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Answers & Solutions

for

NTSE (Stage-I) 2019-20

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you open the question booklet.

1. Use blue/black ballpoint pen only. There is no negative marking.
2. Part I : MAT : 1 - 100 questions
Part II : SAT : 101 - 200 questions
3. This test booklet contains 200 questions of one mark each. All the questions are compulsory.
4. Answer each question by darkening the one correct alternative among the four choices on the OMR SHEET with blue/black ballpoint pen.

Example:

Q. No.	Alternatives
Correct way : 1	① ② ● ④
Q. No.	Alternatives
Wrong way : 1	⊗ ⊖ ⊙ ⊕

Student must darkening the right oval only after ensuring correct answer on OMR Sheet.

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 answer 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. What is sum of all positive factors of 256?
 (1) 526 (2) 511
 (3) 625 (4) 562

Answer (2)

Sol. $256 = 2^8$

$$\begin{aligned} \text{Sum of all factors} &= \frac{(2^{8+1} - 1)}{2 - 1} \\ &= \frac{2^9 - 1}{1} = 511 \end{aligned}$$

2. Value of $\frac{X}{X+1} + \frac{X+1}{X} - \frac{1}{X(X+1)}$ will be?
 (1) X^2 (2) 1
 (3) X (4) 2

Answer (4)

Sol. $\frac{x}{x+1} + \frac{x+1}{x} - \frac{1}{x(x+1)}$

$$\frac{x^2 + x^2 + 1 + 2x - 1}{x(x+1)}$$

$$\frac{2x^2 + 2x}{x^2 + x} = \frac{2(x^2 + x)}{x^2 + x}$$

$$= 2$$

3. Sum of sequence $5+6+7+8+\dots+19$ will be?
 (1) 180 (2) 175
 (3) 185 (4) 190

Answer (1)

Sol. Sum of ($5 + 6 + \dots + 19$) = sum of first 19 natural no. – sum of first 4 numbers.

$$\begin{aligned} &= \frac{19 \cdot 20}{2} - \frac{4 \cdot 5}{2} \\ &= 190 - 10 \\ &= 180 \end{aligned}$$

4. If three numbers are in ratio $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$, difference between largest and smallest is 27 then numbers are
 (1) 54, 72, 81 (2) 24, 45, 51
 (3) 64, 72, 91 (4) 54, 65, 81

Answer (1)

Sol. $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$ or $6 : 8 : 9$

- (Largest – Smallest) $3 \rightarrow 27$
 $1 \rightarrow 9$
 $6 \rightarrow 54$
 $8 \rightarrow 72$
 $9 \rightarrow 81$

Numbers are 54, 72, 81

5. Which of the following number will completely divide the value of $(3^{25} + 3^{26} + 3^{27} + 3^{28})$?
 (1) 35 (2) 40
 (3) 50 (4) 45

Answer (*)

Sol. $3^{25} + 3^{26} + 3^{27} + 3^{28}$
 $3^{25}[1 + 3 + 3^2 + 3^3]$
 $3^{25} \times 40 = 3^{23} \times 45 \times 8$

Therefore two options are possible.

6. Rohan's score on the mid-term exam was 75, and his score of the final exam was 90. If the weight of the final exam is twice that of mid-term, what is Rohan's final score in the course?
 (1) 82.5 (2) 80
 (3) 85.5 (4) 85

Answer (4)

Sol. Final : Mid

2 : 1

\therefore Mid term is $\frac{1}{3}$ rd

Final exam is $\frac{2}{3}$ rd

$\therefore \frac{1}{3} \times 75 + \frac{2}{3} \times 90$

$25 + 60 = 85$

7. A grandmother, mother and daughter wish to arrange themselves in a row in order to be photographed. How many different ways can they arrange themselves?
 (1) 6 (2) 3
 (3) 18 (4) 9

Answer (1)

Sol. Arrangement for Grandmother, Mother, Daughter will be

$$3! = 6$$

8. At the time of marriage a man was 6 year older than his wife, but 12 year after the marriage his age was $\frac{6}{5}$ times the age of his wife. Their ages (in years) at the time of the marriage were?

- (1) 26, 20 (2) 24, 18
(3) 27, 21 (4) 30, 24

Answer (2)

Sol. $M = W + 6$

$$M + 12 = \frac{6}{5}(W + 12)$$

$$\text{Solving, } M = 24, W = 18$$

9. If we throw a dice, what is the probability of obtaining a result that is less than 4. If we know that the result obtained was an even number?

- (1) $\frac{1}{2}$ (2) $\frac{2}{3}$
(3) $\frac{1}{3}$ (4) $\frac{4}{5}$

Answer (3)

Sol. $A = \{1, 2, 3\}$

$$B = \{2, 4, 6\}$$

$$A \cap B = \{2\}$$

$$P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{1}{3}$$

10. There are 10 balls in a box, 5 white and 5 black. Two balls are removed randomly from the box, one after another. The first ball that is removed is black and it is not returned to the box. What is the probability that the second ball that is removed is also black?

- (1) $\frac{5}{9}$ (2) $\frac{4}{9}$
(3) $\frac{3}{9}$ (4) $\frac{1}{9}$

Answer (2)

Sol. 9 balls left

$$9 \text{ ball} = 4 \text{ black} + 5 \text{ white}$$

$$\frac{4_{c_1}}{9_{c_1}} = \frac{4}{9}$$

11. Some equations are based on the basis of a certain system. Using the same pattern solve the unsolved equation. If $10 - 3 = 12$, $12 - 4 = 13$, $14 - 5 = 14$, what is $16 - 6 = ?$

- (1) 10 (2) 15
(3) 16 (4) 18

Answer (2)

Sol. Take the difference and add 5

$$16 - 6 = 10 + 5 = 15$$

12. Excluding stoppages, the speed of a bus is 54kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

- (1) 9 (2) 10
(3) 12 (4) 20

Answer (2)

Sol. If it covers 54 km in an hour then, 45 km in an hour with stoppage

$$T = \frac{D}{S}$$

$$\frac{9}{54} = \frac{1}{6} \text{ hr}$$

$$\frac{1}{6} \times 60 = 10 \text{ min}$$

13. If 40% of 1620 + 30% of 960 = $\%?$ of 5200.

- (1) 12 (2) 24
(3) 5 (4) 18

Answer (4)

$$\text{Sol. } \frac{40}{100} \times 1620 + \frac{30}{100} \times 960 = \frac{x}{100} \times 5200$$

$$4 \times 162 + 3 \times 96 = 52x$$

$$162 + 3 \times 24 = 13x$$

$$x = \frac{234}{13}$$

$$x = 18$$

14. In a row, 25 trees are planted at equal distance from each other. The distance between 1st and 25th tree is 30 m. What is the distance between 3rd and 15th tree?

- (1) 8 m (2) 15 m
(3) 16 m (4) 18 m

Answer (2)

Sol. The distance between two trees will be

$$\frac{30}{24} = \frac{5}{4} \text{ m}$$

Distance between 3rd and 15th tree means there are total 13 tree in between.

$$\frac{5}{4} \times 12 = 15 \text{ m}$$

15. In a school, the bell is rung once after each half an hour. The school starts at 8:00 AM and close at 1:30 PM. The bell is rung 3 times continuously, at the time beginning, at the time of lunch break at 10:00 and 10:30 AM and at the end. How many times is the bell rung every day?

- (1) 21 (2) 22
(3) 19 (4) 20

Answer (4)

Sol. Total 12 times, bell will be rung. Out of 12 times, 4 times it will rung 3 time continuously

$$\text{So, } 4 \times 3 + 8 \times 1$$

$$12 + 8 = 20 \text{ times}$$

16. If 80% of A = 50%, of B and B = x% of A then value of x will be?

- (1) 145 (2) 170
(3) 150 (4) 160

Answer (4)

Sol. Ratio of A and B is 5 : 8

$$B \times \frac{100}{A} = x$$

$$x = 160\%$$

17. The mean of five consecutive numbers is 7. Which is the highest number?

- (1) 10 (2) 7
(3) 9 (4) 8

Answer (3)

Sol. Mean means middle term when there are odd consecutive numbers.

∴ 5, 6, 7, 8, 9 will be number. Highest is 9

18. Find the value of $x^3 + y^3 + z^3 - 3xyz$. If $x + y + z = 15$ and $x^2 + y^2 + z^2 = 51$.

- (1) 540 (2) -540
(3) -225 (4) 765

Answer (2)

Sol. $x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

$$= 15(51 - (xy + yz + zx)) \quad (1)$$

$$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$$

$$225 = 51 + 2(xy + yz + zx)$$

$$xy + yz + zx = 87 \quad (2)$$

From (1) and (2)

$$x^3 + y^3 + z^3 - 3xyz = 15(51 - 87)$$

$$= 15 \times (-36)$$

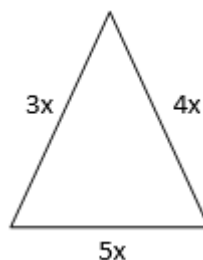
$$= -540$$

19. If area of any triangle is 384 cm² and its sides are in Ratio 3 : 4 : 5, then perimeter of triangle will be?

- (1) 60 cm (2) 48 cm
(3) 64 cm (4) 96 cm

Answer (4)

Sol.



By Heron's formula

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$s = \frac{a+b+c}{2}$$

$$384 = \sqrt{6x \cdot x \cdot 2x \cdot 3x}$$

$$384 = 6x^2$$

$$x^2 = 64$$

$$x = 8$$

$$3x + 4x + 5x = 12x$$

$$= 12 \times 8$$

$$= 96 \text{ cm}$$

20. $\frac{13}{48}$ is equal to

(1) $\frac{1}{3 + \frac{1}{1 + \frac{1}{16}}}$

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

(3) $\frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{4}}}}$

(4) $\frac{1}{3 + \frac{1}{1 + \frac{1}{8}}}$

Answer (3)

Sol. $\frac{1}{3 + \frac{1}{1 + \frac{1}{2 + \frac{1}{4}}}} = \frac{13}{48}$

21. If for any two numbers a and b , the operation $\$$ is defined as follows:

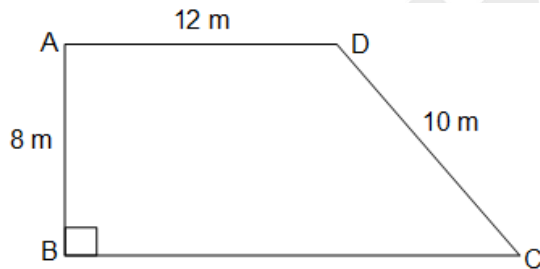
$a \$ b = a \times (a + b)$, then $(2 \$ 0) \$ 1 = ?$

- (1) 12
- (2) 10
- (3) 20
- (4) 4

Answer (3)

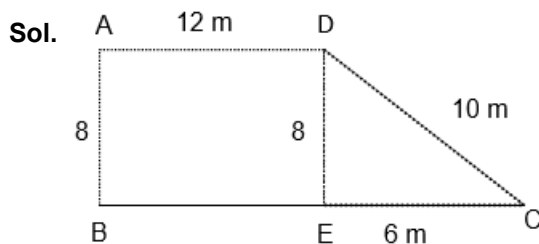
Sol. $(2 \$ 0) \$ 1 = [2 \times (2 + 0)] \$ 1$
 $= 4 \$ 1$
 $= 4 \times (4 + 1)$
 $= 20$

22. The accompanying figure shows right + trapezoid (AD||BC) based on this information and the information in the figure, the area of trapezoid (in m^2) is



- (1) 150
- (2) 120
- (3) 108
- (4) 96

Answer (2)



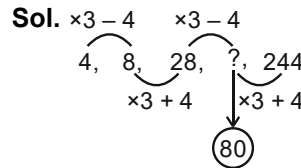
By Pythagoras, $EC = 6$ m
 Area of ABED = $8 \times 12 = 96$ m^2
 Area of $\triangle DEC = \frac{1}{2} \times 8 \times 6 = 24$ m^2
 Area of ABCD = $96 + 24 = 120$ m^2 .

Direction (23 to 25) find the missing numbers in the number series.

23. 4, 8, 28, ?, 244

- (1) 69
- (2) 75
- (3) 80
- (4) 90

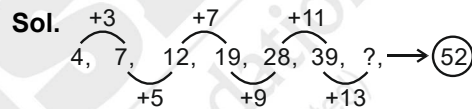
Answer (3)



24. 4, 7, 12, 19, 28, 39, ?

- (1) 48
- (2) 52
- (3) 55
- (4) 58

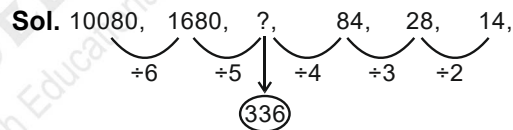
Answer (2)



25. 10080, 1680, ?, 84, 28, 14

- (1) 840
- (2) 168
- (3) 108
- (4) 336

Answer (4)



26. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4,347. The period (in year) is

- (1) 1
- (2) 2
- (3) 3
- (4) 3.5

Answer (2)

Sol. CI = ₹ 4347

$P = ₹ 30,000$

$\therefore A = ₹ 34347$

$A = P \left(1 + \frac{7}{100}\right)^n$

$34347 = 30000 \left(1 + \frac{7}{100}\right)^n$

$\frac{34347}{30000} = \left(\frac{107}{100}\right)^n$

$\left(\frac{107}{100}\right)^2 = \left(\frac{107}{100}\right)^n$

$\therefore n = 2$

27. Among the numbers $\sqrt{2}$, $\sqrt[3]{9}$, $\sqrt[4]{16}$, $\sqrt[5]{32}$ the greatest one is :-

- (1) $\sqrt{2}$ (2) $\sqrt[3]{9}$
(3) $\sqrt[4]{16}$ (4) $\sqrt[5]{32}$

Answer (2)

Sol. $\sqrt{2}$, $\sqrt[3]{9}$, $\sqrt[4]{16}$, $\sqrt[5]{32}$

$\frac{1}{2^2}$	$\frac{2}{3^3}$	2	2
$\frac{3}{2^6}$	$\frac{4}{3^6}$	$\frac{6}{2^6}$	$\frac{6}{2^6}$
8	81	64	64

28. If $x + \frac{1}{x} = 2$ and x is real, then the value of

$x^{17} + \frac{1}{x^{19}}$ is

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

Answer (3)

Sol. Putting $x = 1$

$1 + 1 = 2$

$\therefore 1^{17} + \frac{1}{1^{19}} = 2$

29. To win a 20 over match, the run rate is required 7.2. If in the end of 15th over, the run rate is 6. Then to win the match the required run rate is?

- (1) 1.2 (2) 13.2
(3) 10.8 (4) 12

Answer (3)

Sol. $15 \times 6 + 5x = 20 \times \frac{7.2}{10}$

$90 + 5x = 144$

$x = \frac{54}{5} = 10.8$

30. If P and Q are H.C.F and L.C.F of two algebraic expression respectively and $P + Q = x + y$ then what will be value of $P^3 + Q^3$?

- (1) $x^3 + y^3$ (2) $x^3 - y^3$
(3) $x + y$ (4) $x - y$

Answer (1)

Sol. $P + Q = x + y$

and $PQ = xy$

$\therefore P = x$ & $Q = y$

$\therefore P^3 + Q^3 = x^3 + y^3$

31. Pipe A and B can fill a tank in 12 minutes and 16 minutes respectively. Both pipe are kept open for x minutes and then B is closed and A fills the rest of tank in 5 minutes. The value of x will be

- (1) 4 minutes (2) 6 minutes
(3) 5 minutes (4) 7 minutes

Answer (1)

Sol. Pipe A 12 \rightarrow 4
Pipe B 16 \rightarrow 3

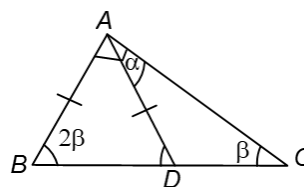
48

Work done by A in 5 minutes = $4 \times 5 = 20$

$\therefore 48 - 20 = 28$ was done by (A + B) in x minutes.

$\therefore x = \frac{28}{7} = 4$ minutes.

32. The accompanying figure shows right triangle ABC and isosceles triangle ABD ($AB = AD$).

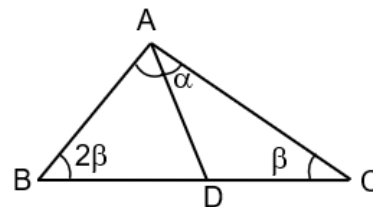


Based on this information and the information in the figure, the value of angle α is

- (1) 60° (2) 45°
(3) 30° (4) 25°

Answer (3)

Sol.



Now in $\triangle ABD$

$AB = AD$

$\therefore \angle ABD = \angle ADB = 2\beta$.

Also, $\angle ADB = \angle DAC + \angle ACD$

$2\beta = \alpha + \beta$

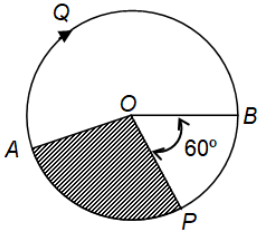
$\beta = \alpha$

In $\triangle ABC$,

$2\beta + 90^\circ + \beta = 180^\circ$

$\beta = 30^\circ = \alpha$

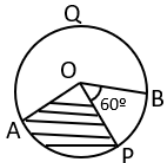
33. The accompanying figure shows a circle whose centre is O and radius is 10cm . The shaded sector equals $\frac{1}{6}$ of the area of the circle. Based on this information and the information in figure the length (in cm) of the arc AQB is:



- (1) 30π (2) $\frac{40}{3}\pi$
(3) $\frac{20}{3}\pi$ (4) 20π

Answer (2)

Sol.



$$l(\text{arc } AQB) = \frac{240}{360} \times 2 \times \pi \times 10$$

$$= \frac{40}{3}\pi$$

34. If length of a rectangle is increased by 25% and its width decreased by 20% then of the following which change in the area of rectangle occur.
- (1) 10% increase (2) 16% increase
(3) 5% decrease (4) No change

Answer (4)

Sol. Let $L = 100$, $B = 100$
Area = 10000
After change
 $L_1 = 125$, $B_1 = 80$
Area₁ = 10000. No change

35. An official meeting is attended by 130 department employees of them 66 drink tea, 56 drink coffee and 63 drink juice, 27 can drink either tea or coffee, 25 can drink coffee or juice and 23 can drink juice and tea, 5 employees can drink any of the three. How many drink only tea?
- (1) 21 (2) 22
(3) 18 (4) 20

Answer (*)

Sol. No option is correct. Data discrepancy. If there would have been 'and' in place of 'or' then answer will be '21'.

36. Of the three number, the sum of first two is 55, third is 65, and sum of third with thrice of the first is 110. The third number is?
- (1) 25 (2) 30
(3) 35 (4) 28

Answer (3)

Sol. $x + y = 55$ (1)
 $y + z = 65$ (2)
 $z + 3x = 110$ (3)

Adding (1), (2), (3)

$$4x + 2y + z = 230$$

$$2x + y + z = 115$$

$$2x = 115 - 65$$

$$2x = 50$$

$$x = 25$$

$$z + 3 \times 25 = 110, z = 35$$

Directions: (37 to 40) Study the following table and answer questions given below:

EMPLOYEES SOURCE OF INCOME (Rs.)					
	K	L	M	N	O
Salary	12000	6000	21000	9000	12000
Bonus	2400	1200	4500	2400	3000
Overtime	5400	2100	6000	5100	6000
Arrers	6000	5400	12000	4200	7500
Miscellaneous	1200	300	1500	300	1500
Total	27000	15000	45000	21000	30000

37. The employee who has minimum ratio of income from arrear to income from salary is.
- (1) K (2) L
(3) M (4) N

Answer (4)

Sol. K L M N O
1:2 9:10 4:7 7:15 5:8

38. The employee who earns maximum bonus in comparison to his total income?
- (1) M (2) N
(3) L (4) K

Answer (2)

Sol. K L M N O



N is earning more than 10% which is maximum.

39. The employee who has maximum percentage of his salary out of the income?

- (1) K (2) L
(3) M (4) O

Answer (3)

Sol. $M = \frac{7}{15} \times 100 = 46.6\%$

40. The income from overtime is what percentage of the income from the arrears in case of employees in category O?

- (1) 80 (2) 75
(3) 25 (4) 20

Answer (1)

Sol. $\frac{6000}{7500} \times 100 = 80\%$

41. The ratio of the present ages of Mohan and Suresh is 4:5. Five year ago, the ratio of their ages was 7:9. Their present ages was (in year) are:

- (1) 40, 50 (2) 18, 25
(3) 40, 60 (4) 20, 25

Answer (1)

Sol. Mohan's and Suresh's present ages be $4x$ and $5x$

$$\frac{4x-5}{5x-5} = \frac{7}{9}$$

$$\Rightarrow x = 10$$

\therefore Present ages are 40, 50

42. For a business lunch in a certain restaurant, you may choose one of 3 different first courses and one of 4 different main course. In addition to first course and the main courses, you have a choice of a soup or dessert. How many different combinations of three course business lunch does this restaurant offer?

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

Answer (4)

Sol. No. of ways of choosing first courses = 3

No. of ways of choosing main course = 4

No. of ways of choosing soup or dessert = 2

Total no. of ways = $3 \times 4 \times 2 = 24$

43. If the length of a rectangular plot of land is increased by $12\frac{1}{2}\%$ and the breadth is decreased by 10%, its area is

- (1) Decreased by 1.25%
(2) Decreased by 2.5%
(3) Increased by 2.5%
(4) Increased by 1.25%

Answer (4)

Sol. Let length be x and breadth be y

$$\text{Increased length} = x + 12\frac{1}{2}\% \text{ of } x$$

$$= x + \frac{25}{2 \times 100} \times x$$

$$= \frac{9x}{8}$$

$$\text{Decreased breadth} = y - \frac{y}{10} = \frac{9y}{10}$$

$$\text{New area} = \frac{81xy}{80}$$

$$\text{Increase in area} = \frac{81xy}{80} - xy = \frac{xy}{80}$$

$$\% \text{ increase} = \frac{\frac{xy}{80}}{xy} \times 100 = \frac{100}{80} = \frac{5}{4}$$

$$= 1.25\%$$

Increased by 1.25%

44. K is an even number and P is an odd number. Which of the following statement is not correct?

- (1) $P - K - 1$ is an odd number
(2) $P + K + 1$ is an even number
(3) $P \times K + P$ is an odd number
(4) $P^2 + K^2 + 1$ is an even number

Answer (1)

Sol. If P is odd

K is even

$P - K - 1$ will be an even number, not odd

45. All of the liquid filling a cuboidal container that measures $2 \text{ cm} \times 10 \text{ cm} \times 20 \text{ cm}$ is poured into a cylindrical container with a base radius of 5 cm . What height (in cm) will the surface of the liquid reach in the cylindrical container?

- (1) $\frac{16}{\pi}$ (2) $\frac{40}{\pi}$
(3) 8π (4) 8

Answer (1)

Sol. Volume of liquid in cuboid = volume of liquid in cylinder upto some height 'h'

$$2 \times 10 \times 20 = \pi \times (5)^2 \times h$$

$$h = \frac{16}{\pi}$$

46. ($0 < \theta < 90^\circ$)

If $\tan \theta + \cot \theta = 2$ then what will be value of $\tan^{100}\theta + \cot^{100}\theta$?

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

Answer (1)

Sol. $\tan \theta + \cot \theta = 2$

$$\Rightarrow \tan \theta + \frac{1}{\tan \theta} = 2$$

$$\Rightarrow \tan \theta = 1$$

$$\Rightarrow \theta = 45^\circ$$

$$\Rightarrow \cot \theta = 1$$

$$(\tan \theta)^{100} + (\cot \theta)^{100} = 1 + 1 = 2$$

47. What is the coefficient of a^2b^2 in the expansion of $(a + b)^4$?

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

Answer (2)

Sol. $(a + b)^4$

$$= a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$$

So, coefficient of $a^2b^2 = 6$

48. In a class composed of x girls, y boys. What part of the class is composed of girls?

- (1) $y(x + y)$ (2) $\frac{x}{xy}$
 (3) $\frac{x}{(x + y)}$ (4) $\frac{y}{xy}$

Answer (3)

Sol. Number of girls = x

Number of boys = y

Part of girls =

$$\frac{\text{Number of girls}}{\text{Total number of students}} = \frac{x}{x + y}$$

49. The expression $2^{6n} - 4^{2n}$, where n is a natural number is always divisible by

- (1) 15 (2) 18
 (3) 36 (4) 48

Answer (4)

Sol. $2^{6n} - 4^{2n}$

$$\Rightarrow (2^6)^n - (4^2)^n$$

$$\Rightarrow 64^n - 16^n$$

$$\Rightarrow 48 | 64^n - 16^n$$

$$\Rightarrow (a - b) | a^n - b^n \quad \forall n \in \mathbb{N}$$

50. If $x = 2 - 2^{1/3} + 2^{2/3}$ then the value of $x^3 - 6x^2 + 18x + 18$ is

- (1) 22 (2) 33
 (3) 40 (4) 45

Answer (3)

Sol. $x = 2 - 2^{1/3} + 2^{2/3}$

$$(x - 2) = 2^{2/3} - 2^{1/3}$$

Cubing both sides

$$x^3 - 8 - 6x(x - 2) = \left(2^{2/3}\right)^3 - \left(2^{1/3}\right)^3 - 3 \cdot 2^{2/3} \cdot 2^{1/3} \left(2^{2/3} - 2^{1/3}\right)$$

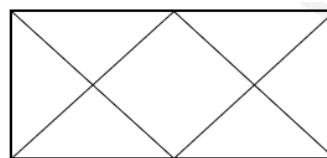
$$\Rightarrow x^3 - 6x^2 + 12x - 8 = 4 - 2 - 6(x - 2)$$

$$\Rightarrow x^3 - 6x^2 + 12x - 8 = 2 - 6x + 12$$

$$\Rightarrow x^3 - 6x^2 + 18x = 22$$

$$\text{So, } x^3 - 6x^2 + 18x + 18 = 22 + 18 = 40$$

51. In this given figure how many triangle are there?



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

Answer (1)

Sol. Number of triangles = 12

52. If Amit's father is Ketan's father's only son and Ketan has neither a brother nor a daughter. What is the relation between Ketan and Amit?

- (1) Uncle-Nephew (2) Father-Daughter
 (3) Father-Son (4) Cousin

Answer (3)

Sol. +
|
*Ketan
|
Amit

Means Ketan is the only son of his father and Ketan is father of Amit.

53. In a certain code language 'si po re' means 'book is thick', 'ti na re' means 'bag is heavy', 'ka si' means 'interesting book' and 'de ti' means 'that bag' what should stand for 'that bag is interesting' in that code language?

- (1) ka re na ti (2) de si re ka
(3) ti po ka na (4) de ti re ka

Answer (4)

Sol. bag — ti
that — de
is — re
interesting — ka

54. In a certain language 'PRINCIPAL' is written as 'MBOQSOMVW' and 'TEACHER' is written as 'FDVSZDB'. Then how is 'CAPITAL' written in that code?

- (1) SVMOFVW (2) SVMODVW
(3) BVMODVM (4) SVMIDVW

Answer (1)

Sol. CAPITAL → SVMOFVW

55. In a certain language ROPE is written as %57\$, DOUBT is written as 35#8* and LIVE is written as @24\$. How is TROUBLE is written in that code?

- (1) *%5#8@\$ (2) *%#58@\$
(3) *%5#8@4 (4) *%#58\$@

Answer (1)

Sol. TROUBLE → * %5 # 8 @ \$

ROPE → % 57 \$

→ D@UBT 35# 8 *. Similarly, we can find other codes

56. If \$ means 'Plus(+)', # means 'minus(-)', @ means multiplied(x), and * means 'divided(÷)' then what is the value of 16\$4@5#72*8?

- (1) 29 (2) 25
(3) 27 (4) 36

Answer (3)

Sol. $16 \$ 4 @ 5 # 72 * 8 = 16 + 4 \times 5 - 72 \div 8$
 $16 + 20 - 9 = 27$

57. In the number '5321648' how many digit will be as far away from the beginning of the number if digit arranged in ascending order as they are in the number?

- (1) None (2) One
(3) Two (4) Three

Answer (2)

Sol. 5321648 in ascending order → 1234568

8 is the only number

58. In a class of 35 students Kunal is placed seventh from the bottom, whereas Sonali is placed ninth from top. Pulkit is placed exactly in between the two. What is Kunal's position from Pulkit?

- (1) 9th (2) 10th
(3) 11th (4) 12th

Answer (2)

Sol. 9th from top Sonali

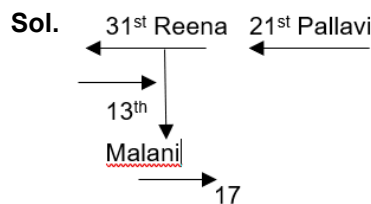
- Pulkit between Sonali and Kunal
7th from bottom Kunal
Between Sonali and Kunal
 $= 35 - (9 + 7)$
 $= 19$

∴ No. of students between Pulkit and Kunal = 9
So, Kunal is 10th from Pulkit

59. In a row of girls facing north, Reena is 10th to the left of Pallavi. Who is 21st from the right end. If Malini, who is 17th from the left and is fourth to the right of Reena, how many girls are there in a row?

- (1) 37 (2) 43
(3) 44 (4) Data Inadequate

Answer (2)



Reena is 10th to the left of Pallavi. So Reena from right = 31 and from left = 13

Total = 31 + 13 - 1
= 43

60. Anupriya was born on 29th Nov, 1970, which was Sunday. When her next birthday will fall on Sunday?

- (1) 1975 (2) 1976
(3) 1981 (4) 1982

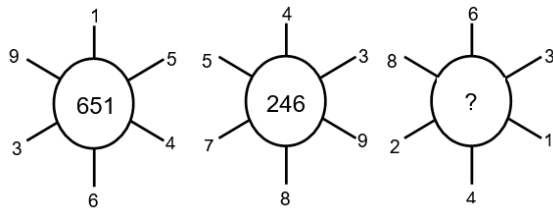
Answer (3)

Sol. 29th Nov, 1970 which was Sunday.

So, Calendar of 1970 would repeat after 11 years.

$\therefore 1970 + 11 = 1981$

61. Which one will replace the question mark?



- (1) 262 (2) 622
(3) 631 (4) 824

Answer (2)

Sol. $(9 \sim 3) = 6$

$(1 \sim 6) = 5 \Rightarrow 651$

$(5 \sim 4) = 1$

$(5 \sim 7) = 2$

$(4 \sim 8) = 4 \Rightarrow 246$

$(3 \sim 9) = 6$

Similarly, $8 \sim 2 = 6$

$6 \sim 4 = 2$

$3 \sim 1 = 2$

62. If + means \div , - means \times , \times means + and \div means - then, $4 + 6 \times 9 \div 6 - 2 \times 5$

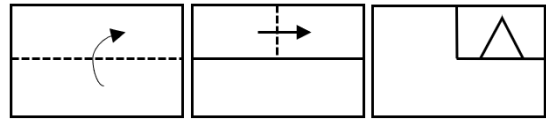
- (1) $\frac{4}{6}$
(2) $\frac{8}{3}$
(3) 2
(4) $\frac{9}{2}$

Answer (2)

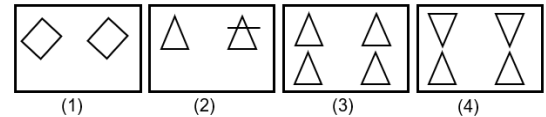
Sol. $\frac{8}{3}$

Direction (63–66) in the Question given below piece of paper folded and cut as shown below in question paper, from the given answer figure.

63. Question figure



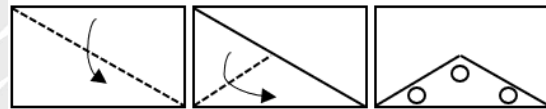
Answer figure



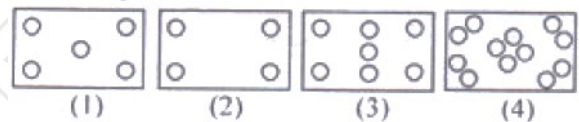
Answer (1)

Sol. By observation

64. Question figure



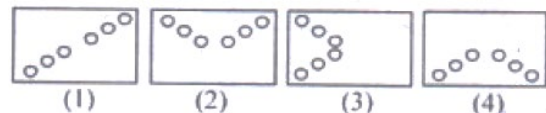
Answer figure



Answer (4)

Sol. By observation

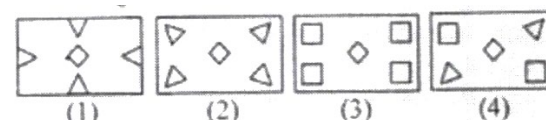
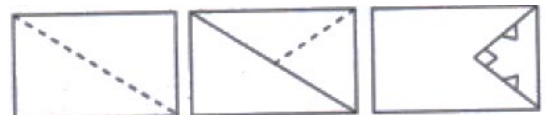
65. Question figure



Answer (1)

Sol. By observation

66. Question figure



Answer (3)

Sol. By observation

67. In the matrix below, the numbers in the cells follow some rules. Identify the number which when substituted for? Maintaining the same rule?

4	1	2
13	11	6
153	120	?

- (1) 32 (2) 45
(3) 16 (4) 48

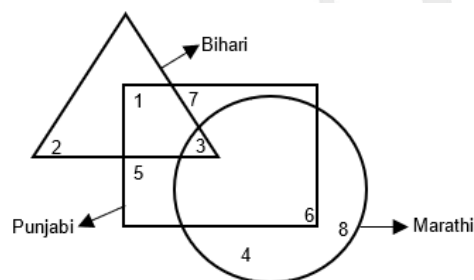
Answer (1)

Sol. $(13)^2 - (4)^2 = 153$

$(11)^2 - (1)^2 = 120$

Similarly $(6)^2 - (2)^2 = 36 - 4 = 32$

Direction (68–72). The Venn diagram given below is about a small circle is Marathi and triangle is Bihari, square is Punjab.



68. What is the total number of Biharis?

- (1) 5 (2) 6
(3) 7 (4) 8

Answer (2)

Sol. 6

69. What is the total number of Punjabis?

- (1) 22 (2) 28
(3) 29 (4) 35

Answer (1)

Sol. 22

70. What is the total number of Marathis?

- (1) 20 (2) 15
(3) 22 (4) 21

Answer (4)

Sol. 21

71. How many Bihari which are not Punjabis?

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

Answer (2)

Sol. 2

72. How many Punjabi which are not Marathi?

- (1) 10 (2) 11
(3) 12 (4) 13

Answer (4)

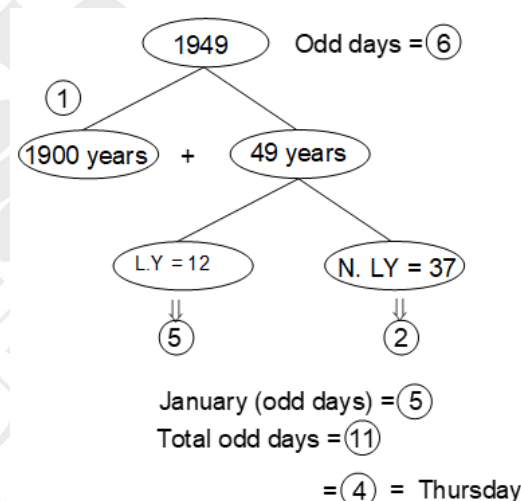
Sol. 13

73. India became a Republic on 26th January, 1950. Which day of the week was it?

- (1) Monday (2) Tuesday
(3) Thursday (4) Saturday

Answer (3)

Sol. 26th January 1950



74. At what angle (larger) are two hands of a clock inclined at 48 minute past 12?

- (1) 264° (2) 263°
(3) 265° (4) 266°

Answer (1)

Sol. Minute hand move in 1' = 6°

and hour hand move in 1' = $\frac{1}{2}^\circ$

Then angle in 12 past 48 minutes

$= 48 \times 6^\circ - 48 \times \frac{1}{2}^\circ$

$= 264^\circ$

75. A clock is set right at 4 am. The clock loses 20 minutes in 24 hours. What will be the time, when the clock indicate 3 am on 4th day?

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

Answer (2)

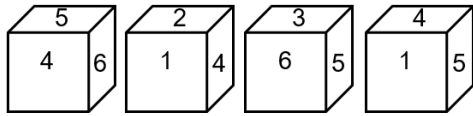
Sol. In 24 hours → 20 minutes

Total time from first day 4 am to 4th day 3 am = 71 hours

In 71 hours → $\frac{20}{24} \times 71 = 59.16 = 1 \text{ hour (approx.)}$

∴ 4 am

76. A die has four different positions. Find the number on the face opposite to 3.



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

Answer (3)

Direction: (77 to 79) are based on given information: A solid cube is painted red on all faces. The side of the cube is 8 cm. It is cut into smaller cubes of side 2 cm. Answer the following question.

77. How many cubes have three faces coloured?

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

Answer (3)

78. How many cubes have two faces coloured?

- (1) 8 (2) 16
(3) 36 (4) 24

Answer (4)

79. How many cubes have only one face coloured?

- (1) 16 (2) 24
(3) 32 (4) 36

Answer (2)

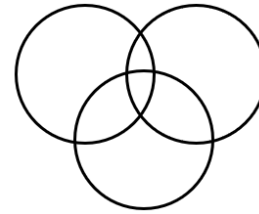
80. Choose the correct option to complete the matrix?

4C	2B	3A
28A	10C	45B
7C	?	15B

- (1) 15A
(2) 12B
(3) 5A
(4) 8C

Answer (3)

81. Which of following is the best represented in diagram?



- (1) Chair, Table, Furniture
(2) Doctor, Social Person, Honest Person
(3) Family, Parents, Children
(4) Gold Jewellery, Silver Jewellery, Ornaments

Answer (2)

Direction: (82 to 84) study the letter series given below and answer the questions that follows.

HDYSMWNBQPOCRTBLZVEGUF

82. Which two neighbours in the given arrangement are farthest in the alphabetical order?

- (1) B and Q (2) D and Y
(3) U and F (4) V and E

Answer (2)

83. Which letter has the same neighbours as in the alphabetical order through they have change places?

- (1) M (2) N
(3) O (4) F

Answer (3)

84. Which three letters have the same distance as they have in the alphabetical order through they have changed places?

- (1) HMP (2) NQZ
(3) QOE (4) YLF

Answer (4)

85. A and B are sisters. R and S are brothers. Daughter of A is the sister of R. Then which relation between B and S?

- (1) Aunt (2) Grandmother
(3) Sister (4) Mother

Answer (1)

Sol. $\begin{matrix} \circ & \text{Sister} & \circ \\ \text{A} & & \text{B} \end{matrix}$



B is Aunt of S

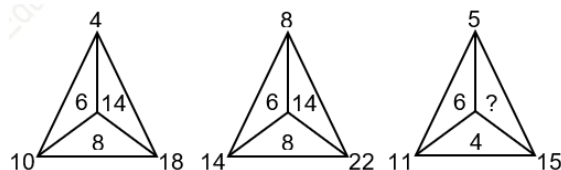
86. Abhay is the husband of Neena and Sunita is the mother of Abhay. Sohan is the uncle of Neeraj. Who is the relation between Sohan and Neena?

- (1) Jeth (2) Dever
(3) Bhatija (4) Jeth/Devar

Answer (*)

Sol. Data insufficient/Data missing

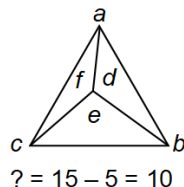
87. Which one will replace the question mark?



- (1) 8 (2) 14
(3) 10 (4) 6

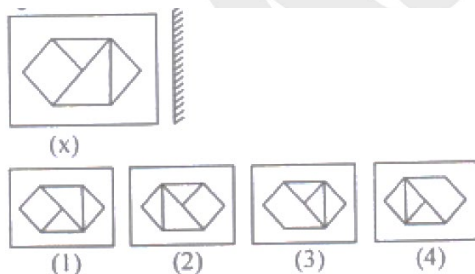
Answer (3)

Sol.



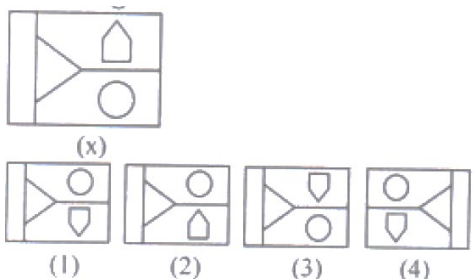
$d = b - a$
 $e = b - c$
 $f = c - a$

88. Choose the correct mirror image of figure (x) from given alternatives?



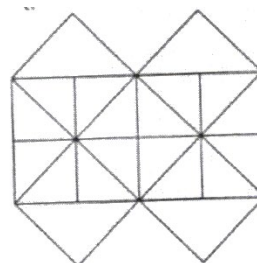
Answer (2)

89. Choose the correct water image of figure (x) from given alternatives:



Answer (1)

90. Which is the minimum number of straight lines needed to construct the following figure?



- (1) 13 (2) 15
(3) 16 (4) 17

Answer (3)

Sol. Minimum number of straight lines required is

$5 + 3 + 4 + 4 = 16$

Direction: (91 to 95). A cube is coloured red on all of its faces. It is then cut into 64 smaller cube of equal size. The smaller cube so obtained are now separated.

91. How many smaller cubes have no surface coloured?

- (1) 24 (2) 16
(3) 8 (4) 10

Answer (3)

Sol. Number of cubes with no surface coloured = $(n - 2)^3$ where n is cube root of total number of small cubes cut.

$\Rightarrow n = (64)^{1/3} = 4$

$\Rightarrow (4 - 2)^3 = 2^3 = 8$

92. How many smaller cube will have atleast two surfaces painted with red coloured?

- (1) 4 (2) 18
(3) 32 (4) 24

Answer (3)

Sol. Number of smaller cubes with at least two surface painted = two surface painted cubes + there surface painted cubes

$\Rightarrow (12 \times (n - 2)) + 8 = 12 \times 2 + 8 = 32$ where n is cube root of total number small cubes

93. How many smaller cubes have two surfaces painted with red coloured?

- (1) 24 (2) 8
(3) 12 (4) 20

Answer (1)

Sol. Number of cubes painted on two surface = $12 \times (n - 2) = 12 \times 2 = 24$

94. How many smaller cubes have only three surfaces painted with red coloured?

- (1) 0 (2) 12
(3) 24 (4) 6

Answer (*)

Sol. No option is correct.

Only 8 corner cubes are painted on three surfaces.

95. A 6 cm cube is cut into 2 cm smaller cube. How many smaller cubes can be obtained from their?

- (1) 108 (2) 156
(3) 27 (4) 64

Answer (3)

Sol. Number of smaller cubes = $\frac{6 \times 6 \times 6}{2 \times 2 \times 2} = 27$

Direction: (96 to 100) Read the following information and answer the question which follow:-

- 'A × B'** means 'A' is father of 'B'
- 'A + B'** means 'A' is daughter of 'B'
- 'A - B'** means 'A' is mother of 'B'
- 'A ÷ B'** means 'A' is brother of 'B'

96. If $P + Q - R ÷ T$, how is T related to P?

- (1) Aunt (2) Brother
(3) Father (4) Cousin

Answer (4)

Sol. Q and R are brother and sister.

P and T are their children.

Therefore P and T are cousin

97. Which of the following means that R is the wife of P?

- (1) $P \times R - Q - T$ (2) $P \div T + R - Q$
(3) $P \div R - Q + T$ (4) $P \times T - Q + R$

Answer (4)

Sol. $P \times T - Q + R$

P is father of T

T is brother of Q

Q is daughter of R

P is husband of R or R is wife of P

98. If ' $P \times T \div Q + R$ ', how is R related to P?

- (1) Daughter
(2) Husband
(3) Son in law
(4) Daughter in law

Answer (3)

Sol. $P \times T \div Q + R$

P is father of T

T is mother of Q

Q is daughter of R

\Rightarrow T is wife of R and R is son-in-law of P

99. If $P \div R - Q \times T$. How is P related to T?

- (1) Grandmother
(2) Mother in law
(3) Sister
(4) Grandfather

Answer (1)

Sol. $P \div R - Q \times T$

P is mother of R

R is brother of Q

Q is father of T

R and Q are children of P.

P is mother of Q

\Rightarrow P is grandmother of T.

100. If $P \div Q + R \times T$, How Q is related to T?

- (1) Aunt
(2) Sister
(3) Brother
(4) None of these

Answer (2)

Sol. $P \div Q + R \times T$

P is mother of Q

Q is daughter of R

R is father of T

Q is daughter of R, who is father of T

\Rightarrow Q is sister of T

PART-II : SCHOLASTIC APTITUDE TEST (SAT)

101. A bomb of Mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 m/s. The kinetic energy of the other mass is

- (1) 324 J
- (2) 486 J
- (3) 256 J
- (4) 524 J

Answer (2)



By conservation of linear momentum

$$mu = m_1v_1 + m_2v_2$$

$$0 = (18 \times 6) + (12v_2)$$

$$12v_2 = -108$$

$$v_2 = \frac{-54}{6} = -9 \text{ m/s}$$

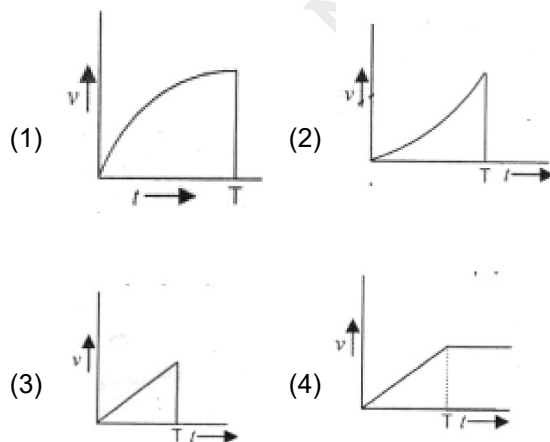
Kinetic energy of m_2 is

$$K_2 = \frac{1}{2}m_2v_2^2 = \frac{1}{2} \times 12 \times (-9) \times (-9)$$

$$K_2 = 6 \times 81$$

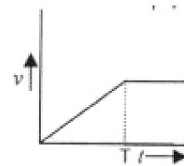
$$K_2 = 486 \text{ J}$$

102. A body initially at rest start moving when a constant external force F is applied on it. The force F is applied for time $t = 0$ to time $t = T$. Which of the following graph represents the variation of the speed (v) of the body with time (t)



Answer (4)

Sol. Since, force is constant so, acceleration is also constant for time $t = T$. For $t > T$, body moves with constant speed.



103. A person cannot clearly see object at a distance more than 40 cm. He is advised to use lens of power

- (1) -2.5 D
- (2) 2.5 D
- (3) -1.5 D
- (4) 1.5 D

Answer (1)

Sol. F.P. = 40 cm

$$u = -\infty, v = -40 \text{ cm}$$

$$\therefore \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\frac{1}{f} = \frac{-1}{40}$$

$$f = -40 \text{ cm}$$

$$\therefore P = \frac{100}{f} = -\frac{100}{40} = -\frac{5}{2}$$

$$P = -2.5\text{D}$$

104. Gravitational force is essentially required for

- (1) Stirring in liquid
- (2) Convection
- (3) Conduction
- (4) Radiation

Answer (2)

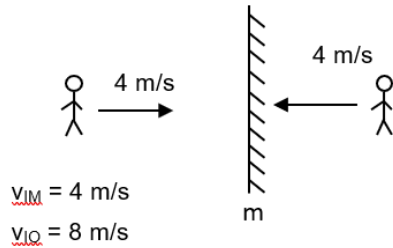
Sol. It is caused by gravity which pulls heavier elements in liquids or gases downwards, causing lighter elements to go upwards.

105. An observer moves towards a stationary plane mirror at a speed of 4 m/s the speed with which his image moves him?

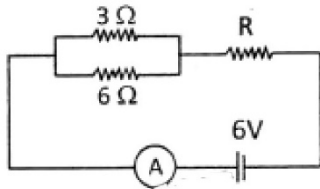
- (1) 2 m/s
- (2) 4 m/s
- (3) 8 m/s
- (4) Image will stay at rest

Answer (3)

Sol.



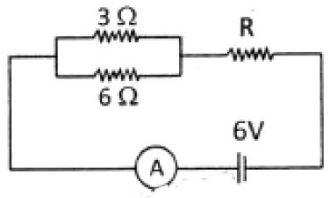
106. If the ammeter in the given circuit reads 2 A, What is the value of resistance R (the resistance of ammeter is negligible).



- (1) 1Ω (2) 2Ω
(3) 3Ω (4) 4Ω

Answer (1)

Sol. $I = 2 \text{ A}$



$$\frac{1}{R_1} = \frac{1}{3} + \frac{1}{6} = \frac{2+1}{6} = \frac{3}{6} = \frac{1}{2}$$

$$\therefore R_1 = 2 \Omega$$

$$R_{eq} = \frac{V}{I} = \frac{6}{2} = 3 \Omega$$

$$\therefore R_1 + R = R_{eq}$$

$$2 + R = 3$$

$$R = 3 - 2$$

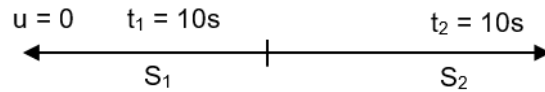
$$R = 1 \Omega$$

107. A particle starts its motion from rest under the action of a constant force. If the distance covered in first 10 second is S_1 and that covered in next 10 seconds is S_2 then

- (1) $S_2 = 6 S_1$ (2) $S_2 = 2 S_1$
(3) $S_2 = 8 S_1$ (4) $S_2 = 3 S_1$

Answer (4)

Sol. $a \rightarrow$ constant



$$S = ut + \frac{1}{2}at^2$$

$$S_1 = 0 + \frac{1}{2}a \times 100$$

$$S_1 = 50a$$

Total distance

$$S = 0 + \frac{1}{2}a \times 400 = 200a$$

$$S = S_1 + S_2$$

$$S - S_1 = 150a$$

$$S_2 = S - S_1 = 150a$$

$$S_2 = 3S_1$$

108. Two planets of radii r_1 and r_2 are made from the same material having same density. The ratio of acceleration due to gravity g_1/g_2 at the surfaces of the planets is

- (1) r_1/r_2 (2) r_2/r_1
(3) $(r_1/r_2)^2$ (4) $(r_2/r_1)^2$

Answer (1)

Sol. We know

$$g = \frac{GM}{R^2} = \frac{G \times \rho \times V}{R^2} = \frac{G}{R^2} \times \frac{4}{3} \pi R^3 \rho$$

$$\therefore g = \frac{4}{3} \pi G \rho R$$

$$\therefore \frac{g_1}{g_2} = \frac{\frac{4}{3} \pi G \rho r_1}{\frac{4}{3} \pi G \rho r_2} = \frac{r_1}{r_2}$$

109. A concave mirror of focal length 15 cm forms an image. The position of the object when the image is virtual and linear magnification is 2 is

- (1) 22.5 cm (2) 7.5 cm
(3) 30 cm (4) 45 cm

Answer (2)

Sol. $f = -15 \text{ cm}; m = +2$

$$m = \frac{f}{f - u}$$

$$2 = \frac{-15}{-15 - u}$$

$$\begin{aligned} 2(-15 - u) &= -15 \\ -30 - 2u &= -15 \\ -2u &= 15 \\ u &= -7.5 \text{ cm} \end{aligned}$$

110. A body on an inclined plane slides down $\frac{1}{4}$ th of distance in 2 seconds. It will slide down the complete distance along the plane in (the inclined plane have zero friction)

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

Answer (1)

Sol. $u = 0$, $s = \frac{d}{4}$, $t = 2\text{s}$

$$S = 0 + \frac{1}{2}at^2$$

$$\frac{d}{4} = \frac{1}{2}a \times 4$$

$$\frac{d}{4} = 2a$$

$$\therefore a = \frac{d}{8}$$

for whole distance

$$S = 0 + \frac{1}{2}at^2$$

$$d = \frac{1}{2} \times \frac{d}{8} t^2$$

$$t^2 = 16$$

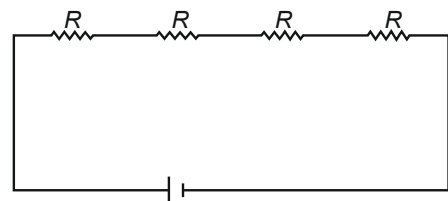
$$t = 4 \text{ s}$$

111. When four equal resistors are connected in series with battery they dissipate a power of 10 W. The power dissipated through any of them if connected across the same battery will be

- (1) 40 W (2) 10/3 W
(3) 90 W (4) 10 W

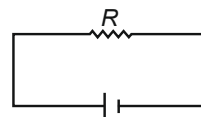
Answer (1)

Sol.



$$P = \frac{V^2}{4R} \Rightarrow 10 = \frac{V^2}{4R} \Rightarrow V^2 = 40R$$

Now,



$$\therefore P = \frac{V^2}{R} = \frac{40R}{R}$$

$$P = 40 \text{ W}$$

112. An electron move with velocity v in a uniform magnetic field B . The magnetic force experienced by the electron is

- (1) Always zero
(2) Never zero
(3) Zero if v is perpendicular to B
(4) Zero if v is parallel to B

Answer (4)

Sol. We know

$$F = qvB \sin \theta$$

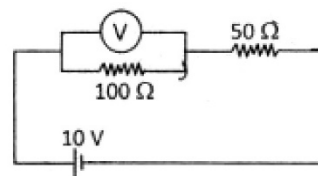
$$\text{If } \theta = 0^\circ$$

$$\therefore F = 0$$

$$\text{If } \theta = 90^\circ$$

$$F = qvB \neq 0$$

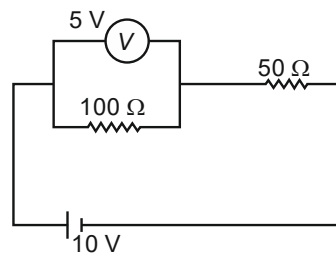
113. In the given circuit the voltmeter reads 5 V. The resistance of the voltmeter in Ohm is



- (1) 200 (2) 100
(3) 10 (4) 50

Answer (2)

Sol. Current across 50Ω is



$$I = \frac{5}{50} = 0.1 \text{ A}$$

Current in series remain same.

∴ Total resistance across voltmeter and 100Ω is 50Ω

$$\therefore \frac{1}{50} = \frac{1}{R} + \frac{1}{100}$$

$$\frac{1}{R} = \frac{1}{50} - \frac{1}{100} = \frac{2-1}{100} = \frac{1}{100}$$

∴ $R = 100\Omega$

114. Which of the following contain seven molecule of water of crystallization?

- (1) Epsom salt (2) Green vitriol
(3) Blue vitriol (4) White vitriol

Answer (* option 1, 2 and 4 are correct)

Sol. Epsom salt – $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$

Blue vitriol – $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

Green vitriol – $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$

White vitriol – $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$

115. Which elements are used for galvanisation?

- (1) Zn and Sn (2) Na and K
(3) Cu and Fe (4) Ca and Mg

Answer (1)

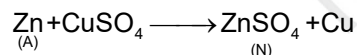
Sol. Galvanisation can be done by Zn and Sn

116. Ramesh dropped a metal piece 'A' in the solution of another metal 'M'. After some time a new colourless compound 'N' is formed. A, M, N respectively can be

- (1) Mg, NaCl, MgCl_2 (2) Fe, ZnSO_4 , FeSO_4
(3) Zn, CuSO_4 , ZnSO_4 (4) Cu, ZnSO_4 , CuSO_4

Answer (3)

Sol. Metal A + Solution of Metal (M) \longrightarrow N (colourless compound)



117. Which fuel has highest calorific value?

- (1) LPG (2) Petrol
(3) CNG (4) Hydrogen

Answer (4)

Sol.

Fuel		Calorific Value (kJ/kg)
LPG	—	55000
Petrol	—	45000
CNG	—	50000
Hydrogen	—	150000

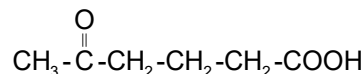
118. The pH of acid rain is

- (1) Less than 5.6 (2) More than 5.6
(3) Equal to 5.6 (4) More than 6.6

Answer (1)

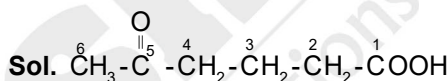
Sol. The pH of acid rain is less than 5.6

119. IUPAC name of the following compound will be :



- (1) 2 – Keto hexan – 6 oic acid
(2) 5 – Keto hexanoic acid
(3) Methyl Ketone butanoic acid
(4) 5 – Aldo hexanoic acid

Answer (2)



5 – keto hexanoic acid

120. Products obtained on electrolysis of brine are :

- (1) NaHCO_3 , H_2 , Cl_2
(2) H_2 , NaOH , NaHCO_3
(3) Cl_2 , NaOH , Na_2O_2
(4) NaOH , H_2 , Cl_2

Answer (4)

Sol. Aqueous solution of NaCl is known as brine



121. In balanced chemical equation



Which of the following alternative are correct?

- (1) $a = 2$, $b = 3$, $c = 1$, $d = 2$, $e = 3$, $f = 5$
(2) $a = 1$, $b = 2$, $c = 1$, $d = 3$, $e = 2$, $f = 3$
(3) $a = 2$, $b = 3$, $c = 2$, $d = 3$, $e = 2$, $f = 5$
(4) $a = 3$, $b = 1$, $c = 3$, $d = 3$, $e = 1$, $f = 3$

Answer (1)

Sol. $2\text{KMnO}_4 + 3\text{H}_2\text{SO}_4 \longrightarrow$

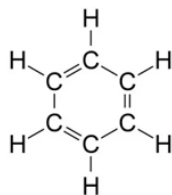


122. Benzene (C_6H_6) have:

- (1) 12 covalent bonds (2) 15 covalent bonds
(3) 18 covalent bonds (4) 9 covalent bonds

Answer (2)

Sol. Benzene (C₆H₆)



Total covalent bonds are = 15

123. 1.0 Kg of Iron (Fe), having atomic mass equal to 56 g mol⁻¹ contains :-

- (1) 2.88×10^{24} atoms (2) 6.93×10^{23} atoms
(3) 6.93×10^{21} atoms (4) 1.075×10^{25} atoms

Answer (4)

Sol. No. of atoms = number of moles \times Avogadro No.

$$N_{\text{Fe}} = \frac{1000}{56} \times 6.022 \times 10^{23}$$

$$N_{\text{Fe}} = 1.075 \times 10^{25} \text{ atoms}$$

124. Aqueous solution of CsO₂ is :

- (1) Basic (2) Neutral
(3) Acidic (4) Amphoteric

Answer (1)

Sol. $2\text{CsO}_2 + 2\text{H}_2\text{O} \longrightarrow 2\text{CsOH} + \text{H}_2\text{O}_2 + \text{O}_2$

Due to formation of CsOH its aqueous solution is basic

125. A student added a drop of universal indicator to 1.00 mL of given solution and found that a green colour is produced. The pH value of the solution will be :

- (1) 7 – 9 (2) 0 – 3
(3) 10 – 12 (4) 4 – 6

Answer (1)

Sol. Universal indicator turns green when it is added to a neutral solution hence pH should be 7.

So, the closest option is 1 that is pH value 7 – 9.

126. Elements present in any group have the same number of :

- (1) Valence electrons (2) Neutrons
(3) Protons (4) None of the above

Answer (1)

Sol. Elements present in any group have same number of valence electrons as their outer shell electronic configuration is the same.

127. Which of the following reactions take place during break down of molecules in the respiration in our body?

- (1) Oxidation
(2) Reduction
(3) Oxidation – reduction
(4) Photo-oxidation

Answer (3)

Sol. Respiration involves

- (a) Oxidation of glucose
(b) Reduction of O₂

128. Lactic acid is produced when pyruvate is broken down

- (1) In presence of oxygen in mitochondria
(2) In absence of oxygen in mitochondria
(3) In presence of oxygen in muscle cells
(4) In absence of oxygen in muscle cells

Answer (4)

Sol. This is the case of anaerobic respiration, which takes place during vigorous muscular activity. During this process lactic acid is produced which gets accumulated in muscles & leads to cramps.

129. Separation of oxygenated and deoxygenated blood.

- I. Fulfils energy requirements of the body
II. Ensures the effect transfer of oxygen in the body

- (1) Both statements are true
(2) Statement I is true but statement II is false
(3) Statement I is false but statement II is true
(4) Both the statements are false

Answer (1)

Sol. Complete separation of oxygenated and deoxygenated blood is a feature of warm-blooded animals; their heart has 4 chambers which ensure the effective transfer of oxygen in the body and also meet the high energy requirement to maintain their constant body temperature.

130. Root pressure is effective way transporting water in xylem. This pressure is generated

- (1) In bright sunlight
(2) During night
(3) At very low temperature
(4) In high trees

Answer (2)

Sol. At night, root pressure (hydrostatic pressure) plays an important role in transport of water. It develops due to mineral ions which are present in vascular tissue of the roots.

131. Choose the correct option to complete 'A', 'B', 'C' and 'D' in the following table.

Hormone	Function
A	Stimulates growth in all organs
B	Stimulates pituitary to release growth hormone
C	Controls blood sugar level
D	Regulates carbohydrate metabolism

- (1) A – Insulin, B–Thyroxine, C–Growth Hormone, D – Growth Hormone Release Factor
- (2) A – Growth Hormone, B–Insulin, C–Thyroxine, D – Growth Hormone Releasing Factor
- (3) A – Thyroxine, B–Insulin, C–Growth Hormone, D – Growth Hormone Releasing Factor
- (4) A – Growth Hormone, B – Growth Hormone Releasing Factor, C–Insulin, D – Thyroxine

Answer (4)

Sol.

A	Growth Hormone	Stimulates growth in all organs
B	Growth Hormone RF	Stimulates pituitary to release growth hormone
C	Insulin	Control blood sugar level
D	Thyroxine	Regulates carbohydrate metabolism

132. If a pea plant with wrinkled seed and heterozygous tall plant were self pollinated, what will be the phenotypes of plants of F₂ generation.

- (1) 75% plants will be tall and have wrinkled seeds and other 25% will be dwarf with wrinkled seeds
- (2) 50% plants will be tall and have wrinkled seeds and 50% will be dwarf with wrinkled seeds
- (3) 50% plants will be tall and have wrinkled seeds and other 50% will be dwarf with round seeds
- (4) 25% plants will be tall and have wrinkled seeds and other 75% will be dwarf with wrinkled seeds.

Answer (1)

Sol. Heterozygous tall plants (Tt) wrinkled seed = rr (recessive trait)

Parents $Tt \downarrow$ X $Tt \downarrow$ (Selfed)

Gamete formation Tr Tr tr tr Tr Tr tr tr

	Tr	Tr	tr	tr
Tr	TTrr Tall wrinkled	TTrr Tall wrinkled	Ttrr Tall wrinkled	Ttrr Tall wrinkled
Tr	Ttrr Tall wrinkled	TTrr Tall wrinkled	Ttrr Tall wrinkled	Ttrr Tall wrinkled
tr	Ttrr Tall wrinkled	Ttrr Tall wrinkled	ttrr dwarf wrinkled	ttrr dwarf wrinkled
Tr	Ttrr Tall wrinkled	Ttrr Tall wrinkled	ttrr dwarf wrinkled	ttrr dwarf wrinkled

$$\text{Tall Wrinkled} = \frac{12}{16} = \frac{3}{4} = 75\%$$

$$\text{Dwarf wrinkled} = \frac{4}{16} = \frac{1}{4} = 25\%$$

133. Two similar pea plants are growing in two different islands separated by a vast ocean. The phenomenon of geographical isolation will

- (1) Not be seen as the plants get self pollinated
- (2) Be seen as the plants are growing in isolated regions
- (3) Not be seen as the plants get pollinated by ocean water currents
- (4) Be seen as the plants do not get pollinated and reproduces asexually

Answer (1)

Sol. Because pea plant is self pollinating in nature as pea flower is bisexual. Therefore geographical isolation would not be having any effect on it.

134. DDT is non-biodegradable chemical when it enters food chain it gets accumulated in each trophic level. This phenomenon is called as -

- (1) Eutrophication
- (2) Chemical amplification
- (3) Biomagnification
- (4) Chemical magnification

Answer (3)

Sol. The accumulation and progressive increase in the concentration of non-biodegradable, harmful chemicals (DDT) at different trophic levels in a food chain is called bioconcentration or biomagnification.

135. Presence of _____ is an indicator of pollution level in water.

- (1) Colour (2) Coliform bacteria
(3) Rhizo bacteria (4) Spiral bacteria

Answer (2)

Sol. Coliform is a group of bacteria, found in human intestines, whose presence in water indicates contamination of water by disease causing microorganisms.

136. Leaves of tendu are the source of income of large number of people in India. These leaves are used to make

- (1) Thatched roofs (2) Bidis
(3) Leaf plates (4) Teeth cleaning agent

Answer (2)

Sol. Tendu leaves (*Diospyros melanoxylon*) are used for making beedis or "Indian cigar".

137. Maximum number of trophic levels supported in any ecosystem is

- (1) One (2) Two
(3) Three (4) Four

Answer (4)

Sol. According to ten percent law, only 10% of the total energy transfers to next trophic level which clearly indicates that very less amount of energy would be available after 4 trophic levels in a food chain.

138. Correct sequence of reflex are is

- (1) Receptor → Motor Neuron → Sensory Neuron → Effector organ → Relay Neuron
(2) Receptor → Sensory Neuron → Motor Neuron → Effector organ → Relay Neuron
(3) Receptor → Sensory Neuron → Motor Neuron → Relay Neuron → Effector organ
(4) Receptor → Sensory Neuron → Relay Neuron → Motor Neuron → Effector organ

Answer (4)

Sol. Path followed by an impulse in a reflex action is called reflex arc

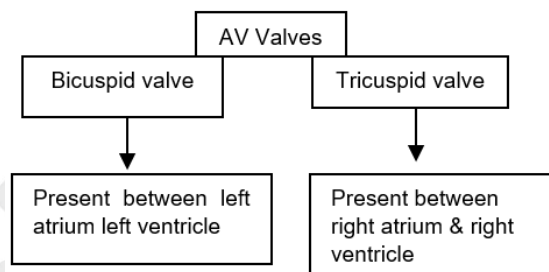
Receptor → Sensory neuron → Relay neuron → Motor neuron → Effectors organ

139. Tricuspid valve is present in

- (1) Right atria and right ventricle
(2) Left atria and left ventricle
(3) Wall of atrium
(4) Wall of ventricle

Answer (1)

Sol. The openings between the atria and ventricles are guarded by atrio-ventricular valves.



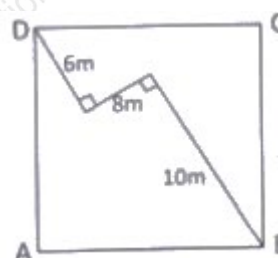
140. BCG vaccine provide protection against

- (1) Measles (2) T. B.
(3) Cholera (4) Small pox

Answer (2)

Sol. BCG vaccine which consists of weakened *Tuberculosis bacillus* provides immunity (protection) against tuberculosis.

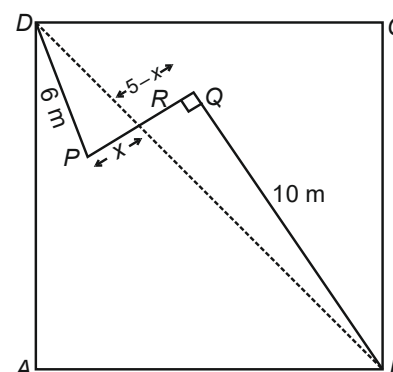
141. Find the area of the square ABCD.



- (1) 160 m² (2) 140 m²
(3) 125 m² (4) 120 m²

Answer (1)

Sol. In the given figure



$$\Delta DPR \sim \Delta BQR$$

$$\Rightarrow \frac{DP}{BQ} = \frac{PR}{QR}$$

$$\frac{6}{10} = \frac{x}{8-x}$$

$$\Rightarrow x = 3m$$

$$DR = 3\sqrt{5}$$

$$BR = 5\sqrt{5}$$

$$BD = 8\sqrt{5}$$

$$BD^2 = 2AB^2$$

$$320 = 2 \times AB^2$$

$$160m^2 = AB^2$$

$$\text{Area of square} = 160m^2$$

142. If $(2^x - 4)^3 + (4^x - 2)^3 = (4^x + 2^x - 6)^3$, then the sum of all real values of x is

- (1) 0.5 (2) 1.5
(3) 2.5 (4) 3.5

Answer (4)

$$\text{Sol. } (2^x - 4)^3 + (2^{2x} - 2)^3 = (2^{2x} + 2^x - 6)^3$$

$$(2^x - 4)^3 + (2^{2x} - 2)^3 - (2^{2x} + 2^x - 6)^3 = 0$$

$$3(2^x - 4)(2^{2x} - 2)(-2^{2x} - 2^x + 6) = 0$$

$$\Rightarrow 2^x = 4 \Rightarrow x = 2$$

$$2^{2x} = 2 \Rightarrow x = \frac{1}{2}$$

$$2^x + 3 = 0 \text{ (Not possible)}$$

$$2^x - 2 = 0 \Rightarrow x = 1$$

$$\text{Sum of all possible values of } x = 2 + \frac{1}{2} + 1$$

$$= 3.5$$

143. If $2019^x + 2019^{-x} = 3$, then the value of

$$\sqrt{\frac{2019^{6x} - 2019^{-6x}}{2019^x - 2019^{-x}}} \text{ is :-}$$

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

Answer (4)

Sol. Let $a = 2019^x$ and $b = 2019^{-x}$

$$\text{Now, } \sqrt{\frac{a^6 - b^6}{a - b}} = \sqrt{(a + b) \left[(a^2 + b^2)^2 - a^2 b^2 \right]}$$

$$= \sqrt{3 \left[((a + b)^2 - 2ab)^2 - a^2 b^2 \right]}$$

$$= \sqrt{3 \times 48}$$

$$= 12$$

144. Let 'p' be a root of the equation $x^2 - 5x + 7 = 0$, then the area of circle with centre at (P, P) and passing through point (1, 4) is

- (1) 3π sq. units (2) 5π sq. units
(3) 7π sq. units (4) None of these

Answer (1)

Sol. Let r be the radius of the circle then $r^2 = (p - 1)^2$

$$+ (p - 4)^2$$

$$r^2 = 2p^2 - 10p + 17$$

$$= 2(p^2 - 5p) + 17$$

$$= 3$$

$$\text{Area of circle} = \pi r^2$$

$$= 3\pi \text{ sq. units}$$

Although the roots of the equation $x^2 - 5x + 7 = 0$ are imaginary

Therefore circle won't exist.

145. If $\frac{1}{x+y} = \frac{1}{x} + \frac{1}{y}$, then the value of $\left(\frac{x}{y}\right)^6 + \left(\frac{x}{y}\right)^3$ is :-

- (1) 0 (2) $\frac{1}{2}$
(3) 1 (4) 2

Answer (4)

$$\text{Sol. } \frac{1}{x+y} = \frac{1}{x} + \frac{1}{y}$$

$$\frac{1}{x+y} - \frac{1}{x} = \frac{1}{y}$$

$$\frac{x - x - y}{x(x+y)} = \frac{1}{y}$$

$$-y^2 = x^2 + xy$$

$$(x - y)(x^2 + xy + y^2) = 0$$

$$x^3 - y^3 = 0$$

$$x^3 = y^3$$

$$\left(\frac{x}{y}\right)^6 + \left(\frac{x}{y}\right)^3 = 2$$

146. Let a, b and c are the roots of the polynomial equation $x^3 - 597x - 5236 = 0$ then the value of $(a^3 + b^3 + c^3)$ is

- (1) 597 (2) 15708
(3) 5236 (4) 10472

Answer (2)

Sol. $a + b + c = 0$

$$\begin{aligned} \Rightarrow a^3 + b^3 + c^3 &= 3abc \\ &= 3 \times 5236 \\ &= 15708 \end{aligned}$$

147. If $\operatorname{cosec} x + \cot x = a$, then the value of $\cos x$ is

- (1) $a^2 + \frac{1}{a^2}$ (2) $\frac{a^2 + 1}{a^2 - 1}$
(3) $\frac{a^2 - 1}{a^2 + 1}$ (4) $\frac{a^2 + 1}{2a}$

Answer (3)

Sol. $\operatorname{cosec} x + \cot x = a$

$$\operatorname{cosec} x - \cot x = \frac{1}{a}$$

$$2\operatorname{cosec} x = a + \frac{1}{a}$$

$$\operatorname{cosec} x = \frac{a^2 + 1}{2a}$$

$$\sin x = \frac{2a}{1 + a^2}$$

$$\cos x = \sqrt{1 - \left(\frac{2a}{1 + a^2}\right)^2}$$

$$\Rightarrow \cos x = \left(\frac{1 - a^2}{1 + a^2}\right) \text{ or } \left(\frac{a^2 - 1}{a^2 + 1}\right)$$

148. In an AP 2, 5, 8, 11, 452. The mean of 15th, 16th, 136th and 137th terms is

- (1) 120 (2) 227
(3) 220 (4) 454

Answer (2)

Sol. 2, 5, 8, 11,, 452

$$a_n = 452$$

$$452 = 2 + (n - 1) \times 3$$

$$n = 151$$

$$a_{15} + a_{137} = a_{16} + a_{136} = a_1 + a_{151}$$

$$\text{So } \frac{a_{15} + a_{16} + a_{136} + a_{137}}{4} = \frac{2[2 + 452]}{4} = 227$$

149. The minimum value of $\tan^2 x + \cot^2 x$ is :-

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

Answer (3)

Sol. $a = \tan^2 x + \cot^2 x - 2 + 2$

$$a = (\tan x - \cot x)^2 + 2$$

$$\therefore \text{Minimum value} = 2$$

Or

$$\therefore \text{AM} \geq \text{GM}$$

$$\Rightarrow \frac{\tan^2 x + \cot^2 x}{2} \geq (\tan^2 x \cot^2 x)^{\frac{1}{2}}$$

$$\Rightarrow \tan^2 x + \cot^2 x \geq 2$$

$$\therefore \text{Minimum value} = 2$$

150. If $f(x) = x^4 + ax^3 + bx^2 + cx + d$ is a polynomial such that $f(1) = 5$, $f(2) = 10$, $f(3) = 15$, $f(4) = 20$, find the value of $\frac{f(12) + f(-8)}{100}$

- (1) 198 (2) 198.4
(3) 198.6 (4) 199.2

Answer (*) No option is correct.

Sol. $f(x) = x^4 + ax^3 + bx^2 + cx + d$

$$f(x) = (x - 1)(x - 2)(x - 3)(x - 4) + 5x$$

$$f(1) = 5, f(2) = 10, f(3) = 15, f(4) = 20$$

$$\begin{aligned} \frac{f(12) + f(-8)}{100} &= \frac{(11 \times 10 \times 9 \times 8) + 60 + 9 \times 10 \times 11 \times 12 + (-40)}{100} \\ &= \frac{990 \times 20 + 20}{100} \\ &= \frac{991}{5} \\ &= 198.2 \end{aligned}$$

151. The product of two 2 digits numbers is 2160 and their H.C.F. is 12. Then sum of the number is

- (1) 72 (2) 84
(3) 96 (4) 60

Answer (3)

Sol. Let number be $12a$ and $12b$, where $1 \leq a, b \leq 8$

$$\Rightarrow 144ab = 2160$$

$$\Rightarrow ab = 15$$

\therefore Only possibilities are

$$a = 3 \text{ and } b = 5 \quad \text{Or} \quad a = 5 \text{ and } b = 3$$

$$\Rightarrow 12(a + b) = 8 \times 12 = 96$$

152. The angles of a pentagon are in arithmetic progression. The sum of the smallest and largest angle is

- (1) 172° (2) 108°
(3) 180° (4) 216°

Answer (4)

Sol. Sum of all angles of a pentagon = 540

Let angles be $(a-2d)$, $(a-d)$, a , $(a+d)$, $(a+2d)$

$$a - 2d + a - d + a + a + d + a + 2d = 540$$

$$5a = 540$$

$$a = 108^\circ$$

Now, sum of largest and smallest angle

$$a - 2d + a + 2d = 216^\circ$$

153. If $\sqrt{p} - \sqrt{q} = 20$, then the maximum value of

$\left(\frac{p-5q}{100}\right)$ is :

- (1) 5 (2) 10
(3) 15 (4) 25

Answer (1)

Sol. $\sqrt{p} - \sqrt{q} = 20$

$$p = 400 + q + 40\sqrt{q}$$

$$\text{Therefore } \frac{400 + q + 40\sqrt{q} - 5q}{100}$$

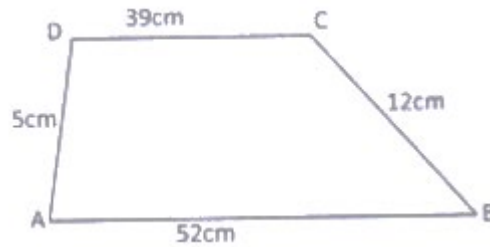
$$\frac{-q + 10\sqrt{q} + 100}{25}$$

Let $\sqrt{q} = y$

$$\frac{-y^2 + 10y + 100}{25}$$

$$\text{Maximum value} = \frac{-D}{4a} = \frac{-500}{-4 \times 25} = 5$$

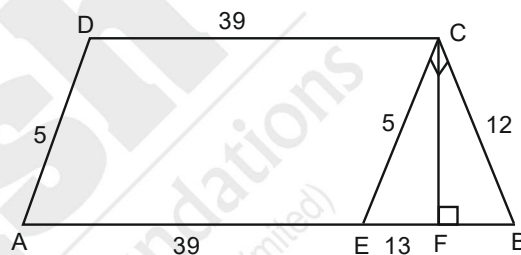
154. The area of trapezium ABCD where $AB = 52$ cm, $BC = 12$ cm, $CD = 39$ cm and $DA = 5$ cm and $AB \parallel CD$, is



- (1) 210 sq. cm. (2) 234 sq. cm.
(3) 260 sq. cm. (4) 280 sq. cm.

Answer (1)

Sol.



$$\frac{1}{2} \times 13 \times CF = \frac{1}{2} \times 5 \times 12$$

$$CF = \frac{60}{13}$$

Area of trapezium = Area of ||gm AECD + area of ΔBEC

$$= \frac{60}{13} \times 39 + \frac{1}{2} \times 5 \times 12$$

$$= 180 + 30$$

$$= 210 \text{ sq. units}$$

155. The difference between areas of a triangle of largest area inscribed in a circle of radius ' r ' units and a triangle of largest area inscribed in a semicircle of radius ' r ' units is.

(1) $\left(\frac{2\sqrt{3}-1}{4}\right)r^2$ sq. units

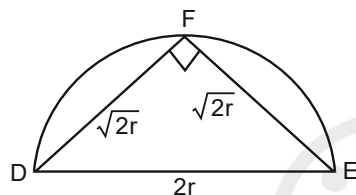
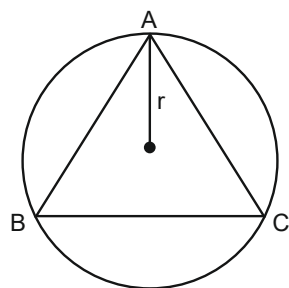
(2) $\left(\frac{4-2\sqrt{3}}{4}\right)r^2$ sq. units

(3) $\left(\frac{3\sqrt{3}+4}{4}\right)r^2$ sq. units

(4) $\left(\frac{3\sqrt{3}-4}{4}\right)r^2$ sq. units

Answer (4)

Sol. The largest triangle that can be inscribed in a circle is equilateral and the largest triangle that can be inscribed in a semi-circle is right isosceles triangle



$$\begin{aligned} \text{Difference in area} &= \frac{\sqrt{3}}{4} \times (\sqrt{3}r)^2 - \frac{1}{2} \times \sqrt{2}r \times \sqrt{2}r \\ &= \frac{3\sqrt{3}r^2 - 4r^2}{4} = \left(\frac{3\sqrt{3} - 4}{4} \right) r^2 \text{ sq. units} \end{aligned}$$

156. If p, q, r and s are distinct prime numbers such that $p + q + r = 72, p + r + s = 74, q + r + s = 89$, The largest of these p, q, r and s is

- (1) $r = 53$ (2) $q = 53$
(3) $s = 53$ (4) $s = 49$

Answer (1)

Sol. $p + q + r = 72$ (i)

$p + r + s = 74$ (ii)

$q + r + s = 89$ (iii)

$\Rightarrow s - q = 2; q - p = 15$

And $s - p = 17;$

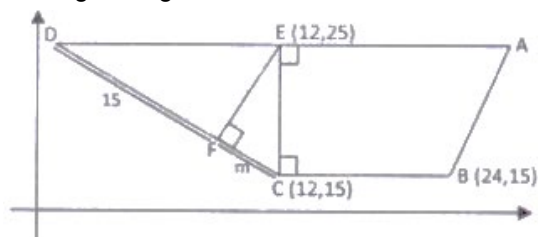
$\therefore (s, p) = (19, 2)$

$(q, p) = (17, 2)$

But, $p + q + r = 72$

$\Rightarrow r = 53$

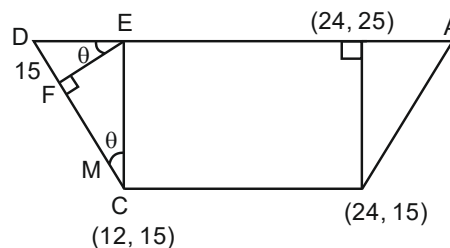
157. In the given figure, the value of m is :-



- (1) 5 (2) 10
(3) 7 (4) 12

Answer (1)

Sol. Using similarity of triangle,



$\triangle EFC$ and $\triangle DEC$ are similar triangles

$$\Rightarrow \frac{10}{15+m} = \frac{m}{10}$$

$$m^2 + 15m - 100 = 0$$

$$m = 5$$

158. Find the sum of all real values of x which satisfy

$$\frac{1}{x^2 - 10x - 45} + \frac{1}{x^2 - 10x - 29} = \frac{2}{x^2 - 10x - 69}$$

- (1) 7 (2) 10
(3) 13 (4) -3

Answer (2)

Sol. $\frac{1}{x^2 - 10x - 45} + \frac{1}{x^2 - 10x - 29} = \frac{2}{x^2 - 10x - 69}$

Let $x^2 - 10x - 45 = k$

Then equation reduces to

$$\frac{1}{k} + \frac{1}{k+16} = \frac{2}{k-24}$$

$$\frac{2k+16}{k(k+16)} = \frac{2}{k-24}$$

$$(k+8)(k-24) = k(k+16)$$

This gives $k = -6$

$$x^2 - 10x - 45 = -6$$

$$\Rightarrow x^2 - 10x - 39 = 0$$

$$(x+3)(x-13) = 0$$

$$X = -3 \text{ or } 13$$

Sum of real values of $x = -3 + 13 = 10$

159. If $N = \sqrt[3]{4} + \sqrt[3]{2} + 1$, then the value of $\frac{1}{N^3} + \frac{3}{N^2} + \frac{3}{N}$ is:-

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

Answer (4)

Sol. $N = 1 + 2^{\frac{1}{3}} + 2^{\frac{2}{3}}$

To find $\frac{1}{N^3} + \frac{3}{N^2} + \frac{3}{N}$

$$(N-1)^3 = 2 + 2^2 + 3 \times 2 \left(2^{\frac{1}{3}} + 2^{\frac{2}{3}} \right)$$

$$(N-1)^3 = 6 + 6(N-1)$$

$$(N-1)^3 = 6N$$

$$\left(\frac{N-1}{N} \right)^3 = \frac{6}{N^2}$$

$$\Rightarrow \frac{1}{N^3} + \frac{3}{N^2} + \frac{3}{N} = 1$$

160. In a class average height of all students is 'p' cm. Among them, average height of 10 students is 'q' cm and the average height of the remaining students is 'r' cm. The number of students in the class is :-

(1) $\frac{p(q-r)}{(p-r)}$ (2) $\frac{q-r}{p-r}$

(3) $\frac{q-r}{10(p-r)}$ (4) $\frac{10(q-r)}{(p-r)}$

Answer (4)

Sol. Using allegation method

$$\begin{array}{ccc} q & & r \\ & p & \\ r-p & & p-q \end{array}$$

$$\therefore \text{No. of students} = \frac{10(q-r)}{p-r}$$

161. What are the National colours of France?

- (1) Blue-Green-Red (2) Green-White-Red
 (3) Green-Yellow-Red (4) Blue-White-Red

Answer (4)

162. Which was not included in Lenin's April theses?

- (1) Formation of Duma
 (2) Bank be Nationalised
 (3) Land be transferred to peasant
 (4) War be brought to a close

Answer (1)

163. Hitler assigned the responsibility of Economic recovery to

- (1) Herbert Spancer (2) Hyalmar Schacht
 (3) W Shirer (4) Robert Lay

Answer (2)

164. Which of these had worked as indentured Labourer?

- (1) Shaukat Ali (2) Alluri Sita Ram Raju
 (3) Jawahar Lal Nehru (4) Baba Ramchandra

Answer (4)

165. Who wrote the Book "Hind Swaraj"?

- (1) Subhash Chandra Bose
 (2) J.L.Nehru
 (3) Kamla Nehru
 (4) Mahatma Gandhi

Answer (4)

166. Which country was known as "Siam"?

- (1) England (2) Thailand
 (3) Holand (4) Swaziland

Answer (2)

167. Which of the following Prime Minister Constituted "Simon Commission"?

- (1) Robert Walpole
 (2) Stanley Baldwin
 (3) Ramsay Mac Donald
 (4) Winston Churchill

Answer (2)

168. Dr. B.R. Ambedkar formed the "Depressed Classes Association" in

- (1) 1928 (2) 1929
 (3) 1930 (4) 1931

Answer (3)

169. 'Jeevita Samaram' is the autobiography of

- (1) C. Kesavan (2) Saudamini
 (3) Mankojee (4) R.C.Dutt

Answer (1)

170. Who established the Vietnamese Communist party?

- (1) Phu So (2) Mao Zedong
 (3) Ho Chi Minh (4) Phan Boi

Answer (3)

171. "When France sneezes the rest of Europe catches cold" who remarked this?

- (1) Mazzini (2) Metternich
(3) Gottfried (4) John Lock

Answer (2)

172. Which one of the following is the main cause of land degradation in Punjab?

- (1) Intensive Cultivation
(2) Deforestation
(3) Over Irrigation
(4) Over Grazing

Answer (3)

173. Traditional rain water harvesting is called in Rajasthan.

- (1) Tank (2) Tanka
(3) Pond (4) Lake

Answer (2)

174. Which of the state has most sugar mills in India?

- (1) Haryana (2) Punjab
(3) Maharashtra (4) Bihar

Answer (3)

175. In which industry Bauxite is used as raw material?

- (1) Steel (2) Cement
(3) Aluminium (4) Jute

Answer (3)

176. Roof top rain water harvesting is the most common practise in which of the following cities:

- (1) Shillong (2) Imphal
(3) Guwahati (4) Patna

Answer (1)

177. Which of the following groups constitute the basic rock form:

- (1) Sandy, Igneous, Metamosplic
(2) Igneous, Sedimentary, Metamosplic
(3) Lignite, Volcanic, Sedimentary
(4) Sandy, Volcanic, Igneous

Answer (2)

178. Mango showers occur in which one of the following group of two states:

- (1) Bihar & West Bengal
(2) Tamil Nadu & Andhra Pradesh
(3) Karnataka & Kerala
(4) Maharashtra & Andhra Pradesh

Answer (3)

179. Topic of Cancer does not pass through

- (1) Chhattisgarh (2) Odisha
(3) Rajasthan (4) Tripura

Answer (2)

180. AMUL milk scheme is an example of which type of industry:

- (1) Basic Industry
(2) Agro based Industry
(3) Joint Industry
(4) Co-Operative Industry

Answer (4)

181. Which one of the figures represents the working age groups of the population

- (1) 15-65 years
(2) 15-66 years
(3) 15-59 years
(4) 15-64 years

Answer (3)

182. Chemical Industry usually are located near:

- (1) Iron & steel Industries
(2) Thermal Power Plant
(3) Oil refineries
(4) Automobile Industry

Answer (3)

183. BAMCEF mean

- (1) Backward and minority community employees federation
(2) Backward and mining community employees federation
(3) Backward and majority community employees federation
(4) Backward and Malabar coastal employees federation

Answer (1)

184. General Election are called as

- (1) On death of any member
(2) Election before specific time in whole country and states
(3) On completing five years
(4) Empty seat due to any reason

Answer (3)

185. In 44th Amendment which fundamental right has been removed from the list of fundamental rights.

- (1) Freedom of speech
- (2) Freedom of make groups
- (3) Right to work
- (4) Right to property

Answer (4)

186. Which of the following statement is correct?

- (1) Union list – 66 subject; state list-97 subjects; Concurrent list – 47 subjects
- (2) Union list – 47 subjects; state list – 97 subjects; Concurrent list – 66 subjects.
- (3) Union list – 97 subjects; state list – 47 subjects; Concurrent list – 66 subjects
- (4) Union list – 97 subjects; state list – 66 subjects; Concurrent list – 47 subjects

Answer (4)

187. A person who is not a member of any house of Parliament, if he is appointed as minister. He has to get elected to the one of the house of Parliament with in

- (1) A month
- (2) Six month
- (3) Three month
- (4) Stipulated time is fixedly the President

Answer (2)

188. Why is "Power sharing" regarded as good?

- (1) Reduces poverty
- (2) Maximises wealth
- (3) Provides employment
- (4) Reduces social conflict

Answer (4)

189. Main feature of "Pressure Groups" is

- (1) Direct control on political power
- (2) Try to influence the politics of Government
- (3) Lax organisation
- (4) Direct participation in political powers

Answer (2)

190. Among the following which are is the main aim of starting civil rights movement in America:

- (1) Adult franchise
- (2) Vote to right for women
- (3) Abolishing social discrimination
- (4) Fan direct election of Congress

Answer (3)

191. President can declare emergency when:

- (1) Prime minister advise him to do so
- (2) Parliament advises him to declare emergency
- (3) The counsil of minister, in writing advises him to do so
- (4) Home Minister asks him to do so

Answer (3)

192. Amnesty International is an international organisation which works for

- (1) Work peace
- (2) Justice
- (3) Restoration of democracy
- (4) Human Rights

Answer (4)

193. In which year "Universal Adult Franchise" was implemented in India?

- (1) 1947
- (2) 1950
- (3) 1919
- (4) 1935

Answer (2)

194. In which year, consumer protection act was enacted?

- (1) 1986
- (2) 1988
- (3) 1985
- (4) 1987

Answer (1)

195. Which among the following is considered to be most liquid assets?

- (1) Gold
- (2) Demand Deposites
- (3) Land
- (4) Money

Answer (4)

196. Food security is ensured in a country only if-

- (1) Enough food is available for all the person
- (2) All persons have the capacity to buy food of acceptable quality
- (3) There is no barrier on access to food
- (4) All above

Answer (4)

197. The headquarter of world trade organisation is situated in

- (1) New York (2) China
(3) Japan (4) Geneva

Answer (4)

198. Under National Rural Employment Guarantee Act (2005), How many days of work are Guaranteed in a year?

- (1) 80 days (2) 100 days
(3) 200 days (4) 300 days

Answer (2)

199. Who is the founder of Grameen Bank of Bangladesh?

- (1) Abdul Rehman (2) M.Yunis
(3) Mujibur Rehman (4) Amartya Sen

Answer (2)

200. From the following in which state of India the use of the chemical fertiliser is highest?

- (1) Punjab (2) Haryana
(3) Rajasthan (4) Himachal Pradesh

Answer (1)

