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## NOTE'S

**Business Mathematics, Logical Reasoning and Statistics**

**100 Important questions**

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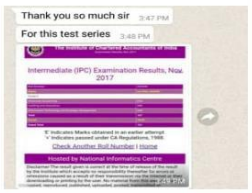
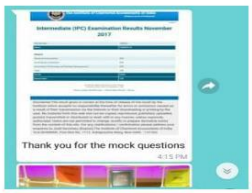
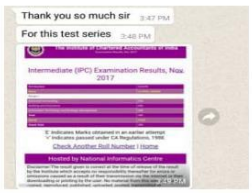
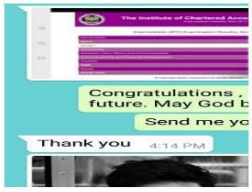
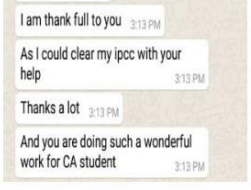
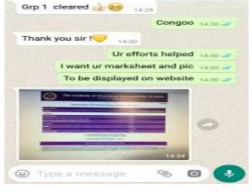
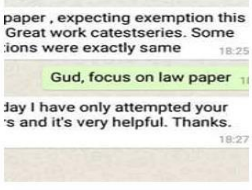








**CA FOUNDATION**

**BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS**

**ANSWERS TO MCQs**

**Answers:**

**1. A**

**Explanation:**

Let the income of A and B be 3x and 2x

Expenditure of A and B be 5y and 3y

Then, 3x-5y = 1500…….(i)

2x-3y = 1500……..(ii)

By solving i and ii we get

X = 3000 and y = 1500

Hence, B's income = 2x = 2 x 3000 = Rs6000

**2. C**

**3. A**

**Explanation:**

Here, A:B:C = 1/4:1/5:1/6 = 15:12:10/60 = 15:12:10

A's share = 407*15/37 = Rs. 165

B's share = 407*12/37 = Rs. 132

C's share = 407*10/37 = Rs. 110

**4. C**

**5. A**

**6. C**

**7. C**

**8. A**

**Explanation:**

Let starting salary be x and annual increment be y

Then, x+4y=1500 ..... 1 and x+10y=1800..... 2

By solving 1&2 we get x=1300=starting salary and y=50= annual increment

**9. B**

**Explanation:**

Let coordinates of C be (x,y)

centroid = X1+X2+X3/3,Y1+Y2+Y3/3

Then, 5+(-1)+x/3=2,6+4+y/3=3

4+x=6, 10+y=9

x=2, y=-1

Coordinates of C are (2,-1)

**10. B**

**11. C**

**12. B**

**13. A**

**Explanation:**

Since a is a positive number therefore its reciprocal i.e. 1/a will also be positive

Since b is a negative number therefore its reciprocal i.e. 1/b will also be negative

So, we can conclude that 1/a is > 1/b

**14. B**

**15. D**

**Explanation:**

Let experience person = x units work per day

Fresh one = y units work per day

Therefore, 7x + 5y ≥ 35

**16. B**

**17. B**

**18. C**

**19. A**

**Explanation:**

The number of triangles that can be formed from a set of 12 points = 12C3 since 7 points are on the same line, therefore no triangle can be formed from these points i.e. number of triangles = 12C3 – 7C3 = 220 – 35 = 185

**20. A**

**Explanation:**

There are two cases possible:

CASE 1:- When mathematics part-II is borrowed (i.e it means part-I has also been borrowed)

Number of ways = 6C1 = 6 ways

CASE 2:-when mathematics part-II is not borrowed (i.e.3 3 books are to be selected out of 7)

Number of ways = 7C3 = 35 ways

Hence, total number of ways = 35 + 6 = 41 ways

**21. A**

**Explanation:**

6Pr = 24 x 6Cr6! (6 – r)! = 24 x 6!r! x (6 – r)!4! = 24r!r! = 244!r! = 4!r = 4

**22. A**

**Explanation:**

No. of ways of drawing 3 balls at a time = 120 ways

No. of ways of drawing 3 white balls out of 5 white balls = 10 ways

Total no .of ways = favourable cases/total no. of cases = 10/129 = 1/12

**23. B**

**Explanation:**

Total no. of 2 digits that can be formed = 9 × 8 = 72

Total no. of 3 digits that can be formed = 9 x 8 x 7 = 504

Total no. of 1 digits that can be formed = 9

Total numbers that can be formed = 9 + 72 + 504 = 585

**24. C**

**Explanation:**

Since 2 particular books are to be kept always at the first and last place, so if we fix places, the remaining 5 books can be arranged in 5! Ways

Those, 2 books can also change their places in 2! ways

The total number of arrangements are = 5! X 2! = 120 × 2 = 240 ways

**25. B**

**Explanation:**

CASE I P=Rs 1400, T=3Yrs, R = X%

SI = PRT/100 = 1400 x X x 3/100 = 42X

CASE II P = Rs 1800, T = 3Yrs, R = X%

SI = PRT/100 = 1800 x X x 3/100 = 54X

Given, case I – case II = 80

54X – 42X = 80

X = 80/12 = 6.67% = R

**26. A**

**Explanation:**

Purchase cost of machine at present =Rs 8100

Present value of the lease rental = a/i[(1 + i)n – 1/(1 + i)n] = 2000/0.18[(1 + 0.18)5 – 1/(1 + 0.18)5] = 11111 x 0.5629 = Rs. 6254.34 (aprox)

**27. B**

**28. B**

**Explanation:**

CASE I  P = Rs 1400, T = 3Yrs, R = X%

SI = PRT/100 = 1400 x X x 3/100 = 42X

CASE II  P = Rs 1800, T = 3Yrs, R = X%

SI = PRT/100 = 1800 x X x 3/100 = 54X

Given, case I – case II = 80

54X – 42X = 80

X = 80/12 = 6.67% = R

**29. B**

**Explanation:**

Given say principal P

SI = 4/9P

T = R

SI = PRT/100

4/9P = P x R x T/100

R = 20/3%

**30. B**

**Explanation:**

A=P[1 + rt/100]

10000 = 8000[1 + r x 2/100]

10000/8000 = 100 + 2r/100

2r = 125 - 100

R = 25/2 = 12.5% p.a.

Let the amount which will become Rs 6875 be P. then,

6875 = p[1 + 12.5 x 3/100]

6875 = p[100 + 37.5/100]

p=6875 x 100/1375

p = Rs. 5000

**31. A**

**32. B**

**Explanation:**

Here, a = 200, d = 25 and Sn = 9450 Assume that the contract time is over run for n days. Then Sn = n2[2a + (n – 1)d]9450 = n2[2 x 200 + (n – 1)25]18900 = n[400 + 25n – 25]18900 = n(375 + 25n)18900 = 375n + 25n225n2 + 375n – 18900 = 0n2 + 15n – 756 = 0 n2 + 36n – 21n – 756 = 0n(n + 36) –21(n +36) = 0(n – 21)(n + 36) = 0n = 21 or n = –36 hence, no. of days can't be negative so n = 21 days

**33. A**

**Explanation:**

Let the first terms of G.P be a, then its second term = a - 2

Common ratio i.e. r=a-2/a

Sum of infinity=50

a/1 – r = 50

a/1 - (a - 2)/a = 50

a/a – a + 2/a = 50

a = 10

r = 10 -2/10 = 8/10 = 4/5

Therefore, the required series is 10, 8, 32/5……..

**34. A**

**35. C**

**Explanation:**

Given, Sn = 2n2 + 5nSn – 1 = 2(n –1)2 +5(n –1)

= 2n2 + 2 – 4n + 5n – 5

= 2n2 + n – 3nth term (Tn) = Sn – Sn – 1

= (2n2 + 5n) – (2n2 + n – 3)

= 4n + 3

**36. A**

**37. B**

**38. A**

**Explanation:**

A = {1, 2, 3} and B = {6, 4, 7}

Relation R = {(2, 4)(3, 6)} will be function from A to B.

**39. D**

**Explanation:**

Let photography = P

Music = M

Swimming = S

n(PUMUS = 200, n(M) = 100, n(P) = 70, n(S) =40

n(M∩P) = 40, n(M∩S) = 30, n(P∩S) = 20

n(P∩M∩S) = 10

n(P∩M'∩S') = n(P) - n(P∩M) -n(P∩S) + n(P∩M∩S)

= 70 – 40 – 20 + 10 = 80 – 60 = 20

**40. C**

**Explanation:**

F: A→B  2→4–2→4  3→9–3→9many one function from A onto B

**41. A**

**Explanation:**

If A = {1, 2, 3, 4}

B = {2, 4, 6, 8}

When f: A→B, f = {(1, 2), (2, 4), (3, 6),(4, 8)}f – 1implies f: B→Af – 1 = {(2, 1), (4, 2),(6, 3), (8, 4)}

**42. D**

**Explanation:**

n(NURUT) = n(N) + n(R) + n(T) - n(N∩R) - n(N∩T) - n(R∩T) + n(N∩R∩T)

= 200 + 100 + 40 – 50 – 25 – 20 + 5

= 250

No. of companies not using any media

= n(S) - n(NURUT)

= 300 - 250

= 50

**43. D**

**Explanations:**

H is sister of G and G is child of D.

So Hand G children of D.

J is aunt of H.

So J can be wife of D‘s brother C or J can be sister of D‘s wife.

In both cases J will be sister in law of D.

**44. B**

**Explanation:**

B and A are husband wife, who have 2 children of same sex. A is mother of D who is father of G. This means both children are males. D is brother of C, so C and D both are sons of A and B. D also has two children – G and H. If B is grandfather of E then C must be father of E.

**45. B**

**Explanation:**

B, C, and D are certainly males H and J are females. Gender of E and G not known.

**46. D**

**47. A**

**48. B**

**49. D**

**Explanation:**

73, 57, 49, 44, 43, 42

73 – 57 = 16

57 – 49 = 8

49 – 45 = 4

45 – 43 = 2

43 – 42 = 1

Differences between the consecutive numbers are in Geometric Progression (G.P)

Hence, 44 is the wrong number.

**50. A**

**Explanation:**

21 – 16 = 5

31 – 21 = 10

48 – 31 = 17

74 – 48 = 26; 10 – 5 = 5; 17 – 10 = 7; 26 –17 = 9

**51. B**

**Explanation:**

1 × 1 = 1

1 × 2 = 2

2 × 3 = 6

6 × 4 = 24

24 × 5 = 120 not 96

120 × 6= 720

96 is wrong

**52. A**

**Explanation:**

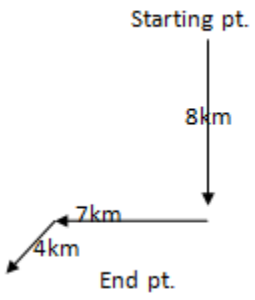
$11 + 1^2 + 1 = 13$

$13 + 2^2 + 1 = 18$

$18 + 4^2 + 1 = 35$……..

**53. B**

**Explanation:**




**54. A**

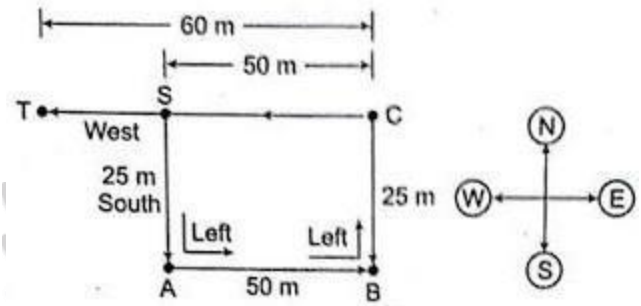
**Explanation:**

The movements of the girl are as shown in Fig. (A to B, B to C, C to D, D to A). Clearly, she is finally moving in the direction DA i.e. North east.

**55. A**

**Explanation:**

According to the question, the direction diagram is as follows




S = Starting point, T = Finishing point

AS = BC = 25m

AB = SC = 50m

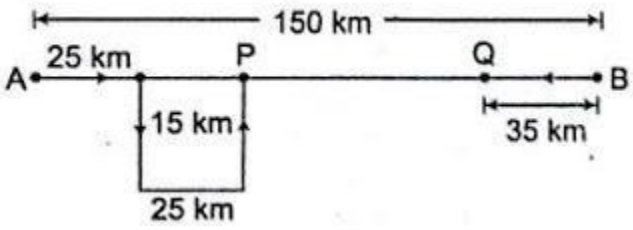
CT = 60m

Required distance, ST = CT – SC = 60 – 50 =10m

Clearly, at point T, Mahesh is 10 m West from S.

**56. A**

**Explanation:**



Required distance = PQ = 150 – (25 + 25 + 35) = 65km

**57. D**

**Explanation:**

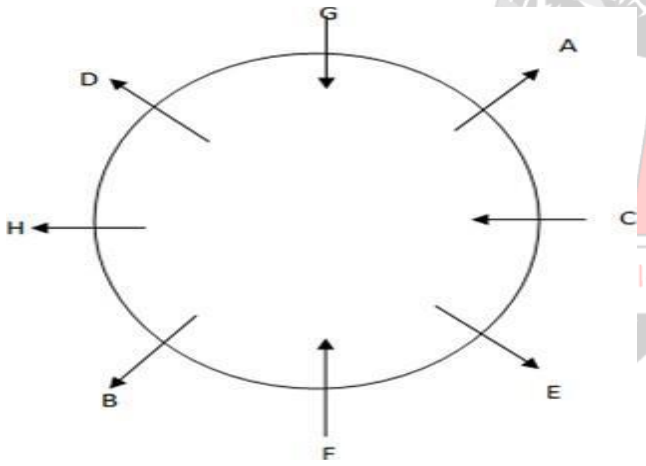
According to the question, the direction diagram is as follows

A = Original position, E = Finishing point

BC =20, AB = 15m, AC = ED = 5m, CD =AE = 10m

Clearly, at finishing point E, Anoop is 10 m East from original position A.

**Directions (Q. 58-62):**




**58. B**

**59. C**

**60. A**

**61. D**

**62. D**

**Direction (Q 63-67):**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ROW 1 | S | P | U | R | T | Q | Facing south |
| ROW 2 | K | L | M | N | O | J | Facing north |

**63. C**

**Explanation:**

In the south facing row, S and Q are sitting at the extreme ends of the row.

**64. B**

**Explanation:**

O is sitting immediate right of N

**65. C**

**Explanation:**

P and R are the immediate neighbours of U.

**66. D**

**Explanation:**

L and N are interchanges their position hence, P faces N.

**67. D**

**Explanation:**

First person is sitting immediate right of second person in all the option except option d).

**68. B**

**69. A**

**70. C**

**71. B**

**72. C**

**73. D**

**74. C**

**75. B**

**76. C**

**77. D**

**78. C**

**79. D**

**80. A**

**Explanation:**

From 1 to 16, there are 4 numbers which are multiple of 4

1st 2 are multiple of 4, and one any other number from (16 - 4) = 12 tickets

4c2*12c1/16c3 = 72/560

2nd all are multiples of 4.

4c3/16c3=4/560

Add both 72/560 + 4/560. = 76/560 = 19/140

**81. D**

**Explanation:**

Prob. of 1st winning = 2/7, so not winning

= 1 – 2/7 = 5/7

Prob. of 2nd winning = 3/5, so not winning

= 1 – 3/5 = 2/5

So required prob. = 2/7 * 2/5 + 3/5 * 5/7 = 19/35

**82. C**

**Explanation:**

P(A) = 3/5 and P(B) = 4/5. Now they are contradicting means one is telling truth and other telling the lie. So,

Probability = (3/5)*(1/5) + (2/5)*(4/5)

= 3/25 + 8/25 = 11/25

**83. B**

**Explanation:**

Total possibility = 5*4*3*2

Favourable outcomes = 2*4*3*2 (to be divisible by 5 unit digit can be filled with only 0 or 5, so only two possibilities are there, then the remaining can be filled in 4, 3 and 2 ways respectively)

So probability = 2/5

**84. B**

**85. A**

**86. B**

**87. A**

**88. C**

**89. B**

**90. B**

**91. B**

**92. A**

**93. A**

**94. B**

**95. C**

**96. C**

**97. B**

**98. A**

**99. B**

**100. B**

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