left to lower right then ↓

Upper right to lower left then ↓

58. If plotted points in a scatter diagram are evenly distributed without depicting any pattern then

59. If plotted points in a scatter diagram lie on a single line then correlation is

a. Perfect Positive b. Perfect Negative c. a or b d. None of these

60. The correlation between shoe-size and intelligence is

a. Positive b. Negative c. Zero d. None of these

61. Product moment correlation coefficient is considered for _____.

a. Finding nature of correlation b. Finding degree of correlation
c. Both of these d. None of these

62. If r is positive then points in a scatter diagram tend to cluster :

a. From lower left corner to upper right corner
b. From lower left corner to lower right corner
c. From lower right corner to upper left corner
d. None of these

63. The co-variance between 2 variables is :

a. Strictly positive b. Strictly negative
c. Always zero d. Either positive, negative or zero

Similarly SD =

Variance =

64. To find degree of agreement about beauty between 2 judges in a beauty contest, we use :

a. Scatter Diagram
b. Product moment correlation coefficient
c. Spearman's rank correlation coefficient
d. Coefficient of concurrent deviation

65. The diff. between observed value and estimated value in a regression analysis is known as Error or Residue.

66. What are the limits of 2 regression coefficient ?

a. No limit
b. Both must be positive
c. One positive & other negative
d. Product of 2 regression coefficients must be numerically less than unity.

67. Regression coefficients remain unchanged due to :

a. Shift of origin b. Change of scale c. Both a and b d. Either a or b

68. Correlation coefficient between 2 variables is -0.90, then coefficient of determination is :

a. 0.90 b. -0.81 c. 0.19 d. 0.81

69. Correlation coefficient between 2 variables is 0.70, then % of variation unaccounted for is :

a. 70% b. 49% c. 51% d. 100%

70. If cov (x,y) = 15, then $\sigma_x \cdot \sigma_y$

71. If $u + 5x = 6$ and $3y - 7v = 20$. $(r)_{xy} = 0.58$ then $(r)_{uv}$ = ?

a. 0.58 b. -0.58 c. 0.84 d. -0.84

72. If sum of squares of diff. in ranks, given by 2 judges A and B of 8 students is 21, what is the value of rank correlation coefficient?

a. 0.70 b. 0.65 c. 0.75 d. 0.80

73. For 10 pairs of observations, No. of concurrent deviations found to be 4. What is coefficient of concurrent deviation?

a. $\sqrt{0.20}$ b. $-\sqrt{0.20}$ c. 1/3 d. -1/3

74. The coefficient of concurrent deviation for 'p' pairs of observations was found to be $1/\sqrt{3}$ If no. of concurrent deviations was found to be 6. Value of 'p' is :

a. 10 b. 9 c. 8 d. None of these

75. If y = 4 + 3x is regression line of y on x. AM of x = -1; AM of y = ?

a. 1 b. -1 c. 7 d. None

76. 2 regression lines are y = -2x+3 and 8x = -y+3. Find value of r.

a. 0.50 b. - 0.50 c. $-1/\sqrt{2}$ d. None of these

77. Given the following equations 2x - 3y = 10 and 3x + 4y = 15, which one is the regression equation of x on y.

a. 3x+4y=15 b. 2x-3y=10 c. Both d. None

78. 2 regression lines are given by : 8x + 10y = 25 and 16x + 5y = 12. & Variance of x = 25, SD of y = ?

a. 16 b. 8 c. 64 d. 4 e. None of these

79.

Variables	Nature of Correlation
1. Profit of insurance company and no. of claims	
2. Demand for goods and their prices under normal circumstances	
3. Years of education and Income	
4. Amount of rainfall and Yield of crop	
5. Sale of woollen garments and temperature	

80. For the bivariate data [(20,5), (21,4), (22,3)] the correlation coefficient between x and y is

a. zero b. 1 c. -1 d. 0.50

81. r = 0.48, cov (x,y) = 36, SD of x = 16, SD of y = ?

a. 18.75 b. -18.75 c. 16.75 d. None of these

82. r = 0.52, cov (x,y) = 7.80, Variance of x = 16, SD of y = ?

a. 2.85 b. 3.25 c. 1.25 d. 3.75

83. If r = 0.40 then coefficient of determination and coefficient of non-determination are resp.

a. 0.16, 0.84 b. 0.36,0.64 c. 0.60,0.40 d. None

84. Simple correlation is known as :

a. Linear correlation b. Non-linear correlation
c. Non-sense correlation d. None of these

85. Slope of regression equation of x on y is :

a. b_{xy} b. b_{yx} c. $1/b_{xy}$ d. $1/b_{yx}$

My Notes :

86. Slope of regression equation of y on x is :

a. b_{xy} b. b_{yx} c. $1/b_{xy}$ d. $1/b_{yx}$

87. $(r)_{xy} = (r)_{yx}$

a. correct b. wrong c. can't say d. None of these

88. b_{yx} is always same as b_{xy}

a. correct b. wrong

89. Covariance measures _____ variation between 2 variables.

a. Joint b. Common c. Relative d. None of these

90. Karl Pearson's Product Moment Correlation Coefficient =

Spearman's Rank Correlation Coefficient =

Coefficient of Concurrent Deviation =

91. $b_{yx} = 1.20$ $b_{xy} = 0.90$; then r = ?

a. 1.039 b. -1.039 c. 1.08 d. Wrong data

92. If $\bar{x} = 30$, $\bar{y} = 90$, $\sigma_x = 8$, $\sigma_y = 5$, r = -0.75. Find Reg. equation of y on x.

a. Joint b. Common c. Relative d. None of these

93. If $(x-\bar{x})(y-\bar{y}) = 30$, n = 3. Find cov (x,y)

94. If cov (x,y) = 36, $\sigma_x = 9$, $\sigma_y = 4$. Find r

a. 1.00 b. -1.00 c. 0 d. None

95. _____ is also known as measure of association between 2 variables.

96. _____ is the best method to obtain correlation between 2 variables.

91. If Reg line of y on x is $3x + 8y = 13y - 63x + 103$. Find b_{yx}

92. If Reg line of x on y is $16x - y = 93x - 21y + 83$. Find b_{xy}

93. If $r = -0.63812$, $b_{yx} = -1.36822$, b_{xy} = ?

93. Correlation between temperature of city and sale of cold drinks is :

a. Positive b. Negative c. Zero d. Can't say

My Notes :

‘ I AM STRONG ’

BECAUSE I KNOW MY WEAKNESS

- CA VINOD REDDY -

Student Life is the SEED of your life.
PLANT it Wisely

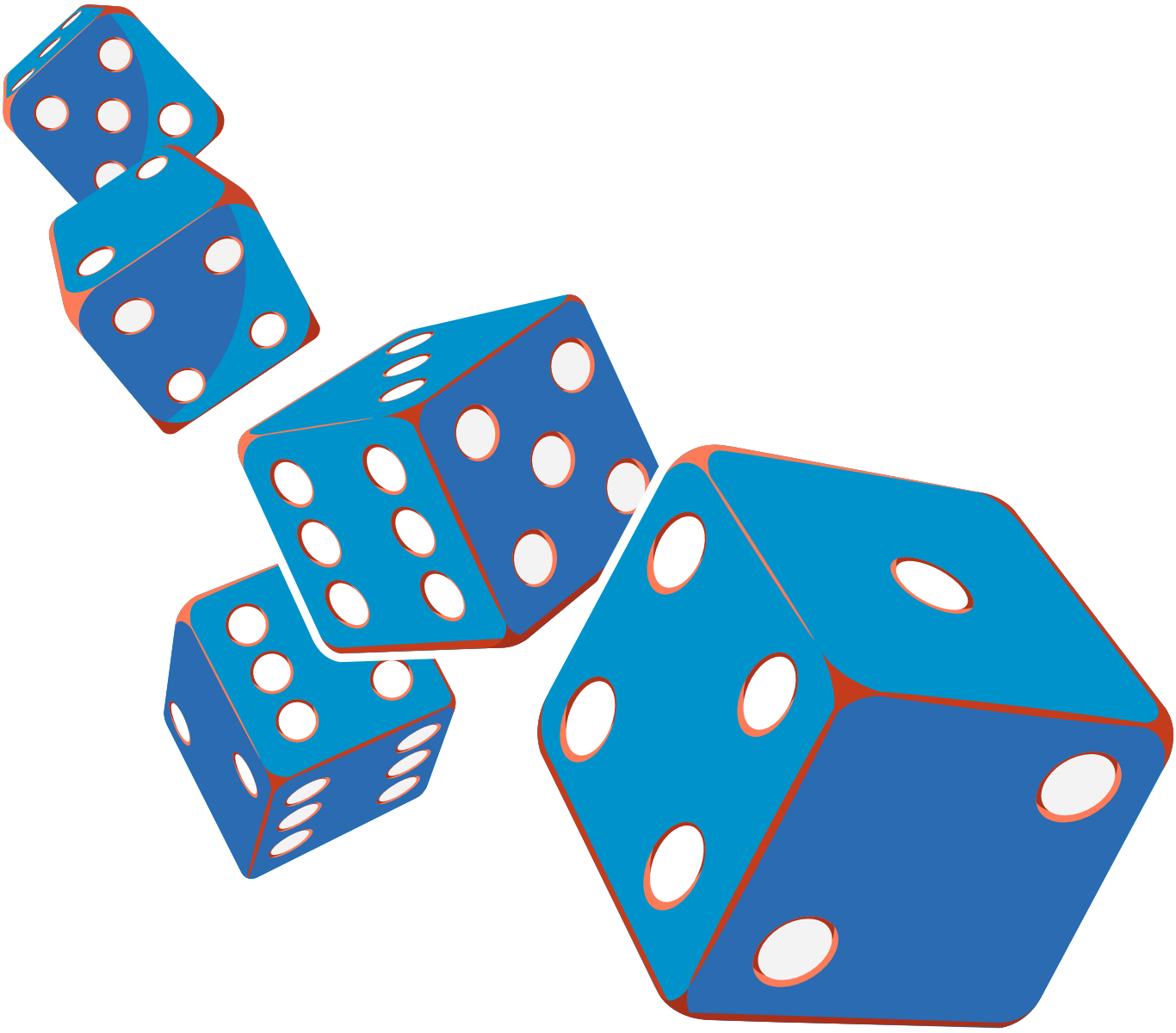
मेहनत इतनी खामोशी से करो के सफलता शोर मचा दे

- CA VINOD REDDY -

Yesterday You Said Tomorrow

Chapter-10

Probability



CA VINOD REDDY

1. Probability is the

2. Classical Definition of Probability

3.

Coin

Dice

Card

4.

A coin is tossed 2 times what is probability of getting

- **2 heads**
- **1 head**
- **Atleast 1 head**
- **Atmost 1 head**

My Notes :

5. An unbaised coin is tossed 3 times. Find the probability of getting

- 2 tails
- Atleast 2 heads
- No tails
- Atmost 2 tails

6. An unbaised coin is tossed 4 times. What is the probability of getting

- 2 heads
- 3 tails
- Atleast 3 tails
- Atmost 3 tails

7. A dice is rolled once. What is the probability of getting

- 3 Points
- 4 Points
- 1 Point
- Atmost 3 Points
- Atleast 5 Points
- Odd Number as point
- Prime Number as point

8. A dice is rolled twice what is the probability of getting

→ 7 points as sum

→ 8 points as sum

→ 9 or more points

→ Atleast 3 points

→ Odd points on both dice

→ Odd points on atleast one dice

→ Even points on both dice

→ 5 or 7 points

→ Sum as prime number

→ Odd points on atleast one dice

→ Sum as odd number

→ Sum as even number

9. A card is drawn from a well shuffled pack of 52 cards. What is probability of getting :

a. A diamond =

b. A King =

c. A Black Card =

d. A Black Queen =

e. A Jack =

10.

P(A∪B) =

P(A′) =

P(B′) =

P (A∩B) =

P(A-B) =

P(B-A) =

P(A′∩B′) =

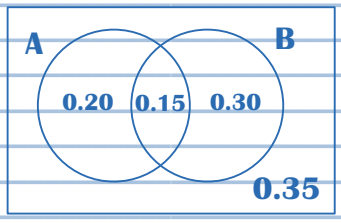
P(A∪B′) =

P(B∪A′) =

P(A △ B) =

P(A∪B∪C) =

11.



P(A) =

P(B) =

P(A′)=

P(B′)=

P(A∪B) =

P(A∩B) =

P(A-B) =

P(B-A) =

P(A′∩B′) =

P(A △ B) =

12. De-morgan's rule of probability (with diagram)

13. If 2 dice are rolled then

Sum of points on 2 dice	Probability
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

14. A card is drawn from a well shuffled pack of 52 cards then what is probability that it is a -

a. Spade =

b. Queen =

c. Spade and Queen =

d. Spade or Queen =

e. Spade but not Queen =

f. Queen but not Spade =

g. Neither Spade nor Queen =

15. A, B are said to be mutually exclusive events then :

16. A, B are said to be mutually exhaustive events then :

17. A, B are said to be independent events when :

18.

Events A & B are said to be	If
	$P(A \cap B) = 0$
	$P(A \cup B) = 1.00$
	$P(A \cap B) = P(A) \times P(B)$
	$P(A) = P(B)$

My Notes :

19. 2 dice are rolled. It is observed that sum of points is 9. What is probability that 4 has appeared on one of the dice?

20.

$P(A/B) =$ $P(A'/B) =$

$P(B/A) =$ $P(A'/B') =$

$P(A/B') =$ $P(B'/A) =$

$P(B/A') =$ $P(B'/A') =$

21. If A, B are independent events then :

My Notes :

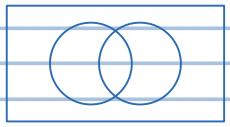
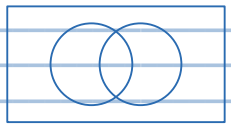
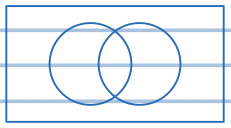
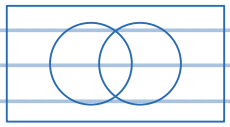
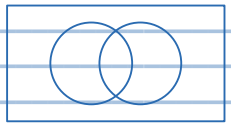
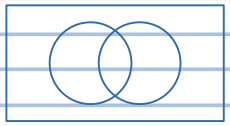
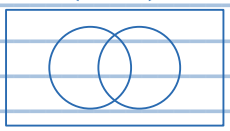
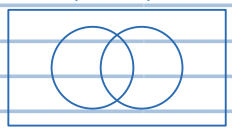
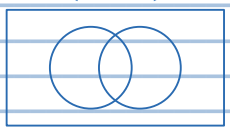
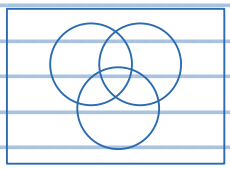
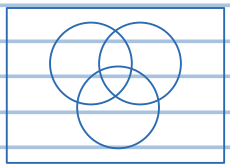
22.

8 Red
6 White
5 Black

3 balls are drawn. What is probability of getting

- 2 Red balls
- Atleast 2 white Balls
- Atmost 1 Black Ball

23.

1. $P(A \cup B)$ 
2. $P(A \cap B)$ 
3. $P(A \cap B')$ 
4. $P(B \cap A')$ 
5. $P(A' \cap B')$ 
6. $P(A \triangle B)$ 
7. $P(A \cup B')$ 
8. $P(B \cup A')$ 
9. $P(A' \cup B')$ 
10. $P(A \cup B \cup C)$ 
11. $P(A' \cap B' \cap C')$ 

My Notes :

24. If $P(A) = 0.30$, $P(B) = 0.40$, $P(A \cap B) = 0.15$. Find

$P(A') =$

$P(B') =$

$P(A \cup B) =$

$P(A-B) =$

$P(B-A) =$

$P(A' \cap B') =$

$P(A \cup B') =$

$P(B \cup A') =$

$P(A \triangle B) =$

$P(A/B) =$

$P(B/A) =$

$P(A/B') =$

$P(A'/B') =$

25. $P(A) = 0.30$, $P(B) = 0.40$, A, B are independent events, then find

$P(A/B) =$

$P(B/A) =$

$P(A/B') =$

$P(B/A') =$

$P(A'/B') =$

$P(B'/A') =$

$P(A \cup B) =$

$P(A-B) =$

$P(B-A) =$

$P(A' \cap B') =$

$P(A' \cup B') =$

26. In a leap year selected at random what is probability of getting

- 53 Mondays
- 52 Mondays
- Atleast 52 Mondays
- 54 Mondays

27. In a non-leap year selected at random what is probability of getting

- 53 Sundays
- 52 Sundays
- Atleast 52 Sundays
- 54 Sundays

28. In a year selected at random what is the probability of getting

- 52 Tuesdays
- 53 Tuesdays

29. What is probability that 15th day of a randomly selected month is Sunday?

30. Probability of A passing exam is 0.30. and B passing exam is 0.40.
What is the probability that

- Both will pass
- Only A will pass
- Only B will pass
- Atleast one will pass
- One & Only One will pass
- Atleast one will fail

31.

x	30	60	90	120	150
Prob. x	0.20	0.30	0.10	0.15	0.25

Find E(x), SD_x, Variance of x

32.

x	10	20	30	40	50
Prob. x	0.20	3k	5k	7k	k

Find E(x), SD_x, Variance of x

33. If odds in favour of event A are 3 : 8. Find P(A), P(A')

34. If odds against event B are 8 : 13. Find P(B), P(B')

My Notes :

35. If odds in favour of event A are 3 : 11; Odds against event B are 2 : 15; A,B are independent events, then find :

P(A) =

P(B) =

P(A∩B) =

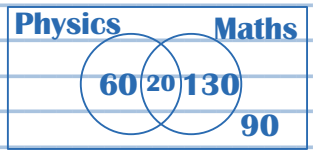
P(A∪B) =

P(A′ ∩ B′) =

P(A-B) =

P(B-A) =

36.

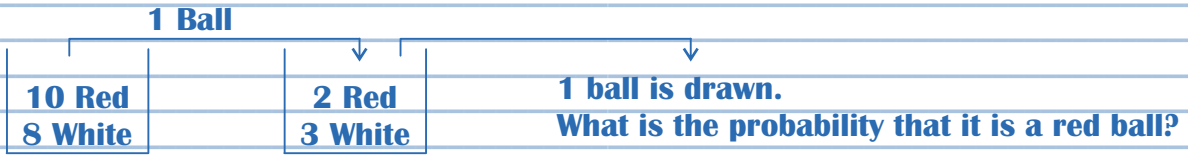


Find probability that a student likes

a. Maths if it is known that he likes physics =

b. Physics if it is known that he doesn't likes maths =

37.



38.

2 Balls

5 Red 6 White	3 Red 11 White

1 ball is drawn from it,
What is the probability that it is a white ball?

39.

Information	Whether A,B are	
	Mutually Exclusive Events?	Mutually Exhaustive Events?
P(A) = 0.30; P(B) = 0.60 P(A ∩ B) = 0.10		
P(A) = 0.60; P(B) = 0.50 P(A ∩ B) = 0.10		
P(A) = 0.30; P(B) = 0.40 P(A ∩ B) = 0		
P(A) = 0.65; P(B) = 0.35 P(A ∩ B) = 0		

40.

Two Broad divisions of Probability are

- Subjective Probability
  - Subjective Probability is basically dependent on personal judgement and experience.
    - It may be influenced by personal belief, attitude and bias.
- Objective Probability
  - It is not based upon personal judgement.

41. An experiment may be described as a performance that produces certain results. The result or outcome of a random experiment are known as events.

My Notes :

42. Events are of 2 types

- Simple or Elementary Event → Getting Head when One Coin is tossed
- Composite or Compound Event → Getting Head when Two Coins are tossed

43. Equally likely events are also known as Mutually Symmetric Events or Equi-probable events.
If P(A) = 0.30, P(B) = 0.30 then A,B are equally likely events OR Equi-probable events OR Mutually Symmetric events

44. If P(A) = 1.00 = 100% then event A is said to be a

45. If P(B) = 0.00 = 0% then event B is said to be a

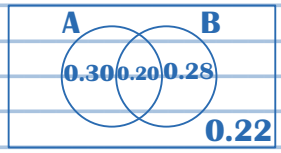
46.

Wages in ₹	100-200	200-300	300-400	400-500
No. of workers	23	57	88	93

If a worker is selected at random, what is the probability that

1. He earns more than ₹ 300 =
2. He earns more than ₹ 400 =
3. He earns between ₹ 200 - ₹ 400 =
4. He earns less than ₹ 300 =

47.

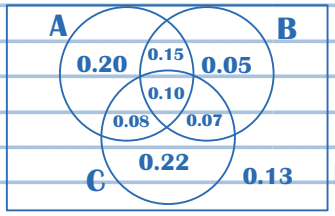


S = Sample Space = Set of all possible outcomes

For above diagram. Find

P(A)
P(B)
P(A′)
P(B′)
P(A∪B)
P(A∩B′)
P(B∩A′)
P(A∪B′)
P(B∪A′)
P(A′∪B′)
P(A/B)
P(B/A)
P(A′/B′)
P(B′/A′)
P(A′/B)
P(B/A′)

48.



From this Venn Diagram : Find

P(A) =
P(B) =
P(C) =
P(A′) =
P(B′) =
P(C′) =
P(A∩B) =
P(B∩C) =
P(A∩C) =
P(A∪B) =
P(B∪C) =
P(A∪C) =
P(A-B) =
P(B-A) =
P(A-C) =
P(C-A) =
P(B-C) =
P(C-B) =
P(A∪B∪C) =
P(A∩B∩C) =
P(A∩B′∩C′) =
P(B∩A′∩C′) =
P(C∩A′∩B′) =
P(A′∪B′) =
P(B′∪C′) =
P(A′∪C′) =
P(A′∩B′∩C′) =
P(A△B) =
P(B△C) =
P(A△C) =

49.

P(A-B) = 0.20, P(B-A) = 0.30, P(A′∩B′) = 0.10. Find

P(A) =
P(B) =
P(A∪B) =
P(A∩B) =
P(A△B) =
P(A∪B′) =
P(B∪A′) =
P(A′∪B′) =
P(A′) =
P(B′) =

My Notes :

50. $P(A) = 0.30, P(B) = 0.20, P(C) = 0.60, P(A \cap B) = 0.10, P(B \cap C) = 0.15, P(A \cap C) = 0.18, P(A \cap B \cap C) = 0.05$, Find $P(A \cup B \cup C)$ and $P(A' \cap B' \cap C')$, $P(A \cup B)$, $P(B \cup C)$ $P(A \cap C')$, $P(B \cup C')$

51. Odds in favour of an event are 2:3 and odds against another event are 3:7. Find the probability that only one of two events occurs. (2 events are independent of each other)

52. There are 3 boxed with composition of balls :

5 Red 8 Blue	6 Red 3 Blue	8 Red 2 Blue

If one box is selected at random and one ball is drawn, what is the probability that it is a red ball?

53. In a business venture, a man can make profit of ₹ 50,000 or incur a loss of ₹ 10,000. The probability of making profit or incurring loss from past experience are known to be 0.75 and 0.25 respectively. What is his expected profit?

54. Ashwat draws 2 balls from a bag containing 3 white and 5 red balls. He gets ₹ 500 if he draws a white ball and ₹ 200 if he draws a red ball. What is his expectation?

55. A number is selected form first 1000 natural numbers, what is probability that number is divisible by 3 or 4 or 5.

56. The probability of an event lies between 0 and 1, both inclusive.

$0 \leq$ Probability (Any event) ≤ 1.00

My Notes :

57. A : Vinod is a minor

B : Vinod is a major

Here A, B are

58. A : Ashwat is an Indian

B : Ashwat is an American

Here A, B are

59. All general Formulae at one place :

1. $P(A) =$
2. $P(B') =$
3. $P(A \cup B) =$
4. $P(A \cap B) =$
5. $P(A-B) =$
6. $P(B-A) =$
7. $P(A \cup B') =$
8. $P(B \cup A') =$
9. $P(A \triangle B) =$
10. $P(A' \cap B') =$
11. $P(A' \cup B') =$
12. $P(A \cup B \cup C) =$
13. $P(A' \cap B' \cap C') =$
14. $P(A/B) =$
15. $P(B/A) =$
16. $P(A/B') =$
17. $P(B/A') =$
18. $P(A'/B) =$
19. $P(A'/B') =$
20. $P(B'/A') =$
21. $P(B'/A) =$

60. When A,B are mutually exclusive events

- $P(A \cap B) = 0$
- $P(A \cup B) =$
- $P(A-B) =$
- $P(B-A) =$
- $P(A' \cup B') =$
- $P(A/B) =$
- $P(B/A) =$
- $P(A \triangle B) =$
- $P(A \cup B') =$
- $P(B \cup A') =$

61. When A,B are mutually exhaustive events then :

$P(A \cup B) = 1.00$

$P(A' \cap B') =$

$P(A \cap B) =$

$P(A/B') =$

$P(B/A') =$

$P(A \triangle B) =$

62. When A,B are independent events then, $P(A \cap B) = P(A) \times P(B)$

$P(A \cap B') =$

$P(B \cap A') =$

$P(A' \cap B') =$

$P(A \cup B) =$

$P(A/B) =$

$P(B/A) =$

$P(A/B') =$

$P(B/A') =$

$P(A'/B) =$

$P(A'/B') =$

$P(B'/A) =$

$P(B'/A') =$

63. 2 dice are rolled, what is probability that points on first dice are more than points on second dice?

64. A committee of 5 members is formed from 8 ladies and 9 gents. What is probability that ladies form the majority?

My Notes :

65. A problem of maths was given to 3 students, chances of solving it are 1/3, 1/5, 1/2 respectively. What is the probability that problem gets solved?

66. 8 identical balls are placed at random in 3 bags. What is the probability that first bag contains 3 balls?

67. $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(A \cap B) = \frac{1}{4}$, Find $P(A'/B')$

67. The probability that there is atleast one error in an account statement prepared by 3 persons A,B,C are 0.20, 0.30, 0.10 respectively. If A, B, C prepare 60, 70, 90 such statements. Find expected number of correct statements.

a. 170 b. 176 c. 178 d. 180

My Notes :

69.

x	1	2	4	6	8
Prob. x	k	2k	3k	3k	k

Find Expected Value of x,
SD of x, Variance of x.

70.

5 Red
6 White
4 Black

→ 4 Balls are drawn. What is the proabibility that there is atleast one ball of each colour?

71.

5 Red
12 Blue
3 Pink

→ 5 Balls are drawn. What is the proabibility that there is atleast one ball of each colour?

72. The expected number of heads in 100 tosses of an unbaised coin is :

73. A man can kill a bird once in 3 shots. The probability that bird is not killed is

a. 1/3 b. 2/3 c. 1.00 d. 0

74. If on an average 9 ships out of 10 return safely to the port, the probability that one ship returns to the port safely is

a. 1/10 b. 9/10 c. 8/10 d. None of these

75. A family has 2 children. The probability that both of them are boys if it is known that one of them is a boy is :

a. 1.00 b. 1/2 c. 3/4 d. None of these

76. Probability of throwing an odd number with an ordinary six faced die is?

a. 1/2 b. 1.00 c. -1/2 d. 1/6

77. When none of the outcomes is favourable to the event then event is said to be

a. Certain b. Sample c. Impossible d. None

78. What is probability that 4 children selected at random would have different birthdays?

a. 98.36% b. 100% c. 99.82% d. 0%

79. For 2 independent events A, B, $P(A \cup B) = 2/3$, $P(A) = 2/5$, $P(B) = ?$

a. 4/15 b. 4/9 c. 5/9 d. 7/18 e. None

80. What is chance of throwing atleast 7 in a single cast with 2 dice?

a. 5/12 b. 7/12 c. 1/4 d. 17/36 e. None

81. Expected value of a random variable

a. Is always positive
b. May be positive or negative
c. May be positive, negative or zero
d. Can never be zero

82. P(A) = 8/17, then odds against event A is .

a. 8:17 b. 17:8 c. 8:9 d. 9:8

83. Initially probability was branch of

a. Physics b. Chemistry c. Statistics d. Mathematics

84. Subjective probability may be used in

a. Mathematics b. Statistics c. Management d. Biology

85. P(A-B) = 0.30, P(A∩B) = 0.10, P(A′∩B′) = 0.15. Find P(A), P(A∪B), P(A′∪B′), P(B), P(A△B), P(B-A), P(A/B), P(B′/A′)

86. P(A/B) is defined only when

a. B is a sure event
b. B is an impossible event
c. B is not a sure event
d. B is not an impossible event

87. P(A/B') is defined only when

a. B is a sure event
b. B is an impossible event
c. B is not a sure event
d. B is not an impossible event

88. P(X/Y) is defined only when

P(X/Y′) is defined only when

89. If A,B,C are 3 mutually exclusive and exhaustive events such that P(A) = 2.P(B) = 3.P(C) then P(B) = ?

a. 6/11 b. 3/11 c. 1/6 d. 1/3

90. P(A-B) = 0.30, P(A△B) = 0.50, P(A′∪B′) = 0.80
Find P(A′ ∩ B′)

91. P(A) = 0.60, P(B) = 0.70, P(A′∩B′) = 0.20
Find P(A-B), P(B-A), P(A∩B)

92. P(A-B) = 0.30, P(B-A) = 0.60, P(A) = 0.55
Find P(A∪B)

a. 1.15 b. 0.15 c. 0.85 d. Wrong data

93. 2 dice are rolled, what is probability that sum of points is a prime number?

94. One card is drawn from each of 2 packs of 52 cards. What is probability that atleast one of them is an ace?

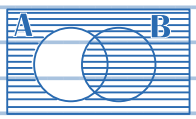
a. 8/104 b. ${}^{8}C_{2}/{}^{104}C_{2}$ c. 25/169 d. 1/169 e. None

95.

Shaded area represents

a. (A-B)
b. (B-A)
c. (A∪B′)
d. (A′∪B′)

96.



Shaded area represents

a. (A-B)
b. (A+B)
c. (A∪B′)
d. (B∪A′)

97. A number is selected from first 100 natural numbers, what is the probability that

- It is a perfect square?
- It is a perfect cube?
- It is an odd number?

98. 2 cards are drawn one after other from a pack of 52 cards, what is the probability that both cards are kings if cards are drawn

- Without Replacement
- With Replacement

99. 2 numbers are selected from first 50 natural numbers, find the probability that both are divisible by 3?

100. Mr. A says to Mr. B "If it rains today I will give you ₹ 50,000 but if it doesn't rain today you have to pay me ₹ 80,000". Find expected gain / (loss) for Mr. B if probability of raining is 0.20

My Notes :

101. A and B tossed 3 coins each. What is probability that both of them will get same number of heads?

My Notes :

Every good or Bad Moment of Your life is a part of your life, It's not your LIFE!

If you are not willing to learn, No one can help you. If you are determined to learn, No one can stop you!

- CA VINOD REDDY -

All the late nights and Early mornings will pay off.

- CA VINOD REDDY -

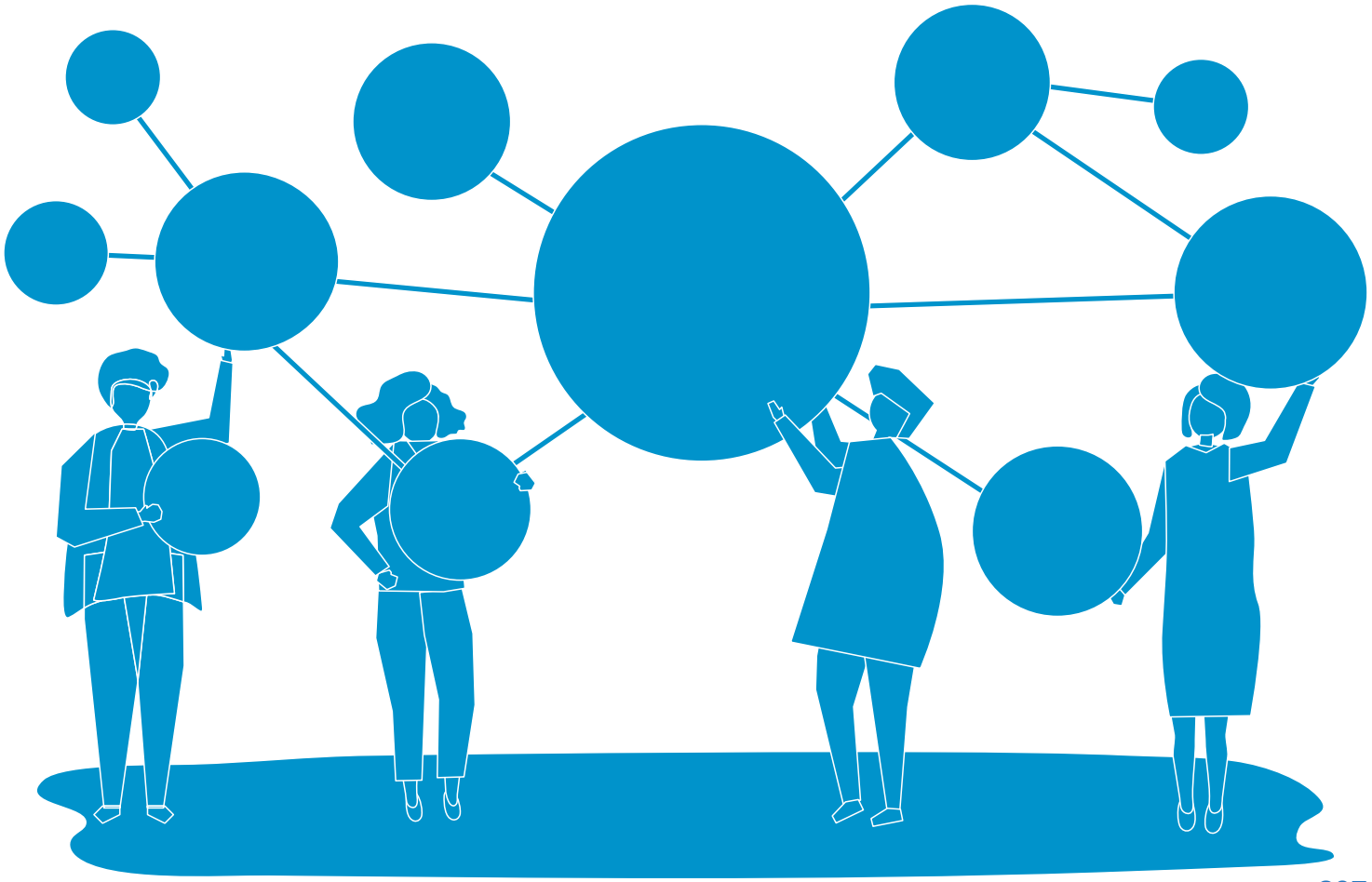
Education is the key to unlock the golden door of FREEDOM

Every student can learn, just not on the same day!

Chapter-11

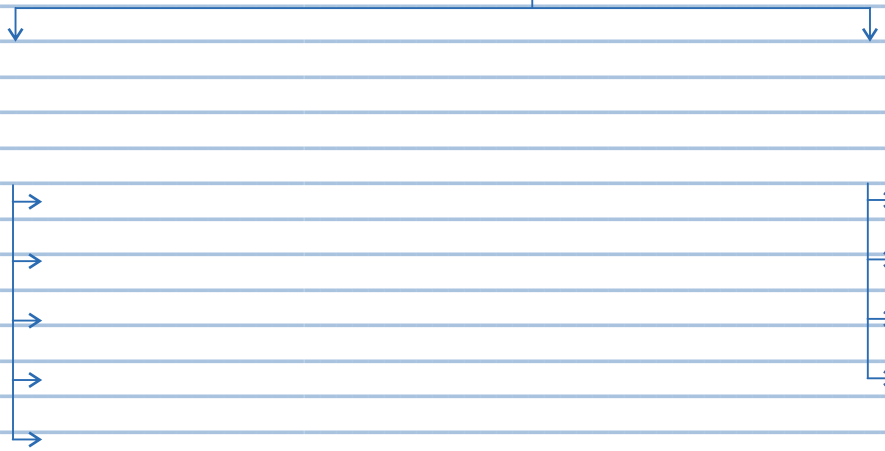
Theoretical Distribution

CA VINOD REDDY



1.

Theoretical Distributions



2.

Binomail's Distribution

prob (x)

where,

n =

p =

x =

q =

3.

4 coins are tossed. What is probability of getting 3 heads

My Notes :

4. 5 coins are tossed. What is probability of getting 3 heads

- Classical Approach
- Binomial's Approach

5. Mode of Binomial's distribution = Largest integer contained in (n+1)P

if (n+1)P is non integer. Data is uni-modal.

If (n+1)P is an integer, then data is bi-modal.

Modes are (n+1)P and (n+1)P-1

6. Freq (x) = $N \times {}^{n}C_{x}\, p^{x}.q^{n-x}$

7. 8 Coins are tossed 40,000 times. Find expected frequency of at most 7 heads?

8. 10 coins are tossed. Find probability of getting

a. 2 heads

b. 3 heads

c. 3 tails

d. 4 tails

e. 5 or 7 heads

f. 4 or 5 or 6 heads

g. Atmost 9 heads

h. Atleast 2 heads

I. Atleast 1 tails

j. Atmost 2 tails

9. 2 dice are rolled what is probability of getting odd points on atleast one dice

- Classical Approach
- Binomial's Approach

10. 2 dice are rolled. What is the probability of getting 5 points on atmost 1 dice?

- Classical Approach
- Binomial's Approach

11. 5 dice are rolled. What is the probability of getting 3 points on 4 dice?

My Notes :

12. 5 dice are rolled. What is the probability of getting at least 5 points on atmost 1 dice?

13. 4 dice are rolled. What is the probability of getting atleast 3 points on atleast 3 dice?

14. 15 dates are selected at random. What is the probability of getting 4 Sundays?

15. 4 x prob(x=4) = prob(x=2) for Binomial's distribution and n=6. Find values of p,q?

16.

n	p	q	Mean	SD	Variance
20	0.20				
80		0.60			
120	0.05				
200			45		
	0.20		50		
		0.20	80		
			100		80
60	0.35				
2,000		0.05			
8,000		0.98			
10,000	0.63				

17. Summary of Binomial's Distribution.

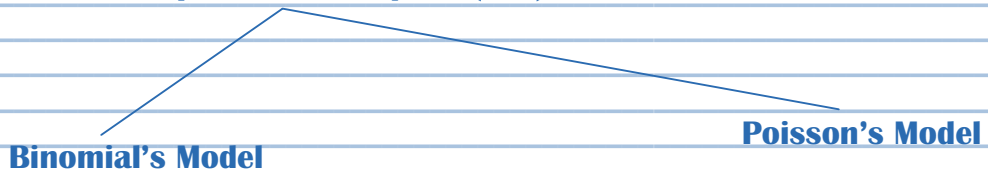
18. Prob (x) as per poisson's model =

19. If m = 4. Find prob (x=5) for poisson's variate.

20. If SD of poisson's variate is 2. Find probability ($-2.30 < x \leq 1$)

21. If m = 3, for poisson's variate. Find prob ($x \geq 1$), prob ($x > 1$), prob ($3 \leq x \leq 5$)

22. n = 200, p = 0.01, find prob (x=2)



My Notes :

23. Difference between Binomial's & Poisson's Distribution.

Binomial's Distribution	Poisson's Distribution

24. If m = 5. Find prob (-8 ≤ x ≤ 1.56) for poisson's variate

25. p(x=3) = p(x=4). Find mean of Poisson's Distribution.

26. Summary of Poisson's Distribution

My Notes :

27. Normal Distribution

1. It is applicable only for distribution of a 'continous variable'
2. Derived by Karl Gauss :- known as Gaussian's theorem.
3. It is based on assumption of Normality.
4. As per assumption of Normality a variable is said to be normally distributed if 50% observations are less than AM and 50% of the observations are more than AM.
5. prob($x < \mu$) = 50%

   Prob ($x > \mu$) = 50%
6. Z = Normal curve wefficient = $\frac{(x-\mu)}{\sigma}$
7. There are 2 parameters of normal distribution namely μ, σ^2 Therefore It is a Bi-parametric distribution
8. Normal curve is a Bell-shaped curve, symmetrical about AM.
9. In probability distribution of this type:

   Prob($x \leq 50$) = prob($x < 50$)

   Prob($x \geq 85$) = prob($x > 85$)

Therefore, we can say that : probability that a particular variable will assume a specific value is always 0.

10. AM= Median= Mode
11. Median = $\frac{(Q_3+Q_1)}{2} = \mu$ = mode
12. Q.D. = $\frac{(Q_3-Q_1)}{2} = 0.6750 \times SD$
13. MD = 0.80 X SD
14. $Q_3 = \mu + 0.675\sigma$

    $Q_1 = \mu - 0.675\sigma$
15. $\Phi(a)$ represents area from $-\infty$ to a.
16. Total area covered by normal curve = 1.00= 100%
17. Expected frequency
18. For normal distribution : SD > MD > QD
19. Points of inflexion for normal distribution are

28. For Normal Distribution

1. Relation between MD & SD

   MD =
2. Relation between QD & SD

   QD=
3. Relation between MD & QD

29.

Q_3	Q_1	Q.D.	M.D.	S.D.
50	20			
69.60	29.40			
86	40			
91.80	40.63			
81.88	43.63			
28.93	12.13			
60.86	12.98			

30. QD < MD < SD

31. We have thrown 6 bombs at a building. 2 bombs are sufficient to destroy the building. Find the probability of destruction of building if chance that bomb hitting the target is 0.20.

32. An overall 70% students passed in the exam. Find the probability that out of 10 students randomly selected atleast 8 have passed the exam?

33. 8 coins are tossed 409600 times. Find the expected frequency of atleast 6 tails?

34. There are 12,800 families with 5 children each. How many of them are expected to have atleast 4 boys?

35. 5% of total bulbs are known to be defective. 6 bulbs are selected at random, what is the probability of getting 3 defective bulbs?

36. 60% of total students passed in exams. Find the probability that in the group of 7 students atleast 5 have passed the exam.

My Notes :

37. 5 coins are tossed 512 times. Find out expected frequency of getting 0,1,2,3,4,5 heads. Also, Find mean, SD, variance of the distribution.

38.

p	q	Variance = n.p.q
0.90		
	0.20	
	0.63	
0.50		
0.85		
0.89		
0.09		
0.02		

Therefore, Variance attains its max value of 0.25n = n/4, when p = q = 0.50

39. Variance in case of Binomial's distribution attains its max value in case of symmetrical Binomial's distribution.

40. In Binomail's distribution, no. of successes, no. of trials must be a whole number. It cannot be in fractions.

41. Find p, q. If n = 6 and
4 x prob(x = 4) = prob(x = 2)

42. 2% of the bulbs manufactured are known to be defective. 200 bulbs are selected at random, what is the probability of getting 3 defective bulbs?

43. An experiment succeeds twice as it fails. If the experiment is repeated 5 times, what is the probability having no success at all?

44. We generally think of using Poisson's model instead of Binomial's model when :

i) Probability of finding success is very small

ii) Probability of having more than one success in this time interval is very low

45. Like Binomial's distribution, Poisson's distribution could also be uni-modal or bi-modal depending upon the value of m

- If 'm' is an integer then it is bi-modal — modes are = (m) and (m-1)
- If 'm' is non-integer then it is uni-modal — mode is = Largest integer contained in 'm'

46.

When	z
$x = \mu$	
$x > \mu$	
$x < \mu$	

47. Wages of workers in a factory are normally distributed with AM and SD of ₹ 8000, ₹ 750 respectively. If 1 worker is selected at random. Find the probability that he earns a) more than ₹ 8500; b) Less than ₹ 8250; c) between ₹ 7500 and ₹ 8750

48. Characteristics of population are known as Parameters
Characteristics of sample are known as Statistic.

49. For normal distribution, Probability density function =

50. The normal distribution is symmetrical when x = μ. When x = μ, then skewness of normal curve is zero; i.e. neither inclined to move towards the right (Negatively skewed) nor towards the left (Positively skewed)

51. The normal curve has 2 points of inflexion to be given by x = $\mu-\sigma$ and x = $\mu+\sigma$
i.e. at these points, the normal curve changes its curvature from concave to convex and from convex to concave.

52. The theoretical probability distribution:-

a) Does not exists
b) Exists only in theory
c) Exists in real life
d) None of these

53. The probability distribution may be _____

a. Discrete
b. Continuous
c. a or b
d. None of these

54. An example of parameter is _____

a. Sample SD
b. Sample mean
c. Sample mode
d. Population mean

55. A trial is an attempt to _____

a. Make something possible
b. Make something impossible
c. Prosecute in court of law
d. Produce an outcome that is neither certain nor impossible

56. The important characteristics of Bernoulli's trials are :

a. Each trial is associated with just 2 possible outcomes.
b. Trials are independent
c. Trials are infinite
d. Both a & b

57. If x is a Binomial Variable with parameters n,p then x can assume

a. Any value between 0 and n
b. Any value between 0 and n, both inclusive
c. Any whole no. between 0 and n, both inclusive
d. Any number between 0 and infinity

58. For a symmetrical binomial's distribution If n = 60.
Find mean, SD, variance of the distribution

59. Which of the following is Bi-parametric distribution :

a. Binomial's Distribution
b. Normal Distribution
c. Both of these
d. None of these

60. Which of the following is Uni-parametric distribution :

a. Binomial's Distribution
b. Poisson's Distribution
c. Normal Distribution
d. None of these

61. The most important continuous probability distribution is known as _____ .

a. Binomial's Distribution
b. Normal Distribution
c. Chi-square Distribution
d. Sampling Distribution

62. The total area of a normal curve is

a. 1.00 (i.e. 100%)
b. 50%
c. 0.25
d. 0.00

63. The normal curve is

a. Bell-shaped
b. U-shaped
c. J-shaped
d. V-shaped

64. The normal curve is

a. Positively skewed
b. Negatively skewed
c. Symmetrical
d. None of these

65. What is SD of number of recoveries among 48 patients when probability of recovering is 0.75

a. 36 b. 81 c. 9 d. 3

66. If $x \sim B(n,p)$, what would be the greatest value of variance of x, when n = 16

a. 2 b. 4 c. 8 d. $\sqrt{5}$

67. If x is a binomial variate with n = 15 and p = 1/3. What is the mode of the distribution

a. 5 and 6 b. 5 c. 5.50 d. 6

68. For Binomial's distribution n = ?, mean = 3, SD = 1.50

a. 2 b. 4 c. 8 d. 12

69. What is probability of 5 correct guesses in 12 true-false questions?

70. If $Q_3 = 25.40$, $Q_1 = 14.60$. Find SD of normal distribution.

a. 9 b. 6 c. 10 d. 8

71. Points of inflexion of a normal curve are 40,60 respectively. Find mean of normal distribution.

a. 8 b. 45 c. 50 d. 60

72. Q1 = 13.25, MD = 8 for a Normal distribution then, find mode of distribution

a. 20 b. 10 c. 15 d. 12

73. If it is known that the probability of missile hitting the target is 1/8, what is the probability that out of 10 missiles fired, atleast 2 will hit the target?

a. 0.4258 b. 0.3968 c. 0.5238 d. 0.3611

74. Salary of workers in a factory is normally distribution with AM & SD of ₹ 10,000 & ₹ 2000 respectively. If 50 workers receive salary more than ₹ 14,000. Find Total no. of workers.

a. 2198 b. 2000 c. 2581 d. None of these

75. Area of a normal curve between z = 0 & z = 1 is 0.3413, then value of $\Phi(1)$ is _____

a. 0.50 b. 0.1587 c. 0.8413 d. -0.3413

76. The Mean Deviation of a normal distribution is 16. What is quartile deviation of the distribution?

a. 10 b. 13.50 c. 15.00 d. 12.05

77. For a poisson's distribution, if prob (x=2) = 3 x prob(x=4), What is the variance of x.

a. 2 b. 4 c. 3 d. $\sqrt{2}$

78. If SD of poisson's variate is 2 then Find prob (1.50 < x < 2.90).

a. 0.231 b. 0.158 c. 0.15 d. 0.144

79. If mean of poisson's variable x is 1, What is p(x = takes the value atleast 1) =

a. 0.456 b. 0.821 c. 0.632 d. 0.254

80. Out of 12800 families with 4 children each, How many families are expected to have all boys?

81. For Binomial's distribution if mean = 9, variance = 2.25, then probability of a failure in a single trial = ?

a. 0.75 b. 0.25 c. 0.50 d. None of these

82. For Binomial's distribution, Match the following :

a. Mean	a. n,p
b. SD	b. n.p
c. Variance	c. npq
d. Parameters	d. $\sqrt{npq}$

83. A listing of possible outcomes of an experiment and their corresponding probability is called as

a. Random Variable
b. Frequency distribution
c. Probability Distribution
d. Contingency table

84.

Distribution	Discrete / Continuous	Parameters	Types
Binomial's			
Poisson's			
Normal			

85. 5 dice are rolled what is probability of getting 3 points on 4 dice?

86. Match the following

a. Mean of Binomial's distri.	a. 0.6750 x SD
b. Mean of Poisson's distri.	b. Symmetrical Binomial's distri.
c. QD of Normal distri.	c. m
d. MD of Normal distri.	d. μ, σ^2
e. Variance of Poisson's distri.	e. is always greater than variance
f. SD of Binomial's distri.	f. Bell shaped
g. Parameters of Normal distri.	g. is always equal to variance
h. When p = q = 0.50	h. $\sqrt{npq}$
I. Shape of Normal Curve	I. 0.80 x SD
j. Binomial's & Poisson's distri.	j. can be uni-modal or bi-modal.

My Notes :

87.

Shaded Area =

88.

Shaded Area =

89.

Shaded Area =

90.

Shaded Area =

91.

Shaded Area =

& It All Began with one small WIN

99% of the FAILURES come from people who have the habit of EXCUSES

- CA VINOD REDDY -

Mistakes are PROOF.....
that you are TRYING

Forget the Mistake.....
Remember the LESSON !

CA VINOD REDDY

Chapter-12

Derivatives & Integration

CA VINOD REDDY

1. What is Derivative or Differential function?

2. Derivative of f(x) is f'(x)

f'(x) by first principle =

3.

f(x)	f'(x)
x	
x^2	
x^3	
x^n	
Log x	
a^x	
e^x	
$\sqrt{x}$	
constant = k	

4.

$\frac{d}{dx}(u + v) =$

$\frac{d}{dx}(u - v) =$

$\frac{d}{dx}(u \times v) =$

$\frac{d}{dx}\left(\frac{u}{v}\right) =$

My Notes :

5. Find $\frac{dy}{dx}$ if

a) $y = 3x^2 + 5x - 2$

b) $y = a^x + x^a + a^a$

c) $y = \frac{1}{3}x^3 - 5x^2 + 6x - 2\log x + 3$

d) $y = \frac{e^x}{\log x}$

e) $y = \frac{2x}{3x^3+7}$

f) $y = 2^x \cdot \log x$

g) $y = 5^x \cdot x^{10}$

h) $y = \frac{3x + 5}{5x + 8}$

6. **Chain Rule** Find $\frac{dy}{dx}$ if $y = a^{(2x+3)}$

7. Find $\frac{dy}{dx}$ if

a. $y = 5^{(2x+3)}$

b. $y = (8x+3)^2$

c. $y = e^{\log x}$

d. $y = \sqrt{(5x+13)}$

e. $y = \sqrt{2x^2 + 5x + 3}$

f. $y = \sqrt{\text{Log}x}$

8.

$y = f(x)$	$\frac{dy}{dx} = f'(x)$
$f(x)^n$	
$a^{f(x)}$	
$e^{f(x)}$	
$\text{Log}\,[f(x)]$	
$\sqrt{f(x)}$	

My Notes :

9. $y = at^3$, $x = 2bt$. Find $\frac{dy}{dx}$

10. $y = x^x$. Find $\frac{dy}{dx}$

11. $y = \sqrt{\frac{1-x}{1+x}}$ Find $\frac{dy}{dx}$

12. Find $\frac{d^2y}{dx^2}$ If $y = 16x^3 - 22x^2 + 18x + 54$

13. Find the gradient of curve $y = 3x^2 - 5x + 4$ at point (1,2)

14. $x = 2t + 5$, $y = t^2 - 2$; Find $\frac{dy}{dx}$

15. $x = 3t^2 - 1$, $y = t^3 - t$; Find $\frac{dy}{dx}$

16. If $f(x) = x^k$ and $f'(1) = 10$; then value of k is

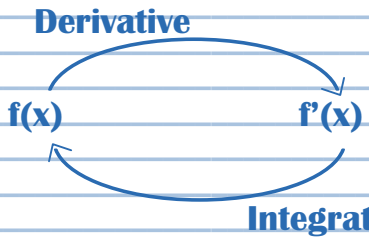
My Notes :

17. $y = e^{\sqrt{2x}}$ Find $\frac{dy}{dx}$

18. $f(x) = \frac{3x^2 - 2x + 5}{2x + 1}$ Find $f'(x)$

19. If $y = x^{x^{x^{\cdots \infty \text{ terms}}}}$ Find $\frac{dy}{dx}$

20.



Therefore, Integration is anti-derivative

21.

$\int x^n.dx =$

$\int k.dx =$

$\int a^x.dx =$

$\int 1 .dx =$

$\int e^x.dx =$

$\int \frac{1}{x} .dx =$

22.

$\int \sqrt{x} .dx =$

$\int \frac{1}{\sqrt{x}} .dx =$

$\int e^{-3x} .dx =$

$\int 3^x .dx =$

$\int x\sqrt{x} .dx =$

23. $\int \left(x + \frac{1}{x^2}\right) .dx =$

24. $\int \sqrt{x}\,(x^3+2x-3).dx =$

25. $\int (e^{3x} + e^{-4x}).dx =$

26. $\int \left(\frac{x^2}{x+1}\right).dx =$

27. $\int \frac{x^3 + 5x^2 - 3}{x+2} .dx =$

28. $\int \frac{x^3}{(x^2+1)^3} .dx =$

(Solve by Method of Substitution)

29. $\int \frac{1}{x^2-a^2}\,dx = \frac{1}{2a}\,\text{Log}\left|\frac{x-a}{x+a}\right| + c$

30. $\int \frac{1}{a^2-x^2}\,dx = \frac{1}{2a}\,\text{Log}\left|\frac{a+x}{a-x}\right| + c$

31. $\int \frac{1}{\sqrt{x^2+a^2}}\,dx = \text{Log}\left|x + \sqrt{x^2+a^2}\right| + c$

32. $\int \frac{1}{\sqrt{x^2-a^2}}\,dx = \text{Log}\left|x + \sqrt{x^2-a^2}\right| + c$

33. $\int e^x\,[f(x) + f'(x)]\,.\,dx = e^x\,.\,f(x) + c$

34. $\int \sqrt{x^2+a^2}\,.\,dx = \frac{x}{2}\sqrt{x^2+a^2} + \frac{a^2}{2}\,\text{Log}\left|x + \sqrt{x^2+a^2}\right| + c$

35. $\int \sqrt{x^2-a^2}\,.\,dx = \frac{x}{2}\sqrt{x^2-a^2} - \frac{a^2}{2}\,\text{Log}\left|x + \sqrt{x^2-a^2}\right| + c$

36. $\int \frac{f'(x)}{f(x)}\,dx = \text{Log}\,f(x) + c$

37. **Integration by parts**

$\int (u.v)\,.\,dx = u\int v.dx - \int\left[\frac{du}{dx} \times \int v.dx\right].dx$

38. If $\int f(x).dx = g(x) + c$; then

$\int_a^b f(x) = g(b) - g(a)$

My Notes :

39. Find $\frac{dy}{dx}$ If $x^2y^2 + 3xy + y = 0$

40. Find $\frac{dy}{dx}$ If $y = \text{Log}\,(x + \sqrt{x^2+a^2})$

41. If $y = (a.e^{mx} + b.e^{-mx})$. Find $\frac{d^2y}{dx^2}$

42. If $y = \sqrt{x+1}$. Find $\frac{dy}{dx}$

a. $1/\sqrt{x+1}$ b. $-1/\sqrt{x+1}$ c. $1/2\sqrt{x+1}$ d. None of these

43. If $f(x) = e^{(ax^2+bx+c)}$ Find $f'(x)$

a. $e^{(ax^2+bx+c)}.(ax+b)$ b. $e^{(ax^2+bx+c)}$ c. $e^{(ax^2+bx+c)}.(2ax+b)$ d. $(ax^2+bx+c) \times e^{ax+b}$

44. If $f(x) = \frac{x^2+1}{x^2-1}$ then $f'(x) = ?$

a. $-4x/(x^2-1)^2$ b. $4x/(x^2-1)^2$ c. $x/(x^2-1)^2$ d. None of these

45. $y = x(x-1)(x-2)$; Find $\frac{dy}{dx}$

a. $3x^2 - 6x + 2$ b. $-6x + 2$ c. $3x^2 + 2$ d. None of these

46. If $xy = 1$; then $y^2 + \frac{dy}{dx} =$

a. 1 b. 0 c. -1 d. None of these

47. $y = \sqrt{x + \sqrt{x}}$ then $\frac{dy}{dx} = ?$

a. $\frac{1}{2\sqrt{x + \sqrt{x}}}$

b. $\frac{1}{2\sqrt{x + \sqrt{x}}} \times (1 + \sqrt{x})$

c. $\frac{2}{\sqrt{x + \sqrt{x}}}$

d. $\frac{1}{2\sqrt{x + \sqrt{x}}} \times (1 + \frac{1}{2\sqrt{x}})$

48. $e^{-xy} - 4xy = 0$; then $\frac{dy}{dx} = ?$

a. -y/x b. y/x c. x/y d. None of these

49. $x^3 + y^3 - 3axy = 0$; then $\frac{dy}{dx}$

a. $\frac{ay - x^2}{y^2 + ax}$ b. $\frac{ay - x^2}{y^2 - ax}$ c. $\frac{ay + x^2}{y^2 + ax}$ d. None of these

50. $x = 2t + 5$ & $y = t^2 - 2$; then $\frac{dy}{dx} = ?$

a. t b. -1/t c. 1/t d. None of these

51. If $y = 1/\sqrt{x}$; then $\frac{dy}{dx}$ = ?

a. $1/2x\sqrt{x}$ b. $-1/x\sqrt{x}$ c. $-1/2x\sqrt{x}$ d. None of these

52. If $x = 3t^2-1$ and $y = t^3-t$; then $\frac{dy}{dx}$ = ?

a. $\frac{3t^2 - 1}{6t}$ b. $3t^2 - 1$ c. $\frac{3t - 1}{6t}$ d. None of these

53. For the curve $x^2+ y^2+ 2gx + 2hy = 0$; the value of $\frac{dy}{dx}$ at (0,0) is

a. $-g/h$ b. g/h c. h/g d. None of these

54. Given $x= t + t^{-1}$ & $y = t-t^{-1}$ then $\frac{dy}{dx}$ for $t = 2$ is

a. 3/5 b. -3/5 c. 5/3 d. None of these

55. $x^3 - 2x^2y^2 + 5x + y - 5 = 0$ then $\frac{dy}{dx}$ at $x = 1$ and $y = 1$ is :

a. 4/3 b. -4/3 c. 3/4 d. None of these

56. $y = x^2 . \text{Log } x$. Find $\frac{dy}{dx}$

a. 1 + 2 Log x b. x (1 + 2 Logx) c . 2 logx d. None of these

57. If $x = at^2$ and $y = 2at$; then $\frac{dy}{dx}_{t=2}$ is

a. 1/2 b. -2 c. -1/2 d. None of these

58. If $f(x) = x^2 - 6x + 8$. Find $f'(5) - f'(8)$

a. f' (2) b. 3f'(2) c. 2f'(2) d. None of these

59. If $f(x) = x^k$ and $f'(1) = 0$ then $k = ?$

a. 10 b. -10 c. 1/10 d. None of these

60. $\int_3^5 x^2.dx = ?$

61. If $\int f(x)\,dx = g(x) + c$; then

$\int_a^b f(x) = g(b) - g(a)$

62. $\int_2^3 (2x^2 + 5x + 3).dx = ?$

63. $\int_7^{10} a^{2x}.dx = ?$

64. $\int_0^4 \sqrt{3x+4}\ .dx = ?$

a. 9/112 b. 112/9 c. 11/9 d. None of these

65. $\int_0^2 \left(\frac{x+2}{x+1}\right) .dx = ?$

a. $2 + \text{Log}_e 2$ b. $2 + \text{Log}_e 3$ c. $\text{Log}_e 3$ d. None of these

66. $\int_0^4 \frac{(x+1)(x+4)}{\sqrt{x}} .dx = ?$

a. $51\frac{1}{5}$ b. 48/5 c. 48 d. $55\frac{7}{15}$

67. $\int \text{Log } x^2 .dx = ?$

a. x (logx - 1) + k b. 2x (logx - 1) + k
c. 2 (logx - 1) + k d. None of these

68.

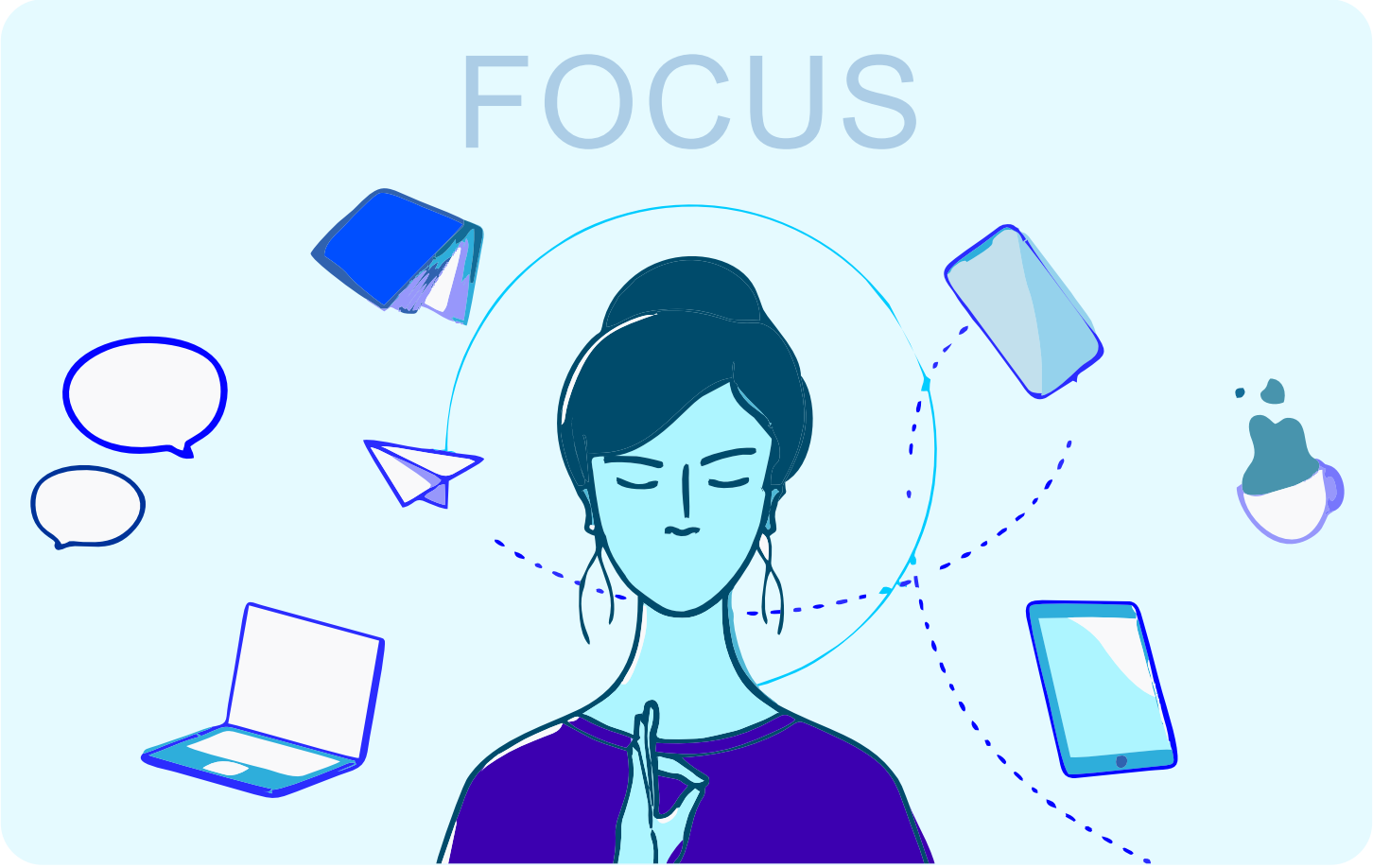
$y = f(x)$	$\frac{dy}{dx} = f'(x)$
x	
x^2	
x^3	
$4x^3$	
$5x^4 + 2x^2$	
$8x^3 - 9x^{10}$	
$10x^3 + 16x^2 + 18x$	
35	
$8x^2 - 35x + 18$	
a^x	
a^{2x}	
a^{2x+5}	
5^{8x+9}	
e^x	
e^{2x+5}	
e^{5x^2+2x+5}	
$\log_e x$	
$\sqrt{x}$	
$\sqrt{2x+5}$	
$\sqrt{2x^2+3x+9}$	
$\text{Log } x$	
$\text{Log } (2x+3)$	

68.

$y = f(x)$	$\frac{dy}{dx} = f'(x)$
$\text{Log } \sqrt{x}$	
$\text{Log } (5x^2 + 2x + 3)$	
$a^x \cdot e^x$	
$\text{Log of } x \cdot \sqrt{x}$	
$(3x + 2) \cdot 5^x$	

My Notes :

To be in the 1%
You have to do what 99% won't



You get what you FOCUS on.
So FOCUS on what you want!

CA VINOD REDDY

True Humility is staying teachable,
Regardless of how much
you already know...

Believe you Can....

& You are Half Way There

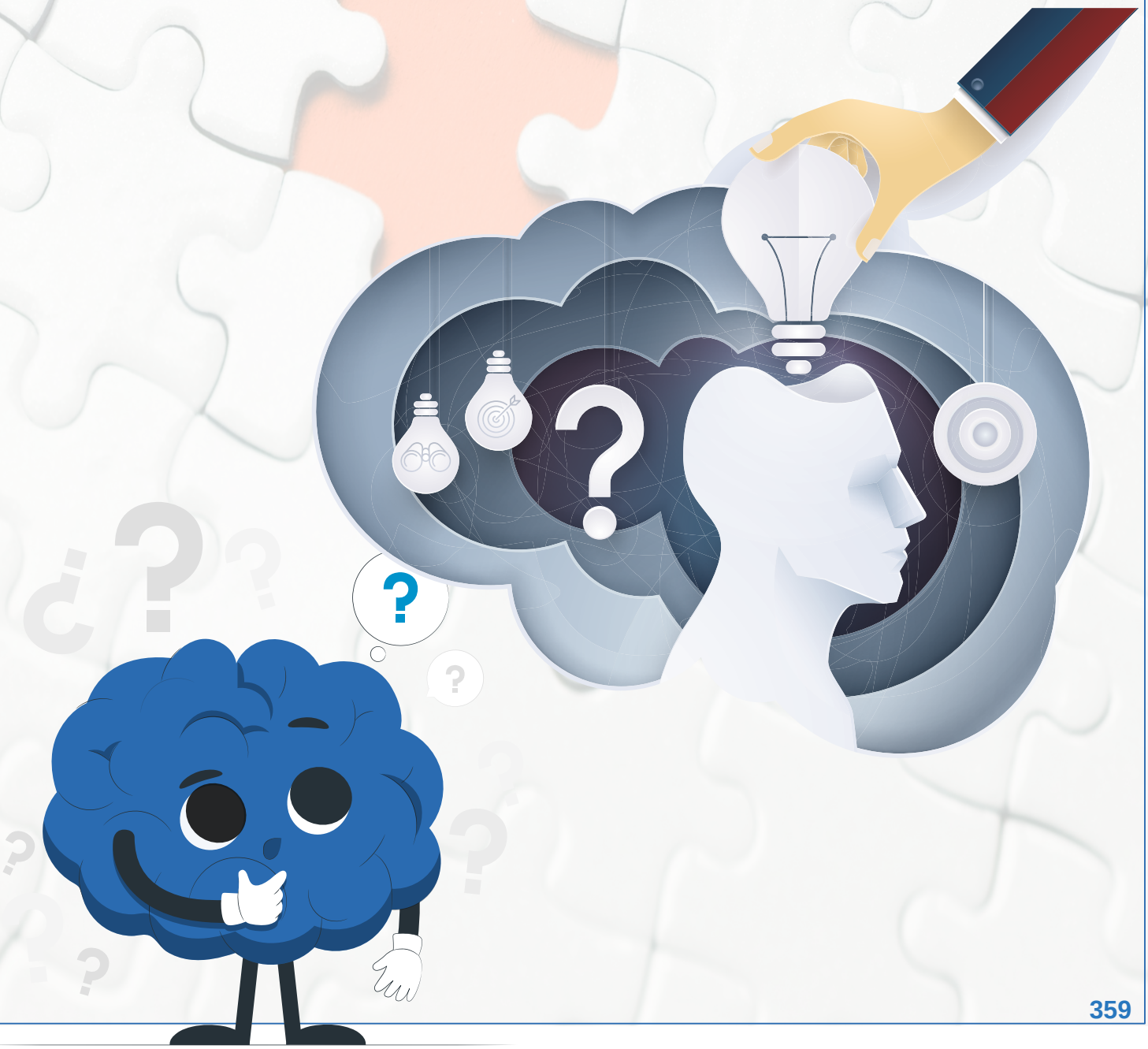
- CA VINOD REDDY -

If You Focus on HURT,
you will continue to suffer,
if you focus on LESSON,
You will continue to GROW!

Chapter-13

LOGICAL REASONING

CA VINOD REDDY



1. Series is classified into

A. Number Series.

B. Alphabet Series.

C. Letter Series.

2. 2, 7, 16, ?, 46, 67, 92

a. 29 b. 31 c. 41 d. None

3. 2, 5, 10, 17, ?, 37

a. 30 b. 21 c. 25 d. 26

4. 1, 1, 4, 8, 9, 27, 16, ?

a. 32 b. 48 c. 64 d. 50

5. 120, 99, 80, 63, ?

a. 48 b. 40 c. 30 d. None

6. 10, 11, 22, 23, 46, 47, 94, 95

a. 96 b. 110 c. 190 d. 180

7. 1000, 500, 250, 125, ?

a. 69 b. 25 c. 60 d. 62.5

8. 6, 11, 17, 24, 32, ?

a. 41 b. 40 c. 64 d. None of these

9. 1, 9, 25, 49, 81, ?

a. 169 b. 121 c. 225 d. 289

10. 10, 12, 36, 38, 114, 116, 348, ?

a. 350 b. 1050 c. 1044 d. None of these

11. 5760, 960, 192, ?, 16, 8

a. 48 b. 64 c. 384 d. None of these

12. 5, 25, 36, 6, 8, 64, 625, ?

a. 25 b. 390625 c. 125 d. 5

13. 2, 3, 5, 7, 11, 13, ?

a. 19 b. 17 c. 15 d. 21

My Notes :

14.

Coding

Letter Coding ← → **Number Coding**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

15. If MENTION is coded as NFOUJPO then EXPERT will be coded as -

16. If VINOD is coded as WHONE then SUSHEEL will be coded as -

17. If TAP is coded as QBU then GREEN will be coded as -

18. If MOBILE is coded as NQEMQK then ASHWAT will be coded as -

19. If MAT is coded as 34 then PILLAR will be coded as -

20. Find the odd man out -

i. January, May, December, April

ii. 10, 14, 16, 28, 17, 30, 38, 42

iii. 25, 49, 35, 81, 121, 64, 4

iv. 78, 91, 26, 52, 130, 117, 82, 143, 39

v. 1, 64, 27, 16, 125, 343

vi. Physics, Biology, Chemistry, Accounts

vii. Book, Pen, Pencil, Bike

21. Find the odd man out - 49, 39, 36, 225

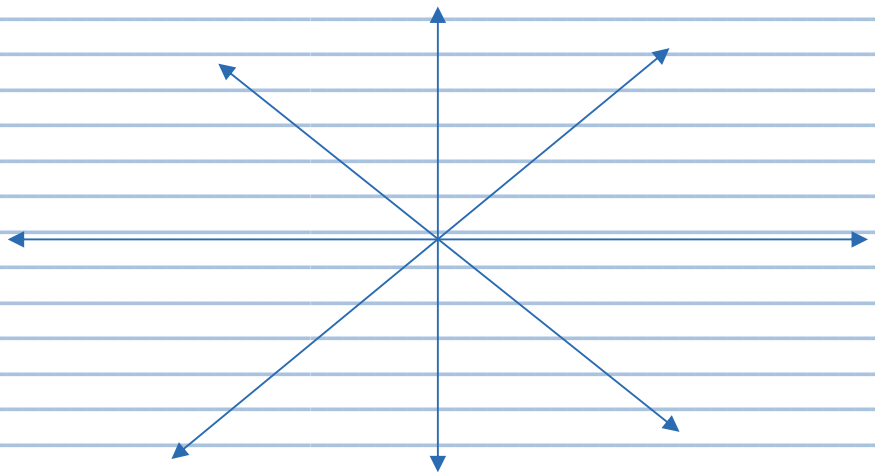
39 : only

225 : only

36 : only

49 : only

22.



23. North then right

24. North left then left then right

25. West then left then right

26. Southwest then left then right

27. Northwest then right

28. Seating arrangements are classified into

i)

ii)

iii)

29. P Q R S T facing north

Who are to the left of R :

Who is to the immediate left of S :

Who is to the immediate right of P :

30. A B C D E F facing south

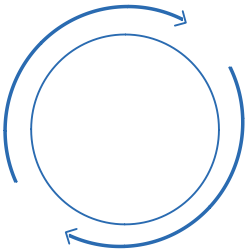
Who is to the right of A :

Who is to the left of B :

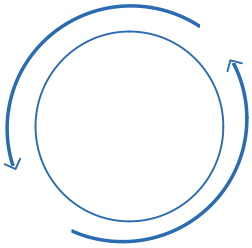
Who is to the immediate right of C :

Who is to the immediate left of E :

31.

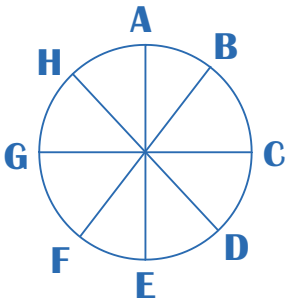


Clockwise



Anti-clockwise

32.



If A, B, C, D, E, F, G, H are facing centre, then

A facing

B

C

D

E

F

G

H

My Notes :

33.

1. Father's Father
2. Father's Mother
3. Father's Brother
4. Father's Sister
5. Children of Uncle
6. Wife of Uncle
7. Children of Aunt
8. Husband of Aunt
9. Mother's Father
10. Mother's Mother
11. Mother's Brother
12. Mother's Sister
13. Children of Maternal Uncle
14. Wife of Maternal Uncle
15. Grandfather's Son
16. Grandfather's Only son
17. Mother or Father's Mother
18. Grandmother's Mother
19. Grandmother's Father
20. Grandson's Daughter
21. Grandson's Son
22. Grand-daughter's Son
23. Grand-daughter's Daughter
24. Daughter's Husband
25. Son's Wife
26. Husband's Father
27. Husband's Mother
28. Wife's Brother
29. Wife's Sister
30. Wife's Father
31. Wife's Mother
32. Brother's Son
33. Brother's Daughter
34. Sister's Son
35. Sister's Daughter
36. Brother's Wife
37. Sister's Husband
38. My father's son is my
39. My father's daughter is my
40. My father's father is my

41. My mother's brother is my
42. My daughter's husband is my
43. My son's wife is my
44. My Brother's wife is my
45. My brother's daughter is my
46. My brother's son is my
47. My wife's father is my
48. My wife's mother is my
49. My wife's sister is my
50. My wife's brother is my
51. My father's wife is my
52. My mother's husband is my
53. My son's daughter is my
54. My daughter's son is my

34. 6, 11, 21, 36, 56, ?

a. 42 b. 51 c. 81 d. 91

35. 10, 100, 200, 310, ?

a. 400 b. 410 c. 420 d. 430

36. 11, 13, 17, 19, 23, 25, ?

a. 27 b. 29 c. 31 d. None of these

37. 6, 12, 21, 33, ?

a. 36 b. 39 c. 45 d. 48

38. 2, 5, 9, 14, ?, 27

a. 20 b. 16 c. 18 d. None of these

39. 11, 21, ?, 56, 81

a. 42 b. 36 c. 91 d. 51

40. 10, 18, 28, 40, 54, ?, 88

a. 70 b. 86 c. 72 d. 80

41. 195, 168, 143, 120, ?, 80

a. 100 b. 99 c. 105 d. None of these

42. 8, 10, 40, 42, 168, 170, 680, 682, ?

a. 684 b. 1528 c. 2728 d. None of these

43. 28, 33, 31, 36, 34, ?

a. 38 b. 39 c. 42 d. None of these

My Notes :

44. 5760, 960, 192, ?, 16, 8

a. 96 b. 48 c. 32 d. None of these

45. 2, 3, 3, 5, 10, 13, 39, 43, ?, 177

a. 46 b. 172 c. 48 d. None of these

46. If RAMAN is written as 12325 and DINESH is written as 675489, How HAMAM is written?

a. 92323 b. 92233 c. 93292 d. None of these

47. If RED is coded as 6720 then GREEN would be coded as

a. 9207716 b. 167129 c. 1677209 d. 1672091

48. If BROTHER is coded as 2456784, SISTER is coded as 919684, what is coded as BORBERS?

a. 2542849 b. 2542898 c. 2454889 d. 2524889

49. If DELHI is coded as 73541 & CALCUTTA as 82589662, How is CALICUT coded?

a. 5279431 b. 5978213 c. 8251896 d. 8543962

50. If CLOCK is coded as 34235 and TIME as 8679, what will be the code for MOTEL?

a. 72894 b. 77684 c. 72964 d. 27894

51. In a certain code NAME is written as 4258 then what would be the code for MEAN?

a. 2458 b. 5842 c. 8524 d. 5824

52. If GOLD is written as IQNF then WIND would be coded as

a. VHMC b. YKPF c. XJOE d. DNIW

53. If ROSE is written as TQUG, How BISCUIT can be written in that code

a. DKUEWKV b. CJTDVJU c. DKVEWKV d. DKUEWKY

54. If DELHI is coded as CCIDD then How would you code BOMBAY?

a. AJMTVT b. AMJXVS c. MJXVSU d. None of these

55. If PALAM is given with a code number of 43 then, what will be the code number for SANTACRUZ?

a. 123 b. 85 c. 120 d. 125

56. If 256 means you are good
637 means we are bad
358 means good and bad
which of the following represents 'and' in that code

a. 2 b. 5 c. 8 d. 3

57. Find odd man out from : Avni, Ishani, Esha, Usha, Veena

a. Veena b. Esha c. Usha d. Avni

58. Find the odd man out from : 64, 32, 512, 243, 1024, 8, 2048

a. 2048 b. 243 c. 64 d. 8

59. Find the odd man out from AB, MN, YZ, VU

a. AB b. MN c. YZ d. VU

60. If A = 1, PAT = 37, then TAP =

a. 73 b. 37 c. 36 d. 38

61. If D = 4, BAD = 7, then what is the value of ANT?

a. 8 b. 17 c. 35 d. 37

62. If MATHEMATICS = 12345123678, then MAHATMA = ?

a. 1242312 b. 12345123 c. 12345678 d. 12425341

63. If D = 4, COVER = 63, then BASIS = ?

a. 55 b. 50 c. 49 d. 54

64. If HKUJ means FISH, what does UVCD means?

a. STAR b. STAB c. STAL d. None of the these

65. If NOIDA is written as STNIF, How MEERUT can be written in that code?

a. QIIVYX b. RJJWZV c. RJJWZY d. RIIVYX

66. If 'BEQUICK' is coded as ZCOSGAI then INDIAN is coded as

67. If RAMAYANA is coded as PYKYWYLY then MAHABHARATA can be written in that code as

My Notes :

68. In a certain code HYDROGEN is coded as JCJZYSSD then how can ANTIMONY be coded?

69. In certain language PLAYER is coded as QNDCJX then how SINGER will be coded in that language

70. In certain code MONKEY is written as XDJMNL. How TIGER is written in that code?

71. If BAT can be written as DCV, then MAN can be written as

72. If CAT can be written as CNANT, then GOD can be written as

73. If SIR can be written as PSPIPR, then MAN can be written as

74. If TIMBER is written as BERMIT then how would BANTER be written in that code

75. In a certtain code COURSE is written as ESRUOC. How BREATH can be written in the same code

76. In a certain code 493 means 'Friendship difficult challenge'; 961 means 'Struggle difficult exam'; 178 means 'Exam believable subject', then which digit is used for believable?

a. 7 b. 8 c. a or b d. None of these

77. Vehicle is coded as Book, Book as Flower, Flower as House, House as Calculator. then where is the treasure of huge amount of knowledge hidden?

a. Book b. Calculator c. Flower d. Vehicle

78. If TALENT is written as LATENT then how would EXOTIC be written in that code?

a. EXOTIC b. OXETIC c. TICOXE d. None of these

My Notes :

79. In a certtain language NOITCELES represents SELECTION then AIDNI represents-

a. AIDSI b. HINDI c. INDIA d. None

80. Mohan starts walking from point A & 1 km towards south, turns left and walks 1 km. Then he turns left and again walks 1 km. Now he is facing ...

a. East b. West c. South d. North

81. Suresh starts from a point walks 2 miles towards south, turns right and walks $1\frac{1}{2}$ miles, turns left and walks $\frac{1}{2}$ miles and then he turns back. What direction is he facing now?

a. East b. West c. South d. North

My Notes :

82. A man facing East, then he turns left and goes 10 m, then he turns right and goes 5 m then goes 5 m to the south and from there 5 m to the west. In which direction he is from original place?

a. East b. West c. South d. North

83. From her home Avni Reddy wishes to go to school. From home she goes towards north & then turns left & then turns right and finally she turns left and reaches school. In what direction her school is situated with respect to her home?

a. North-East b. North-West c. South-East d. South-West

84. K is a place which is located 2 kms away in north-west direction from the capital P. R is another place that is located 2 kms away in south-west direction from K. M is another place that is located 2 kms away in north-west direction from R. T is another place that is located 2 kms away in south-west direction from M. In which direction T is located in relation to P.

a. South-West b. North-West c. West d. North

85. I started walking down a road in the morning facing sun. After walking for sometime I turned to my left then I turned to my right. In which direction was I going then?

a. East b. West c. North d. South

86. You are going straight, first eastwards then turn to the right, then right again, then left. In which direction would you be going now?

a. East b. West c. South d. North

87. You go North, turn right, then right again, & then go to the left. Which direction are you facing now?

a. East b. West c. South d. North

88. Ashwat Reddy traveled 15 kms eastwards, then turned left and travelled 5 kms then turned left and travelled 15 kms. How far is he from starting point?

a. 30 kms b. 35 kms c. 15 kms d. 5 kms

89. Hari travelled 17 kms to the east, he turned left and went 15 kms, he again turned left and went 17 kms. How far is he from starting point?

a. 17 kms b. 2 kms c. 15 kms d. 32 kms

90. Sudha travels 8 kms to the south, then she turns to the right and walks 4 kms. Then again she turns to her right and moves 8 kms forward. How many kms away is she from starting point?

a. 7 kms b. 6 kms c. 4 kms d. 8 kms

91. From my house I walked 5 kms towards North. I turned right and walked 3 kms. Again I went 1 km to the south. How far am I from my house?

a. 7 kms b. 6 kms c. 4 kms d. 5 kms

92. Rama left home and walked 5 kms southwards. turned right and walked 2 kms and turned right and walked 5 kms and turned left and walked 5 kms. How many kilometers will she have to walk to reach her home straight?

a. 5 kms b. 7 kms c. 17 kms d. 15 kms

93. Facing the East Gopi walks straight 4 kms, turns left and walks 3 kms and again turns left and walked 4 kms. How far is he now from the starting point?

a. 2 kms b. 3 kms c. 10 kms d. 11 kms

94. Pran and Khan start from their office and walk in opposite direction each travelling 10 kms. Pran then turns left and walks 10 kms while Khan turns right and walks 10 kms. How far are they from each other?

a. 0 kms b. 5 kms c. 10 kms d. 20 kms

95. A starts walking from a point 'P'. A goes westward and covers a distance of 4 kms and then turns to his right and walks 3 kms. How far 'A' is from starting point.

a. 7 kms b. 9 kms c. 2 kms d. 5 kms

96. A cyclist goes 30 kms to North and turning to the East he goes 40 kms. Again he turns to his right and goes 20 kms. After this he turns to his right and goes 40 kms. How far is he from his starting point?

a. 20 kms b. 10 kms c. 25 kms d. 40 kms

97. A man travels 3 kms in the East and turns to south and moves 4 kms. How far is he from starting point?

a. 5 kms b. 6 kms c. 2 kms d. 10 kms

98. Dhrish travels 8 kms towards the North, turns left and travels 3 kms and then again turns right and covers another 4 kms then turns right and travels another 3 kms. How far is he from starting point?

a. 18 kms b. 11 kms c. 12 kms d. 15 kms

99. Mitan travelled 12 kms southwards and turned left and travelled 10 kms, then turned left and travelled 12 kms. How far was Mitan from starting point?

a. 8 kms b. 10 kms c. 12 kms d. 14 kms

100. Ashwat travelled 15 kms towards East then turned towards North and travelled 15 kms and turned west & travelled 15 kms. How far is he from starting point?

a. 15 kms b. 30 kms c. 45 kms d. zero kms

101. Daily in the morning the shadow of Ram temple falls on Hanuman temple, and in the evening shadow of Hanuman temple falls on Ram temple. In which direction Hanuman temple is from Ram temple?

a. East b. West c. South d. North

My Notes :

102. A man on a moped starts from a point and rides 4 kms south then turns left and rides 2 kms and turns again to the right to ride to go more. In which direction is he moving now?

a. East b. West c. South d. North

103. If Ashwat sees rising sun behind the temple and setting sun behind railway station from his house. What direction of temple from railway station?

a. East b. West c. South d. North

104. A is B's daughter. B is C's mother. D is C's brother. How is D related to A?

a. Father b. Grandfather c. Brother d. Son

My Notes :

105. P is Q's brother. R is Q's mother. S is R's father. T is S's mother. How is P related to T?

a. Grand-daughter b. Great grandson c. Grandson d. Grandmother

106. A is B's brother. C is D's father. E is B's mother A & D are brothers. How is E related to C?

a. Sister b. Sister in law c. Niece d. Wife

107. Given that A is mother of B, C is son of A, D is brother of E, E is daughter of B, who is the grandmother of D?

a. A b. B c. C d. D

108. M is the son of P. Q is grand daughter of O who is husband of P. How is M related to O?

a. Son b. Daughter c. Mother d. Father

109. A is B's sister . C is B's mother. D is C's father. E is D's mother. How is A related to D?

a. Grandmother b. Grandfather c. Daughter d. Grand-daughter

110. A is father B & C, B is son of A. But C is not son of A. How is C related to A?

a. Niece b. Son-in-law c. Daughter d. Grandson

111. A is father B , C is daughter of B, D is brother of B. E is son of A. What is relationship between C and E?

a. Brother & sister b. Cousins c. Niece & uncle d. Uncle & Aunt

112. If P is husband of Q and R is mother of S & Q. What is R to P?

a. Mother b. Sister c. Aunt d. Mother in law

113. X is husband of Y. W is daughter of X. Z is husband of W. N is daughter of Z. What is the relation of N to Y?

a. Cousin b. Niece c. Daughter d. Grand-daughter

114. A's mother is sister of B and she has daughter C who is 21 years old. How is B related to C?

a. Niece b. Maternal Uncle c. Daughter d. Uncle

115. A is D's brother. D is B's father. B & C are sisters. How is C related to A?

a. Cousin b. Niece c. Aunt d. Nephew

116. A is B's brother, C is A's mother. D is C's father, E is B's son. How is E related to A?

a. Cousin b. Nephew c. Uncle d. Grandson

117. A and B are brothers. E is daughter of F. F is wife of B. What is relationship of E to A?

a. Sister b. Daughter c. Niece d. Sister-in-law

118. M and F are a married couple. A and B are sisters. A is sister of F. Who is B to M?

a. Sister-in-law b. Sister c. Mother d. Niece

119. Q is son of P. X is daughter of Q. R is aunty (Bua) of X and L is son of R, then what is L to P?

a. Grandson b. Granddaughter c. Daughter d. Nephew

120. Rajiv is brother of Atul. Sonia is sister of Sunil. Atul is son of Sonia. How is Rajiv related to Sonia?

a. Nephew b. Son c. Brother d. Father

121. There are 2 film stars, one is father of other's son. what is relation of two with each other?

a. Grandfather-Grandson
b. Grandfather-son
c. Husband-Wife
d. Father & Son

122. Ramu's mother said to Ramu : "My mother has a son whose son is Ashwat". How is Ashwat related to Ramu?

a. Uncle
b. Cousin
c. Brother
d. Nephew

123. There are 5 houses P,Q,R,S,T. P is right of Q and T is left of R and right of P. Q is right of S. Which house is in the middle?

a. P
b. Q
c. R
d. T

124. Five friends are sitting on bench. A is to the left of B but on the right of C, D is to the right of B but on the left of E. Who are at the extremes?

a. A,B
b. A,D
c. C,E
d. B,D

125. In a college party, 5 girls are sitting in a row. P is to the left of M and to the right of O. R is sitting to the right of N but to the left of O, who is sitting in the middle?

a. O b. R c. P d. M

126. 5 boys A,B,C,D,E are standing in a row. D is to the right of E, B is on the left of E but on the right of A. D is to the left of C, who is standing on extreme right. Who is standing in the middle?

a. B b. C c. D d. E

127. 4 Ladies A,B,C,D and 4 gentlemen E,F,G,H are sitting in a circle around a table facing each other -
I. No 2 ladies or gentlemen are sitting side by side
II. C who is sitting between G, E facing D
III. F is between D and A and facing G
IV. H is to the right of B

Qs. 1 Who is sitting to the left of A?
a. E b. F c. G d. H

Qs. 2 E is facing whom?
a. F b. B c. G d. H

Qs. 3 Who are immediate neighbours of A?
a. G,H b. E,F c. E,H d. F,H

128. P to W are sitting in front of one another in two rows. Each row has 4 persons. P is between U and V and facing North. Q, who is immediate left of S is facing W. R is between T and S and W is to the immediate right of V.

Qs. 1 Who is sitting in front of R?

a. U b. Q c. V d. P

Qs. 2 Who is to the immediate right of R?

a. S b. U c. T d. None of these

Qs. 3 In which of the following pairs, persons are sitting in front of each other?

a. S,V b. R,V c. T,V d. U,R

129. A to H are seated in a straight line facing North. C sits 4th left of G. D sits second right of G. Only 2 people sit between D and A. B and F are immediate neighbour of each other. B is not immediate neighbour of A. H is not neighbour of D.

a. Who among the following sits third to the right of C?

a. B b. F c. A d. E

b. Which of the following represents persons seated at 2 extreme ends of line?

a. C,D b. A,B c. B,G d. D,H

c. What is position of H with respect to F?

a. 3rd to left b. immediate right c. 2nd to right d. 4th to left

d. How many persons are seated between A & E?

a. 1 b. 2 c. 3 d. 4

130. Given that A is mother of B. C is son of A. D is brother of E. E is daughter of B. Who is grandmother of D?

a. A b. B c. C d. D

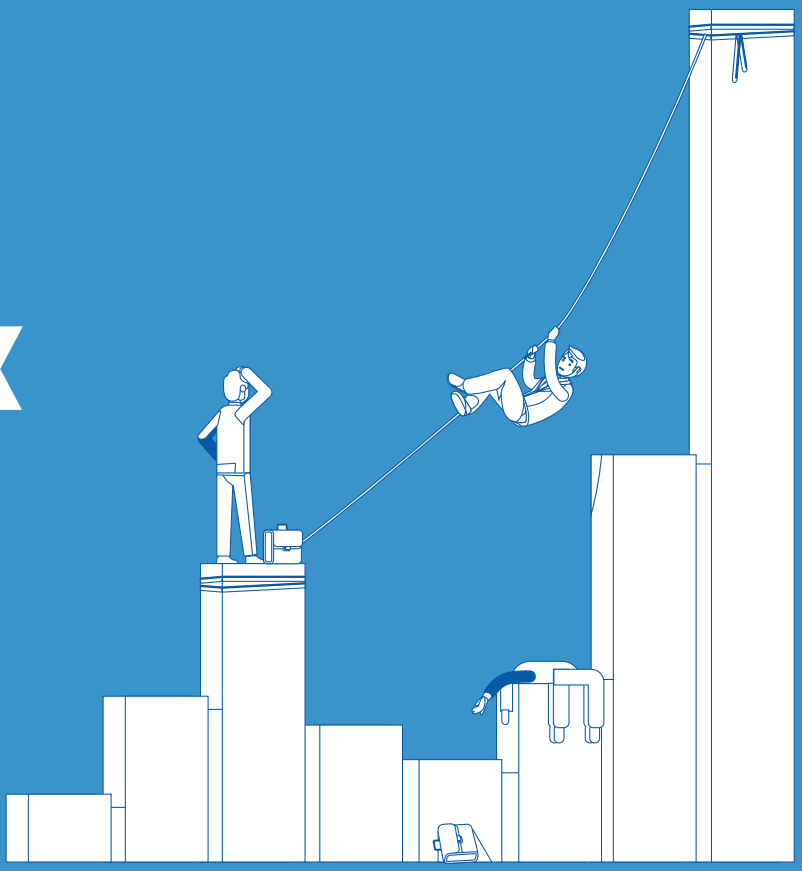
We FALL

●

We BREAK

●

We FAIL



BUT THEN

We RISE ★

We HEAL ★

We OVERCOME ★

CA VINOD REDDY

What makes life so difficult?

'PEOPLE'

All things are difficult before they are EASY

- CA VINOD REDDY -

Chapter-14

Index Numbers

CA VINOD REDDY

1. Often we encounter news of price rise, GDP growth, production growth, etc. It is important for student of chartered accountancy to learn techniques of measuring growth / rise or decline of various economic & business data and reporting it with the help of index numbers.

2. Definition of Index Numbers :

1. Index number is ratio or avg of ratios of prices, quantities, values where 2 or more time periods are involved, one of which is the base period.

2. The value at base time period serves as standard point for comparison.

Examples : Sensex, CII, HDI, CPI, etc.

3. There are 2 broad types of index numbers

a.

b.

Simple index number is computed for one variable where as composite index number is calculated from 2 or more variables. Most index numbers are composite in nature.

4. All index Numbers are UNIT FREE.

5. Issues involved in the construction of index numbers

a. Selection of data.
b. Base period.
c. Selection of weights.
d. Use of averages
e. Choice of variable
f. Selection of formula

6.

Price Relative =

Quantity Relative =

Value Relative =

My Notes :

7.

Year (B.Year) 2016	Price of commodity A	Quantity of commodity A	Value of commodity A	Relatives		
				Price	Qty.	Value
2016	50	8				
2017	103	13				
2018	68	16				
2019	98	21				
2020	111	28				
2021	125	35				

8.

Simple Aggregative Price Index Number =

Simple Aggregative Quantity Index Number =

Simple Aggregative Value Index Number =

9.

Commodities	Year		
	2021	2022	2023
Cheese (per 10 gms)	12	15	16.80
Egg (per piece)	3	3.60	3.30
Potato (per kg)	5	6.00	5.70
Aggregate	20		
Simple Aggregative Price Index Number			

Commodities	Year		
	2021	2022	2023
Cheese (per 100 gms)			
Egg (per dozen)			
Potato (per 20 kg)			
Aggregate			
Simple Aggregative Price Index Number			

Observations from above two tables :

10.

Simple Aggregative Index Numbers do not satisfy unit test

↓

To overcome this limitation of simple aggregative index number we have introduced

11. Weighted Aggregative Index Numbers :

While finding weighted aggregative price index numbers we use weight as :

While finding weighted aggregative quantity index numbers we use weight as :

My Notes :

12.

Weighted Aggregative Index Numbers	Price	Quantity
1. Laspeyre's		
2. Paasche's		
3. Marshall Edgeworth's		
4. Fisher's Ideal Indices		

13.

$$\text{Chain Index} = \frac{\text{(Link relative of Current Year x Chain Index of Previous Year)}}{100}$$

My Notes :

14.

Year	Price	Link Relatives	Chain Indices
2011	50		
2012	60		
2013	62		
2014	65		
2015	70		
2016	78		
2017	82		
2018	84		
2019	88		
2020	90		
2021	103		
2022	108		

15. **Limitations of Index Numbers :**

1. Indices are collected mostly from samples.
2. They depict only broad trend and not real picture
3. There are many methods employed from constructing index numbers, the result gives diff values and this at times creates confusion.

16.

Year	Wholesale Price Index	GNP at current Prices	Real GNP
2021	113.10	7499	
2022	116.30	7935	
2023	121.20	8657	
2024	127.70	9323	

$$\text{Deflated Value} = \frac{\text{Current Value}}{\text{Price Index of current year}}$$

17.

Year	Original Price Index	Shifted Price Index to the base 2020
2010	100	
2011	104	
2012	106	
2013	107	
2014	110	
2015	112	
2016	115	
2017	117	
2018	125	
2019	131	
2020	140	
2021	147	

$$\text{Shifted Price Index} = \frac{\text{Original Price Index}}{\text{Price Index of the year on which base has to be shifted}} \times 100$$

18.

Tests of Adequacy : a.
b.
c.
d.

19. When unit test of index numbers is said to be satisfied?

20. When time reversal test is said to be satisfied?

- You will notice that Laspeyre's & Paasche's method do not satisfy Time-reversal test but Fisher's formula satisfy Time-reversal test.
- While selecting an appropriate index formula, the time reversal test and factor reversal test are considered necessary in testing the consistency.

21. When factor reversal test is said to be satisfied?

Fisher's formula satisfy time reversal test as well as factor reversal test.
Therefore, it is called as ideal index number.

22. When circular test of index numbers is said to be satisfied?

23. A series of numerical figures which show the relative position is called as _____ .

24. Index number for the base period is always taken as

a. 200 b. 50 c. 150 d. 100

25. _____ play very important part in construction of index numbers.

a. Weights b. Classes c. Estimations d. Students

26. _____ is particulars suitable for construction of index numbers.

a. AM b. GM c. HM d. None of these

27. Index number show _____ changes rather than absolute amounts of change.

a. Relative b. Percentage c. Major d. Minor

28. The _____ makes index numbers time reversible

a. AM b. GM c. HM d. Mode

29. The _____ of group indices gives General Index.

a. AM b. GM c. HM d. None of these

30. _____ Test is extension to time reversal test.

a. Factor Reversal Test b. Circular Test c. Both d. None

31. Factor Reversal Test is satisfied by :

a. Fisher's Index b. Laspeyre's Index c. Paasche's Index d. None of these

32. Laspeyre's formula does not satisfy :

a. Factor Reversal Test b. Time Reversal Test c. Circular Test d. All of these

33. The value at _____ time period serves as standard point for comparison

a. Base b. High c. My d. Past

34. Index numbers are often constructed from _____

a. Frequency b. Class c. Sample d. Temple

35. The ratio of price of a single commodity in a given period to its price in the base year is called as

a. Price Relative b. Close Relative

c. Cousin d. Price

36. $\frac{\text{Sum of prices of all commodities}}{\text{Sum of prices of all commodities in base year}} \times 100 = ?$

a. Price Relative b. Quantity Relative

c. Simple aggregative price index number d. Weighted aggregative price index number

37. P_{01} is the index for time.

a. 1 on 0 b. 0 on 1 c. 1 on 1 d. 0 on 0

38. P_{10} is the index for time.

a. 1 on 0 b. 0 on 1 c. 1 on 1 d. 0 on 0

39. P_{ab} is the index for time.

a. a on b b. b on a c. a on a d. b on b

40. When product of price index number and quantity index number is equal to corresponding value index number then the test that holds good is _____ .

a. Unit Test b. Time Reversal Test

c. Circular Test d. Factor Reversal Test

41. The formula should be independent of the unit in which or for which prices and quantities are quoted in :

a. Unit Test b. Time Reversal Test

c. Circular Test d. Factor Reversal Test

42. Fisher's ideal formula does not satisfy _____ test.

a. Unit Test b. Circular Test c. Time Reversal Test d. None of these

43. Laspeyre's and Paasche's method _____ time reversal test.

a. Satisfy b. Do not satisfy c. Sometimes satisfy d. Can satisfy

44. There is no such thing as unweighted index numbers.

a. True b. False

45. Theoretically GM is best avg in construction of index numbers but in practice, mostly AM is used -

a. True b. False

46. The number of tests of adequacy are _____

a. 3 b. 4 c. 8 d. 2

47. We use price index numbers _____

a. To measure and compare prices b. To measure prices

c. To compare prices d. None of these

48. If price of all commodities in a place have increased 1.25 times in comparison to their base period, the index number of prices of that place now is :

a.125 b. 25 c. 150 d. 225

49. If index number of prices at a place in 2022 is 250 with 2005 as base year then prices have increased on avg by

a. 250% b. 150% c. 350% d. 50%

50. If prices of all commodities in a place have decreased 35% over the base period prices, then index number of prices of that place now is ,

a. 35 b. 135 c. 65 d. None of these

51. Link relative index number is expressed for the period of 'n' is :

a. $\frac{P_n}{P_{(n+1)}}$ b. $\frac{P_n}{P_{(n-1)}}$ c. $\frac{P_{(n+1)}}{P_{(n-1)}}$ d. None of these

52. Fisher's ideal Price Index

$= \sqrt{\quad}$

53. Fisher's ideal Quantity Index

$= \sqrt{\quad}$

54. Consumer price index for the year 1957 was 313 with 1940 as the base year. The avg. monthly wages in 1957 of the workers in the factory be ₹ 160, their real wages is :

a. ₹ 48.40 b. ₹ 51.12 c. ₹ 40.30 d. None of these

55. Bowley's Index = $\frac{\text{Lasp. Index + Paasche's Index}}{2}$

56.

Commodity	Base Year		Current Year		
	Price	Quantity	Price	Quantity	
	20	125	22	150	
	28	163	32	170	
	30	128	32	150	
	38	193	42	200	
	42	186	42	193	
	45	176	48	192	
	60	185	56	198	
	70	198	75	210	

Find Lasp. Price Index =

Paasche's Price Index =

Marshall Edgeworth's. Price Index =

Fisher's Ideal Price Index =

Dorbish-Bowley's Price Index =

Lasp. Quantity Index =

Paasche's Quantity Index =

Fisher's Quantity Index =

Marshall Edgeworth's. Quantity Index =

Dorbish-Bowley's Quantity Index =

57. Circular test is not met by Laspeyre's and Paasche's index OR Fisher's index. The simple geometric mean of price relatives and weighted aggregative with fixed weights meets this test.

58. In 1980, the net monthly income of an employee was ₹ 800 p.m. The consumer price index was 160 in 1980. It rises to 200 in 1984. If he has to be rightly compensated the additional amount to be paid to employee is

a. ₹ 175 b. ₹ 185 c. ₹ 200 d. ₹ 125

59. Uses of Index Numbers

a. Framing suitable policies in economics & business.

b. They reveal trends and tendencies.

c. They are used for forecasting the future.

d. They are useful in deflating.

e. Useful to measure changes in cost of living.

60. The purpose determines the type of index numbers to use.

a. True b. False

My Notes :

CLASSY is when you have
a lot to say
but you CHOOSE to remain
SILENT in front of fools

CA VINOD REDDY

People don't care for you,
when you are alone
They just care for you
when they are alone!

We are not our best intentions, We are what we DO!

CA VINOD REDDY

No matter where you are in life, GOD always has more in store. He never wants you to stop growing

Form is Temporary Class is Permanent

CA VINOD REDDY

Your . I CAN is more important than your I.Q