

LAST DAY REVISION QUESTION

Super-300 Question Revision Series

Part-1 Business Mathematics

Coverage in Part-1

S.no	Chapter	Weightage
1.	Time Value of Money	12-14 Marks
2.	Permutation & Combination	4-6 Marks
3.	Sequence & Series	3-4 Marks
4.	Equations	3-4 Marks
5.	Inequalities	1-2 Marks
6.	Set Relations & Function	3-4 Marks
Total Coverage in this Sheet		26-34 Marks

Your Math's Professor
Aman Khedia



Write Down Basic Tricks

How to Calculate Any Power

How to Calculate Log

How to Calculate Antilog

Basic Math's Formal's

Basic Tips

TIME VALUE OF MONEY

- In how many years, a sum will become double at 5% p.a. compound interest.
(a) 14.0 years (b) 15 years
(c) 16 years (d) 14.3 years
- The time by which a sum of money is 8 times of itself if it doubles itself in 15 years interest compounded annually.
(a) 42 years (b) 43 years
(c) 45 years (d) 46 years
- What is the rate of simple interest if a sum of money amounts to ₹ 2,784 in 4 years and ₹ 2,688 in 3 years?
(a) 1% p.a. (b) 4% p.a.
(c) 5% p.a. (d) 8% p.a.
- The compound interest for a certain sum @ 5% p.a. for first year is ₹ 25. The S-I for the same money @ 5% p.a. for 2 years will be.
(a) ₹ 40 (b) ₹ 50
(c) ₹ 60 (d) ₹ 70
- The cost of Machinery is ₹ 1,25,000/- If its useful life is estimated to be 20 years and the rate of depreciation of its cost is 10% p.a., then the scrap value of the Machinery is [given that $(0.9)^{20} = 0.1215$]
(a) ₹ 15,187 (b) ₹ 15,400
(c) ₹ 15,300 (d) ₹ 15,250
- Mr. X invests 'P' amount at Simple Interest rate 10% and Mr. Y invests 'Q' amount at Compound Interest rate 5% compounded annually. At the end of two years both get the same amount of interest, then the relation between two amounts P and Q is given by:
(a) $P = \frac{41Q}{80}$ (b) $P = \frac{41Q}{40}$
(c) $P = \frac{41Q}{100}$ (d) $P = \frac{41Q}{200}$
- If the difference of S.I and C.I is ₹ 72 at 12% for 2 years. Calculate the Principle.
(a) ₹ 8,000 (b) ₹ 6,000
(c) ₹ 5,000 (d) ₹ 7,750
- If a simple interest on a sum of money at 6% p.a. for 7 years is equal to twice of simple interest on another sum for 9 years at 5% p.a.. The ratio of sum will be:
(a) 2 : 15 (b) 7 : 15
(c) 15 : 7 (d) 1 : 7
- By mistake a clerk, calculated the simple interest on principal for 5 months at 6.5% p.a. instead of 6 months at 5.5% p.a. If the error in calculation was ₹ 25.40. The original sum of principal was _____.
(a) ₹ 60,690 (b) ₹ 60,960
(c) ₹ 90,660 (d) ₹ 90,690
- The S.I. on a sum of money is $\frac{4}{9}$ of the principal and the no. of years is equal to the rate of interest per annum. Find the rate of interest per annum?
(a) 5% (b) 20/3%
(c) 22/7% (d) 6%



11. A sum of money compounded annually becomes ₹ 1,140 in two years and ₹ 1,710 in three years.
Find the rate of interest per annum.
(a) 30% (b) 40%
(c) 50% (d) 60%
12. The partners A and B together lent ₹ 3,903 at 4% per annum interest compounded annually. After a span of 7 years, A gets the same amount as B gets after 9 years. The share of A in the sum of ₹ 3,903 would have been:
(a) ₹ 1,875 (b) ₹ 2,280
(c) ₹ 2,028 (d) ₹ 2,820
13. If a sum triples in 15 years at simple rate of interest, the rate of interest per annum will be:
(a) 13.0% (b) 13.3%
(c) 13.5% (d) 18.0%
14. How much amount is required to be invested every year as to accumulate ₹ 6,00,000 at the end of 10 years, if interest is compounded annually at 10% rate of interest [Given: $(1.1)^{10} = 2.59374$].
(a) ₹ 37,467 (b) ₹ 37,476
(c) ₹ 37,647 (d) ₹ 37,674
15. A sum of money invested of compound interest doubles itself in four years. It becomes 32 times of itself at the same rate of compound interest in
(a) 12 years (b) 16 years
(c) 20 years (d) 24 years
16. A certain sum of money was invested at simple rate of interest for three -years. If the same has been invested at a rate that was seven percent higher, the interest amount would have been ₹ 882 more. The amount of sum invested is:
(a) ₹ 12,600 (b) ₹ 6,800
(c) ₹ 4,200 (d) ₹ 2,800
17. A sum of ₹ 44,000 is divided into three parts such that the corresponding interest earned after 2 years, 3 years and 6 years may be equal. If the rates of simple interest are 6% p.a., 8% p.a. and 6% p.a. respectively, then the smallest part of the sum will be:
(a) ₹ 4,000 (b) ₹ 8,000
(c) ₹ 10,000 (d) ₹ 12,000
18. Mr. X bought an electronic item for ₹ 1,000. What would be the future value of the same item after 2 years, if the value is compounded semi-annually at 22% per annum?
(a) ₹ 1,488.40 (b) ₹ 1,518.07
(c) ₹ 2,008.07 (d) ₹ 2,200.00
19. If an amount is kept at simple interest, it earns an interest of ₹ 600 in first two years but when kept at compound interest it earns an interest of ₹ 660 for the same period, then the rate of interest and principal amount respectively are:
(a) 20%, ₹ 1,200 (b) 10%, ₹ 1,200
(c) 20%, ₹ 1,500 (d) 10%, ₹ 1,500
20. A person lends ₹ 6,000 for 4 years and ₹ 8,000 for 3 years at simple interest. If he gets ₹ 2,400 as total interest, the rate of interest is:
(a) 5% (b) 4%
(c) 6% (d) 7%



21. The difference between the Compound interest and Simple interest at 10% per annum for 4 years on ₹ 10,000 is ₹ _____.
- (a) 650 (b) 640
(c) 641 (d) 600
22. The effective rate of interest equivalent to the nominal rate of 7% converted monthly:
- (a) 7.26% (b) 7.22%
(c) 7.02% (d) 7.20%
23. Mr. X invest ₹ 10,000 every year starting from today for next: 10 years. suppose interest rate is 8% per annual compounded annually. Calculate future value of the annuity.
- (a) ₹ 1,56,454.88 (b) ₹ 1,56,554.88
(c) ₹ 1,44,865.625 (d) None of these
24. If ₹ 1,000 be invested at interest rate of 5% and the interest be added to the principal every 10 years, then the number of years in which it will amount to ₹ 2,000 is:
- (a) $16\frac{2}{3}$ years (b) $6\frac{1}{4}$ years
(c) 16 years (d) $6\frac{2}{3}$ years
25. A person borrows ₹ 5,000 for 2 years at 4% per annual simple interest. He immediately lends to another person at $6\frac{1}{4}$ % per annual for 2 years find his gain in the transaction for year:
- (a) ₹ 112.50 (b) ₹ 225
(c) ₹ 125 (d) ₹ 107.50
26. The future value of an annuity of ₹ 1,000. made annually for 5 years at the interest of 14% compounded annually is:
Given $(1.14)^5 = 1.92541$
- (a) ₹ 5,610 (b) ₹ 6,610
(c) ₹ 6,160 (d) ₹ 5,160
27. If ₹ 10,000 is invested at 8% per year compounded quarterly, then the value of the investment after 2 years is:
[given $(1 + 0.02)^8 = 1.171659$]
- (a) ₹ 11,716.59 (b) ₹ 10,716.59
(c) ₹ 117.1659 (d) None of the above
28. A certain money doubles itself in 10 years when deposited on simple interest. It would triple itself in
- (a) 20 years (b) 15 years
(c) 25 years (d) 30 years
29. If compound interest on a sum for 2 years at 4% per annum is ₹ 102, then the simple interest on the same sum for the same period at the same rate will be
- (a) ₹ 99 (b) ₹ 101
(c) ₹ 100 (d) ₹ 95
30. A man invests an amount of ₹ 15,860 in the names of his three sons A, B and C in such a way that they get the same interest after 2,3 and 4 years respectively. If the rate of interest is 5%, then the ratio of amount invested in the name of A, B and C is:
- (a) 6: 4: 3 (b) 3: 4: 6
(c) 30: 12: 5 (d) None of the above



31. What is the net present value of piece of property which would be valued at ₹ 2 lakh at the end of 2 years? (Annual rate of increase = 5%)
 (a) ₹ 1.81 lakh (b) ₹ 2.01 lakh
 (c) ₹ 2.00 lakh (d) None of the above
32. The value of furniture depreciates by 10% a year, if the present value of the furniture in an office is ₹ 21,870, calculate the value of furniture 3 years ago
 (a) ₹ 30,000 (b) ₹ 35,000
 (c) ₹ 40,000 (d) ₹ 50,000
33. The certain sum of money became ₹ 692/ in 2 yrs and ₹ 800/ - in 5 yrs then the principle amount is _____
 (a) ₹ 520 (b) ₹ 620
 (c) ₹ 720 (d) ₹ 820
34. A sum of money amount to ₹ 6,200 in 2 years and ₹ 7,400 in 3 years as per S.I. then the principal is
 (a) ₹ 3,000 (b) ₹ 3,500
 (c) ₹ 3,800 (d) None
35. A sum was invested for 3 years as per C.I. and the rate of interest for first year is 9%, 2nd year is 6% and 3rd year is 3% p.a. respectively. Find the sum if the amount in three years is ₹ 550 ?
 (a) ₹ 250 (b) ₹ 300
 (c) ₹ 462.16 (d) ₹ 350
36. A person wants to lease out a machine costing ₹ 5,00,000 for a 10 year period. It has fixed a rental of ₹ 51,272 per annum payable annually starting from the end of first year. Suppose rate of interest is 10% per annum compounded annually on which money can be invested. To whom this agreement is favourable?
 (a) Favour of Lessee (b) Favour of Lessor
 (c) Not for both (d) Can't be determined
37. Let a person invest a fixed sum at the end of each month in an account paying interest 12% per year compounded monthly. If the future value of this annuity after the 12th payment is ₹ 55,000 then the amount invested every month is?
 (a) ₹ 4,837 (b) ₹ 4,637
 (c) ₹ 4,337 (d) ₹ 3,337
38. In simple interest if the principal is ₹ 2,000 and the rate and time are the roots of the equation $x^2 - 11x + 30 = 0$ then simple interest is
 (a) ₹ 500 (b) ₹ 600
 (c) ₹ 700 (d) ₹ 800
39. A man invests ₹ 12,000 at 10% p.a. and another sum of money at 20% p.a. for one year. The total investment earns at 14% p.a. simple interest the total investment is:
 (a) ₹ 8,000 (b) ₹ 20,000
 (c) ₹ 14,000 (d) ₹ 16,000
40. An amount P becomes ₹ 5,100.5 and ₹ 5,203 after second and fourth years respectively at R% of interest per annum compounded annually. Thus, values of P and R are:
 (a) ₹ 4,000 and 1.5 (b) ₹ 5,000 and 1
 (c) ₹ 6,000 and 2 (d) ₹ 5,500 and 3



41. A certain sum invested at 4% per annum compounded semi-annually amounts to ₹ 1,20,000 at the end of one year. Find the sum:
 (a) 1,15,340 (b) 1,10,120
 (c) 1,12,812 (d) 1,13,113
42. Find the present value of ₹ 1,00,000 to be required after 5 years if the interest rate be 9%. Given that $1.09^5 = 1.5386$.
 (a) 78,995.98 (b) 64,994.15
 (c) 88,992.43 (d) 93,902.12
43. The ratio of principal and the compound interest value for three years (compounded annually) is 216: 127. The rate of interest is:
 (a) 0.1777 (b) 0.1567
 (c) 0.1666 (d) 0.1587
44. A stock pays annually an amount of ₹ 10 from 6th year onwards. What is the present value of the perpetuity, if the rate of return is 20%?
 (a) 20.1 (b) 19.1
 (c) 21.1 (d) 22.1
45. A certain sum amounted to ₹ 575 at 5% in a time in which ₹ 750 amounted to ₹ 840 at 4%. If the rate of interest is simple, find the sum-
 (a) 525 (b) 550
 (c) 515 (d) 500
46. Two equal amounts of money are deposited in two banks each at 15% p.a. for 3.5 years in the bank and for 5 years in the other. The difference between the interest amount from the bank is ₹ 144. Find the sum
 (a) ₹ 620 (b) ₹ 640
 (c) ₹ 820 (d) ₹ 840
47. Assuming that the discount rate is 7% p.a. how much would you pay to receive ₹ 200 growing at 5% annually for ever?
 (a) ₹ 2,500 (b) ₹ 5,000
 (c) ₹ 7,500 (d) ₹ 10,000
48. A man invested one-third of his capital at 7% one-fourth at 8% and the remainder at 10%. If the annual income is ₹ 561. The capital is -
 (a) ₹ 4,400 (b) ₹ 5,500
 (c) ₹ 6,600 (d) ₹ 5,800
49. What is the compound interest (in ₹) on a sum of ₹ 12,600 for $1\frac{1}{2}$ years at 20% per annum if the interest is compounded half-yearly? (Nearest to a rupee).
 (a) 4,271 (b) 4,171
 (c) 4,711 (d) 4,117
50. If the nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year then the projected real GDP after 6 years is:
 (a) 1.587P (b) 1.921P
 (c) 1.403P (d) 2.51P

51. Let the operating profit of a manufacturer for five years is given as:

Years	1	2	3	4	5	6
Operating profit (in lakh ₹)	90	100	106.4	107.14	120.24	157.34

Then the operating profit of Compound Annual Growth Rate (CAGR) for year 6 with respect to year 2 is given that:

- (a) 9% (b) 12%
(c) 11% (d) 13%
52. What is the difference (in ₹) between the simple interest and the compound interest on a sum of ₹ 8,000 for $2\frac{2}{5}$ years at the rate of 10% p.a. when the interest is compounded yearly?
(a) 136.12 (b) 129.50
(c) 151.75 (d) 147.20
53. Anshika took a loan of ₹ 1,00,000@8% for 5 years. What amount will she pay if she wants to pay the whole amount in five equal installments?
(a) ₹ 25,045.63 (b) ₹ 26,045.68
(c) ₹ 28,045.50 (d) None
54. A machine worth ₹ 4,90,740 is depreciated at 15% on its opening value each year. When its value would reduce to ₹ 2,00,750 ?
(a) 5 years 5 months (b) 5 years 6 months
(c) 5 years 7 months (d) 5 years 8 months
55. 10 years ago, the earning per share (EPS) of ABC Ltd. was ₹ 5 share. Its EPS for this year is ₹ 22. Compute at what rate, EPS of the company grow annually?
(a) 15.97% (b) 16.77%
(c) 18.64% (d) 14.79%
56. Mr. Prakash invested money in two schemes 'A' and 'B' offering compound interest at the rate of 8% and 9% per annum respectively. If the total amount of interest accrued through these two schemes together in two years was ₹ 4,818.30 and total amount invested was ₹ 27,000. What was the amount invested in schemes 'A'?
(a) ₹ 12,000 (b) ₹ 12,500
(c) ₹ 13,000 (d) ₹ 13,500
57. A five year annuity due has periodic cash flow of ₹ 100 each year. If the interest rate is 8% the future value of this annuity is given by:
(a) $(₹ 100) \times (\text{future value at rate } 8\% \text{ for } 5 \text{ years}) \times (0.08)$
(b) $(₹ 100) \times (\text{future value at rate } 8\% \text{ for } 5 \text{ years}) \times (1 - .08)$
(c) $(₹ 100) \times (\text{future value at rate } 8\% \text{ for } 5 \text{ years}) \times (1 + 0.08)$
(d) $(₹ 100) \times (\text{future value at rate } 8\% \text{ for } 5 \text{ years}) \times (1/0.08)$
58. The present value of an Annuity immediate is the same as
(a) Annuity regular for $(n - 1)$ year plus the initial receipt in the beginning of the period.
(b) Annuity regular for $(n - 1)$ years
(c) Annuity regular for $(n + 1)$ years
(d) Annuity regular for $(n + 1)$ years plus the initial receipt in the beginning of the period



PERMUTATION & COMBINATION

59. If ${}^{18}C_r = {}^{18}C_{r+2}$ find the value of rC_5 .
(a) 55 (b) 50
(c) 56 (d) None of these
60. 7 books are to be arranged in such a way so that two particular books are always at first and last place. Find the number of arrangements.
(a) 60 (b) 120
(c) 240 (d) 480
61. Six points are on a circle. The number of quadrilaterals that can be formed are:
(a) 30 (b) 360
(c) 15 (d) None of the above
62. The number of ways of arranging 6 boys and 4 girls in a row so that all 4 girls are together is:
(a) $6!.4!$ (b) $2(7!.4!)$
(c) $7!.4!$ (d) $2.(6!.4!)$
63. How many ways a team of 11 players can be made out of 15 players if one particular player is not to be selected in the team.
(a) 364 (b) 728
(c) 1,001 (d) 1,234
64. If 15 persons are to be seated around 2 round tables, one occupying 8 persons and another 7 persons. Find the number of ways in which they can be seated.
(a) $\frac{15!}{18!}$ (b) ${}^{15}C_7 \frac{7!}{8!}$
(c) $7!.8!$ (d) $2. {}^{15}C_7 6! 7!$
65. The letters of the word "VIOLENT" are arranged so that the vowels occupy even place only. The number of permutations is _____.
(a) 144 (b) 120
(c) 24 (d) 72
66. If ${}^{13}C_6 + 2 {}^{13}C_5 + {}^{13}C_4 = {}^{15}C_x$ then, $x =$ _____.
(a) 6 (b) 7
(c) 8 (d) 9
67. Number of ways of shaking hands in a group of 10 persons shaking hands to each other are:
(a) 45 (b) 54
(c) 90 (d) 10
68. There are 5 books on English, 4 Books on Tamil and 3 books on Hindi. In how many ways can these books be placed on a shelf if the books on the same subjects are to be together?
(a) 1,36,800 (b) 1,83,600
(c) 1,03,680 (d) 1,63,800
69. 5 Men and 4 Women to sit in a row in such a manner that the women always occupy the even places. The number of such arrangement will be:
(a) 126 (b) 1056
(c) 2080 (d) 2880



70. A person has ten friends of whom six are relatives. If he invites five guests such that three of them are his relatives, then the total number of ways in which he can invite them are:
 (a) 30 (b) 60
 (c) 120 (d) 75
71. An examination paper with 10 questions consists of 6 questions in mathematics and 4 questions in statistic part. At least one question from each part is to be attempted in how many ways can this be done?
 (a) 1024 (b) 945
 (c) 1005 (d) 1022
72. There are 6 men and 4 women in a group, then the number of ways in which a committee of 5 persons can be formed of them, if the committee is to include at least 2 women are:
 (a) 180 (b) 186
 (c) 120 (d) 105
73. In how many ways can a selection of 6 out of 4 teachers and 8 students be done so as to include at least two teachers?
 (a) 220 (b) 672
 (c) 596 (d) 968
74. The maximum number of points of inter section of 10 circles will be:
 (a) 2 (b) 20
 (c) 90 (d) 180
75. If ${}^{n+1}C_{r+1} : {}^nC_r : {}^{n-1}C_{r-1} = 8 : 3 : 1$, then n is equal to:
 (a) 20 (b) 16
 (c) 10 (d) 15
76. If 3 books on computer, 3 books on commerce, and 5 books on economics are arranged in such away that the books of same subject are kept together, then the number of ways in which this can be done are:
 (a) 4320 (b) 35820
 (c) 35920 (d) 25920
77. The number of triangles that can be formed by choosing the vertices from a set of 12 points, seven of which lie on the same straight line, is:
 (a) 185 (b) 175
 (c) 115 (d) 105
78. Which of the following is a correct statement?
 (a) ${}^nP_n = {}^nP_{n-1}$ (b) ${}^nP_n = {}^{2n}P_{n-2}$
 (c) ${}^nP_n = {}^{3n}P_{n-3}$ (d) ${}^nP_n = {}^{n \cdot (n-1)}P_{n-1}$
79. How many numbers can be formed with the help of 2,3,4,5,6,1 which are not divisible by 5, given that it is a five-digit no. and digits are not repeating?
 (a) 600 (b) 400
 (c) 1200 (d) 1400
80. A fruity basket contains 7 apples, 6 bananas, and 4 mangoes. How many selections of 3 fruits can be made so that all 3 are apples?
 (a) 35 ways (b) 120 ways
 (c) 165 ways (d) 70 ways



81. 'n' locks and 'n' corresponding keys are available but the actual combination is not known. The maximum number of trials that are needed to assign the keys to the corresponding locks is:
- (a) $(n - 1)C_2$ (b) $(n + 1)C_2$
(c) $\sum_{k=2}^n (k - 1)$ (d) $\sum_{k=2}^n k$
82. ${}^n C_p + 2 {}^n C_{p-1} + {}^n C_{p-2} = ?$
- (a) ${}^{n+1} C_p$ (b) ${}^{n+2} C_p$
(c) ${}^{n+1} C_{p+1}$ (d) ${}^{n+2} C_{p-1}$
83. If four letter words are taken with or without meaning from the word 'Logarithm' without repetition, how many words will be formed?
- (a) 5040 (b) 2520
(c) 3024 (d) 40320
84. The number of ways 4 boys and 3 girls can be seated in a row so that they are alternate is:
- (a) 12 (b) 288
(c) 144 (d) 256
85. How many 3 digit odd numbers can be formed using the digits 5,6,7,8,9, if the digits can be repeated?
- (a) 55 (b) 75
(c) 65 (d) 85



SEQUENCE & SERIES

86. If in an A.P., T_n represents n th term.
If $t_7 : t_{10} = 5 : 7$ then $t_8 : t_{11} =$ _____
(a) 13 : 16 (b) 17 : 23
(c) 14 : 17 (d) 15 : 19
87. Divide 144 into three parts which are in AP and such that the largest is twice the smallest, the smallest of three numbers will be:
(a) 48 (b) 36
(c) 13 (d) 32
88. If Sum (S_n) of ' n '- terms of an Arithmetic Progression is $(2n^2 + n)$. What is the difference of its 10^{th} and 1^{st} term?
(a) 207 (b) 36
(c) 90 (d) 63
89. Geometric Mean of P, P^2, P^3, \dots, P^n will be:
(a) P^{n+1} (b) $P^{\frac{1+n}{2}}$
(c) $P^{\frac{n(n+1)}{2}}$ (d) None of the above.
90. If sum of 3 arithmetic means between "a" and 22 is 42, then "a" = _____.
(a) 14 (b) 11
(c) 10 (d) 6
91. The sum of all two Digit odd numbers is
(a) 2475 (b) 2575
(c) 4950 (d) 5049
92. If 5^{th} term of a G.P. is $\sqrt[3]{3}$, then the product of first nine terms is
(a) 8 (b) 27
(c) 243 (d) 9
93. If the sum of n terms of an A.P be $2n^2 + 5n$, then its ' n 'th' term is:
(a) $4n - 2$ (b) $3n - 4$
(c) $4n + 3$ (d) $3n + 4$
94. If the sum of n terms of an A.P be $3n^2 - n$ and its common difference is 6, then its first term is:
(a) 2 (b) 3
(c) 4 (d) 5
95. If the sum of the 4^{th} term and the 12^{th} term of an A.P. is 8, what is the sum of the first 15 terms of the progression?
(a) 60 (b) 120
(c) 110 (d) 150
96. If Geometric mean (G.M.) of a, b, c, d is 3, then G.M. of $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}, \frac{1}{d}$ will be:
(a) $1/3$ (b) 3
(c) 81 (d) $1/81$



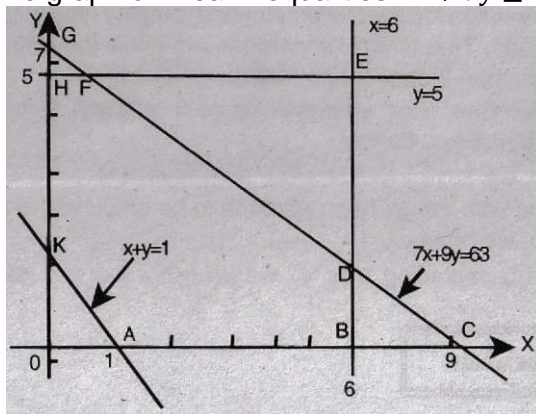
97. The sum to m terms of the series $1 + 11 + 111 + \dots$ upto m terms, is equal to:
 (a) $\frac{1}{81}(10^{m+1} - 9m - 10)$ (b) $\frac{1}{27}(10^{m+1} - 9m - 10)$
 (c) $10^{m+1} - 9m - 10$ (d) None of these
98. The sum of the infinite G.P. $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots$ is equal to:
 (a) 1.95 (b) 1.5
 (c) 1.75 (d) None of these
99. If x, y, z are the terms in G.P. then the terms $x^2 + y^2, xy + yz, y^2 + z^2$ are in:
 (a) A.P. (b) G.P.
 (c) H.P. (d) None of these.
100. If $S_n = n^2p$ and $S_m = m^2p(m \neq n)$ is the sum of an A.P., then $S_p =$ _____
 (a) p^2 (b) p^3
 (c) $2p^3$ (d) p^4
101. If the sum of first ' n ' terms of an A.P. is $6n^2 + 6n$, then the fourth term of the series:
 (a) 120 (b) 72
 (c) 48 (d) 24
102. The sum of n terms of the series $\log x + \log \frac{x^2}{y} + \log \frac{x^3}{y^2} + \dots$ is
 (a) $\frac{n}{2} \left[2n \log \left(\frac{x}{y} \right) + \log xy \right]$ (b) $\frac{n}{2} \left[n \log xy + \log \left(\frac{x}{y} \right) \right]$
 (c) $\frac{n}{2} \left[n \log \left(\frac{x}{y} \right) - \log xy \right]$ (d) $\frac{n}{2} \left[n \log \left(\frac{x}{y} \right) + \log xy \right]$
103. If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are in arithmetic progression then a^2, b^2, c^2 , are in
 (a) Arithmetic Progression (b) Geometric Progression
 (c) Both in arithmetic and geometric Progression (d) None of these
104. The sum of all numbers between 100 and 1000 which are divisible by 11 will be:
 (a) 44550 (b) 66770
 (c) 55440 (d) 33440
105. If the P^{th} term of an A.P. is ' q ' and the q^{th} term is ' p ', then its r^{th} term is
 (a) $p + q - r$ (b) $p + q + r$
 (c) $p - q - r$ (d) $p - q$
106. If the ratio of sum of n terms of two APs is $(n + 1) : (n - 1)$, then the ratio of their m^{th} terms is:
 (a) $(m + 1) : 2m$ (b) $(m + 1) : (m - 1)$
 (c) $(2m - 1) : (m + 1)$ (d) $m : (m - 1)$
107. If $2 + 6 + 10 + 14 + 18 + \dots + x = 882$ then the value of x
 (a) 78 (b) 80
 (c) 82 (d) 86
108. Sum upto infinity of series.
 $\frac{1}{2} + \frac{1}{3^2} + \frac{1}{2^3} + \frac{1}{3^4} + \frac{1}{2^5} + \dots$
 (a) $19/24$ (b) $24/19$
 (c) $5/24$ (d) None



109. Find the no. of terms of the series 25, 5, 1 $\frac{1}{3125}$
 (a) 6 (b) 7
 (c) 8 (d) 9
110. The 20th term of arithmetic progression whose 6th term is 38 and 10th term is 66 is:
 (a) 118 (b) 136
 (c) 178 (d) 210
111. If the sum of 'n' terms of an AP (Arithmetic Progression) is $2n^2$, the fifth term is _____.
 (a) 20 (b) 50
 (c) 18 (d) 25
112. The nth term of the series 9,7,5, and 15,12,9, are same. Find the nth term?
 (a) 7 (b) 8
 (c) 9 (d) 10
113. If pth term of an AP is q and its qth term is p, then what will be the value of (p + q)th term?
 (a) 0 (b) 1
 (c) p + q - 1 (d) 2(p + q - 1)

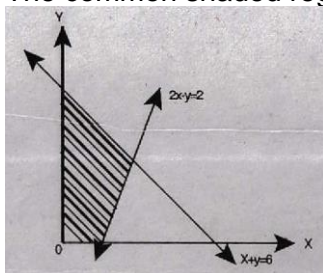
LINEAR INEQUALITIES

114. The solution of the inequality $\frac{(5-2x)}{3} \leq \frac{x}{6} - 5$ is
 (a) $x \geq 8$ (b) $x \leq 8$
 (c) $x = 8$ (d) None of these.
115. Solution space of the inequalities $2x + y \leq 10$ and $x - y \leq 5$:
 (i) includes the origin.
 (ii) includes the point (4, 3)
 which one is correct ?
 (a) Only (i) (b) Only (ii)
 (c) Both (i) and (ii) (d) None of the above.
116. The union forbids employer to employ less than two experienced person (x) to each fresh person (y). This situation can be expressed as:
 (a) $x \leq y/2$ (b) $y \leq x/2$
 (c) $y \geq x/2$ (d) None of these
117. The graph of linear inequalities $7x + 9y \leq 63$, $x + y \geq 1$, $0 \leq x \leq 6$ and



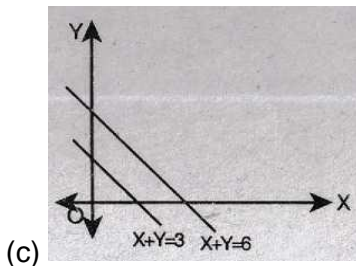
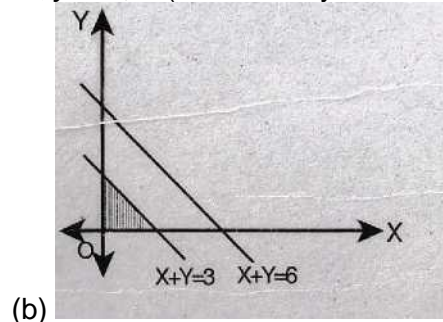
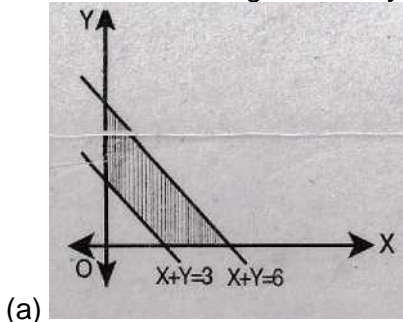
Common region of the inequalities is:

- (a) BCDB and DEFD (b) Unbounded
 (c) HFGH (d) ABDFHKA
118. The common shaded region in the graph represents the linear inequalities as:



- (a) $x + y \geq 6$
 $2x - y - 2 \geq 0$
 $x, y \geq 0$
- (b) $x + y \geq 6$
 $2x - y - 2 \leq 0$
 $x, y \geq 0$
- (c) $x + y \leq 6$
 $2x - y - 2 \leq 0$
 $x, y \geq 0$
- (d) $x + y \leq 6$
 $2x - y - 2 \geq 0$
 $x, y \geq 0$

119. The common region of $x + y \leq 6$; $x + y \geq 3$; $x \geq 0$; $y \geq 0$, is (as shown by shaded region):



(a)

(b)

(c)

(d) None the these.

120. On Solving the Inequalities $5x + y \leq 100$, $x + y \leq 60$, $x \geq 0$, $y \geq 0$, we get the following solution:

- (a) $(0,0)$, $(20,0)$, $(10,50)$ & $(0,60)$ (b) $(0,0)$, $(60,0)$, $(10,50)$ & $(0,60)$
 (c) $(0,0)$, $(20,0)$, $(0,100)$ & $(10,50)$ (d) None of these

121. Solve for x of the Inequalities

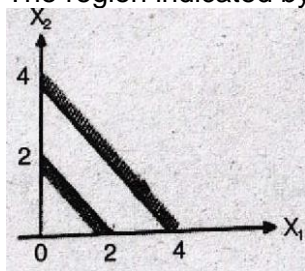
$$2 \leq \frac{3x - 2}{5} \leq 4 \text{ where } x \in \mathbb{N}$$

- (a) $\{5,6,7\}$ (b) $\{3,4,5,6\}$
 (c) $\{4,5,6\}$ (d) None

122. The common region in the graph of the inequalities $x + y \leq 4$, $x - y \leq 4$, $x \geq 2$ is

- (a) Equilateral triangle (b) Isosceles triangle
 (c) Quadrilateral (d) Square

123. The region indicated by the shading in the graph is expressed by the inequalities



- (a) $x_1 + x_2 \leq 2$
 $x_1 + x_2 \geq 4$
 $x_1 \geq 0, x_2 \geq 0$ (b) $x_1 + x_2 \leq 2$
 $x_2 x_1 + x_2 \leq 4$
 $x_1 \geq 0, x_2 \geq 0$
 (c) $x_1 + x_2 \geq 2$
 $x_1 + x_2 \geq 4$
 $x_1 \geq 0, x_2 \geq 0$ (d) $x_1 + x_2 \geq 2$
 $x_1 + x_2 \leq 4$
 $x_1 \geq 0, x_2 \geq 0$

124. If $2x + 5 > 3x + 2$ and $2x - 3 \leq 4x - 5$, then 'x' can take which of the following value?

- (a) 4 (b) -4
 (c) 2 (d) -2



EQUATIONS

125. Roots of the equation $3x^2 - 14x + k = 0$ will be reciprocal of each other if:
 (a) $k = -3$ (b) $k = 0$
 (c) $k = 3$ (d) $k = 14$.
126. Positive value of 'k' for which the roots of equation $12x^2 + kx + 5 = 0$ are in ratio 3 : 2, is:
 (a) $5/12$ (b) $12/5$
 (c) $\frac{5\sqrt{10}}{2}$ (d) $5\sqrt{10}$
127. If p & q are the roots of the Equation $x^2 - bx + C = 0$, then what is the Equation whose roots are $(pq + p + q)$ and $(pq - p - q)$?
 (a) $x^2 - 2cx + c^2 - b^2 = 0$ (b) $x^2 - 2bx + c^2 + b^2 = 0$
 (c) $8cx^2 - 2(b + c)x + c^2 = 0$ (d) $x^2 + 2bx - (c^2 - b^2) = 0$
128. If one of the roots of the equation $x^2 + px + a$ is $\sqrt{3} + 2$, then the value of 'p' and 'a' is:
 (a) $-4, -1$ (b) $4, -1$
 (c) $-4, 1$ (d) $4, 1$
129. If $|x - 2| + |x - 3| = 7$ then, 'x' will be equal to
 (a) 6 (b) -1
 (c) 6 and -1 (d) None of the above
130. Roots of equation $2x^2 + 3x + 7 = 0$ are α and β . The value of $\alpha\beta^{-1} + \beta\alpha^{-1}$ is
 (a) 2 (b) $3/7$
 (c) $7/2$ (d) $-19/14$
131. If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be:
 (a) $x^2 - 14x + 49 = 0$ (b) $x^2 - 24x + 144 = 0$
 (c) $x^2 - 50x + 49 = 0$ (d) $x^2 - 19x + 144 = 0$
132. The roots of the equation $y^3 + y^2 - y - 1 = 0$ are:
 (a) $(1, 1, -1)$ (b) $(-1, -1, 1)$
 (c) $(1, 1, 1)$ (d) None of these
133. The number of students in each section of a school is 36. After admitting 12 new students, four new sections were started. If total number of students in each section now is 30, than the number of sections initially were.
 (a) 6 (b) 10
 (c) 14 (d) 18
134. If roots of equation $x^2 + x + r = 0$ are ' α ' and ' β ' and $\alpha^3 + \beta^3 = -6$. Find the value 'r'?
 (a) $\frac{-5}{3}$ (b) $\frac{7}{3}$
 (c) $\frac{-4}{3}$ (d) 1
135. If difference between the roots of the equation $x^2 - kx + 8 = 0$ is 4, then the value of k is:
 (a) 0 (b) ± 4
 (c) $\pm 8\sqrt{3}$ (d) $\pm 4\sqrt{3}$



136. If the sides of an equilateral triangle are shortened by 3 units, 4 units and 5 units respectively and a right triangle is formed, then the side of an equilateral triangle is:
 (a) 6 units (b) 7 units
 (c) 8 units (d) 10 units.
137. If $u^{5x} = v^{5y} = w^{5z}$ and $u^2 = vw$, then the value of $xy + xz - 2yz$ will be:
 (a) 5 (b) 2
 (c) 1 (d) 0
138. Let α and β be the roots of $x^2 + 7x + 12 = 0$. Then the value of $\left(\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}\right)$ will be:
 (a) $\frac{7}{12} + \frac{12}{7}$ (b) $\frac{49}{144} + \frac{144}{49}$
 (c) $-\frac{91}{12}$ (d) None of the above.
139. Find the condition that one roots is double the other of $ax^2 + bx + c = 0$
 (a) $2b^2 = 3ac$ (b) $b^2 = 3ac$
 (c) $2b^2 = 9ac$ (d) $2b^2 > 9ac$
140. Find value of $x^2 - 10x + 1$ if $x = \frac{1}{5-2\sqrt{6}}$
 (a) 25 (b) 1
 (c) 0 (d) 49
141. The rational root of the equation $0 = 2p^3 - p^2 - 4P + 2$ is:
 (a) 2 (b) -2
 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$
142. The harmonic mean of the roots of the equation $(5 + \sqrt{2}) \times 2 - (4 + \sqrt{5})x + 8 + 2\sqrt{5} = 0$ is
 (a) 2 (b) 4
 (c) 6 (d) 8
143. The sum of square of any real positive quantity and its reciprocal is never less than:
 (a) 1 (b) 2
 (c) 3 (d) 4
144. If the roots of the equation $x^2 - px + q = 0$ are in the ratio 2 : 3, then:
 (a) $p^2 = 25q$ (b) $p^2 = 6q$
 (c) $6p^3 = 5q$ (d) $6p^2 = 25q$
145. What will be the value of k, if the roots of the equation $(k - 4)x^2 - 2kx + (k + 5) = 0$ are equal?
 (a) 18 (b) 20
 (c) 19 (d) 21



RELATIONS & FUNCTION

146. $X = \{x, y, w, z\}, y = \{1, 2, 3, 4\}$
 $H = \{(x, 1), (y, 2), (y, 3), (z, 4), (x, 4)\}$
 (a) H is a function from X to Y
 (b) H is not a function from X to Y
 (c) H is a relation from Y to X
 (d) None of the above
147. If $A = \{x: x^2 - 3x + 2 = 0\}$,
 $B = \{x: x^2 + 4x - 12 = 0\}$, then
 $B - A$ is Equal to
 (a) $\{-6\}$ (b) $\{1\}$
 (c) $\{1, 2\}$ (d) $\{2, -6\}$
148. If $F: A \rightarrow R$ is a real valued function defined by $f(x) = \frac{1}{x}$, then $A =$ _____.
 (a) R (b) $R - \{1\}$
 (c) $R - \{0\}$ (d) $R - N$
149. If $f: R \rightarrow R, f(x) = x + 1$,
 $g: R \rightarrow R, g(x) = x^2 + 1$
 then $f \circ g(-2)$ equals to
 (a) 6 (b) 5
 (c) -2 (d) None
150. If $A = \{\pm 2, \pm 3\}, B = \{1, 4, 9\}$ and
 $F = \{(2, 4), (-2, 4), (3, 9), (-3, 9)\}$ then 'F' is defined as :
 (a) One to one function from A into B.
 (b) One to one function from A onto B.
 (c) Many to one function from A onto B.
 (d) Many to one function from A into B.
151. The number of proper sub set of the set $\{3, 4, 5, 6, 7\}$ is
 (a) 32 (b) 31
 (c) 30 (d) 25
152. If $f: R \rightarrow R$ is a function, defined by $f(x) = 10x - 7$, if $g(x) = f^{-1}(x)$, then $g(x)$ is equal to
 (a) $\frac{1}{10x-7}$ (b) $\frac{1}{10x+7}$
 (c) $\frac{x+7}{10}$ (d) $\frac{x-7}{10}$
153. If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then $f\left(\frac{2x}{1+x^2}\right)$ is equal to:
 (a) $f(x)$ (b) $2f(x)$
 (c) $3f(x)$ (d) $-f(x)$



154. If R is the set of all real numbers, then the function $f: R \rightarrow R$ defined by $f(x) = 2^x$
- (a) one-one onto (b) one-one into
(c) many-one into (d) many-one onto
155. The number of subsets of the set formed by the word Allahabad is:
- (a) 128 (b) 16
(c) 32 (d) 64
156. In a group of students 80 can speak Hindi, 60 can speak English and 40 can speak English and Hindi both, then number of students is:
- (a) 100 (b) 140
(c) 180 (d) 60
157. A is $\{1,2,3,4\}$ and B is $\{1,4,9,16,25\}$ if a function f is defined from set A to B where $f(x) = x^2$ then the range of f is:
- (a) $\{1,2,3,4\}$
(b) $\{1,4,9,16\}$
(c) $\{1,4,9,16,25\}$
(d) None of these
158. Let $F: R \Rightarrow R$ be defined by
- $$f(x) = \begin{cases} 2x & \text{for } x > 3 \\ x^2 & \text{for } 1 < x \leq 3 \\ 3x & \text{for } x \leq 1 \end{cases}$$
- The value of $f(-1) + f(2) + f(4)$ is
- (a) 9 (b) 14
(c) 5 (d) 6
159. The number of integers from 1 to 100 which are neither divisible by 3 nor by 5 nor by 7 is.
- (a) 67 (b) 55
(c) 45 (d) 33
160. The range of the function F defined by $f(x) = \sqrt{16 - x^2}$ is
- (a) $[-4,0]$ (b) $[-4,4]$
(c) $[0,4]$ (d) $[+4,4]$
161. $f(x) = \{(2,2); (3,3); (4,4); (5,5); (6,6)\}$ be a relation of set $A = \{2,3,4,5,6\}$ It is a:
- (a) Reflexive and Transitive (b) Reflexive and Symmetric
(c) Reflexive only (d) An equivalence relation
- Given $A = \{2,3\}$, $B = \{4,5\}$, $C = \{5,6\}$ then $A \times (B \cap C)$ is:
- (a) $\{(2,5), (3,5)\}$ (b) $\{(5,2), (5,3)\}$
(c) $\{(2,3), (5,5)\}$ (d) None of these
162. A survey shows that 74% of the Indian like grapes, whereas 68% like bananas. What percentage of the Indian like both grapes and bananas if everybody likes either fruit?
- (a) 42% (b) 26%
(c) 58% (d) 62%