DATE : 04/11/2018

Test Booklet Code

K-10

KARNATAKA

Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

Regd. Office : Aakash Tower, 8, Pusa Road, New Delhi-110005 | Ph.: 011-47623456

Answers & Solutions

for

NTSE (Stage-I) 2018-19

INSTRUCTIONS TO CANDIDATES

1. Use blue/black ball point pen only. There is no negative marking.
2. All the questions are compulsory. This test booklet contains 200 questions (Paper-I : 100 & Paper-II : 100) of one mark each.
3. Paper-I : MAT : 1 - 100 questions

   Paper-II : SAT : 1 - 100 questions
4. Answer each question by darkening the one correct alternative among the four choices on the OMR Sheet with blue/black ball point pen.
5. Students are not allowed to scratch/alter/change out an answer once marked on OMR Sheet, by using white fluid/eraser/blade/tearing/wearing or in any other form.
6. Separate sheet has been provided for rough work in this test booklet.
7. Please handover the OMR sheet to the invigilator before leaving the Examination Hall.
8. Darken completely the ovals of your answers on OMR Sheet in the time limit allotted for that particular paper.
9. Your OMR Sheet will be evaluated through electronic scanning process. Incomplete and incorrect entries may render your OMR sheet invalid.
10. Use of electronic gadgets, calculator, mobile etc., is strictly prohibited.

PAPER-I : MENTAL ABILITY TEST (MAT)

Directions (Q.1 to Q.9) : Complete the given number / letter / figure analogy by choosing the correct answer from the given alternatives

1. 496 : 204 : : 329 : ?

(1) 90 (2) 110

(3) 115 (4) 135

Answer (3)

Sol. Conceptual

2. $\frac{7}{11} : \frac{336}{110} :: ? : \frac{720}{156}$

(1) $\frac{9}{17}$ (2) $\frac{9}{13}$

(3) $\frac{11}{13}$ (4) $\frac{11}{17}$

Answer (2)

Sol. Conceptual

3. 11 18 32 60 : 17 30 56 108 : : 13 24 46 90 : ?

(1) 17 36 68 138 (2) 19 30 52 124

(3) 19 36 70 136 (4) 19 36 70 138

Answer (4)

Sol. Conceptual

4. FLOWERY : 21 O 12 D 22 I 2 : : BUNCHES :

(1) 25 F 13 X 19 V 8 (2) 2 F 14 X 8 V 19

(3) 25 H 13 P 19 R 8 (4) 2 H 14 P 8 R 19

Answer (1)

Sol. Conceptual

5. A W S X C : R N J O T : : ? : U Q M R W

(1) F A V Z D (2) D Z V A F

(3) I N R M H (4) D I N J F

Answer (2)

Sol. Conceptual

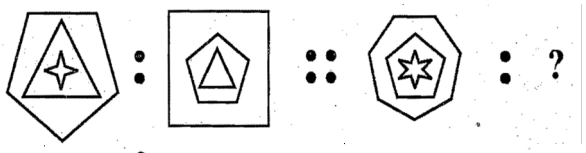
6. E H K A M : Y M W T Q : : P W O R Z : ?

(1) D K C F A (2) B I A D L

(3) A F C K D (4) L D A I B

Answer (4)

Sol. Conceptual

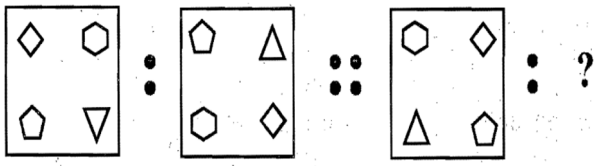
7. 

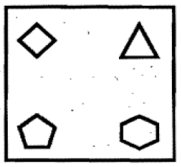
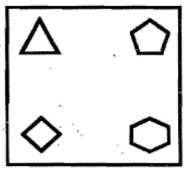
(1)  (2) 

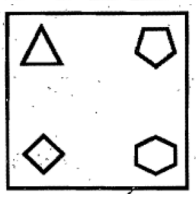
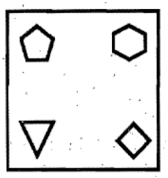
(3)  (4) 

Answer (1)

Sol. Conceptual

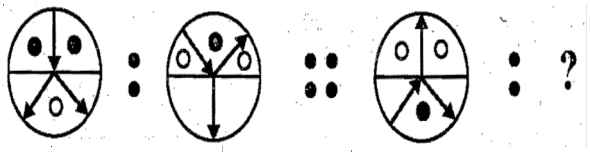
8. 

(1)  (2) 

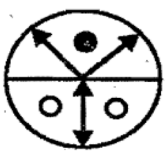
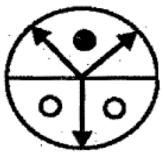
(3)  (4) 

Answer (3)

Sol. Conceptual

9. 

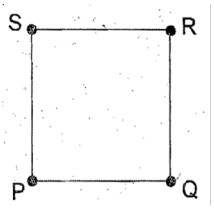
(1)  (2) 

(3)  (4) 

Answer (2)

Sol. Conceptual

10. P, Q, R AND S are four persons standing at the corners of a square park of area 100 m × 100 m. They move anticlockwise along the edge of the park by 100m, 150m, 200m and 250m respectively. Now in which direction is Q with respect to S?



(1) Southeast (2) Southwest

(3) Northeast (4) Northwest

Answer (4)

Sol. Conceptual

11. A person starts from point A and walks 800m in the northeast direction to reach B. Then he turns towards east and walks 350m and reaches C. He then moves in the southwest direction by 650m to reach D. He again moves by 250m eastward and reaches E. He now walks 150m in the southwest direction and finally arrives at F. Find the distance between A and F.

(1) 400m (2) 500m

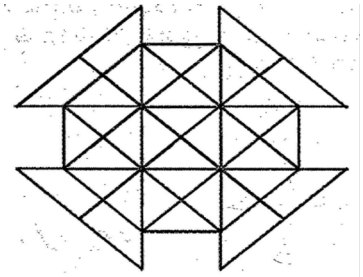
(3) 600m (4) 800m

Answer (3)

Sol. Conceptual

Directions (Q.12 to Q.16) : *Identify the number of specified geometric shapes in the given diagarams and make the correct answers.*

12. How many SQUARES are there in the given figure?



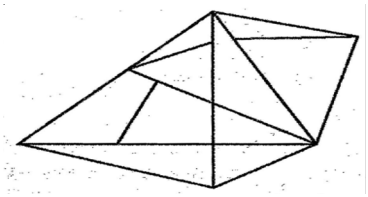
(1) 23 (2) 22

(3) 21 (4) 20

Answer (2)

Sol. Conceptual

13. How many TRIANGLES are there in the given figure?



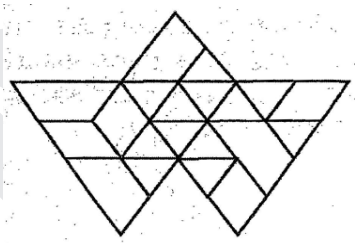
(1) 23 (2) 22

(3) 21 (4) 20

Answer (3)

Sol. Conceptual

14. How many RHOMBUS are there in the given figure?



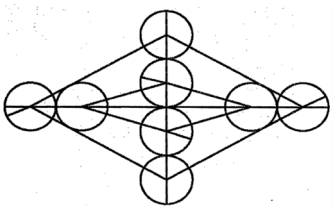
(1) 16 (2) 17

(3) 18 (4) 19

Answer (2)

Sol. Conceptual

15. How many SEMICIRCLES are there in the given figure?



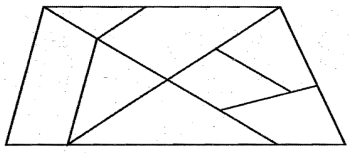
(1) 28 (2) 26

(3) 24 (4) 22

Answer (3)

Sol. Conceptual

16. How many TRAPEZIUMS are there in the given figure?



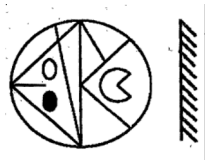
(1) 6 (2) 7

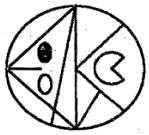
(3) 8 (4) 9

Answer (1)

Sol. Conceptual

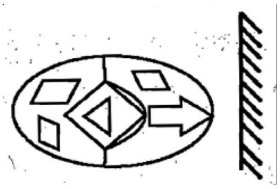
Directions (Q.17 & Q.18) : *Find the correct mirror images for the following problem figures choosing from the alternatives*

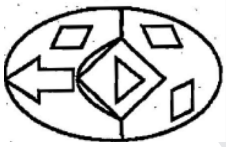
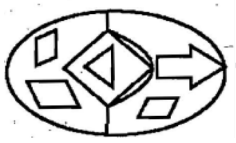
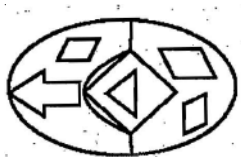
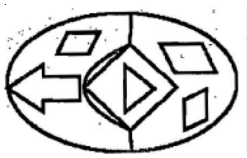
17. 

(1) 
(2) 
(3) 
(4) 

Answer (2)

Sol. Conceptual

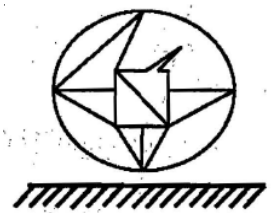
18. 

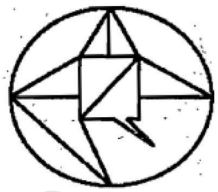
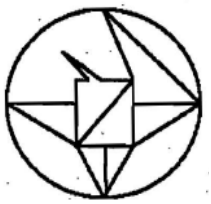
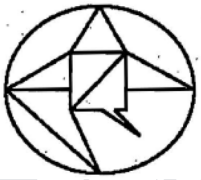
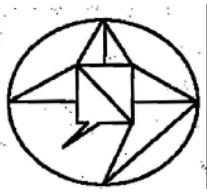
(1) 
(2) 
(3) 
(4) 

Answer (4)

Sol. Conceptual

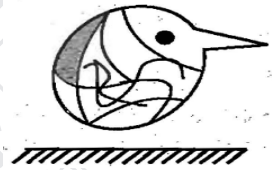
Directions (Q.19 & Q.20) : *Find the correct WATER images for the following problem figures choosing from the alternatives.*

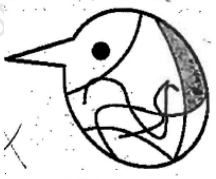
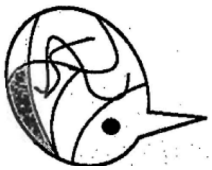
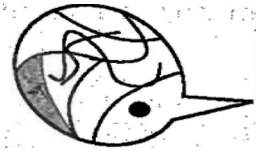
19. 

(1) 
(2) 
(3) 
(4) 

Answer (1)

Sol. Conceptual

20. 

(1) 
(2) 
(3) 
(4) 

Answer (3)

Sol. Conceptual

21. At present a boy's father is 6 times older and his grandfather 13 times older than the boy. If six years later, the grandfather will be seven times older than the boy, what is the present age of the boy's father?

(1) 36 years (2) 42 years
(3) 30 years (4) 48 years

Answer (1)

Sol. Let present age of Boy = x, Father= 6x & Grand father = 13x

According to Q

$13x + 6 = 7 \times (x + 6)$

$\therefore$ Fathers age $= 6 \times 6 = 36$ years

22. The present ages of son and his father ar in the ratio 5:21. Four years earlier their ages were in the ratio 3:19. What is the present age of the son?

(1) 4 years (2) 6 years

(3) 8 years (4) 10 years

Answer (4)

Sol. Let the present age of son & father be 5x & 21x 4years earlier their ages will be (5x-4) & (21x-4) years

$$\frac{5x-4}{21x-4}=\frac{3}{19}\Rightarrow x=2$$

Present age of son $=5\times2=10$

Directions (Q.23 to Q.32) : *Complete the following number / letter / figural series by choosing the correct answer from the given alternatives*

23. ?,22,31,58,139,382

(1) 17 (2) 18

(3) 19 (4) 20

Answer (3)

Sol. $\underset{19}{16+3},\ \underset{31}{22+3^2},\ \underset{58}{31+3^3},\ \underset{139}{58+3^4}$

24. 12,9,27,23,92,87,?,?

(1) 355,158 (2) 385,379

(3) 425,419 (4) 435,429

Answer (4)

Sol. Conceptual

25. 47,7,69,28,?,?,125,1344,159,13440

(1) 94,158 (2) 95,168

(3) 95,178 (4) 96, 268

Answer (2)

Sol. Alternate Series

$7\times4=28$ $47+22=69$

$28\times6=168$ $63+26=95$

$168\times8=1344$ $95+30=125$

$1344\times10=13400$ $125+34=159$

26. $\frac{5}{11},\frac{25}{30},\frac{105}{87},?,\frac{1705}{771}$

(1) $\frac{425}{258}$ (2) $\frac{525}{261}$

(3) $\frac{625}{389}$ (4) $\frac{1125}{760}$

Answer (1)

Sol. $11\times3-3=30$

$30\times3-3=87$

$87\times3-3=258$

$258\times3-3=771$

27. m _ m _ n _ m _ _ n n _

(1) m m n n m n

(2) m n n m n m

(3) n m m m n m

(4) n m n m m n

Answer (2)

Sol. Conceptual

28. W M C S, I Y O E, _ _ _ _, G W M C

(1) U Y O E

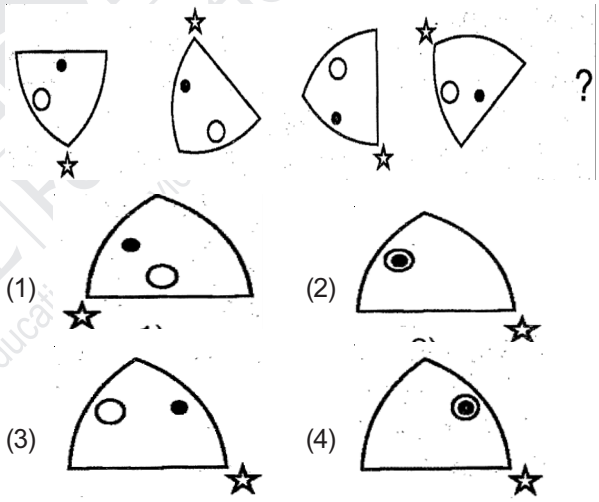
(2) Q A K U

(3) U K A Q

(4) P B J T

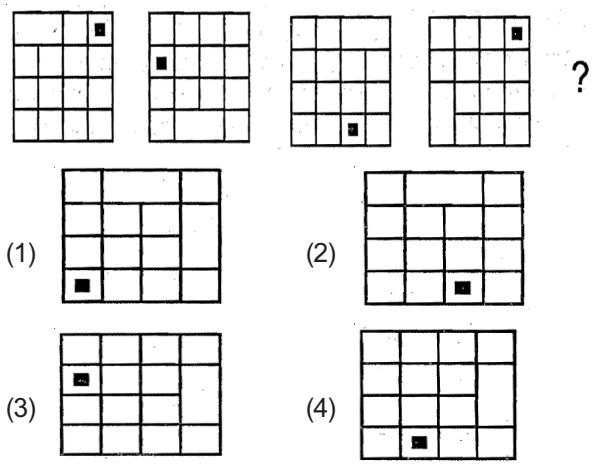
Answer (3)

Sol. Postion of letter - 10

29. 

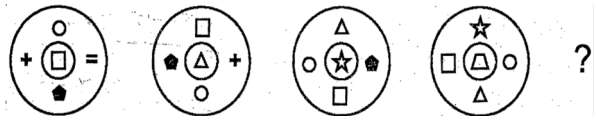
Answer (4)

Sol. Conceptual

30. 

Answer (3)

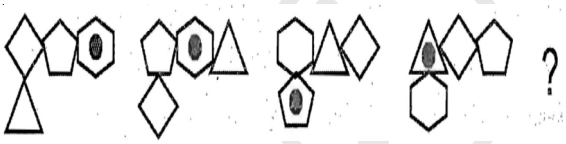
Sol. Conceptual

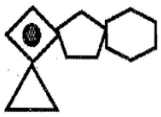
31. 

(1) 
(2) 
(3) 
(4) 

Answer (2)

Sol. Conceptual

32. 

(1) 
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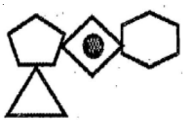
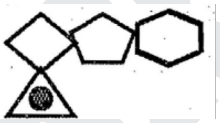
(3) 
(4) 

Answer (1)

Sol. Conceptual

33. A,B,C,D,E AND F are sitting around a round table facing its centre.
    a. C is just left of E
    b. A is the only one between D and E
    c. B is sitting opposite to E
    d. D is the only one between A and B

    Then where is F sitting?
    (1) Between B and D
    (2) Between A and D
    (3) Between B and C
    (4) Between A and C

Answer (3)

Sol. Conceptual

34. Six elephants P,Q,R,S,T and U are weighed. The elephant U is heavier than R but lighter than T. Elephants P and S are of same weight. Elephant Q is lighter than P and R is heavier than S. Which one of the elephants is the heaviest?
    (1) Q (2) T
    (3) R (4) U

Answer (2)

Sol.
Q
S,P
R
U
Heaviest → T

Directions (Q.35 to Q.40) : *In the following questions four groups of numbers/leters/ pairs of numbers are given. Of these are alike and one is different. Find the one which is different*

35. (1) 210 (2) 135
    (3) 72 (4) 33

Answer (1)

Sol. Conceptual

36. (1) 193 (2) 283
    (3) 293 (4) 323

Answer (4)

Sol. Not a prime number

37. (1) 12,156 (2) 14,182
    (3) 16,272 (4) 18,342

Answer (2)

Sol. $\begin{matrix}12\times13\\14\times13\\16\times14\\18\times19\end{matrix} \rightarrow \begin{matrix}[n\times(n+1)]\\[n\times(n-1)]\\[n\times(n+1)]\\[n\times(n+1)]\end{matrix}$

38. (1) 1,4 (2) 2,12
    (3) 3,36 (4) 4,80

Answer (1)

Sol. Conceptual

39. (1) LONGITUDINAL (2) TRIBUTARIES
    (3) AGRICULTURAL (4) MOUNTAINOUS

Answer (2)

Sol. Conceptual

40. (1) ASYLUM (2) RHYTHM
    (3) FLYFOT (4) PHYSIC

Answer (2)

Sol. Except (1) all other have 2 syllables

41. If R E L I C is coded as 7 4 3 6 5 and A N T H E M as 2 9 0 1 4 8 then M E R C A N T I L E can be written as:
    (1) 8 4 2 7 3 6 9 0 5 4 (2) 8 4 3 9 6 9 5 7 0 4
    (3) 8 4 5 7 6 3 0 2 1 4 (4) 8 4 7 5 2 9 0 6 3 4

Answer (4)

Sol. Conceptual

42. The minute hand of a colck in the horizontal plane is on the number 6 of the clock and is pointing towards west. If the hour hand is pointing towards southeast, what time will the clock show exactly after there hours from now?

(1) 1.30 hour (2) 4.30 hour

(3) 7.30 hour (4) 10.30 hour

Answer (2)

Sol. Conceptual

Directions (Q.43 & Q.44) : *To get the correct equation, choose which set of signs from the given alternatives to be substituted sequentially in places of* $(*)$

43. $15 * 3 * 5 * 16 * 41$

(1) $= + - \div$ (2) $\div + = -$

(3) $- + \div =$ (4) $\div \times + =$

Answer (4)

Sol. $15 \div 3 \times 5 + 16 = 41$

44. $13 * 4 * 5 * 12 * 6$

(1) $> + \times \div$ (2) $\times + = \div$

(3) $\times + > \div$ (4) $\times + = -$

Answer (3)

Sol. $13 \times 4 + 5 > 12 \div 6$

45. **Directions:** When $-$ and $=$, 60 and 20 are intercharged, find which one of the following equations will be correct.

(1) $100 - 80 + 60 \times 2 = 20$

(2) $80 - 20 = 60 \times 3 + 80$

(3) $100 = 80 - 20 + 60 \times 2$

(4) $80 = 20 = 60 \times 2 + 40$

Answer (2)

Sol. Conceptual

46. **Directions:** The interchange of which of the given numbers/ signs in the alternatives will make the given equation meaningful?

(1) 8 and 6 (2) + and $-$

(3) 3 and 8 (4) $\times$ and +

Answer (4)

Sol. $(20 \times 3) + (6 \times 8) - 32 = 76$

47. Direction: If

V stands for $\times$ $\wedge$ stands for +

$\forall$ stands for $-$ A stands for $\div$

Then, which of the following will be correct equations?

(1) $72 \wedge 64$ A $16 < 16$ V $8 \forall 72$

(2) 48 A 12 V $16 > 80 \forall 32 \wedge 24$

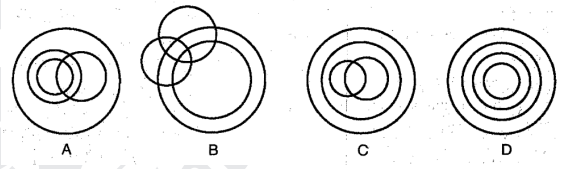
(3) 72 A 24 V $8 < 48 \wedge 16 \forall 32$

(4) 16 V $8 \forall 72 > 80$ A $8 \wedge 48$

Answer (3)

Sol. $72 \div 24 \times 8 < 48 + 16 - 32$

Directions (Q.48 & Q.49) : *The following Venn diagarams represent the relation among four given objects. Indicate the appropriate Venn diagram to represent the relationship.*



48. Quadrilaterals, Rhombus, Parallelograms, Squares

(1) A (2) B

(3) C (4) D

Answer (3)

Sol. Conceptual

49. Grandmothers, Sister, Mothers, Sisters-in-law

(1) D (2) C

(3) B (4) A

Answer (3)

Sol. Conceptual

Directions (Q.50 & Q.51) : *There are 120 students in a class. Among them,*

a. 20 students play both hockey and kabaddi, as well the same number of students play only football.

b. 25 students play both hockey and football.

c. 15 students play both football and kabaddi.

d. The number of students who play only hockey are the same as the number of students who do not play any of the three games.

e. The number of students who play only hockey is half of the number of students who play football only

50. How many sutdents play only kabaddi?

(1) 10 (2) 20

(3) 30 (4) 40

Answer (*) No option is correct

51. How many students do not play any of the three games?

(1) 5 (2) 10
(3) 15 (4) 20

Answer (2)

Sol. Conceptual

Directions (Q.52 & Q.53) : *Take the given statements as true and decide which of the conclusions logically follow from the statements*

52. **Statements :**

a. All buses are ships.

b. All ships are aeroplanes.

Conclusions :

I. Some aeroplanes are ships.

II. All buses are aeroplanes

(1) Only conclusion I follows
(2) Only conclusion II follows
(3) Both conclusions I and II follow
(4) Neither conclusoin I nor II follows

Answer (3)

Sol. Conceptual

53. **Statements :**

a. All sparrows are crows.

b. Some pigeons are sparrows

Conclusions :

I. Some crows are pigeons.

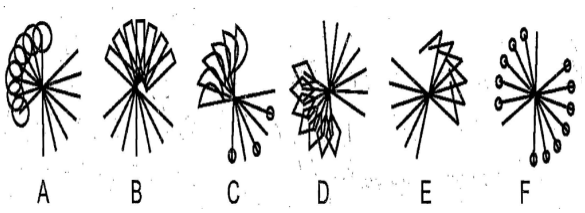
II. All pigeons are sparrows.

(1) Only conclusion I follows
(2) Only conclusion II follows
(3) Both conclusion I and II follows
(4) Neither conclusion I nor II follows

Answer (1)

Sol. Conceptual

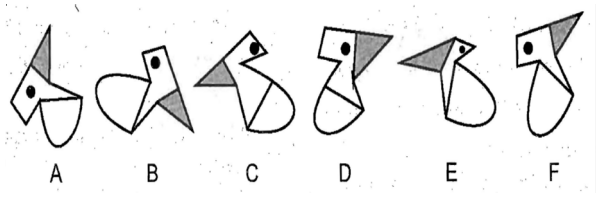
Directions (Q.54 & Q.55) : *Find the set of figures which have similar characteristics, choosing from the given alternatives.*

54. 

(1) A and C (2) B and E
(3) D and A (4) F and D

Answer (3)

Sol. Conceptual

55. 

(1) A and D (2) C and E
(3) D and F (4) B and F

Answer (4)

Sol. Conceptual

Directions (Q.56 to Q.58) : *Identify the wrong number/ group of letters in the series*

56. 5, 35, 220, 1050, 4200

(1) 35 (2) 220
(3) 1050 (4) 4200

Answer (2)

Sol. Conceptual

57. 256, 343, 64, 49, 16, 7, 2, 1

(1) 256 (2) 49
(3) 2 (4) 1

Answer (3)

Sol. Alternate series

$256 \quad 64 \quad 16 \quad 2$
$4^4 \quad 4^3 \quad 4^2 \quad 4^2$

58. Y W T P Z, V T Q M W, S Q N J T, P N L I Q, M K H D N

(1) P N L I Q (2) S Q N J T
(3) V T Q M W (4) Y W T P Z

Answer (1)

Sol. Conceptual

59. The difference between two numbers is 6 and the average of their squares is 234. What is the average of the two numbers?

(1) 13 (2) 15
(3) 16 (4) 18

Answer (2)

Sol. Conceptual

Directions (Q.60 to Q.63) : *Find the missing number in the given matrices*

60.
10	12	29
22	8	27
32	14	?

(1) 31 (2) 34
(3) 38 (4) 44

Answer (4)

Sol. Conceptual

61.
128	76	14
132	58	18
137	?	23

(1) 74 (2) 72

(3) 64 (4) 60

Answer (1)

Sol. Conceptual

62.
87	42	19
93	63	13
31	?	8
37	36	2

(1) 13 (2) 14

(3) 15 (4) 16

Answer (3)

Sol. Conceptual

63.
9	6	39
12	13	?
5	14	43

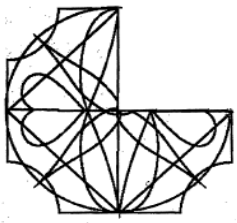
(1) 50 (2) 62

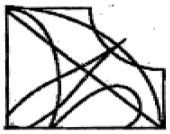
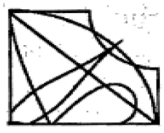
(3) 63 (4) 69

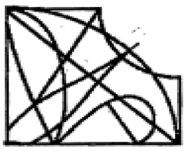
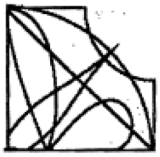
Answer (2)

Sol. Conceptual

Directions (Q.64 to Q.67) : *Find the missing part of the given figure from the alternatives.*

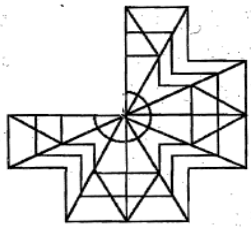
64. 

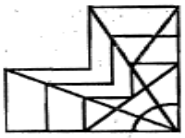
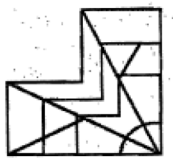
(1)  (2) 

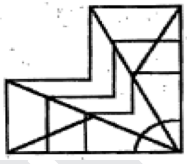
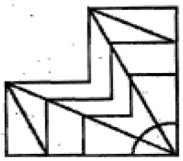
(3)  (4) 

Answer (4)

Sol. Conceptual

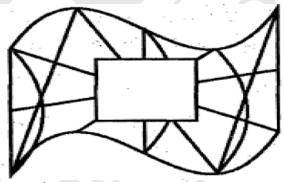
65. 

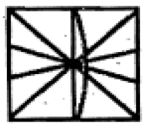
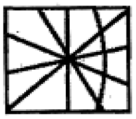
(1)  (2) 

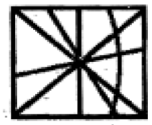
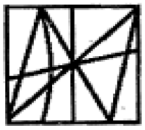
(3)  (4) 

Answer (3)

Sol. Conceptual

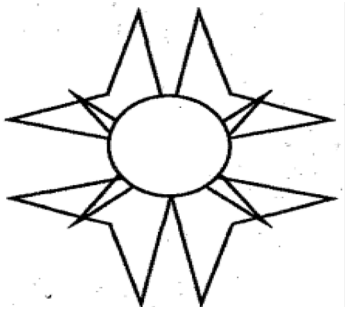
66. 

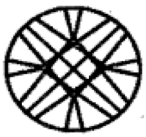
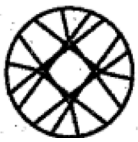
(1)  (2) 

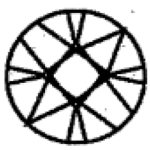
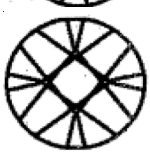
(3)  (4) 

Answer (2)

Sol. Conceptual

67. 

(1)  (2) 

(3)  (4) 

Answer (4)

Sol. Conceptual

68. In this problem,

i. A < B means A is daughter of B

ii. A > B means A is son of B

iii. A = B means A is brother of B

iv. A + B means A is father of B

Which of the following indicates "P is grandson of S"?

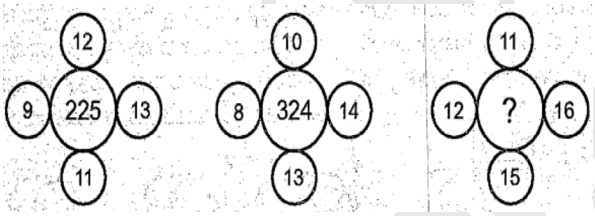
(1) P = Q < R + S (2) P > Q = R < S

(3) P + Q = R > S (4) P < Q + R = S

Answer (2)

Sol. Conceptual

Directions (Q.69 to Q.72) : *In the questions below, the numbers in the figures are related. Identify their relationship and find the missing numbers in the given series.*

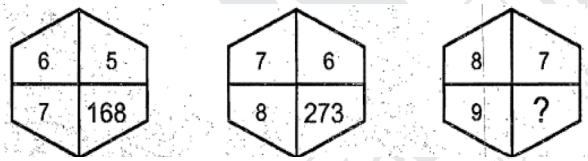
69. 

(1) 484 (2) 576

(3) 676 (4) 729

Answer (4)

Sol. Conceptual

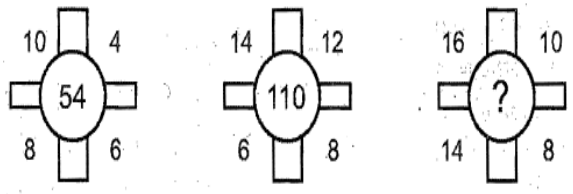
70. 

(1) 316 (2) 396

(3) 416 (4) 476

Answer (3)

Sol. Conceptual

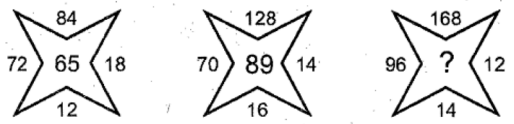
71. 

(1) 132 (2) 154

(3) 168 (4) 184

Answer (2)

Sol. Conceptual

72. 

(1) 208 (2) 178

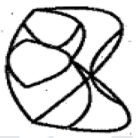
(3) 164 (4) 144

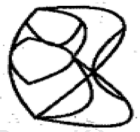
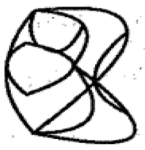
Answer (1)

Sol. Conceptual

Directions (Q.73 & Q.74) : *In the questions below, a problem figure is given. The problem figure is hidden in one of the figures given as alternatives. Find the figure in which the problem figure is hidden.*

73. 

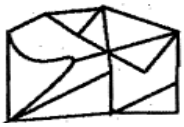
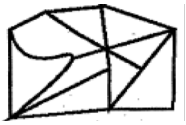
(1)  (2) 

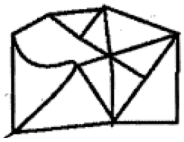
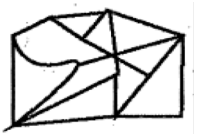
(3)  (4) 

Answer (3)

Sol. Conceptual

74. 

(1)  (2) 

(3)  (4) 

Answer (4)

Sol. Conceptual

Directions (Q.75 & Q.76) : *In the following questions, a set of numbers is given. From the alternatives, choose the set which is similar to the given set.*

75. 81, 144, 225

(1) 169, 484, 529 (2) 625, 676, 841

(3) 729, 784, 961 (4) 441, 784, 841

Answer (1)

Sol. Conceptual

76. 315, 210, 35

(1) 261, 87, 29 (2) 288, 192, 32

(3) 225, 75, 25 (4) 207, 68, 23

Answer (2)

Sol. Conceptual

77. In a leap year the new year day celebration is on a wednesday. What day will be the teachers' day in the same year? (as per English calendar)

(1) Sunday (2) Wednesday

(3) Friday (4) Saturday

Answer (4)

Sol. Conceptual

78. In a code language, if H A T can be coded as J A R and W E as I S, in the same code, J U G can be written as:

(1) D O N (2) M E T

(3) L A P (4) P E G

Answer (2)

Sol. Conceptual

Directions (Q.79 & Q.80) : Given below are two matrices containing letters. the rows and the columns are numbered 1 to 4 in Matrix I and 5 to 8 in Matrix II. Each letter from these matrices are represented first by its row number and next by its column number.

Ex: Letter "O" is represented as 14, 23, 31, 42.

	1	2	3	4
1	M	E	N	O
2	N	M	O	E
3	O	N	E	M
4	E	O	M	N

Matrix - I

	5	6	7	8
5	A	T	I	R
6	I	R	T	A
7	T	A	R	I
8	R	I	A	T

Matrix - II

79. Which set of numbers will represent the word R A T I O N?

(1) 77, 55, 88, 78, 42, 34

(2) 85, 87, 56, 57, 24, 44

(3) 66, 76, 75, 65, 14, 21

(4) 58, 68, 67, 22, 31, 13

Answer (3)

Sol. Conceptual

80. Which set of numbers will represent the word I N M A T E?

(1) 65, 44, 11, 87, 77, 24

(2) 78, 13, 34, 55, 67, 23

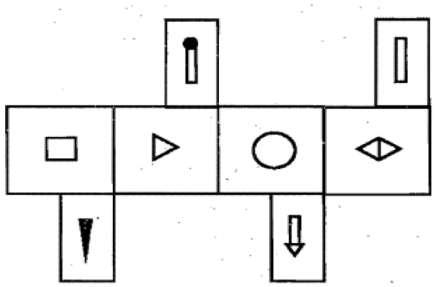
(3) 57, 21, 43, 66, 88, 12

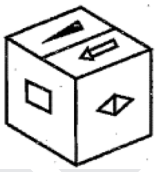
(4) 86, 32, 22, 68, 56, 41

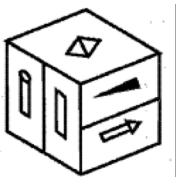
Answer (4)

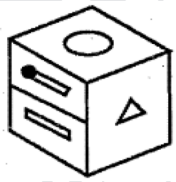
Sol. Conceptual

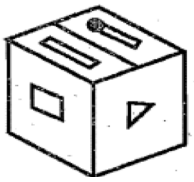
81. **Direction :** When the given figure is folded as a cube, which one of the formation of cubes shown below is NOT POSSIBLE?



(1) 

(2) 

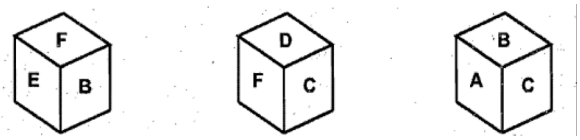
(3) 

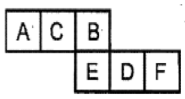
(4) 

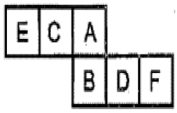
Answer (2)

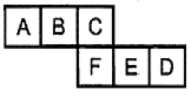
Sol. Conceptual

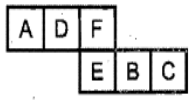
82. **Direction :** The different faces of a cube are shown through three folded cubes. Among the alternatives, identify which one of the figures represent the unfolded cube.



(1) 

(2) 

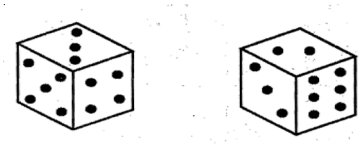
(3) 

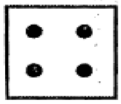
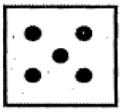
(4) 

Answer (4)

Sol. Conceptual

83. **Direction:** Two positions of the dice are shown below. When face with 3 dots is shown at the top, which face will be at the bottom?



(1) 
(2) 
(3) 
(4) 

Answer (4)

Sol. Conceptual

Directions (Q.84 & Q.85) : *Answer the following questions based on the sequence of numbers / letters given.*

84. 4 1 9 1 9 7 2 3 6 1 6 8 2 2 4 2 8 1 7 7 4 2 8 1 8 1 1 1 2 2 3 6 1 9 9

If the product of any two consecutive numbers is the very next number, how many times such numbers occur in the given sequence?

(1) 8 (2) 9
(3) 12 (4) 13

Answer (3)

Sol. Conceptual

85. z e b c y e a n e r c b e u c g e m c a n e y x c d e b v c e p

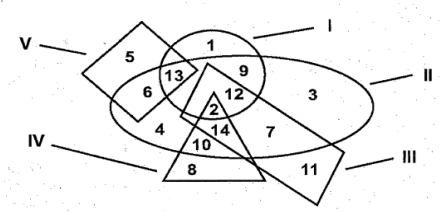
In the given letter sequence, if all the "e"s from letter z to g are changed to "c" and all the "c"s from letter g to p are changed to "e", how many "c"s and "e"s will occur respectively in the sequence?

(1) 5, 6 (2) 6, 6
(3) 6, 7 (4) 7, 7

Answer (4)

Sol. Conceptual

Directions (Q.86 to Q.88) : *The following questions are based on the given intersecting figures.*



86. How many numbers are enclosed in only two figrues?

(1) 5 (2) 4
(3) 3 (4) 2

Answer (2)

Sol. Conceptual

87. Which of all the three shapes have "14" inside?

(1) I, II, V (2) II, IV, V
(3) II, III, IV (4) III, IV, V

Answer (3)

Sol. Conceptual

88. Which one of the following statements is true?

(1) The number 12 is not inside all the three shapes I, II and IV

(2) The number 3 is inside all the three shapes I, II and III

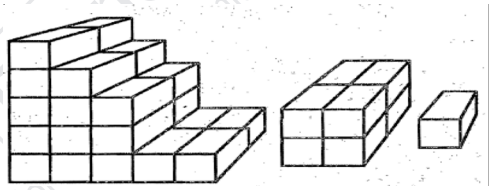
(3) The number 13 is inside all the three shapes I, II and IV

(4) The number 4 is inside all the three shapes I, IV and V

Answer (1)

Sol. Conceptual

89. How many blocks are unseen in the given figure?



(1) 9

(2) 8

(3) 7

(4) 10

Answer (1)

Sol. Conceptual

90. To calculate the average rainfall in the second week of August 2018 in Bangalore, the following data is given. Decide whether the data given is sufficient.

I. The average rainfall of first four days of the week is 147 mm

II. The average rainfall of last three days of the week is 133 mm.

(1) Data in I only is sufficient

(2) Data in II only is sufficient

(3) Data in I and II together are sufficient

(4) Data in I and II are not sufficient

Answer (3)

Sol. Conceptual

Directions (Q.91 to Q.93) : The words are given under Column - I. Their codes are given under Column - II without following the same order as in Column - I. Find the codes for the letters of words in Column - I and find the codes for the given words in the questions.

Column - I	Column - II
SUN	y b l
C A P	k d m
N A M E	a x y k
G O L D	f p s c
S T A R	k l n i
R O A D	s k n c

91. M A S T E R

(1) a k l b x d (2) k m s i x n

(3) b x l d c f (4) a k l i x n

Answer (4)

Sol. Conceptual

92. S O L U T E

(1) m c x b a n (2) l c f b i x

(3) s n b l m a (4) l c f b a x

Answer (2)

Sol. Conceptual

93. D O C U M E N T

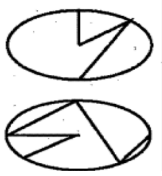
(1) s c m b a x y i (2) s c m b a n y e

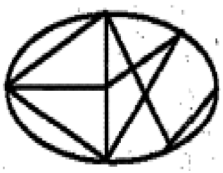
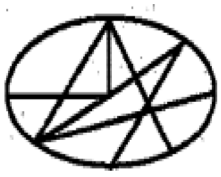
(3) k a m b x y e f (4) f c n b a x y i

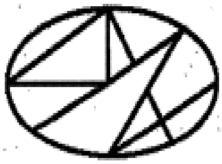
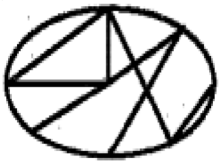
Answer (1)

Sol. Conceptual

Directions (Q.94 & Q.95) : In the following questions a set of two figures is given as problem figure. Find which one of the following alternative figures would be formed, if the first figure is superimposed on the second figure.

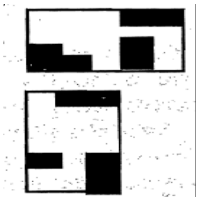
94. 

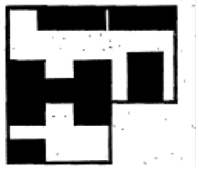
(1)  (2) 

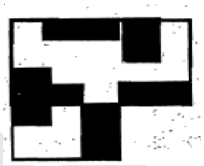
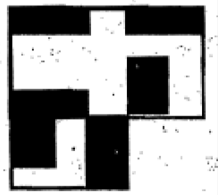
(3)  (4) 

Answer (4)

Sol. Conceptual

95. 

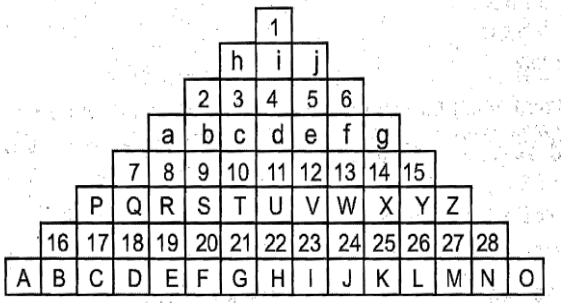
(1)  (2) 

(3)  (4) 

Answer (2)

Sol. Conceptual

Directions (Q.96 to Q.98) : The following questions are based on the numbers and letters arranged in the pyramid pattern. Study the pattern and complete the given analogy.



96. T c 8 : V e 14 : : E R 17 : ?

(1) L Y 27 (2) L Y 24

(3) K X 27 (4) J W 26

Answer (3)

Sol. Conceptual

97. C P 8 : R a 3 : : F S 11 : ?

(1) U W 15 (2) U H 24

(3) U W 5 (4) U d 6

Answer (4)

Sol. Conceptual

98. 2 8 D : 6 14 L : : ? : 5 13 K

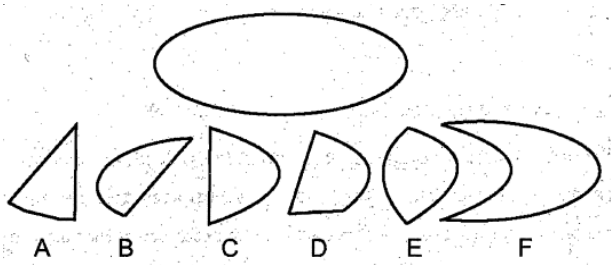
(1) 3 11 I (2) 3 9 E

(3) 3 10 F (4) 3 11 G

Answer (2)

Sol. Conceptual

99. In order to form the given ellipse, which four appropriate parts out of A,B,C,D,E and F are to be combined?

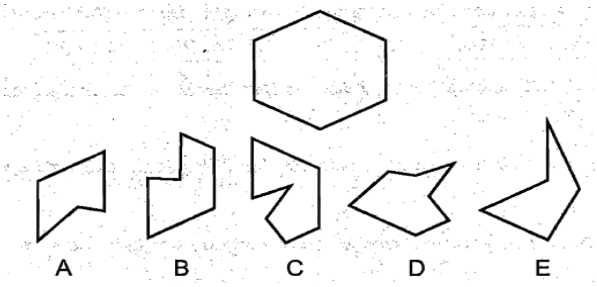


(1) B, D, C, F
(2) E, F, D, A
(3) B, A, C, F
(4) A, C, E, B

Answer (3)

Sol. Conceptual

100. In order to form the given hexagon, which three appropriate parts out of A, B, C, D and E are to be combined?



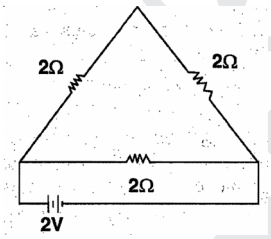
(1) A, C, D
(2) A, B, E
(3) B, D, E
(4) C, D, E

Answer (1)

Sol. Conceptual

PAPER-II : SCHOLASTIC APTITUDE TEST (SAT)

1. The current in the circuit shown below is



(1) 1.5 A
(2) 0.5 A
(3) 2.5 A
(4) 0.66 A

Answer (1)

Sol. Series conection = 2 + 2 = 4

$$\frac{1}{R}=\frac{1}{2}+\frac{1}{4}=\frac{2+1}{4}=\frac{3}{4} \Rightarrow R=4/3$$

$V = iR$

$$i=\frac{V}{R}=\frac{2}{4/3}=\frac{6}{4}=3/2=1.5A$$

2. A heating unit of an electric stove is rated at 880 W. It is connected to a power supply of 220 V the current it will consume

(1) 2 A
(2) 6 A
(3) 4 A
(4) 8 A

Answer (3)

Sol. $P = vi$

$$i=\frac{P}{V}=\frac{850}{220}=4$$

$i = 4A$

3. A wire of resistance 12 ohm is bent in the form of a circular ring. The effective resistance between the two points on any diameter of the circle is

(1) 24 Ω
(2) 12 Ω
(3) 6 Ω
(4) 3 Ω

Answer (4)

Sol. Now two resisters are connected in parallel so each resistance 6 ohm

$$\frac{1}{R}=\frac{1}{6}+\frac{1}{6} \Rightarrow \frac{1}{R}=\frac{2}{6} \Rightarrow R=3\Omega$$

4. A person needs a lens of power - 4.5D for correction of his/her vision then the focal length of corrective lens is

(1) + 4.5 m
(2) - 0.22 m
(3) + 2.2 m
(4) - 0.45 m

Answer (2)

Sol. $P=\frac{1}{f}$

$$-4.5=\frac{1}{f}$$

$$f=\frac{1}{-4.5}$$

$$f=\frac{10}{45}=\frac{2}{9}$$

= - 0.22 m

5. Sheela cannot read newspaper when she holds it closer than 100 cm. The defect in her eye and the power of lens prescribed to her [Normal eye near point = 25 cm]

(1) Myopia with + 3D lens

(2) Myopia with - 3D lens

(3) Hypermetropia with - 3D lens

(4) Hypermetropia with + 3D lens

Answer (4)

Sol. $\frac{1}{f}=\frac{1}{v}=\frac{1}{u}$ $\frac{1}{f}=\frac{1}{-100}-\frac{1}{-25}$

$\frac{1}{f}=\frac{-1+4}{100}$

$\frac{1}{f}=\frac{3}{100}$

$f=100/3$

$P=\frac{100}{f}=\frac{100}{100/3}=3D$

Hypermetropia with + 3D lens

6. A metallic rod falls under gravity with its ends pointing east and west, then

(1) no e.m.f. induced at all

(2) an e.m.f. induced in it as it cuts the magnetic lines of force

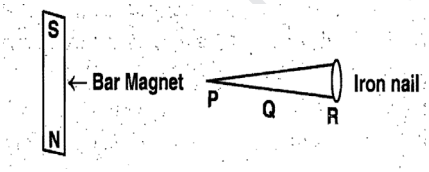
(3) Two e.m.f.s of equal but opposite signs are induced giving no net e.m.f.

(4) its acceleration is equal to the product of g and the radius of the ring

Answer (2)

Sol. an e.m.f induced it cuts the magnetic lines of foroce

7. A bar magnet is used to pick up the iron nail



At which part P,Q and R is the easiest for the magnet to pick up th eiron nail?

(1) At P

(2) At Q

(3) At R

(4) It makes no difference at any part

Answer (3)

Sol. Since near the head the iron material is more it gets attracted more due to the formation of domains

8. An athlete completes one round of a circular track of radius R in 40 seconds. The displacement at the end of 2 minutes 20 seconds will be

(1) Zero (2) 2R

(3) πR (4) $7\pi R$

Answer (2)

Sol. 1 round complets in 40 sec

$2\pi r \rightarrow 40\,sec$

2mints 20 sec = 140 sec

t = 3×40+20

he completed 3 round and $\frac{1}{2}$ revolution

so displant is 2R

9. The amount of material that releases 4.5×10^{14}J of energy when it is completely converted into energy during a nuclear reaction [Given speed of light = 3×10^{8} m/s]

(1) 0.5 g (2) 5 g

(3) 50 g (4) 500 g

Answer (2)

Sol. $E = \Delta mc^2$

$4.5\times10^{14}=\Delta mx\left(3\times10^{r}\right)^2$

$4.5\times10^{14}=\Delta mx9\times10^{16}$

$\Delta m=\frac{4.5\times10^{14}}{9\times10^{16}}$

$= 0.5 \times 10^{-12}$ kg

$= 0.5 \times 10^{-2} \times 10^{3}$

$= 0.5 \times 10$

$= 5g$

10. For a nuclear reactor 48 KJ of energy is produced per minute. If the energy released per fission is 3.2×10^{-11} J then the number of fissions which would be taking place in a reactor per second is

(1) 5×10^{14} (2) 2×10^{14}

(3) 5.2×10^{13} (4) 2.5×10^{13}

Answer (4)

Sol. $60\,sec \rightarrow 48\times10^{3}\,J$

$1sec \rightarrow \frac{48\times10^{3}}{60}=8\times10^{2}\,J$

number of fissions would be = $\frac{8\times10^{2}}{3.2\times10^{-1}}=\frac{80}{32}\times10^{13}$

$= 2.5 \times 10^{13}$ J

11. Select the correct statement.
(1) A lens with + 2D power and - 0.5m focal length is convex lens.
(2) A lens with + 2D power and + 0.5m focal length is convex lens
(3) A lens with - 2D power and + 0.5m focal length is convcave lens
(4) A lens with + 2D power and - 0.5m focal length is concave lens.

Answer (2)

Sol. P = + 2 D

$$P = \frac{1}{f} \Rightarrow 2 = \frac{1}{f} \Rightarrow f = \frac{1}{2} = 0.5m$$

12. The magnification of image formed at a distance of 4 cm by a needle when it is placed at a distance of X cm away from a convex mirror of focal length 12cm
(1) - 0.66 (2) + 0.66
(3) - 1.5 (4) + 1.5

Answer (2)

Sol. $m = \frac{f - v}{f}$

for convex lens

f = + 12

v = + 4

$$m = \frac{12 - 4}{12} = \frac{8}{12} = \frac{2}{3} = +0.66$$

13. The speed of sound in air at NTP is 332 m/s. If air pressure becomes four times the normal then the speed of sound waves will
(1) double
(2) quadruple
(3) remain the same
(4) become $\frac{1}{4}$ of the original value

Answer (3)

Sol. Air pressure has no effect at all in ideal gas approximation. This is because pressure and density both contribute to sound velocity equally.

14. An isoelectronic species are
a. Na^+ b. Al^{3+}
c. Mg^{2+} d. Ca^{2+}
(1) a, b and c (2) a, c and d
(3) a, b and d (4) a, b, c and d

Answer (1)

Sol. Isoelectronic species have same number of electrons

15. Identify the correct order of elements according to their metallic character.
(1) B > Al > Mg > K (2) Al > Mg > B > K
(3) Mg > Al > K > B (4) K > Mg > Al > B

Answer (4)

Sol. Conceptual

16. Identify the correct representation of reaction occurring during chloralkali process.
(1) $2NaCl_{(l)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(l)} + Cl_{2(g)} + H_{2(g)}$
(2) $2NaCl_{(aq)} + 2H_2O_{(aq)} \rightarrow 2NaOH_{(aq)} + Cl_{2(g)} + H_{2(g)}$
(3) $2NaCl_{(aq)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + Cl_{2(aq)} + H_{2(g)}$
(4) $2NaCl_{(aq)} + 2H_2O_{(l)} \rightarrow 2NaOH_{(aq)} + Cl_{2(g)} + H_{2(g)}$

Answer (4)

Sol. Conceptual

17. Identify the sets of quantum numbers which are not possible?
a. $n = 0, l = 0, m_l = 0, m_s = +1/2$
b. $n = 1, l = 0, m_l = 0, m_s = -\frac{1}{2}$
c. $n = 1, l = 1, m_l = 0, m_s = +\frac{1}{2}$
d. $n = 2, l = 1, m_l = 0, m_s = -\frac{1}{2}$
(1) a and b (2) a and c
(3) a and d (4) b and d

Answer (2)

18. An example(s) for endothermic process (es) is (are)
a. Dilution of sulphuric acid
b. Sublimation of dry ice
c. Condensation of water vapours
d. Evaporation of water
(1) a and c (2) b only
(3) c only (4) b and d

Answer (4)

19. $X \xrightarrow{\text{Alkaline}KMnO_4 + \text{Heat}} Y$

$Y + X \xrightarrow[\text{(acid)}]{\text{Esterification}} Z$

Identify X,Y and Z.
(1) Ethanoic acid, Ethanol and Ethylethanoate
(2) Ethanol, Ethylethanoate and Ethanoic acid
(3) Ethanol, Ethanoic acid and Ethylethanoate
(4) Ethanoic acid, Ethylethanoate and Ethanol

Answer (3)

Sol. $\underset{(X)}{CH_3-CH_2-OH} \xrightarrow{\text{Alkaline } KMnO_4 + \text{Heat}} \underset{(Y)}{CH_3COOH} + H_2O$

$\underset{(Y)}{CH_3COOH} + \underset{(X)}{CH_3-CH_2-OH} \underset{(acid)}{\overset{\text{Esterification}}{\rightleftharpoons}} \underset{\substack{(Z)\\ \text{EthylEthanoate}}}{CH_3COOC_2H_5} + H_2O$

20. Identify the solid acid at room temperature.

(1) $\begin{matrix}COOH\\|\\COOH\end{matrix}$ (2) CH_3COOH

(3) H_2CO_3 (4) HCOOH

Answer (1)

Sol. Conceptual

21. Assertion (A): Combustion of 16 g of methane gas liberates 18 g of water.

Reason (R): In the combustion of methane, water is one of the product.

Select the correct option from the given alternatives.

(1) Both A and R are true, but R is not the correct explanatoin of A

(2) A is true but R is false

(3) A is false but R is true

(4) Both A an dR are false

Answer (3)

Sol. Conceptual

22. Assertion (A): Sodium Chloride formed by the action of Chlorine gas on sodium metal is a stable compound.

Reason (R): Sodium and Chloride ions acquire octet configuration in sodium Chloride formation.

Select the correct option from the given alternatives.

(1) A and R are correct and R is the correct explanation of A

(2) A and R are correct, but R is not the correct explanation of A

(3) A is true but R is false

(4) Both A and R are false

Answer (1)

Sol. Conceptual

23. Choose the correct statements about the given chemical reaction.

$3Fe_{(s)} + 4H_2O_{(g)} \rightarrow Fe_3O_{4(s)} + 4H_{2(g)}$

a. Iron is getting oxidised.

b. Water is getting reduced

c. Water is acting as reducing agent

d. Water is acting as oxidising agent.

(1) a, b and c (2) c and d

(3) a, b and d (4) b and c

Answer (3)

Sol. Conceptual

24. The half life of a radioisotope is 4 hours. If the initial mass of the isotope was 200 g, the mass remaining after 24 hours undecayed.

(1) 1.042 g

(2) 3.125 g

(3) 2.084 g

(4) 4.167 g

Answer (2)

Sol. If Y = number of half life

$$Y = \frac{\text{total time}}{\text{half life}} = \frac{24}{4} = 6$$

C = amount left after Y half life

C_o - Initial amount

$$\therefore C = C_o\left(\frac{1}{2}\right)^y = 200\left(\frac{1}{2}\right)^6 = 3.125g$$

25. The element 'X' has an electronic configuration 2, 8, 3. Element 'Y' has an electronic configuration 2, 8, 7. The chemical formula of the compound formed when they react is

(1) Ionic XY_3 (2) Covalent X_3Y

(3) Covalent XY_3 (4) Ionic X_3Y

Answer (1)

Sol. Conceptual

26. Identify the olfactory indicators.

(1) Vanilla and turmeric (2) Vanilla and petunia

(3) Vanilla and clove (4) Vanilla and Hydrangia

Answer (3)

Sol. Conceptual

27. Read the following statements and select the correct option.

A: When the body size of animals is large, the diffusion pressure alone cannot take care of oxygen delivery to all parts of the body.

B : In human beings haemoglobin pigments take up oxygen from the air in the lungs to carry it to tissues which are deficient in oxygen.

(1) A is true and B is false

(2) A is false and B is true

(3) Both A and B are true

(4) Both A and B are false

Answer (3)

Sol. Conceptual

28. Assertion (A): Plants can survive without separate respiratory organs.

Reason (R): Each plant part takes care of its own gas exchange needs.

Select the correct option from the given alternatives.

(1) A is true and R is false

(2) A is false and R is true

(3) Both A and R are true and R explains A

(4) Both A and R are true but R doesnot explain A

Answer (3)

Sol. Conceptual

29. match Column - I with Column - Ii and identify the correct answer.

Column - I	Column - II
a. Oxytocin	i. Reabsorption of water
b. Luteinizing hormone	ii. Regulation of diurnal rhythm of our body
c. Vasopressin	iii. Uterus contraction during child birth
d. Melatonin	iv. Body growth
	v. Induces ovulation

(1) A - iii, B - v, C - i, D - ii

(2) A - ii, B - iii, C - iv, D - i

(3) A - v, B - i, C - ii, D - iv

(4) A - v, B - iv, C - i, D - iii

Answer (1)

Sol. Oxytocin helps in uterus contraction during child birth

- Luteinizing hormone helps in ovulation

- Vasopressin helps in reabsorbing water

- Melationin helps in regulation of diurual rhythm in our body

Hence option 1 is correct

30. The recessive character in pea plant in the following

(1) Violet flower (2) Axillary flower

(3) Round seed (4) Green seed

Answer (4)

Sol. Conceptual

31. Assertion (A): The walls of the ventricle are thicker than the walls of the auricles.

Reason (R): The ventricles have to pump blood to long distances and various organs.

(1) A is true and R is false

(2) A is false and R is true

(3) Both A and R are true and R explain A

(4) Both A and R are true but R does not explain A

Answer (3)

Sol. The wall of ventricles are thicker because, it increase the pressure during contraction, SO that blood is supplied to all body parts.

32. The presence of following kind of bacteria in water indicates contamination by disease causing micro-oganisms

(1) Agrobacterium (2) Coliform

(3) Pseudomonas (4) Lactobacillus

Answer (2)

33. Read the following statements and select the correct option.

A: Imbibition is a special type of phenomenon by which plant cells absorb water.

B: The rupturing of seed coat in germinating seeds is due to imbibition.

(1) Both A and B are true

(2) Both A and B are false

(3) A is true and B is false

(4) A is false and B is true

Answer (4)

Sol. Imbibition is a special type of diffusion, where water is absorbed by solids colloids causing an enormous increase in volume. Usually takes place in seeds & dry wood.

Hence A is false & B is true i.e, option (4)

34. Identify the correct statements about chlorophyll.

A. Chlorophyll is highly sensitive to light.

B. There are varieties in Chlorophyll.

C. The formation of Chlorophyll does not depend on the exposure of the plant to light.

d. Nutritiional deficiences of minerals cause loss of chlorophyll

(1) A and C only (2) A, B and D only

(3) B,C and D only (4) A and D only

Answer (2)

Sol. Chlorophyll is highly sensitive to light and there are varieties in chlorophyll like chlorophyll A,B,C,D,E

But , formation of chlorophyll requires the exposure of plant to sunlight.

Hence option 2 is correct

35. Haemophilia is more common in males because it is a

(1) recessive character carried by Y chromosome

(2) dominant character carried by Y chromosome

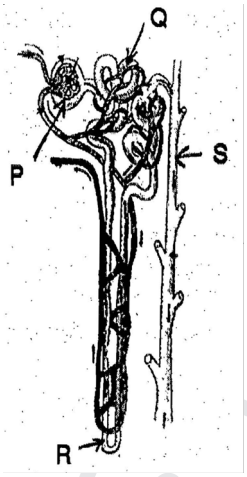
(3) dominant trait carried by X chromosome

(4) recessive trait carried by X chromosome

Answer (4)

Sol. Conceptual

36. A person was found to have reduced level of reabsorption of water and glucose due to kidney damage. The following labelled part would be th esite of damage for this patient.



(1) Q (2) P
(3) S (4) R

Answer (1)

Sol. P is malphigan corpuscle

Q is PCT

R is Henle's loop

S is Collecting duct

PCT helps in the absorption of Glucose & Water, hence 1st option is correct

37. Examine the following statements and select the correct option.

A: Ethylene promotes fruits ripening.

B: Gibberlins are used to increase the length of grape stalks.

(1) A is true B is false
(2) A is false and B is true
(3) Both A and B are true
(4) Both A and B are false

Answer (3)

Sol. Conceptual

38. Identify the correct statements about blood.

A. Platelets are produced in the bone marrow
B. When haemoglobin combines with oxygen it forms carboxyhaemoglobin
C. Calcuium ions play an important role in clotting of blood
D. Fibrins are formed by the conversion of fibrinogen by the enzyme thrombin.

(1) A and B only (2) B, C and D only
(3) B and D only (4) A, C and D only

Answer (4)

Sol. When carbon monoxide combines with haemoglobin, it forms carboxy haemgolobin, hence B is incorrect & A,C,D is correct i.e, option 4

39. A farmer wants to save his crops from heavy rain and likes to have early flowering. The technique that could be used in this situation

(1) Photoperiodism (2) Vernalization
(3) Phototropism (4) Polyploidy

Answer (2)

Sol. Vernalization refers to promotion of flowering by a period of low temperature.

The stimulus is perceived by mature stem apex or by embryo of seed.

Hence it is option 2.

40. Assertion (A): Genetic variation is disadvantgeous to a population.

Reason (R): It does not enable any individual to adapt to the environment.

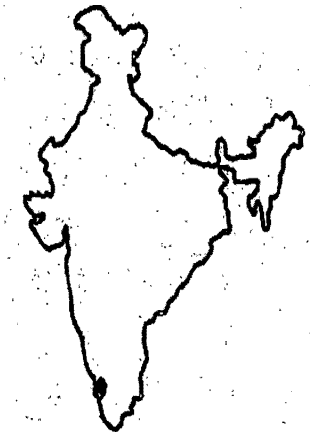
Select the correct option from the given alternatives.

(1) Both A and R are true and R explains A
(2) Both A and R are false
(3) A is true and R is false
(4) A is false an R is true

Answer (2)

Sol. Conceptual

41. The location shown on the map of India was a French Colony



(1) Chandranagore (2) Goa
(3) Mahe (4) Pondicherry

Answer (3)

Sol. Conceptual

42. Assertion (A): The Mughal Emperor Jahangir issued a royal permission to English East India Company to establish their warehouse factory.

Reason (R) : English Company established their first warehouse factory at Surat.

Select the correct option from the given alternatives.

(1) A is true R is false (2) R is true A is false

(3) Both A and R are correct. R is the correct explanation of A

(4) Both A and R true, but R is not correct explanation of A

Answer (3)

Sol. Conceptual

43. The correct chronological order of the treaties signed between British and Native States.

A. The streaty of Salbai, the treaty of Srirangapatna, the treaty of Amritsar and the treaty of Mangalore.

B. The treaty of Salbai, the treaty of Mangalore, the treaty of Srirangapatna and the treaty of Amritsar.

C. The treaty of Amritsar, the treaty of Mangalore, the treaty of Salbai and the treaty of Srirangapatna.

D. The treaty of Amritsar, the treaty of Salbai, the treaty o fSrirangapatna and the treaty of Mangalore

(1) A (2) B

(3) C (4) D

Answer (2)

Sol. Conceptual

44. The List 'A' Contains the great personalities and the List 'B' with their works. The correct option that matches exactly.

A	B
A. Montesque	i. Uncle Tom's Cabin
B. Rousseau	ii. Common Sense
C. Mazini	iii. The Spirit of Laws
D. Harriet Stowe	iv. Social Contract
	v. Italy Austria Papacy

(1) A-iii, B-iv, C-v, D-i (2) A-iv, B-iii, C-i, D-ii

(3) A-v, B-iv, C-i, D-iii (4) A-ii, B-iv, C-iii, D-i

Answer (1)

Sol. Conceptual

45. The correct provision passed by the British Government in India in their chronological order is

A. Supreme Court of Judicature was established at Calcutta.

B. A new institution named 'Board of Controllers' consisting of six Commissioners was started.

C. The post of Governor General was changed in to Viceroy.

D. Representation of the regional Council was allowed Indians through election based on religion.

(1) D C A B (2) A B C D

(3) B A D C (4) C D B A

Answer (2)

Sol. Conceptual

46. Choose the correct statements with reference to the Indian judiciary system before the British rule in northern part of India.

A. All Indians were treated with only the Shariyat laws of mughals

B. Criminal courts were under the control of Qajis

C. Civil courts were called 'Diwani Adalat'

D. Hindus were dispensed justice as per the Hindu scriptures

(1) A and B only (2) A, B and C only

(3) C and D only (4) B, C and D only

Answer (4)

Sol. Conceptual

47. The correct statement related to Sathya Shodak Samaj is

A. The samaj started the Cow Protection Association

B. The samaj opened the schools for shudras and girls

C. The samaj advocated polytheism

D. The samaj encouraged vedic education

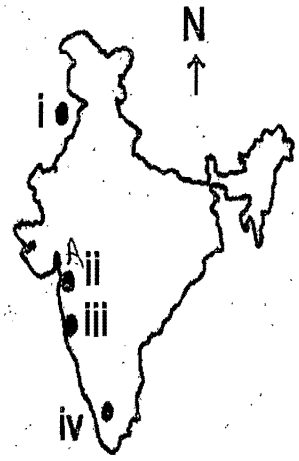
(1) A (2) B

(3) C (4) D

Answer (2)

Sol. Conceptual

48. Select the correct order of events related to freedom struggle starting from North to Sourth as shown in the map.



A. Dandi Sathyagraha took place

B. The Moplah uprising against Bristish

C. The Declaration of Poorna Swaraj

D. The Quit India Movement was launched

(1) i-C, ii-A,iii-D,iv-B (2) i-B, ii-D, iii-A, iv-C

(3) i-D, ii-C, iii-B, iv-A (4) i-A, ii-B, iii-C, iv-D

Answer (1)

Sol. Conceptual

49. The chronological order of the incidents of the first war of Indian Independence.

A. The Queen of Britain passed a Declaration assuring a stable Government for Indians.

B. A group of soldiers declared Bahadurshah Zafar as the emperor of India.

C. The Sepoys of Meerut revolted against their British Officers.

D. Tantia Tope was executed by British at Shivapuri

(1) D C B A (2) B A C D

(3) A D B C (4) C B A D

Answer (4)

Sol. Conceptual

50. The correct group of statements related to the functions and characteristics of banks

A. Accptance of deposits and deals with money

B. Issuing national savings certificates.

C. Issuing latters of credit gurantee.

D. Discounting of bills.

(1) A and B only (2) A, C and D only

(3) A, B and C only (4) C and D only

Answer (2)

Sol. Conceptual

51. Assertion (A): The R.B.I. lends money to commercial banks in the events of any shortfall of funds.

Reason (R): The R.B.I. controls the supply of money through reverse repo rate.

Select the correct option from the given alternatives.

A. A is correct and R is the correct explanation of A

B. R is correct and A is wrong

C. Both A and R are wrong

D. A is correct and R is not the correct explanation of A

(1) A (2) B

(3) C (4) D

Answer (4)

Sol. Conceptual

52. Observe the following pictures of Entrepreueurs and identify them in correct order of their achievements.

A. Successful in getting listed the company first on NASDAQ.

B. Established a small scale Anand Milk Dairy (Amul) in Kaira District.

C. Awarded the best entrepreneur of the year 2001 by the Ernest young.

D. Took the advantage of open sky policy of the government and started JET.

(1) i-B, ii-C, iii-D, iv-A (2) i-A, ii-C, iii-B, iv-D

(3) i-B, ii-D, iii-C, iv-A (4) i-C, ii-B, iii-A, iv-D

Answer (4)

Sol. Conceptual

53. Select the correct statemetns regarding the advantage of registration of partnership firms

A. A registered firm can file a suit in court of law against third party

B. A registered firm can file a case against the other partners agains the loans they owe to the firm

C. Partnership firm partners can not file case against their own firm

D. A registered partnership firm can not be dissolved

(1) A and C only (2) C and D only

(3) D and A only (4) A and B only

Answer (3)

Sol. Conceptual

54. Assertion (A): Service charges are collected from current account holder by the banks.

Reason (R): This account is opened by business men only for the development of their business.

Select the correct option from the given alternatives.

(1) R is correct, A is wrong

(2) Both R and A are wrong

(3) R is correct and A is exactly related to R

(4) R is correct and A is not exactly related to R

Answer (3)

Sol. Conceptual

55. The correct option organised on the basis of evolution and growth of commerce

A. Internatioanl trade stage

B. Money economy stage

C. Agricultural stage

D. Pastrol stage

(1) A B D C (2) B A C D

(3) D C B A (4) C B A D

Answer (3)

Sol. Conceptual

56. Choose the group of correct statements related to Mica.

a. it is an important non-metallic mineral

b. it can be easily split into very thin

c. it is transparent and heat resistant

d. it is used in electrical industry, telephone, aeroplane

(1) a, b and c (2) a and d

(3) a, b and d (4) a,b,c and d

Answer (4)

Sol. Conceptual

57. Choose the correct group of statements with respect to " The Siwalik Hills".

a. They are the outer most ranges or foot hills of the Himalayas.

b. They are the lowes range of the Himalayas

c. Their height is 600 to 1500mts and width is 15 to 150km

d. They extend from Rajasthan to Assam

(1) a,b and c (2) b,c and d

(3) a,b,c and d (4) a,c and d

Answer (1)

Sol. Conceptual

58. Match the Column 'A' with Column 'B' and choose the correct matching

Colum-A	Column-B
a. Karnataka	i. Kala baisakhis
b. Uttar Prades	ii. Mango showers
c. West Bengal	iii. Coffee blossom
d. Kerala	iv. Andhis
	v. Tea blossom

(1) a-iii,b-i,c-ii, d-iv (2) a-i,b-iii,c-ii,d-v

(3) a-iii,b-iv,c-i,d-v (4) a-iv,b-iii,c-ii,d-v

Answer (3)

Sol. Conceptual

59. Read the following statements and select the correct option

A. It is method of farming in which a large amount of capital and labour are applied per unit of land.

B. Under this type of farming, land is cultivated throughout the year

C. Farmers try to raise two or more crops to get maximum production from small land holdings

D. It is common in the fertile and irrigated areas of the country

(1) Shifting farming (2) Humid farming

(3) Plantation farming (4) intensive farming

Answer (4)

Sol. Conceptual

60. Match the column 'A' with Column 'B' and choose the correct answer

Column-A	Column-B
a. Yamunotri	i. Valley
b. Armakonda	ii. Hill station
c. Kulu	iii. Glacier
d. Ranikhet	iv. Peak
	v. Ground water

(1) a-iii,b-iv,c-i,d-v (2) a-ii,b-iv,c-i,d-iii

(3) a-iv,b-iii,c-ii,d-i (4) a-iii,b-iv,c-i,d-ii

Answer (4)

Sol. Conceptual

61. Match the column 'A' with column 'B' and choose the correct answer.

Column - A	Column - B
A. Black buck	i. Extinct
B. Asiatic elephant	ii. Rare
C. Andaman wild pig	iii. Endangered
D. Hiamalayan brown bear	iv. Vulnerable
	v. Endemic

(1) a-ii,b-v,c-i,d-iii (2) a-iii,b-iv,c-v,d-ii

(3) a-v,b-iii,c-iv,d-ii (4) a-iii,b-iv,c-v,d-i

Answer (2)

Sol. Conceptual

62. The Himalayan yew species is in danger because

(1) A chemical compound called 'Taxol' is extracted from the bark to cure cancer

(2) The hide of the animal is extracted for producing percussive instruments

(3) The birds feathers are colourful and they are collected by killing

(4) The insecticides have brought adverse effects on them

Answer (1)

Sol. Conceptual

63. Read the following statements and select the correct option.

A. During the time of Chandragupta Maurya, dams, lakes and irrigation systems were extensively.

B. In the 14th century, the tank in Hauz Khas in Delhi was constructed by Iltutmish for supplying water to Siri Fort area.

(1) A is false and B is true

(2) A is true and B is false

(3) Both A and B are ture

(4) Both A and B are false

Answer (2)

Sol. Conceptual

64. Read the following statements and write the correct option with which all those links.

A. This soil is suitable for cultivation of coffee with adequate doses of manures and fertilizers

B. This soil is mainly found in Karnataka, Kerala, Tamilnadu, Madhyapradesh and the hilly areas of Odisha and Assam.

C. Humus content in this soil is low

D. It is found in areas with high temperature and heavy rainfall

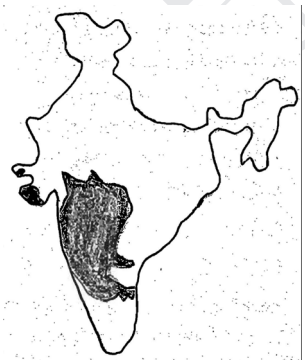
(1) Alluvial soil (2) Black soil

(3) Red soil (4) Laterite soil

Answer (4)

Sol. Conceptual

65. Choose the correct type of soil with reference to the shaded area in the given map



(1) Mountain Soils (2) Black Soils

(3) Laterite Soils (4) Red and Yellow soils

Answer (2)

Sol. Conceptual

66. Choose the correct group of answer with regarding Child Adolescent Labour Prohibition and Regulation Act.

a. No children below 14 years shall be employed in any sector for any reasons

b. As per the Act, children between the age of 15 and 18 are considered as Adolescent children

c. According to the Article 14 of this act, a fine of ruppees 50,000 and 2 years imprisonment is imposedon violators.

d. If children below 14 years are engagedin any household activites, the parents and the head of the family is declared as offenders

(1) a and b only (2) a,b,c and d

(3) a,b and c only (4) c and d only

Answer (2)

Sol. Conceptual

67. Arrange the following Acts in chronological order

a. Civil Rights Protection Act

b. Untouchability Crime Act

c. Child Solescent, Labour Prohibition and Regulation Act

d. Protection of Children from Sexual Offences Act.

(1) a, b,c,d (2) b,a,c,d

(3) b,a,d,c (4) c,b,d,a

Answer (2)

Sol. Conceptual

68. "Culture is that complex whole which includes knowledge, belief, art, rules and regulations, traditions and any other capabilities earned by the human being as a member of society" it was defined by

(1) Malinowski (2) E.B Tylor

(3) Max Weber (4) Emile Durkheim

Answer (2)

Sol. Conceptual

69. Choose the correct option relating to untouchability Crime Act.

A. The Government of India has implemented this Act in 1955.

B. This Act was renamed as 'Civil Rights Protection Act in 1976

C. According to this Act, practice of untouchability is a crime

D. This Act consisted of certain mistakes which were amended later

(1) A and B (2) B and C

(3) B,C and D (4) A,B,C and D

Answer (4)

Sol. Conceptual

70. In Column 'A' the works and in Column 'B' their authors are given. Choose the correct matching

Column-A	Column-B
a. Buddha and his Dhamma	i. G. S Ghruye
b. Indian saints	ii. Iravati Karve
c. Institutions and Relationship	iii. A.R Desai
d. Indian rural Sociology	iv. C. Parvatahamma
	v. Dr. B.R. Ambedkar

(1) a-v,b-iic-iii,d-iv (2) a-ii,b-iii,c-iv,d-v
(3) a-iii,b-iv,c-v,d-i (4) a-v,b-i,c-ii,d-iii

Answer (4)

Sol. Conceptual

71. Which of the following statement/statements is/are not correct related to the President of India?

a. appoint the Governors to the States

b. addresses the joint session of both the Houses of Parliament

c. appoint the Governors to the States

d. nominates 12 members to the Rajya sabha

(1) a and c only (2) b and d only
(3) c only (4) a only

Answer (3)

Sol. Conceptual

72. The President of India may declare 'National Emergency'

a. External aggression b. Internal disturbances
c. Natural disasters d. Financial crises

(1) a and b only (2) b and c only
(3) c and d only (4) a and c only

Answer (1)

Sol. Conceptual

73. Identify the correct chronological sequence in which among the following became Secretary Generals of UNO.

i. Antonio Guterres ii. U. Thant
iii. Kofi Annan iv. Boutros Ghalli

(1) i,iii,ii, iv (2) ii,iv,iii,i
(3) iii,iv,i,ii (4) iv,ii,i,iii

Answer (2)

Sol. Conceptual

74. Choose the correct sequence to indicate the following statements as True (T) or False (F).

a. RTI is an implied Fundamental Right

b. RTI has been included in Article 19(1) of the Consitution

c. RTI came into force on October 12, 2005

(1) FFF (2) TTT
(3) FFT (4) FTT

Answer (2)

Sol. Conceptual

75. Read the following statemetns and select the correct option.

Assertion (A): Directive principles are enshrined in the Constitution for the Government Administration.

Reason (R): People can question in the court for not implementing Directive Principles.

(1) A is false but R is true
(2) R is false but A is ture
(3) A and R are true and R is correct explanation of A
(4) A and R are true but R is not correct explanation of A

Answer (2)

Sol. Conceptual

76. Indicators involved in Human Development Index (HDI)

(1) National Income, Employment Rate and Sex Ratio
(2) Per Capita Income, Life Expectancy and Literacy Rate of women
(3) Life Expectancy, Literacy Attainment and Purchasing Power of People
(4) National Income, Purchasing power of People and Sex Ratio

Answer (3)

Sol. Conceptual

77. Identify the correct statement from the following

(1) As the literacy of people increases, birth rate also increases
(2) As the literacy of people increases, birth rate decreases
(3) As the literacy of people decreases birth rate also decreases
(4) There is no relation between literacy of people and birth rate.

Answer (2)

Sol. Conceptual

78. Consider the following aspectes of Fiscal Deficit

A. Primary Dificit $= \begin{pmatrix}\text{Fiscal}\\ \text{Deficit}\end{pmatrix} - \begin{pmatrix}\text{Interest}\\ \text{Payment}\end{pmatrix}$

B. Revenue Deficit $= \begin{pmatrix}\text{Total}\\ \text{Revenue}\end{pmatrix} - \begin{pmatrix}\text{Total}\\ \text{Expenditure}\end{pmatrix}$

Reference to the above

(1) A is correct, B is not correct

(2) B is correct, A is not correct

(3) Both A and B are correct

(4) Both A and B are not correct

Answer (1)

Sol. Conceptual

79. Aspects of Money supply concepts are given below.

a. Currency Notes b. Coins

c. Savings deposits in Post Office

d. Time/term deposits of Commerical Banks

The Group which classifies the above aspects as 'Narrow' and 'Broad' Money respectively

(1) a,b and c,d (2) a,c and b,d

(3) a,d and b,c (4) b,d and a,c

Answer (1)

Sol. Conceptual

80. Statistics related to 2011 census are given below. Identify the correctly matched ones.

List-A	List-B
A. Work participation rate	i. 30.7%
B. People living in villages	ii. 65.46%
C. Female literacy rate	iii. 39.8%
D. 0 - 14 years children	iv. 68.8%

(1) A-iv,B-iii,C-i,D-ii (2) A-iii,B-iv,C-ii,D-i

(3) A-iv,B-ii,C-i,D-iii (4) A-iii,B-iv,C-i,D-ii

Answer (2)

Sol. Conceptual

81. If the sum of 'n' terms of an arthimetic progression is $S_n = 3n + 2n^2$ then its common difference is

(1) 9 (2) 6

(3) 4 (4) 3

Answer (3)

Sol. $S_n = 3n + 2n^2$

$t_n = S_n - S_{n-1}$

$= 2n^2 + 3n - 2(n-1)^2 - 3(n-1)$

$= 2n^2 + 3n - 2n^2 - 2 + 4n - 3n + 3$

$= 4n + 1$

$t_1 = 5, \quad t_2 = 9 \quad t_3 = 13$

common difference = 9 - 5 = 4.

82. The value of $\left(\sqrt[2010]{2\sqrt{7} - 3\sqrt{3}}\right)\left(\sqrt[4020]{55 + 12\sqrt{21}}\right)$ is

(1) -1 (2) 0

(3) 1 (4) 2

Answer (3)

Sol. $\left(\sqrt[2010]{2\sqrt{7} - 3\sqrt{3}}\right)\sqrt[4020]{55 + 12\sqrt{21}}$

$\left(\sqrt[2]{7} - 3\sqrt{3}\right)^{1/2010}\sqrt[4020]{\left(2\sqrt{7}\right)^2 + \sqrt{7}3\sqrt{3} + \left(3\sqrt{3}\right)^2}$

$\left(2\sqrt{7} - 3\sqrt{3}\right)^{\frac{1}{2010}}\left(2\sqrt{7} + 3\sqrt{3}\right)^{\frac{2}{4020}}$

$\left(\left(20\sqrt{7}\right)^2 - \left(3\sqrt{3}\right)^2\right)^{\frac{1}{2010}}$

$(28 - 27)^{1/2010} = 1$

83. If the graphs of $x - y = 2$ and $kx + y = 3$ (k is a constant) intersect at a point in first quadrant then the value of k is

(1) equal to -1 (2) greater than -1

(3) less than $4/3$ (4) between -1 and $4/3$

Answer (4)

Sol. $x - y = 2$

$kx + y = 3$

adding (k+1)x = 5

$x = \frac{5}{k+1}$

$y = x - 2$

$= \frac{5}{k+1} - 2 = \frac{-2k+3}{k+1}$

In first quadrant

x > 0 & y > 0

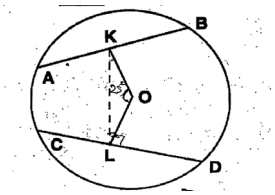
$\frac{5}{k+1} > 0$ $\qquad$ $\frac{-2k+3}{k+1} > 0$

$\Rightarrow k > -1$ $\qquad$ $\underset{-1}{-}\ \underset{3/2}{+}\ -$

$K \in \left(-1, \frac{3}{2}\right)$

so k lies between - 1 and 4/3

84. In the given circle with centre 'O', K and L are the mid points of equal chords AB and CD respectively. $\angle OLK = 25^0$ then the value of $\angle LKB$ is equal to



(1) 125°

(2) 115°

(3) 105°

(4) 90°

Answer (2)

Sol. Equal chord are equidistant from centre

$\angle OLK = \angle OKL = 25$

& $\angle LKB = 90° + 25 = 115°$

85. A tangent of length 'L' is drawn from a point 'A' to a circle of radius 'r'. The length of tangent is $\frac{4}{3}$ of r, then the shortest distance from point A to circle is

(1) $\frac{r}{2}$ (2) $\frac{2r}{3}$

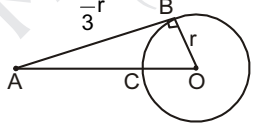
(3) $\frac{L}{2}$ (4) $\frac{2L}{3}$

Answer (2), (3)

Sol. $OA = \sqrt{\left(\frac{4}{3}r\right)^2 + r^2}$

$= \sqrt{\frac{16r^2}{9} + r^2}$

$= \frac{5}{3}r$



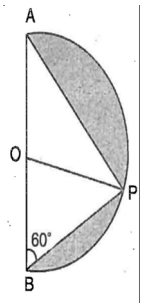
Shortent Dirtance $= \frac{5}{3}r - r$

$= \frac{2r}{3}$ and $L = \frac{4r}{3}$

$r = \frac{3L}{4}$ $= \frac{2}{3}\cdot\frac{3.L}{4}$

$= L/2$

86. In the figure a semicircle with centre 'O' is drawn on AB. If $\angle ABP = 60^0$ then the ratio of larger to smaller shaded region is



(1) $\frac{4\pi - 2\sqrt{3}}{2\pi - 2\sqrt{3}}$ (2) $\frac{4\pi - 3\sqrt{3}}{3\pi - 3\sqrt{3}}$

(3) $\frac{4\pi - 3\sqrt{3}}{2\pi - 3\sqrt{3}}$ (4) $\frac{2\pi - 2\sqrt{3}}{\pi - 2\sqrt{3}}$

Answer (3)

Sol. Area of segment $\overset{\frown}{AB} = \frac{\pi r^2\theta}{360} - \frac{1}{2}r^2\sin\theta$ for $\theta = 120°$

Area as segment $\overset{\frown}{PB} = \frac{\pi r^2\theta}{360} - \frac{1}{2}r^2\sin\theta$ for $\theta = 120°$

Ratio $= \frac{\pi\times\frac{120}{360} - \frac{1}{2}\sin 120°}{\pi\frac{60}{360} - \frac{1}{2}\sin 60}$

$= \frac{\frac{\pi}{3} - \frac{1}{2}\frac{\sqrt{3}}{2}}{\frac{\pi}{6} - \frac{1}{2}\frac{\sqrt{3}}{2}} = \frac{4\pi - 2\sqrt{3}}{12}\times\frac{24}{4\pi - 6\sqrt{3}} = \frac{4\pi - 3\sqrt{3}}{2\pi - 3\sqrt{3}}$

87. The value of 'C' if $\left(\frac{C}{2}, 14\right)$ is the mid point of the line joining the points $(-3,8)$ and $(-15,20)$ is

(1) 2 (2) -9

(3) -18 (4) -15

Answer (3)

Sol. $\frac{c}{2} = \frac{-3-15}{2}$

c = - 18

88. If the line segment joining (2,3) and (-1,2) is divided internally in the ratio 3:4 by the graph of the equation $x + 2y = k$ then the value of 'k' is

(1) $\frac{5}{7}$ (2) $\frac{31}{7}$

(3) $\frac{36}{7}$ (4) $\frac{41}{7}$

Answer (4)

Sol. (2,3) & (-1,2)

Ratio 3 : 4

$\left(\frac{-3+8}{7},\frac{6+12}{7}\right)\equiv\left(\frac{5}{7},\frac{18}{7}\right)$

$x + 2y = k$

$\frac{5}{7}+\frac{36}{7}=k$

89. If $(\sin\theta+\operatorname{cosec}\theta)^2+(\cos\theta+\sec\theta)^2=\tan^2\theta+\cot^2\theta+k$ then the value of 'k' is

(1) 9 (2) 7

(3) 4 (4) 3

Answer (2)

Sol. $(\text{Sin}\theta+\text{corec}\theta)^2+(\cos\theta+\sec\theta)^2$

$\sin^2\theta+\text{corec}^2\theta+2+\cos^2\theta+\sec^2\theta+2$

$5+1+\cot^2\theta+1+\tan^2\theta$

$7+\tan^2\theta+\cot^2\theta$

so k = 7

90. If $(3\sin\theta)+(5\cos\theta)=5$, then the value of $(5\sin\theta)-(3\cos\theta)$ is

(1) ±4 (2) ±3

(3) ±5 (4) ±2

Answer (2)

Sol. $3\sin\theta+5\cos\theta=5$ (1)

Let $5\sin\theta-3\cos\theta=x$ (2)

squring and adding (1) and (2)

$9 + 25 = 25 + x^2$

$x^2 = 9$ $x=\pm3$

91. If the roots of $x^2-px+q=0$ are two consecutive integers then the value of p^2-4q is

(1) 4 (2) 3

(3) 2 (4) 1

Answer (4)

Sol. $x^2-px+q=0$

Roots are consecutive integer so

$\alpha-\beta=1$

$(\alpha+\beta)^2-4\alpha\beta=1$

$p^2-4q=1$

92. The mean of 'n' numbers of a series is $\overline{X}$. If the sum of first $(n-1)$ terms is 'k' then the nth number is

(1) $\overline{X}-k$ (2) $n\overline{X}-k$

(3) $\overline{X}-nk$ (4) $n(\overline{X}-k)$

Answer (2)

Sol. $\overline{X}=\frac{x_1+x_2.....+x_n}{n}$

$x_n=n\overline{X}-k$

93. Three squares of a chess board are selected at random. The probability of getting two squares of one colour and other of a different colour is

(1) $\frac{16}{21}$ (2) $\frac{8}{21}$

(3) $\frac{3}{32}$ (4) $\frac{3}{8}$

Answer (2)

Sol. $n(s)=64_{C_3}=\frac{\lfloor64}{\lfloor3.\lfloor6}=\frac{64\times63\times62}{63\times2}$

$n(E)=32_{C_2}.32_{C_1}$

$=\frac{\lfloor32}{\lfloor2.\lfloor30}.32=\frac{32\times31\times32}{2}$

$P(E)=\frac{32\times31\times32}{2\times64\times21\times31}=\frac{8}{21}$

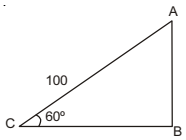
94. The string of a kite of length 100m makes an angle of 60^0 with the horizontal ground. Imaging that there is no slack in the string, the height of the kite from the ground is

(1) $50\sqrt{3}$ m (2) $100\sqrt{3}$ m

(3) $50\sqrt{2}$ m (4) 100 m

Answer (1)

Sol.



Let AB = height

In ΔACB $\sin60^\circ=\frac{AB}{100}$

$AB=100\times\frac{\sqrt{3}}{2}=50\sqrt{3}m/s$

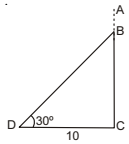
95. The tip of a partially broken tree touches the ground at a point 10m from foot of it and makes an angle of elevation of 30^0 from the ground. Then, the height of the tree is

(1) $\frac{10}{\sqrt{3}}$m (2) $10\sqrt{3}$ m

(3) $\frac{20}{\sqrt{3}}$m (4) $30\sqrt{3}$ m

Answer (2)

Sol.



Height of Tree = BC + CD

$\text{In } \Delta BCD \quad \tan 30^\circ = \frac{BC}{10}$

$BC = \frac{10}{\sqrt{3}}m \quad (1)$

$(0)30^\circ = \frac{10}{BD}$

$BD = \frac{10}{\sqrt{3}} \times 2 = \frac{20}{\sqrt{3}}$

$\text{Height} = \frac{10}{\sqrt{3}} + \frac{20}{\sqrt{3}} = \frac{30}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{30\sqrt{3}}{3} = 10\sqrt{3}$

96. If l,m and n are zeroes of the polynomial $f(x) = 2x^3 + 5x^2 + 6x + 10$ then the value of $\frac{1}{l} + \frac{1}{m} + \frac{1}{n}$ is

(1) $-\frac{5}{2}$ (2) $-\frac{3}{5}$

(3) $-\frac{5}{3}$ (4) $-\frac{2}{5}$

Answer (2)

Sol. $f(x) = 2n^3 + 5x^2 + 6n + 10$

$\ell m + mG + \ell n = \frac{6}{2}3$

$\ell mn = \frac{10}{2} = -5$

$\text{Nov } \frac{1}{\ell} + \frac{1}{m} + \frac{1}{n} = \frac{mn + m\ell + \ell m}{\ell mn}$

$= \frac{3}{-5}$

97. The perimeters of similar triangles ΔABC and ΔDEF are 60cm and 36cm respectively. If BC=18cm then measure of EF is

(1) 1.08 cm (2) 30 cm

(3) 10.8 cm (4) 8 cm

Answer (3)

Sol. $\frac{60}{36} = \frac{18}{EF} \Rightarrow EF = \frac{18 \times 36}{60} = \frac{54}{5} = 10.8cm$

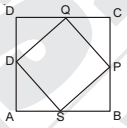
98. If PQRS is a square whose vertices are on the sides of a square ABCD then the ratio of the areas of square PQRS to square ABCD is

(1) 1:2 (2) $1:\sqrt{2}$

(3) 2:1 (4) $\sqrt{2}:1$

Answer (1)

Sol.



Let AB = a

area ABCD = a^2

$PQ = \sqrt{\left(\frac{a}{2}\right)^2 + \left(\frac{a}{2}\right)^2} = \sqrt{\frac{a^2}{2}} = \frac{a}{\sqrt{2}}$

$PQRS = \frac{a^2}{2}$

$\text{Ratio Ratio} = \frac{a^2}{2}\frac{1}{a^2} = \frac{1}{2}$

1:2

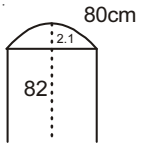
99. The volume of a burette of height 82.1cm obtained by attaching a hemisphereical nob on one side of a cylinder of height 80cm is

(1) 1.1 Lt. (2) 1.0 Lt.

(3) 1.2 Lt. (4) 1.4 Lt.

Answer (1)

Sol.



$\text{Volume } = \pi \times (2.1)^2 \times 80 + \frac{2}{3}\pi(2.1)^3$

$= 1.10$

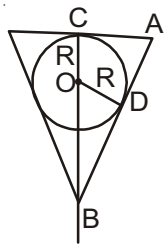
100. A conical vessel of radius 6cm and height 8cm is respectively filled with water. A metal sphere is lowered into the water. The size of the sphere is such that when it touches the inner surface, it just gets immersed. Then, the fraction of water that overflows from the conical vessel is

(1) $\frac{3}{8}$ (2) $\frac{5}{8}$

(3) $\frac{7}{8}$ (4) $\frac{5}{16}$

Answer (1)

Sol.



BC = 8 cm AC = 6cm

OC = OD = R AD = 6cm

BD = AB - AD

= 10 - 6

= 4 cm

$BO^2 = OD^2 + BD^2$

$(8-R)^2 = R^2 + 4^2$

$\Rightarrow R = 3$ cm

fraction of the volume $= \frac{\frac{4}{3}\pi R^3}{\frac{1}{3}\pi r^2 h}$

$= \frac{4\times 3^3}{6^2\times 8}$

$= \frac{3}{8}$

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