



Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

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Answers & Solutions *for* NTSE (Stage-I) 2018-19

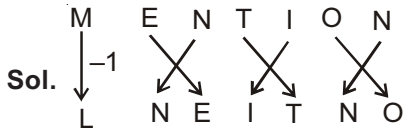
INSTRUCTIONS TO CANDIDATES

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.

PART-I : MENTAL ABILITY TEST (MAT)

1. In a certain code, MENTION is written a LNEITNO.
How is PATTERN Written in that code?
(1) APTTREM (2) PTAETNR
(3) OTAETNR (4) OTAETRN

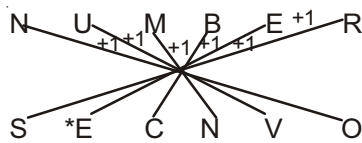
Answer (3)



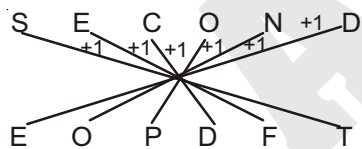
2. In a certain code language, the word NUMBER is written 'SECNVO'. How will the word 'SECOND' be written in that language?
(1) EPOEGH (2) EOPDFT
(3) OPETFD (4) TEFDPQE

Answer (2)

Sol. EOPDFT

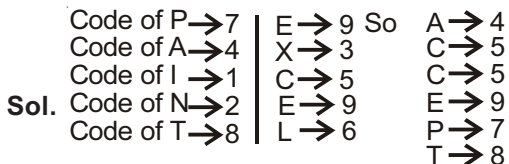


*Instead of E it should be F



3. If PAINT is code as 74128 and EXCEL is coded as 93596, then would you code ACCEPT?
(1) 455978 (2) 547978
(3) 554978 (4) 735961

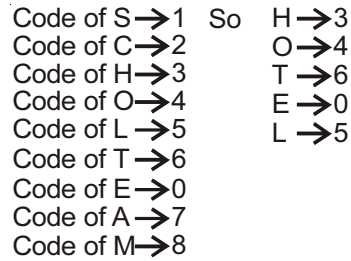
Answer (1)



4. In a certain code, if SCHOOL is coded as 123445, TEAM as 6078, how is HOTEL coded in that code?
(1) 34785 (2) 60734
(3) 43605 (4) 34605

Answer (4)

Sol.



5. Which number would replace question mark in the series 7, 12, 19, ?, 39
(1) 29
(2) 28
(3) 26
(4) 24

Answer (2)



6. Which fraction comes next in the sequence 1/2, 3/4, 5/8, 7/6?
(1) 9/32
(2) 10/17
(3) 11/34
(4) 12/35

Answer (1)

Sol. Printing mistake

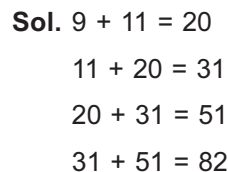
$$\frac{1}{2}, \frac{3}{4}, \frac{5}{8}, \frac{7}{6}, ? \quad * = \text{instead of } 6, \text{ it should be } = 16$$

Numerator = 1, 3, 5, 7, ? = 9

Donominator = 2, 4, 8, 16, ? = 32

7. Find the missing number in the given series:
9, 11, 20, 31, _____ 82.
(1) 41 (2) 60
(3) 51 (4) 71

Answer (3)



Directions (Q.8 to Q10) : Study the following number series to answer the given question.

2, 6, 7, 5, 4, 3, 7, 4, 8, 9, 4, 8, 9, 4, 3, 2, 5, 4, 7, 9, 8, 6, 8, 7, 1, 2, 5, 3, 7, 6, 8, 9, 3, 6

8. How many 7s are there in the series which are immediately precede by an even number and immediately followed by an odd number?

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

Answer (3)

Sol. (6,7,5) , (4,7,9) , (8, 7,1)

9. Which of the following will not be number of the series 1, 8, 27, 64, 125, _____

- (1) 256
- (2) 512
- (3) 729
- (4) 1000

Answer (1)

Sol. 1, 8, 27, 64,

It is a series of cube of natural no's.

$$512 = 8^3$$

$$729 = 9^3$$

$$1000 = 10^3$$

but 256 is not perfect cube of any natural no.

10. How many such number are there in the series which are immediately followed by its multiple?

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

Answer (3)

Sol. (2, 6) , (4,8) , (4,8) , (1,2) , (3,6).

11. Which term comes next in the series? YEB, WFD, UHG, SKI, _____

- (1) QGL
- (2) TOL
- (3) QOL
- (4) QNL

Answer (3)

Sol. Y E B, W F D, U H G, S K I,

First letter of each term = Y, W, U, S, Q

Second letter of each term = $\underbrace{E, F, H, K, O}_{+1 \ +2 \ +3 \ +4}$

Third letter of each term = $\underbrace{B, D, G, I, L}_{+2 \ +3 \ +2 \ +3}$

So, last term is QOL

12. Pointing towards a person in a photograph, Anjali said, "He is the only son of the father of my sister's brother". How is the person related to Anjali?

- (1) Mother
- (2) Father
- (3) Maternal Uncle
- (4) Brother

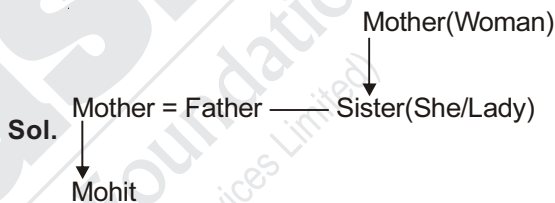
Answer (4)



13. Pointing out to a lady, Mohit said, "she is the daughter of the woman who is the mother of the husband of my mother". Who is the lady to Mohit?

- (1) Aunt
- (2) Grand Daughter
- (3) Daughter
- (4) Sister

Answer (1)



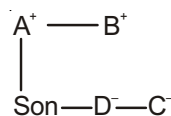
14. A and B are brother C and D are sister. A's son is D's brother. How is B related to C?

- (1) Father
- (2) Brother
- (3) Grand Father
- (4) Uncle

Answer (4)

Sol. Positive sign represents male and negative sign represent female

ACC to question, B is uncle of C

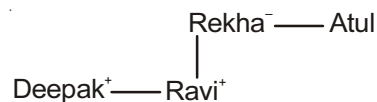


15. Deepak is brother of Ravi. Rekha is sister of Atul, Ravi is son of Rekha. How is Deepak related to Rekha?

- (1) Son
- (2) Brother
- (3) Nehpew
- (4) Father

Answer (1)

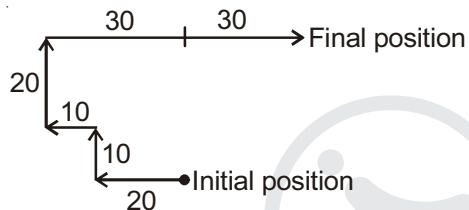
Sol. Positive sign represents male and negative sign represent female



16. I am facing south. I turn right and walk 20 metre. Then I turn right again and walk 10 metre. Then I turn left and walk 10 metre and then turning right walk 20 metre. Then I turn right again and walk 60 metre. In which direction am I from the starting point?
- (1) North-West
 - (2) North-East
 - (3) North
 - (4) West

Answer (2)

Sol. According to question, I will be in North-East direction



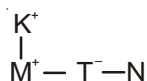
Directions (Q17 to Q19): Study the following information carefully and answer the questions given below:

- 'P\$Q' means 'P is father of Q'.
- 'P\$Q' means 'P is son of Q'.
- 'P@Q' means 'P is sister of Q'.
- 'P%Q' means 'P is wife of Q'.
- 'P&Q' means 'P is husband of Q'.

17. In the expression 'M+K\$T@N' how is M related to N?
- (1) Sister
 - (2) Cousin
 - (3) Brother
 - (4) Paternal Uncle

Answer (3)

Sol. Positive sign represents male and negative sign represent female



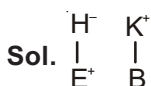
18. Which of the following expression represents the relation V is mother of D?
- (1) V%Q@R\$D
 - (2) D+T@J\$V
 - (3) V%Q\$R@D
 - (4) V@F\$D%M

Answer (3)

Sol. $V\%Q\$R@D \Rightarrow$

19. In the expression 'E+H@K\$B' how is B related to E?
- (1) Brother
 - (2) Sister
 - (3) Cousin
 - (4) Can't be determined

Answer (3)



20. Rajeev is facing west. He turns 45 degree in the clockwise direction and then another 180 degree in the same direction and then 270 degree in the anticlockwise direction. Find which direction he is facing now?
- (1) South
 - (2) West
 - (3) Southe-West
 - (4) South-East

Answer (3)

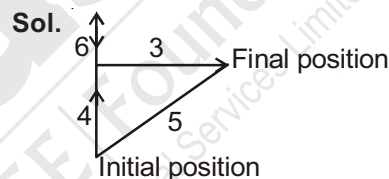
Sol. Clockwise $\rightarrow 45 + 180 = 225$

Anticlockwise $\rightarrow 270$

So, rajeev is turning anticlockwise direction by $45^\circ(270-225)$

21. Rohit walks 10 km towards North. From there he walks 6km towards South. Then, he walks 3km towards east. How far and in which direction is he with reference to his starting point?
- (1) 3 km South
 - (2) 4 km East
 - (3) 5 km South
 - (4) 5km North-East

Answer (4)

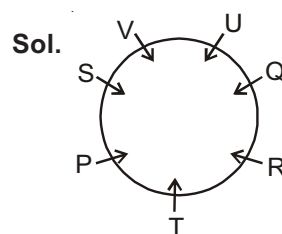


Directions (Q22-Q25) : Study the information and answer the questions given:

Seven people -P, Q, R, S, T, U and V are sitting in a circle facing the centre. P is between T and S. U is between Q and V. Q is 2nd to the right of T.

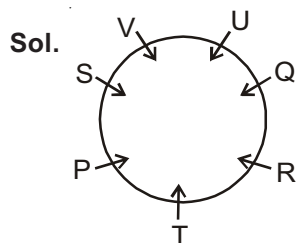
22. V is sitting
- (1) Between P and U
 - (2) to the immdiate left to U
 - (3) 2nd to the left of P
 - (4) 4th to the left of T

Answer (3)



23. Who is sitting in the immediate left of R?
- (1) T
 - (2) S
 - (3) U
 - (4) V

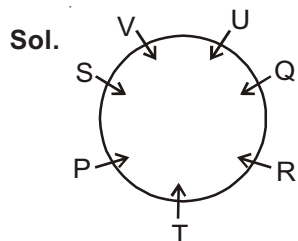
Answer (1)



24. Which pair amongst the following are not immediate neighbours?

- (1) TR
- (2) SP
- (3) VU
- (4) SQ

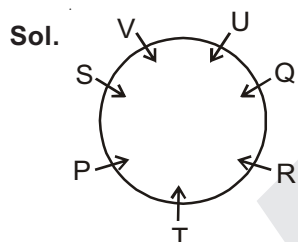
Answer (4)



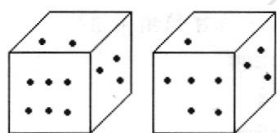
25. What is the position of S with respect to U?

- (1) 2nd to the right
- (2) 3rd to the left
- (3) Immediate left
- (4) Immediate right

Answer (1)



26. Two positions of dice are shown below. How many points will be on the top when 2 points are at the bottom?

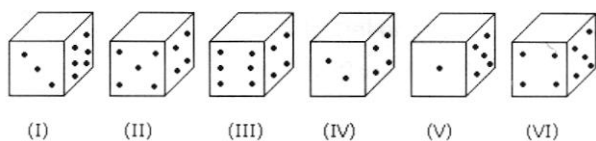


- (1) 6
- (2) 1
- (3) 4
- (4) 5

Answer (2)

Directions (Q27 to Q30) : Study the information and answer the questions given:

Six dice with upper faces erased are as shows. The sum of the numbers of dots on the opposite face of each dice is 7.



27. If even numbered (ii, iv, vi) dice have even number of dots on their top faces, then what would be the total number of dots on the top faces of their dice?

- (1) 12
- (2) 14
- (3) 24
- (4) 18

Answer (4)

Sol. Ist figure → 2 & 5 are opposite

IInd figure → 1 & 6 are opposite

IIIrd figure → 2 & 5 are opposite

IVth figure → 1 & 6 are opposite

Vth figure → 3 & 4 are opposite

VIst figure → 1 & 6 are opposite

28. If the odd numbered dice have even number of dots on their top faces, then what would be the total number of dots on the top faces of their dice?

- (1) 8
- (2) 10
- (3) 12
- (4) 14

Answer (1)

Sol. The total number of dots on the top faces of their dice is equal to $2 + 2 + 4 = 8$

29. If dice (I), (II) and (III) have even number of dots on their bottom faces and the dice (IV), (V) and (VI) have odd number of dots on their top faces, then what would be the difference in the total number of top faces between these two sets?

- (1) 2
- (2) 4
- (3) 6
- (4) 0

Answer (3)

Sol. The difference in the total number of top faces between these two sets is equal to

$$(5 + 1 + 5) - (1 + 3 + 1) = 11 - 5 = 6$$

30. If the even numbers of dice have odd number of dots on their top faces and odd numbered dice have even of dots on their bottom faces, then what would be the total number of dots on their top faces?

- (1) 14
- (2) 18
- (3) 16
- (4) 12

Answer (3)

Sol. The total number of dots on their top faces is equal to $1 + 1 + 1 + 5 + 5 + 3 = 16$

Directions (Q31 & Q32) : In each question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusion and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

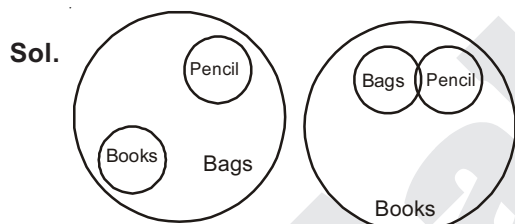
31. **Statements:** All bags are books. All pencils are books.

Conclusions:

- I. some pencils are bags.
- II. No pencil is bag.

- (1) Only conclusion I follows
- (2) Only conclusion II follows
- (3) Either I or II follows
- (4) Either I nor II follows

Answer (3)



32. **Statements:** All mangoes are golden in colour.

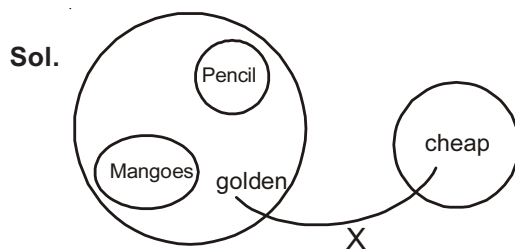
No golden-coloured things are cheap.

Conclusions:

- I. All mangoes are cheap.
- II. Golden-coloured mangoes are not cheap.

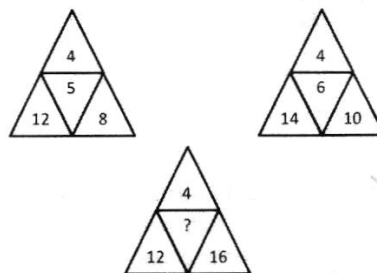
- (1) Only conclusion I follows
- (2) Only conclusion II follows
- (3) Either I or II follows
- (4) Neither I nor II follows

Answer (2)



Directions (Q33 to Q38): There is a question mark in empty cell. Find out the correct alternative?

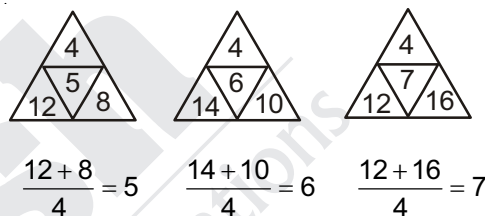
33.



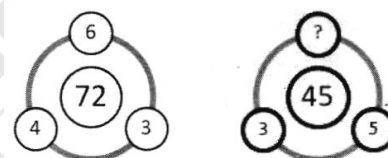
- (1) 7
- (2) 8
- (3) 3
- (4) 9

Answer (1)

Sol.



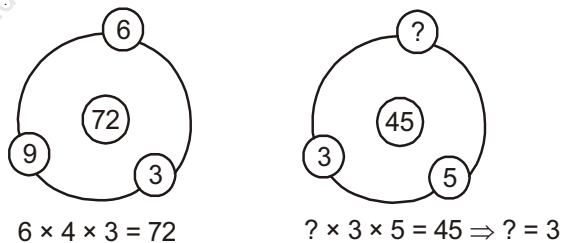
34.



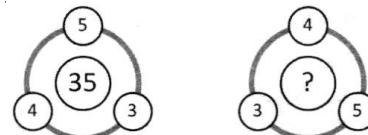
- (1) 2
- (2) 4
- (3) 3
- (4) 5

Answer (3)

Sol.

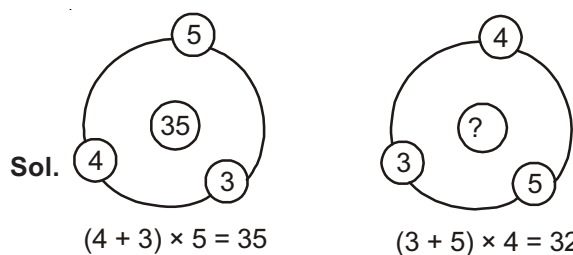


35.



- (1) 23
- (2) 12
- (3) 60
- (4) 32

Answer (4)



36.

61	
4	5

?	
6	7
- (1) 128 (2) 71
(3) 127 (4) 89

Answer (3)

- Sol.**

61	
4	5

?	
6	7
- $5^3 - 4^3 = 61$ $7^3 - 6^3 = 343 - 216 = 127$

37.

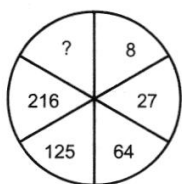
5	15	8
	6	

3	?	6
	4	
- (1) 12 (2) 18
(3) 9 (4) 10

Answer (3)

- Sol.** $(8 - 5) \times \frac{4+6}{2} = 15$
- $(6 - 3) \times \frac{2+4}{2} = 9$

38. Find the missing character (?) in the following diagram.

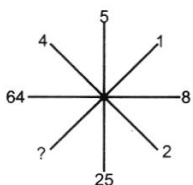


- (1) 4 (2) 305
(3) 343 (4) 729

Answer (3)

- Sol.**

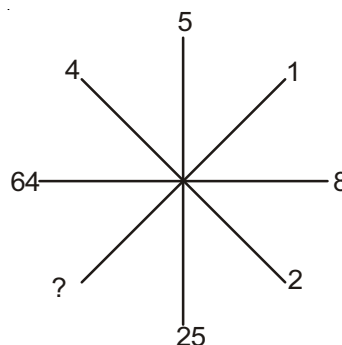
39. Find the missing character (?) in the following diagram.



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

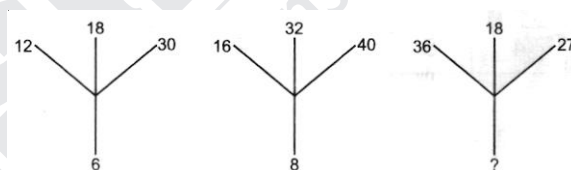
Answer (1)

Sol.



- Opposite of 5 is $5^2 = 25$
Opposite of 8 is $8^2 = 64$
Opposite of 2 is $2^2 = 4$
Opposite of 1 is $1^2 = 1$

40. Find the missing character in the following (?) figure such that it follows rule



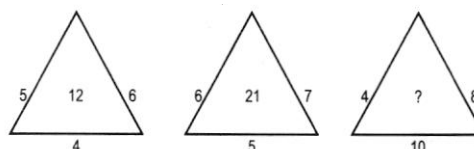
- (1) 18 (2) 12
(3) 9 (4) 6

Answer (3)

Sol.

- $HCF(12, 18, 30) = 6$
- $HCF(16, 32, 40) = 8$
- $HCF(36, 18, 27) = 9$

41. Find the missing character (?) in the following figure such that it follows rule



- (1) 14 (2) 22
(3) 32 (4) 320

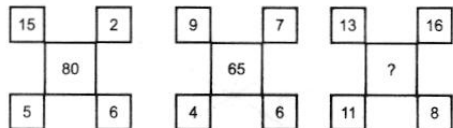
Answer (3)

Sol. $\frac{5 \times 4 \times 6}{10} = \frac{120}{10} = 12$

$\frac{6 \times 5 \times 7}{10} = \frac{210}{10} = 21$

$\frac{4 \times 10 \times 8}{10} = \frac{320}{10} = 32$

42. Find the missing character (?) in the following figure such that it follows rule



(1) 48

(2) 72

(3) 35

(4) 120

Answer (1)

Sol. $15 - 5 = 10$

$13 - 11 = 2$

$2 + 6 = 8$

$= 24$

$10 \times 8 = 80$

$= 48$

$$\left| \begin{array}{l} 9 - 4 = 5 \\ 7 + 6 = 13 \end{array} \right| \quad \left| \begin{array}{l} 16 + 8 \\ 5 \times 13 = 65 \end{array} \right| \quad \left| \begin{array}{l} 24 \times 2 \\ 24 \times 2 \end{array} \right|$$

Directions (Q43 to Q50) : There is a series provided to you where a gap is left. Analyze the series and fill the gap

43. 5, 8, 28, 162, _____, 12870

(1) 1738

(2) 2318

(3) 1288

(4) 2224

Answer (3)

Sol. 5, 8, 28, 162, _____, 12870

$5 \times 2 - 2 = 8$

$8 \times 4 - 4 = 28$

$28 \times 6 - 6 = 162$

$162 \times 8 - 8 = 1288$

$1288 \times 10 - 10 = 12870$

44. abb_baa_a_bab_aba

(1) abba

(2) abab

(3) ccac

(4) aabb

Answer (1)

Sol. abba/baab/abba/baab/a

45. J99, H63, _____, D15, B3

(1) E23

(2) F35

(3) F31

(4) D33

Answer (2)

Sol. J99, H63, _____, D15, B3

$\overset{-2}{\text{J99}}, \overset{-2}{\text{H63}}, \overset{-2}{\text{F35}}, \overset{-2}{\text{D15}}, \text{B3}$

Position of J in english alphabet is 10

so $10^2 - 1 = 99$, J99

similarly position of F in english alphabet is 6

so $6^2 - 1 = 35$, F35

46. 0.15, 0.3, _____, 1.2, 2.4

(1) 4.8

(2) 0.0006

(3) 0.6

(4) 0.9

Answer (3)

Sol. Number $\times 2$

47. 2, 3, 5, 7, 11, _____, 17

(1) 12

(2) 13

(3) 14

(4) 15

Answer (2)

Sol. Prime number series

48. 8, 43, 11, 41, _____, 39, 17

(1) 43

(2) 37

(3) 14

(4) 19

Answer (3)

$\overset{+3}{8}, \overset{+3}{43}, \overset{+3}{11}, \overset{+3}{41}, 14, 39, 17$

Sol.

$\overset{-2}{14}, \overset{-2}{39}$

49. 6, 11, 21, 36, 56, _____

(1) 42

(2) 51

(3) 81

(4) 91

Answer (3)

Sol. 6, 11, 21, 36, 56

$\overset{+5}{6}, \overset{+10}{11}, \overset{+15}{21}, \overset{+20}{36}, \overset{+25}{56}, 81$

50. 210, 209, 213, 186, 202, _____

(1) 77

(2) 177

(3) 138

(4) 200

Answer (1)

Sol. 210, 209, 213, 186, 202

$210 - (1)^3 = 209$

$209 + (2)^2 = 213$

$213 - (3)^3 = 186$

$186 + (4)^2 = 202$

$\therefore (202) - (5)^3 = 77$

Directions (Q51 & Q52) : There is a series provided to you where one of the entry is wrong. Analyze the series and find the wrong entry.

51. 2, 12, 38, 80, 150, 252, 392

- (1) 392 (2) 2
(3) 38 (4) 150

Answer (3)

Sol. Use relation $n^3 + n^2$

so first term $1^3 + 1^2 = 2$

$2^3 + 2^2 = 12$

similarly $3^3 + 3^2 = 36$

52. 0, 6, 24, 60, 95, 210, 336

- (1) 210 (2) 336
(3) 120 (4) 95

Answer (4)

Sol. 0, 6, 24, 60, 95, 210, 336

$$\begin{aligned} +2 \left\{ \begin{array}{l} 0 \times 1 \\ 2 \times 3 \end{array} \right\} + 2 &= 0 \\ +2 \left\{ \begin{array}{l} 4 \times 6 \\ 6 \times 10 \end{array} \right\} + 3 &= 6 \\ +2 \left\{ \begin{array}{l} 8 \times 15 \\ 10 \times 21 \end{array} \right\} + 4 &= 24 \\ +2 \left\{ \begin{array}{l} 12 \times 28 \end{array} \right\} + 5 &= 60 \\ +2 \left\{ \begin{array}{l} 16 \times 36 \end{array} \right\} + 6 &= 120 \\ +2 \left\{ \begin{array}{l} 20 \times 45 \end{array} \right\} + 7 &= 210 \\ +2 \left\{ \begin{array}{l} 24 \times 56 \end{array} \right\} + 8 &= 336 \end{aligned}$$

Directions (Q53 to 57) : In following question in certain code language if '+' means 'x', '-' means '+', 'x' means '÷' and '÷' means '-', then answer the following question.

53. $16 + 2 - 3 \div 4 = ?$

- (1) 31 (2) 26
(3) 15 (4) None of these

Answer (1)

Sol. $+ \rightarrow X$

$- \rightarrow +$

$\times \rightarrow \div$

$\div \rightarrow -$

$\therefore 16 + 2 - 3 \div 4$

means

$16 \times 2 + 3 - 4$

$= 32 + 3 - 4$

$= 31$

54. $9+3 \div 18 \times 3+4=?$

- (1) 30 (2) 3
(3) 13 (4) 0

Answer (2)

Sol. $9 \times 3 - 18 \div 3 \times 4$

$= 27 - 6 \times 4$

$= 27 - 24 = 3$

55. $28 \div 36 - 49 \times 7 + 2 = ?$

- (1) 12 (2) 10
(3) 8 (4) 6

Answer (4)

Sol. $28 \div 36 - 49 \times 7 + 2$ will mean

$28 - 36 + 49 \div 7 \times 2$

$= 28 - 36 + 7 \times 2$

$= 6$

56. $171 \times 57 \div 279 \times 93$

- (1) 250 (2) 253
(3) 252 (4) 0

Answer (4)

Sol. $171 \times 57 \div 279 \times 93$ will mean

$171 \div 57 - 279 \div 93$

$= 3 - 3$

$= 0$

57. $8 \div 6 - 9 \times 12 + 4$

- (1) 5 (2) 7
(3) 9 (4) 13

Answer (1)

Sol. $8 \div 6 - 9 \times 12 + 4$ will mean

$8 - 6 + 9 \div 12 \times 4$

$= 2 + \frac{3}{4} \times 4$

$= 2 + 3$

$= 5$

58. When $12 + 10 = 1205$, $11+8=885$, $16+15 = ?$

- (1) 2405 (2) 105
(3) 1025 (4) 130

Answer (1)

Sol. $12 \times 10 = 120 : 1205$

$11 \times 8 = 88 : 885$

$16 \times 15 = 240 : 2405$

Directions (Q.59 & Q.60) : In these questions, find the missing number in the number pattern.

59. 268 [29] 210

218 [?] 166

- (1) 42 (2) 25
(3) 26 (4) 29

Answer (3)

Sol. $\frac{268 - 210}{2} = \frac{58}{2} = 29$

$\frac{218 - 166}{2} = \frac{52}{2} = 26$

60.

8	3	21
6	5	25
12	2	?

- (1) 24 (2) 19
(3) 22 (4) 20

Answer (3)

Sol. $8 \times 3 - 3 = 21$

$6 \times 5 - 5 = 25$

$12 \times 2 - 2 = 22$

Directions (Q.61 to Q. 63) : In these questions select the related number from the given options

61. $9 : 80 :: 100 : ?$

- (1) 901 (2) 1009
(3) 9889 (4) 9999

Answer (4)

Sol. $9 : 80$

$(9 \times 9) - 1$ gives 80

similarly $(100 \times 100) - 1$ will give 9999

62. $2 : 3 :: 23 : ?$

- (1) 25 (2) 28
(3) 46 (4) 29

Answer (4)

Sol. $2 : 3$

3 is the next prime number after 2

Similarly 29 is next prime number after 23

63. $2 : 12 :: 8 : ?$

- (1) 18 (2) 128
(3) 396 (4) 576

Answer (4)

Sol. $2 : 12$

$2^2 \times (2 + 1) = 12$

$\therefore 8^2 \times (8 + 1) = 64 \times 9$
 $= 576$

Directions (Q.64 to 68) : Study the following information carefully and answer the questions that follow:

Madhu and Shobha are good in Dramatics and Computer science. Anjali and Madhu are good in Computer Science and Physics. Anjali, Poonam and Nisha are good in Physics and History. Nisha and Anjali are good in Physics and Mathematics. Poonam and Shobha are good in History and Dramatics.

64. Who is good in Computer Science, History and Dramatics?

- (1) Anjali (2) Madhu
(3) Shobha (4) Nisha

Answer (3)

For Q.64 to Q.68

Sol.

	Dramatics	Computer science	Physics	History	Mathematics
Madhu	✓	✓	✓		
Shobha	✓	✓		✓	
Anjali		✓	✓	✓	✓
Poonam	✓		✓	✓	
Nisha			✓	✓	✓

65. Who is good in Physics, Dramatics and Computer Science?

- (1) Shobha (2) Poonam
(3) Madhu (4) Anjali

Answer (3)

Sol. Madhu is good in Physics, Dramatics and Computer Science.

66. Who are good in Physics, History and Dramatics?

- (1) Poonam (2) Shobha
(3) Madhu (4) Anjali

Answer (1)

Sol. Poonam is good in Physics, History and Dramatics.

67. Who is good in History, Physics, Computer Science and Mathematics?

- (1) Poonam
(2) Nisha
(3) Madhu
(4) Anjali

Answer (4)

Sol. Anjali is good in History, Physics, Computer Science and Mathematics.

68. Who is good in Physics, History, Mathematics but not in computer Science?

- (1) Madhu (2) Poonam
(3) Nisha (4) Anjali

Answer (3)

Sol. Nisha is good in Physics, History, Mathematics but not in computer Science.

Directions (Q.69 to Q.71) : In these question four option are given in each question out of which only one is correctly spelt. Find the correctly spelt word.

69. (1) Apparrel (2) Aparell
(3) Aparel (4) Apparel

Answer (4)

Sol. Apparel

70. (1) Commissioner (2) Commissionar
(3) Comissioner (4) Commissionor

Answer (1)

Sol. Commissioner

71.

- (1) Etiquete (2) Etiquette
(3) Ettiquet (4) Ettiquette

Answer (2)

Sol. Etiquette

72. Which of the following is the same as wrestling, Karate, Boxing?

- (1) Swimming (2) Polo
(3) Ploe vault (4) Judo

Answer (4)

Sol. Judo

73. Which of the following is the same as Canoe, Raft, Wangan?

- (1) Dinghy (2) Shallot
(3) Canopy (4) Submarine

Answer (1)

Sol. Dinghy

Directions (Q.74 to Q.78) : The numbered cells in the square below have been filled with letters, the columns and the rows are identified by the numbers 0 to 9. A letter in a cell is represented first by its column number and then by its row number e.g. G in column 3 and row 1 is represented by 31. In each of the followign questions a word has been given which is represented by one of the four correc alternatives.

	0	1	2	3	4	5	6	7	8	9
0	1	L	B	P	K	N	H	S	A	E
1	M	A	Q	G	T	V	I	O	N	U
2	H	R	W	J	A	X	B	E	C	I
3	T	Y	A	I	U	U	O	N	J	F
4	F	O	B	M	E	G	U	K	W	R
5	A	C	L	J	X	R	A	A	X	T
6	P	S	U	E	Z	K	V	W	D	L
7	Z	D	Y	V	F	O	H	Y	I	O
8	M	I	Z	Q	E	A	U	E	I	S
9	P	E	O	D	E	U	Q	O	C	G

74. MIND

- (1) 01, 61, 73, 36 (2) 08, 61, 55, 44
(3) 34, 33, 50, 17 (4) 73, 33, 61, 17

Answer (3)

Sol. 34, 33, 50, 17

75. JAIL

- (1) 32, 05, 25, 44 (2) 32, 05, 87, 96
(3) 35, 23, 26, 33 (4) 83, 65, 25, 44

Answer (2)

Sol. 32, 05, 87, 96

76. BLOT

- (1) 20, 10, 71, 22
(2) 24, 10, 26, 48
(3) 34, 35, 63, 03
(4) 62, 25, 57, 95

Answer (4)

Sol. 62, 25, 57, 95

77. JOKE

- (1) 32, 14, 56, 44
(2) 35, 14, 37, 78
(3) 86, 63, 40, 59
(4) 83, 71, 25, 36

Answer (1)

Sol. 32, 14, 56, 44

78. OMIT

- (1) 14, 34, 88, 95
(2) 63, 44, 88, 03
(3) 79, 09, 61, 41
(4) 97, 34, 62, 95

Answer (1)

Sol. 14, 34, 88, 95

Directions: (Q.79 to Q.83) : Study each of the following tables and choose the alternative which can best replace the sign of interrogation(?)

79.

3	8	10	2	?	1
6	56	90	2	20	0

- (1) 0 (2) 3
 (3) 5 (4) 7

Answer (3)

Sol. $3^2 - 3 = 6$

$8^2 - 8 = 56$

$10^2 - 10 = 90$

$2^2 - 2 = 2$

$\therefore 5^2 - 5 = 20$

80.

1	2	3	2	10	12
2	5	12	10	16	13
1	2	1	?	10	24

- (1) 5 (2) 11
 (3) 13 (4) 8

Answer (3)

Sol. $1 + 2 + 1 = 2^2$

$2 + 5 + 2 = 3^2$

$3 + 12 + 1 = 4^2$

$2 + 10 + ? = 5^2$

$\therefore ? = 13$

81.

963	2	844
464	?	903

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

Answer (2)

Sol. $963 \Rightarrow 9 + 6 + 3 = 18$

$844 \Rightarrow 8 + 4 + 4 = 16$

$18 - 16 = 2$

similarly $464 \Rightarrow 4 + 6 + 4 = 14$

$903 \Rightarrow 9 + 0 + 3 = 12$

$14 - 12 = 2$

82.

1	2	3
11	7	5
120	45	?

- (1) 19 (2) 17
 (3) 16 (4) 15

Answer (3)

Sol. $(11-1)(11+1) = 120$

$(7-2)(7+2) = 45$

$\therefore (5-3)(5+3) = 16$

83.

15			4
	33		
		27	
			2
	36		2
		8	
	32	X	
	18	9	
	22	11	
	12	3	

- (1) 3 (2) 4
 (3) 8 (4) 12

Answer (2)

Sol. $12 + 3 = 15$

$22 + 11 = 33$

$18 + 9 = 27$

$32 + x = 36 \Rightarrow x = 4$

Directions: (Ques. 84-86) In each of the following questions four words have been given each of which three are alike in some manner and the fourth one is different. Choose out the odd one

84.

- (1) Apple (2) Mango
 (3) Watermelon (4) Gauva

Answer (3)

Sol. Watermelon

85. (1) Microscope (2) Telescope
 (3) Periscope (4) Setethoscope

Answer (4)

Sol. Setethoscope

86. (1) Commander (2) Commodore
 (3) Brigadier (4) Admiral

Answer (3)

Sol. Brigadier

Direction: (Ques. 87-90) In each of the following questions series of number / alphabets is given with term/terms missing. Choose the correct alternative that will continue the same pattern and fill in the blank space

87. $\frac{4}{9}, \frac{9}{20}, (\dots), \frac{39}{86}$

- (1) $\frac{17}{40}$ (2) $\frac{19}{42}$
 (3) $\frac{20}{45}$ (4) $\frac{29}{53}$

Answer (2)

Sol.
$$\frac{\overset{\times 2+1}{4} \overset{\times 2+1}{9} \overset{\times 2+1}{19} \overset{\times 2+1}{39}}{\underset{\times 2+2}{9} \underset{\times 2+2}{20} \underset{\times 2+2}{42} \underset{\times 2+2}{86}}$$

88. $\frac{2}{\sqrt{5}}, \frac{3}{5}, \frac{4}{5\sqrt{5}}, \frac{5}{25}, (\dots)$

(1) $\frac{6}{5\sqrt{5}}$

(2) $\frac{6}{25\sqrt{5}}$

(3) $\frac{6}{125}$

(4) $\frac{7}{25}$

Answer (2)

Sol. Numerator is getting increased by 1 in each term and denominator is getting multiplied by $\sqrt{5}$

\therefore next term will be $\frac{6}{25\sqrt{5}}$

89. 0, 2, 3, 5, 8, 10, 15, 17, 24, 26, (.....)

(1) 35

(2) 32

(3) 30

(4) 28

Answer (1)

Sol.
$$0 \overset{+2}{\rightarrow} 2 \overset{+1}{\rightarrow} 3 \overset{+2}{\rightarrow} 5 \overset{+3}{\rightarrow} 8 \overset{+2}{\rightarrow} 10 \overset{+5}{\rightarrow} 15 \overset{+2}{\rightarrow} 17 \overset{+7}{\rightarrow} 24 \overset{+2}{\rightarrow} 26 \overset{+9}{\rightarrow} 35$$

90. P3C, R5F, T8I, V12L, (.....)

(1) Y 17 O

(2) X 17 M

(3) X 17 O

(4) X 16 O

Answer (3)

Sol.
$$\begin{array}{l} +2 \left\{ \begin{array}{l} P \\ R \\ T \\ V \\ X \end{array} \right. \quad +2 \left\{ \begin{array}{l} 3 \\ 5 \\ 8 \\ 12 \\ 17 \end{array} \right. \quad +3 \left\{ \begin{array}{l} C \\ F \\ I \\ L \\ O \end{array} \right. \end{array}$$

91. A man is facing north-west. He turns 90° in the clockwise direction and then 135° in the anticlockwise direction. Which direction is he facing now

(1) East

(2) West

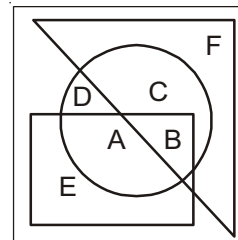
(3) North

(4) South

Answer (2)

Sol. West

92. Which one of the following statements is correct with regard to the given figure



(1) A and B are in all the three shapes

(2) E, A, B, C are in all the three shapes

(3) F, C, D, B, A are in all the three shapes

(4) Only B is in all the three shapes

Answer (4)

Sol. Only B is in all the three shapes

93. Arrange the following given names in the appropriate order based on the telephone directory (telephone directory) and select the correct order

(1) Avdesh (2) Avadhesh

(3) Awadesh (4) Awadhesh

(1) 2, 3, 4, 1

(2) 2, 1, 3, 4

(3) 1, 2, 3, 4

(4) 2, 1, 4, 3

Answer (2)

Sol. 2, 1, 3, 4

Directions: (Que. 94 to 95) are based on the following alphabet series

A B C D E F G H I J K L M N O P Q R S T U V
W X Y Z

94. Which letter is exactly midway between H and S in the given alphabet series

(1) L

(2) M

(3) N

(4) No such letter

Answer (4)

Sol. No such letter

95. Which letter is midway between 22nd letter from the left and 21st letter from the right

(1) L

(2) M

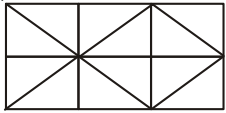
(3) N

(4) O

Answer (3)

Sol. N

96. How many squares does the given figure have?

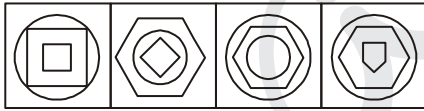
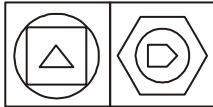


- (1) 6 (2) 7
(3) 9 (4) 10

Answer (3)

Directions (Q.97) : In the following questions there are two problem figures followed by the answer figures labelled as A, B, C and D. The two problem figures have some common characteristics/features. Select the answer figure which has the same commonality.

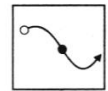
97.



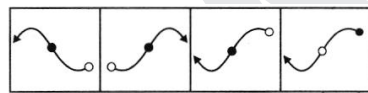
- (1) C (2) D
(3) A (4) B

Answer (2)

98. Choose the correct mirror-image of the figure (x) from amongst the four alternatives A, B, C and D



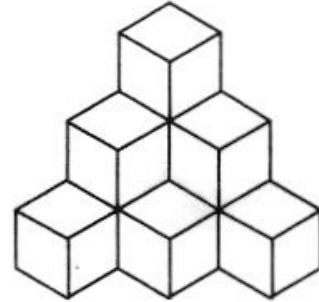
X



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

Answer (3)

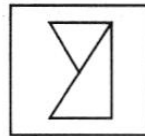
99. How many cubes are there in the following figures?



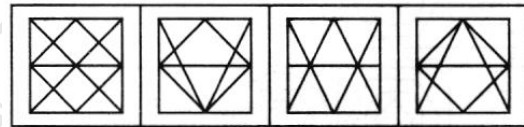
- (1) 11
(2) 10
(3) 7
(4) 6

Answer (2)

100. You are given a figure (x) followed by four figures 1, 2, 3 and 4 such that (x) is embedded in one of them. Trace out the correct alternative



X



- (1) A
(2) B
(3) C
(4) D

Answer (3)



PAPER-II : SCHOLASTIC APTITUDE TEST (SAT)

1. A cell is having two boundaries, the outer being cell wall and the inner being plasma membrane. The inherent property of this pair moving from outside to inside is:

- (1) Semi-permeable and Permeable
- (2) Semi-permeable and Semi-permeable
- (3) Permeable and Semi-permeable
- (4) Permeable and Permeable

Answer (3)

Sol. The outer boundary of cell is cell wall, which is fully permeable and inner boundary is plasma membrane which is semi-permeable

2. The process of osmosis is the movement across the cell membrane of :

- (1) Salts from a hypotonic solution to hypertonic solution
- (2) Salts from a hypertonic solution to hypotonic solution
- (3) Water from a hypotonic solution to hypertonic solution
- (4) Water from a hypertonic solution to hypotonic solution

Answer (3)

Sol. Osmosis is the movement of solvent from high concentration to low concentration through semi-permeable membrane, so water movement from a hypotonic solution [contain more solvent] to hypertonic solution [contain less solvent] will takes place

3. A poorly developed zone in the center of a cell that has DNA molecule is called as :

- (1) Nucleolus of prokaryote
- (2) Nucleoid of prokaryote
- (3) Nucleus of prokaryote
- (4) Nucleus of eukaryote

Answer (2)

Sol. Undefined, poorly developed zone in the centre of Prokaryotic cell is nucleoid

4. In a practical laboratory, a student while observing the slide of tissue with the help of a microscope, found a bunch of cylindrical shaped cells having interconnections belong to the category of :

- | | |
|--------------------|---------------------|
| (1) Adipose tissue | (2) Heart muscle |
| (3) Smooth muscle | (4) Skeletal muscle |

Answer (2)

Sol. Cylindrical shaped, found in network (bunch) branched (interconnections) are Heart muscle

5. Pteridophyte plants can be better described as:

- (1) Non vascular, non seed producing
- (2) Vascular, non seed producing
- (3) Vascular seed producing
- (4) Nonvascular seed producing

Answer (2)

Sol. Pteridophytes are (cryptogams) i.e. with no seeds. Also they are vascular. So vascular and non-seed producing

6. If a potted plant and a dish containing potassium hydroxide are covered by a sealed container made up of glass are kept in sunlight for a week, what will happen:

- (1) Plant will grow taller
- (2) Leaf turn yellow due to no photosynthesis
- (3) Leaf turn green due to excess photosynthesis
- (4) Leaf turn yellow due to no oxygen in the jar

Answer (2)

Sol. As potassium hydroxide(KOH) absorb all CO_2 , so leaf turn yellow due to no photosynthesis

7. Rings of cartilage are present in the throat

- (1) To keep the throat erect
- (2) To produce the voice
- (3) To prevent the air passage from infection
- (4) To prevent air passage from collapse

Answer (4)

Sol. they are present to prevent air passage from collapse

8. The process of excretion involves a sequential arrangement of following organs:

- i. Urinary bladder
 - ii. Kidney
 - iii. Ureter
 - iv. Urethra
- | | |
|--------------------|--------------------|
| (1) i, iii, ii, iv | (2) ii, i, iii, iv |
| (3) ii, iv, iii, i | (4) ii, iii, i, iv |

Answer (4)

Sol. Sequence is : Kidney \rightarrow ureter \rightarrow urinary bladder

(ii) (iii) (i)

\rightarrow urethra

(iv)

9. The part of brain concerned with the precise voluntary muscle coordination is:

- (1) Cerebrum (2) Cerebellum
(3) Pons (4) Medulla oblongata

Answer (2)

Sol. For precision of voluntary muscle coordination is cerebellum

10. Sex determination in humans is due to the presence of :

- (1) Presence of X-chromosome in female
(2) Presence of only Y-chromosome in male
(3) Formation of two types of eggs by female
(4) Formation of two types of sperms by male

Answer (4)

Sol. Sex-determination is the mechanism by which we determine the sex of an individual. In human male (xy) is heterozygous which decides sex of child. So formation of two types of sperms by male is correct

11. The arms of humans, leg of horse, leg of a lizard and wing of birds are linked to each other because:

- (1) Structures having similar development but different functions
(2) Structures having similar function but different development
(3) Structures having similar development and different functions
(4) Structures having different development but different functions

Answer (1)

Sol. They all are homologous organs so structures having similar development but different functions is correct.

12. In one experiment showing Mendelian inheritance, a tall pea plant with purple flowers was crossed with short pea plant with white flower. All the progeny in the next generation was seen to have purple flowers but half of them were short. What will be the genetic makeup of tall parent:

- (1) TTPP (2) TtPP
(3) TTpp (4) TtPp

Answer (2)

Sol. As all flower are purple so genetic makeup of parent would be homozygous (pp) for flower colour and half are short and other half are tall genetic makeup for tall parent would be (Tt)

13. A solid cube of silver has a mass of 84g. What is the resistance between the opposite faces. Given that density of silver is 10.5 g/cm^3 and resistivity is

$$1.6 \times 10^{-4} \Omega \text{cm.}$$

- (1) $0.4 \times 10^{-4} \Omega$ (2) $0.8 \times 10^{-4} \Omega$
(3) $0.4 \times 10^{-8} \Omega$ (4) $0.8 \times 10^{-8} \Omega$

Answer (2)

Sol. Volume = $\frac{\text{mass}}{\text{density}}$

$$\therefore L^3 = \frac{84}{10.5}$$

$$\therefore L = 2 \text{cm}$$

$$R = \rho \frac{L}{A} = \rho \frac{L}{L^2} = \frac{\rho}{L}$$

$$= \frac{1.6 \times 10^{-4}}{2}$$

$$= 0.8 \times 10^{-4} \Omega$$

14. Farsighted people, who have lost their spectacles, can still read a book by looking through a small (3-4 mm) hole in a sheet of a panel because


- (1) Because the fine hole produces an image of the letters at a longer distance.
(2) Because in doing so, the distance of the object is increased.
(3) Because in doing so, the focal length of the eye lens is effectively decreased.
(4) Because in doing so, the focal length of the eye-lens is effectively increased.

Answer (3)

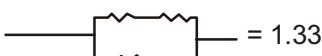
15. The equivalent resistance of network of three 2Ω resistors can not be

- (1) 0.67 (2) 2Ω
(3) 3Ω (4) 6Ω

Answer (2)

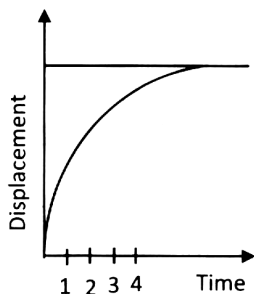
Sol.  = 6

 = 3

 = 1.33

 = $\frac{2}{3} = 0.67$

16. The displacement of body as a function of time is shown in figure. The figure indicates that



- (1) The body starts with a certain velocity, but the motion is retarded and finally the body stops.
- (2) The velocity of the body is constant throughout
- (3) The acceleration of the body is constant throughout
- (4) The body starts with a constant velocity, the body moves with another constant velocity.

Answer (1)

17. A bird is in a wire cage hanging from a spring balance. The reading of the balance is taken when the bird is flying about in the cage, and when the bird is at rest in the cage. The first reading will be

- (1) Much greater than the second
- (2) Greater than the second
- (3) Less than the second
- (4) Same as the second

Answer (3)

18. A concave mirror is placed on a table with its pole touching the table. The mirror is rotated about its principle axis in clockwise direction. The image of a person looking straight into it

- (1) Rotates in clockwise direction
- (2) Rotates in anti-clockwise direction
- (3) Is inverted
- (4) Does not rotate

Answer (4)

19. A man standing in a swimming pool looks at a stone lying at the bottom. The depth of the swimming pool is h . At what distance from the surface of water is the image of the stone formed? Take μ as refractive index of water.

- (1) h
- (2) μh
- (3) $\frac{h}{\mu}$
- (4) $\frac{\mu}{h}$

Answer (3)

Sol. $\mu = \frac{\text{real depth}}{\text{apparent depth}}$

$\therefore \text{Apparent depth} = \frac{\text{real depth}}{\mu} = \frac{h}{\mu}$

20. "Metal dishes" (Dish Antennas) are used for receiving TV signals from distant communication satellites. These 'Metal Dishes' are

- (1) Convex Reflectors
- (2) both convex and concave reflectors
- (3) Concave reflector
- (4) Convex refractors

Answer (3)

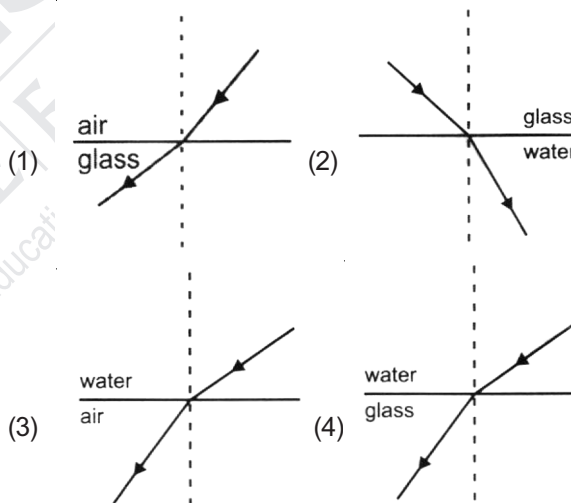
21. Linear magnification (m) Produced by a rear view mirror fitted in vehicles

- (1) Is equal to one
- (2) Is infinity
- (3) Is more than one
- (4) Is less than one

Answer (4)

Sol. Image height is always smaller in convex mirror.

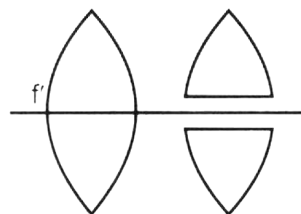
22. Which of the following ray diagrams, show the correct refraction of ray of light



Answer (4)

Sol. Rarer medium to denser medium ray bends towards normal

23. If a symmetrical convex lens of focal length 'f' is cut into two parts along the principal axis as shown in the figure, the focal length of each part will be



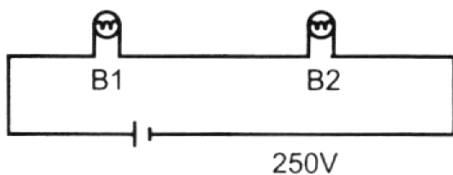
- (1) $f/2$
- (2) $f/4$
- (3) f
- (4) ∞

Answer (3)

24. Which statement is true for an eye donor
- Eye donor can belong to any age group or gender
 - People who use spectacles can not donate eye
 - Eye must be removed within 4-6 hours after death
 - Eye removal process takes only 10-15 minutes
- (1) i, ii, iii (2) i, iii, iv
(3) i, ii, iv (4) ii, iii, iv

Answer (2)

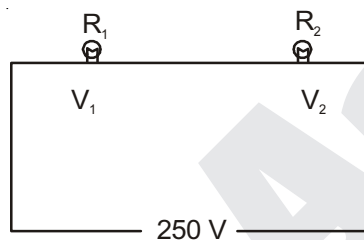
25. Electric bulb B_1 (1000W - 250V) and electric bulb B_2 (100W - 200V) are connected across source of 250V as shown in figure what is the potential drop across electric bulb B_2 ?



- (1) 200V (2) 250V
(3) 98V (4) 48V

Answer (3)

Sol.



$$R_1 = \frac{250^2}{100} = 625$$

$$R_2 = \frac{200^2}{100} = 400$$

$$I = \frac{250}{R_1 + R_2}$$

$$V_2 = R_2 I = \frac{400}{1025} \times 250 = 98V$$

26. A beam of alpha particles moving towards east is deflected towards south by magnetic field. The direction of magnetic field is
- towards south
 - towards east
 - downward
 - upward

Answer (4)

27. What is the formula for ferric Oxide?

- (1) Fe O (2) Fe₂ O₃
(3) Fe₃ O₄ (4) Fe₂ O

Answer (2)

Sol. Ferric oxide



28. In the presence of concentrated H₂SO₄ acetic acid reacts with ethyl alcohol to produce
- Aldehyde
 - Carboxylic Acid
 - Sulphur Dioxide
 - Ester

Answer (4)

Sol. Esterification reaction

29. Which of the following is also known as laughing gas?
- Methyl isocyanate
 - Sulphure Dioxide
 - Nitrous Oxide
 - Methyl phosphate

Answer (3)

Sol. Nitrous oxide N₂O

30. The ion of an element has 3 positive charge, 27 mass number and 14 neutrons. Find the number of electrons in this ion.
- 13
 - 10
 - 14
 - 16

Answer (2)

Sol. ${}_{13}^{27}\text{Al}$ P = 13

$$n = 14$$

$$\text{Al}^{3+} = 10 \text{ electrons}$$

31. Which of the following is responsible for the blackening of silver jewellery on prolonged exposure to air?
- Ag₃N
 - Ag₂O
 - Ag₂S and Ag₃N
 - Ag₂S

Answer (4)

32. A metal is strongly heated in the presence of air to form a black mass. The metal is.....
- Copper
 - Potassium
 - Silver
 - Zinc

Answer (1)

33. Which of these shows Tyndall effect?

- (1) Common Salt Solution
- (2) Lemon Juice
- (3) Milk
- (4) Copper Sulphate Solution

Answer (3)

Sol. Colloidal solution

34. Which substance is chemically resistant and can hold aqua regia?

- (1) Ceramics
- (2) Glass
- (3) Plastic
- (4) Fibre

Answer (2)

35. What mass of Oxygen is required to react completely with 15g of Hydrogen gas to form water?

- (1) 120g
- (2) 107.5g
- (3) 132.5g
- (4) 112g

Answer (1)

Sol. $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
 $\frac{4\text{g}}{2} + \frac{32\text{g}}{1} \rightarrow \frac{36\text{g}}{2}$

36. On which of the following substance will you pour Hydrochloric acid if you wish to prepare carbon dioxide gas in laboratory?

- (1) Zinc particles
- (2) Copper sulphate particle
- (3) Pieces of marbles
- (4) Ammonium chloride

Answer (3)

37. Solder is an alloy of _____

- (1) Copper and Mercury
- (2) Copper and lead
- (3) Copper and Lead
- (4) Lead and Tin

Answer (4)

Sol. Solder = Sn + Pb

38. What is the formula of Propanal?

- (1) $\text{CH}_3\text{CH}_2\text{CHO}$
- (2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$
- (3) CH_3COCH_2
- (4) $\text{CH}_3\text{CH}_2\text{COCH}_2$

Answer (1)

Sol. $\overset{3}{\text{CH}_3}-\overset{2}{\text{CH}_2}-\overset{1}{\text{CHO}}$

39. Shweta went for a journey by train in June 2018. Her train was to depart at 7am. Her mother packed 'Bread Pakedas' For her lunch. However Shweta did not eat them till evening. In the evening when she opened her lunch box, she felt an unpleasant smell. The taste of Pakodas was also sour. This happened due to _____

- (1) Thermal Decomposition
- (2) Calcinations
- (3) Isomerism
- (4) Rancidity

Answer (4)

40. Which of the following elements will be in Group 16 of Periodic table?

Symbol	Atomic Number
Te	52
Re	75
Se	34
Xe	54

- (1) Te and Xe
- (2) Se and Te
- (3) Re and Se
- (4) Te and Re

Answer (2)

41. Who wrote the 'Two Treatises of Government'?

- (1) Jean Jacques Rousseau
- (2) John locke
- (3) Montesquieu
- (4) Louis XVI

Answer (2)

Sol. John locke

42. Louis Blanc wanted encourage cooperatives and replace capital enterprises, Name the country to which he belong?

- (1) Russia
- (2) Germany
- (3) France
- (4) Italy

Answer (3)

Sol. France

43. Name the economist who had once advised Hitler against, in vesting in rearmament

- (1) Pastor Niemoeller
- (2) Hjalmar Schacht
- (3) Ernst Hiemer
- (4) Erna Kranz

Answer (2)

Sol. Hjalmar Schacht

44. Who was the first Inspector General of Forests appointed by the British in India?
- (1) George Yule
 - (2) Verrier Elwin
 - (3) Dietrich Brandis
 - (4) H.S. Gibson

Answer (3)

Sol. Dietrich Brandis

45. 'Chapkan' means
- (1) a long buttoned coat
 - (2) a type of turban
 - (3) a western three piece suit
 - (4) phenta (hat)

Answer (1)

Sol. A long buttoned coat

46. Who introduced opium into China in the early sixteenth century?
- | | |
|----------------|----------------|
| (1) Britishers | (2) Japanese |
| (3) Russians | (4) Portuguese |

Answer (4)

Sol. Portuguese

47. Who was the Austrian Chancellor when Congress of Vienna (1815) was held?
- (1) Giuesppe Mazzini
 - (2) Duke Metternich
 - (3) Gluseppe Garibaldi
 - (4) Otto Von Bismarck

Answer (2)

Sol. Duke Metternich

48. Name the two imperialist countries against which the nationalist Vietnamese fought?
- | | |
|------------------------|------------------------|
| (1) France and Britain | (2) Britain and Japan |
| (3) Japan and France | (4) France and Germany |

Answer (3)

Sol. Japan and France

49. Who Formed the Swaraj Party?
- (1) Jawahar Lal Nehru and Mahatma Gandhi
 - (2) Jawaharlal Nehru and Subhash Chandra Bose
 - (3) Jawaharlal Nehru and Motilal Nehru
 - (4) Motilal Nehru and C.R. Dass

Answer (4)

Sol. Motilal Nehru and C.R. Dass

50. Which two new colonial powers joined European powers in the process of carving up of Africa between themselves at Berlin in 1885?
- (1) Britain and France
 - (2) Italy and France
 - (3) Belgium and Germany
 - (4) Britain and Italy

Answer (3)

51. What does Proto-industrialisation mean?
- (1) The first, and early form of industrialisation
 - (2) Industrialisation after 1800 C.E.
 - (3) Industrialisation after 1900 C.E.
 - (4) Industrialisation after 2000 C.E.

Answer (1)

Sol. The first, and early form of industrialisation

52. Who among the following authored 'Godan'?
- | | |
|-------------------------|------------------|
| (1) Rabindranath Tagore | (2) Prem Chand |
| (3) Bankim Chandra | (4) Srinivas Das |

Answer (2)

53. In which country women do not have the right to vote?
- | | |
|-------------|------------|
| (1) Estonia | (2) Saudi |
| (3) Fiji | (4) Mexico |

Answer (2)

54. The name of the autobiography written by Nelson Mandela is
- (1) Robben island
 - (2) The long walk to Freedom
 - (3) Blacks
 - (4) Aparthied

Answer (2)

55. Who appoints the judges of the Supreme Court and the High Court?
- (1) The President
 - (2) The Prime Minister
 - (3) The Chief Justice of the Supreme Court
 - (4) The president on the advice of the Prime Minister and in consultation with the Chief Justice of the Supreme Court

Answer (4)

Sol. The president on the advice of the Prime Minister and in consultation with the Chief Justice of the Supreme Court

56. Kisovo was a province of _____ before its split

- (1) Vietnam (2) Zimbabwe
(3) Sri Lanka (4) Yugoslavia

Answer (4)

57. Which language was recongnised as the official language after independene in Sri Lanka?

- (1) Tamil (2) Hindi
(3) Sinhali (4) Telgu

Answer (3)

58. Which country does not have federal system?

- (1) Belgium
(2) India
(3) Myanmar
(4) The United States of America

Answer (3)

59. The _____ legislates on residuary subjects

- (1) Union Government (2) State Government
(3) Local Government (4) President

Answer (1)

60. Which one of the following regional parties is associated with West Bengal?

- (1) Lok jan Shakti Party (2) Janta Dal
(3) Forward Bloc (4) Democratic Front

Answer (3)

61. Which of the following statement is true

- (1) Elnino is a Greek word meaning the child
(2) Presence of the Eln Nino leads to decrease in Sea-surface temperatures
(3) El Nino is a name given to the periodic development of warm ocean current along the coast of Peru
(4) I TCZ is a broad through of high pressure in equatorial latitudes

Answer (3)

Sol. El Nino is a name given to the periodic development of warm ocean current along the coast of Peru

62. Maldives island are situated to the _____ of Lakshdweep ilsand

- (1) South
(2) North
(3) East
(4) West

Answer (1)

63. Which of the following not a nuclear power station

- (1) Kaiga
(2) Narora
(3) Korba
(4) Kakrapar

Answer (3)

64. What causes rainfall on the coastal area of Tamil nadu in the beginning of winters

- (1) South West monsoon
(2) Temperature cyclones
(3) North East monsoon
(4) Local Air circulation

Answer (3)

65. Which of the following two extreme locations are connecting the east west corridor

- (1) Mumbai and Nagpur
(2) Ahmdabad and Kolkatta
(3) Silchar and Porbandar
(4) Nagpur and Siliguri

Answer (3)

66. Match list 1 (River) and list 2 (Dam) and select the correct answer using the code given below

List 1 (River)

List 2 (Dam)

- | | |
|---------------|----------------------|
| A. Narmada | i. Hirakud |
| B. Kaveri | ii. Indira sagar Dam |
| C. Bhigirathi | iii. Mettur |
| D. Mahanadi | iv. Tehri |

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

Answer (3)

67. The Red soil develop a reddish colour due to

- (1) Deforestation and over grazing
(2) The presence of potash and magnesium
(3) Diffusion of iron in Crystalline and metamorphic rocks
(4) Formation from the lave flows

Answer (3)

Sol. Diffusion of iron in Crystalline and metamorphic rocks

68. The longitudinal extent of India is
 (1) 69°7'E to 97° 25' E (2) 68°7'E to 98° 25' E
 (3) 68°7'E to 97° 25' E (4) 69°7'E to 99° 25' E

Answer (3)

69. The _____ is a longitudinal position of a place where the local time 12 Noon when it is 7:30 pm at Greenwich
 (1) 113.5°W (2) 112.5°E
 (3) 112.5°W (4) 113.5°E

Answer (3)

70. Nokrek Bio Reserver is situated in _____ state of India
 (1) Assam (2) West Bengal
 (3) Meghalaya (4) Sikkim

Answer (3)

71. Boundaries of which of the states does not touch Myanmar?
 (1) Mizoram (2) Meghalaya
 (3) Manipur (4) Nagaland

Answer (2)

72. Arrange these hills from west to east
 A. Khasi
 B. Garo
 C. Naga
 D. Jaintia
 (1) C, A, B, D (2) D, B, A, C
 (3) A, B, C, D (4) B, A, D, C

Answer (4)

73. National consumer day is celebrated on _____
 (1) 24th March (2) 24th December
 (3) 24th September (4) 24th November

Answer (2)

74. Money in hand is an example of _____
 (1) Human capital (2) Fixed capital
 (3) Working capital (4) Physical capital

Answer (3)

75. Non market activity is _____
 (1) Selling the product near by temple
 (2) Selling the products through the regulated market
 (3) Producing for self consumption
 (4) State of unemployment

Answer (3)

76. Calculate the female literacy rate from the given data

Gender	Total Person	Literate Person
Males	1200	1050
Females	580	360
Total	1780	1410

- (1) 62.0% (2) 28.6%
 (3) 25.8% (4) 20.22%

Answer (1)

77. The Quality of Education in a country does not depend upon
 (1) Literacy Rate
 (2) Growth Rate
 (3) Health Status
 (4) Acquisition of skills by people

Answer (2)

78. Which one of the following agency issue one rupee currency note in India
 (1) Reserve bank of India
 (2) Ministry of Finance
 (3) Commerce Ministry
 (4) Commercial Bank

Answer (2)

79. In which year the first five year plan started
 (1) 1947 (2) 1951
 (3) 1948 (4) 1950

Answer (2)

80. Removing barriers or restriction set by the government is called
 (1) Liberalization
 (2) Investment
 (3) Favourable trade
 (4) Free trade

Answer (1)

81. Solve

$$\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}} = ?$$

- (1) $\cos 2A$
 (2) $2 \sec A$
 (3) $2 \tan A$
 (4) $2 \sin A$

Answer (2)

Sol. $\sqrt{\frac{1+\sin A}{1-\sin A}} + \sqrt{\frac{1-\sin A}{1+\sin A}}$
 $= \frac{1+\sin A + 1-\sin A}{\sqrt{1-\sin A}\sqrt{1+\sin A}}$
 $= \frac{2}{\sqrt{1-\sin^2 A}}$
 $= \frac{2}{\sqrt{\cos^2 A}}$
 $= \frac{2}{\cos A}$
 $= 2 \sec A$

82. $\frac{1}{2(3x+4y)} + \frac{12}{7(4x-3y)} = \frac{1}{2}$

$\frac{7}{(3x+4y)} + \frac{4}{(4x-3y)} = 2$

Find the values of x and y

if $3x + 4y \neq 0, 4x - 3y \neq 0$

(1) $x = \frac{444}{25}, y = \frac{16}{25}$

(2) $x = 0, y = 1$

(3) $x = \frac{16}{25}, y = \frac{256}{25}$

(4) $x = 2, y = 2$

Answer (1)

Sol. Let $\frac{1}{3x+4y} = u$ and $\frac{1}{4x-3y} = v$

\therefore equations becomes

$\frac{u}{2} + \frac{12}{7}v = \frac{1}{2}$... (i)

$7u + 4v = 2$... (ii)

Multiplying equation (i) by 14

$7u + 24v = 7$ (iii)

subtracting equation (ii) from (iii)

$20v = 5$

$\Rightarrow v = \frac{1}{4}$, plugging this in (ii), we get $u = \frac{1}{7}$

$\therefore 3x + 4y = 7$

$4x - 3y = 4$

On solving above equations we get $x = \frac{444}{25}, y = \frac{16}{25}$

83. A gardener wants to grow some plants in a garden. If 4 plants are grown extra in each row, the number of rows will reduce by 2. If 4 plants are grown less in each row, the number of rows increases by 4. Find the total number of plants grown

- (1) 90 (2) 100
(3) 108 (4) 96

Answer (4)

Sol. Let the number of rows be x and number of columns be y.

\therefore Total number of plants = xy

ATQ

$(x-2)(y+4) = xy$ & $(x+4)(y-4) = xy$

$xy + 4x - 2y - 8 = xy$ & $xy - 4x + 4y - 16 = xy$

$4x - 2y = 8$

$-4x + 4y = 16$

Solving above equations we get $x = 8, y = 12$

\therefore Total number of plants = $12 \times 8 = 96$

84. The sum of all sides of a cube is 9 cm. The volume of the cube is

(1) $\frac{3}{4} \text{ cm}^3$ (2) $\frac{81}{108} \text{ cm}^3$

(3) $\frac{27}{64} \text{ cm}^3$ (4) $\frac{27}{32} \text{ cm}^3$

Answer (3)

Sol. Let the side of cube measures x units

A cube has 12 sides

$\therefore 12x = 9 \text{ cm}$

$\Rightarrow x = \frac{3}{4} \text{ cm}$

Thus volume of cube = $\frac{27}{64} \text{ cm}^3$

85. If $x : y = 3 : 5$ and $x : z = 5 : 7$, then what is $(y - z) : (y + z)$ equal to?

- (1) $2/23$ (2) $27/46$
(3) $18/46$ (4) $15/46$

Answer (1)

Sol. $x : y = 3 : 5$ and $x : z = 5 : 7$

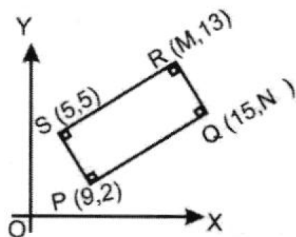
Let $x = 15K, \therefore y = 25K$ & $z = 21K$

Thus $(y - z) : (y + z)$ will be

$(25K - 21K) : (25K + 21K)$

or $4 : 46 = 2 : 23$

86. Find the value of M-N in the rectangle PQRS,



- (1) Intersecting at (n, m)
- (2) Coincident
- (3) Parallel
- (4) Intersecting at (m, n)

Answer (4)

Sol. We know that diagonals of a parallelogram bisect each other

\therefore Mid point of P & Q coincides with mid point of Q & S

Thus

$$\frac{9+M}{2} = \frac{5+15}{2}$$

$$\Rightarrow 9 + M = 20$$

$$\Rightarrow M = 11$$

$$\text{Also } \frac{2+13}{2} = \frac{5+N}{2}$$

$$\Rightarrow 2 + 13 = 5 + N$$

$$\Rightarrow N = 10$$

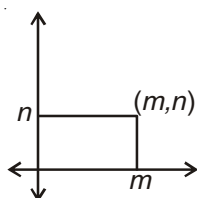
$$\therefore M - N = 1$$

87. A pair of equation $x = m$ and $y = n$ graphically represent lines which are _____.

- (1) Intersecting at (n, m)
- (2) Coincident
- (3) Parallel
- (4) Intersecting at (m, n)

Answer (4)

Sol.



Clearly the lines intersect at (m, n)

88. If $x = 1 + \cos A$, $y = \operatorname{cosec}^2 A$, $z = 1 - \cos A$, then the value of $(xy)z$ is

- (1) $\operatorname{cosec} A$
- (2) 1
- (3) $1 - \operatorname{cosec}^2 A$
- (4) $\cos^2 A$

Answer (2)

Sol. $x = 1 + \cos A$, $y = \operatorname{cosec}^2 A$, $z = 1 - \cos A$

$$(xy)z = (1 + \cos A) (\operatorname{cosec}^2 A) (1 - \cos A)$$

$$\Rightarrow (xy)z = (1 + \cos A) (1 - \cos A) \operatorname{cosec}^2 A$$

$$\Rightarrow (xy)z = (1 - \cos^2 A) \operatorname{cosec}^2 A$$

$$\Rightarrow (xy)z = (\sin^2 A) (\operatorname{cosec}^2 A)$$

$$\Rightarrow (xy)z = 1$$

89. The mode of the given series is 36. Find the value of K

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	7	6	K	16	12	8	10

- (1) 10
- (2) 15
- (3) 20
- (4) 30

Answer (1)

Sol. 36 lies in the class interval 30 – 40

\therefore it is modal class

$$\text{mode} = l + \left(\frac{f_m - f_1}{2f_m - f_1 - f_2} \right) \times h$$

where $l = 30$, $f_m = 16$, $f_1 = k$, $f_2 = 12$

$$\text{Thus } 36 = 30 + \left(\frac{16 - K}{32 - K - 12} \right) \times 10$$

$$\Rightarrow \frac{6}{10} = \frac{16 - K}{20 - K}$$

$$\Rightarrow 120 - 6K = 160 - 10K$$

$$\Rightarrow 4K = 40$$

$$\Rightarrow K = 10$$

90. If $x + y + z = 0$ and $x \neq 0, y \neq 0, z \neq 0$, then find the

value of $\frac{x^2}{yz} + \frac{y^2}{xz} + \frac{z^2}{xy}$

- (1) 0
- (2) 1
- (3) 2
- (4) 3

Answer (4)

Sol. $x + y + z = 0$

$$\Rightarrow x^3 + y^3 + z^3 = 3xyz$$

$$\frac{x^2}{yz} + \frac{y^2}{zy} + \frac{z^2}{xy}$$

$$= \frac{x^3 + y^3 + z^3}{xyz}$$

$$= \frac{3xyz}{xyz}$$

$$= 3$$

91. What will be the area of the largest triangle that can be inscribed in a semicircle of radius $\frac{r}{16}$

- (1) $16r^2$ (2) $\frac{r^2}{64}$
 (3) $\frac{r^2}{32}$ (4) $\frac{r^2}{256}$

Answer (4)

Sol. For the area to be maximum

base = $2 \times$ radius & height = radius

Thus $\frac{1}{2} \times \left(2 \times \frac{r}{16}\right) \times \left(\frac{r}{16}\right)$ sq. units

$$= \frac{r^2}{256} \text{ sq. units}$$

92. From a face of a cubical wooden block, a hemispherical depression is cut out in such a way that the diameter of hemisphere is half the edge of the cube.

What will be the surface area of remaining solid?

- (1) $\frac{l^2(l^2+4)}{2}$ (2) $64l^2$
 (3) $\frac{1}{4}l^2(\pi+24)$ (4) $\frac{1}{16}l^2(\pi+96)$

Answer (4)

Sol. Surface area of remaining solid

= (surface area of cube) – (area of circle with diameter $\frac{l}{2}$) + (surface area of hemisphere with diameter $\frac{l}{2}$)

$$= 6l^2 - \pi \frac{l^2}{16} + 2\pi \frac{l^2}{16}$$

$$= \frac{l^2}{16}(\pi+96)$$

93. Rahim sells apples to his customers at the cost price itself but uses a weight of 800 g instead of 1 kg weight. Find his profit %

- (1) 25% (2) 20%
 (3) 15% (4) 30%

Answer (1)

Sol. When Rahim sells 1000g, customer actually gets 800 g Thus he make a profit equivalent to the cost price of 200 g for every 800 g

$$\text{Thus profit\%} = \frac{200}{800} \times 100\%$$

$$= 25\%$$

94. If $x + \frac{1}{x} = 5$, then find the value of $x^9 + \frac{1}{x^9}$

- (1) 1330690 (2) 1310330
 (3) 1330670 (4) 1310370

Answer (3)

Sol. $x + \frac{1}{x} = 5$

cubing both sides

$$x^3 + \frac{1}{x^3} + 3(x)\left(\frac{1}{x}\right)\left(x + \frac{1}{x}\right) = 125$$

$$x^3 + \frac{1}{x^3} = 110$$

cubing both sides of above equation

$$x^9 + \frac{1}{x^9} + 3(x^3)\left(\frac{1}{x^3}\right)\left(x^3 + \frac{1}{x^3}\right) = (110)^3$$

$$x^9 + \frac{1}{x^9} + 3(110) = 1331000$$

$$x^9 + \frac{1}{x^9} = 1330670$$

95. If a natural number 'a' is divided by 7, the remainder is 5. If a natural number 'b' is divided by 7, the remainder is 3. The remainder is 'r' if a + b is divided

by 7. Find the value of $\frac{3r+5}{4}$

- (1) 7 (2) 2
 (3) 8 (4) 11

Answer (2)

Sol. $a = 7l_1 + 5$

$$b = 7l_2 + 3$$

where l_1 , & l_2 are any whole numbers

$$a + b = 7(l_1 + l_2) + 8$$

$\therefore (a + b)$ when divided by 7 will give remainder 1.

$$\text{Thus } \frac{3r+5}{4} = \frac{3 \times 1 + 5}{4} = 2$$

96. Rajat's salary in 2017 is Rs. 1,77,100. His salary from 2014 has risen annually by 10, 15 and 40 per cent respectively to reach 2017 salary figures. What was his salary in 2004?

- (1) Rs. 95,000 (2) Rs. 1,15,000
 (3) Rs. 1,20,000 (4) Rs. 1,00,000

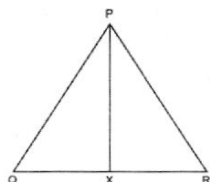
Answer (4)

Sol. Let the salary in 2014 be $100x$

\therefore After 10% increase in 2015, salary = $110x$
after 15% increase in 2016, salary = $126.5x$
finally after 40% increase, salary in 2017 = $177.1x$
thus $177.1x = 1,77,100$
 $\Rightarrow x = 1000$

Thus salary in 2014 was Rs. 1,00,000

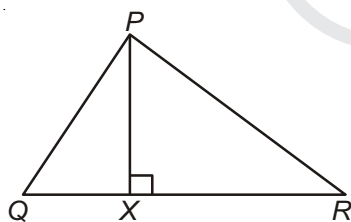
97. In $\triangle PQR$, $PX \perp QR$. Find the value of $PQ^2 + QR^2 - 2QR \cdot QX$



- (1) PR^2 (2) $2PQ^2$
(3) $QR \cdot QX^2$ (4) $2PR^2 + PQ^2$

Answer (1)

Sol.



$$\begin{aligned} & PQ^2 + QR^2 - 2QR \cdot QX \\ &= PX^2 + QX^2 + QR^2 - 2QR \cdot QX \\ &= PX^2 + (QR - XR)^2 + QR^2 - 2QR \cdot QX \\ &= PX^2 + QR^2 + XR^2 - 2QR \cdot XR + QR^2 - 2QR \cdot QX \\ &= PR^2 + 2QR^2 - 2QR \cdot XR - 2QR \cdot QX \\ &= PR^2 + 2QR \cdot (QR - XR) - 2QR \cdot QX \\ &= PR^2 + 2QR \cdot QX - 2QR \cdot QX \\ &= PR^2 \end{aligned}$$

98. The points $P(0, 4)$, $Q(-3, 1)$, $R(0, -2)$ and $S(3, 1)$ are the vertices of a

- (1) Parallelogram (2) Square
(3) Kite (4) Rhombus

Answer (2)

Sol. Mid point of P & R : $\left(\frac{0+0}{2}, \frac{4-2}{2}\right)$ i.e. $(0, 1)$

Mid point of Q & S : $\left(\frac{-3+3}{2}, \frac{1+1}{2}\right)$ i.e. $(0, 1)$

As mid points are same \therefore definitely a parallelogram

$$PR = \sqrt{(0-0)^2 + (4+2)^2} = 6$$

$$QS = \sqrt{(3-3)^2 + (1+1)^2} = 2$$

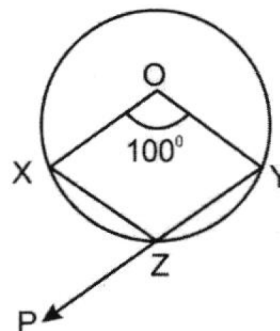
As diagonals are equal \therefore either rectangle or square

$$PQ = \sqrt{(0+3)^2 + (4-1)^2} = \sqrt{18}$$

$$QR = \sqrt{(-3-0)^2 + (1+2)^2} = \sqrt{18}$$

As adjacent sides are equal \therefore it is a square

99. O is the centre of a circle and $\angle XOY = 100^\circ$. Find the measure of $\angle XZP$



- (1) 50° (2) 100°
(3) 150° (4) 80°

Answer (1)

Sol. Reflex angle $XOY = 260^\circ$

$\therefore \angle XZY = 130^\circ$ (Angle at circumference is half of angle)

Thus $\angle XZY = 50^\circ$

100. In trapezium $PQRS$, $PQ \parallel RS$ and $PQ = 2RS$. If PR and QS intersect at point O , what will be the ratio of areas of $\triangle POQ$ and $\triangle ROS$?

- (1) $1 : 1$ (2) $2 : 1$
(3) $4 : 1$ (4) $1 : 2$

Answer (3)

Sol. Clearly $\triangle POQ \sim \triangle ROS$ (by AAA similarity)

Now $PQ = 2RS$

$$\Rightarrow \frac{PQ}{RS} = 2$$

$$\therefore \frac{ar\triangle POQ}{ar\triangle ROS} = 4$$

(Ratio of areas of similar Δ 's is square of the ratio of corresponding sides)