MODEL TEST PAPER 2

Time Allowed : 1½ hours | Max. Marks : 40

General Instructions :

All questions are compulsory.

The marks intended for questions are given in brackets [ ].

Select the correct option for each of the following questions.

SECTION-A (16 Marks) [16 × 1]

1. If $A = \begin{bmatrix} 3 & 5 \\ 4 & -2 \end{bmatrix}\begin{bmatrix} x \\ 4 \end{bmatrix} = \begin{bmatrix} 26 \\ 0 \end{bmatrix}$, then the value of x is :

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

2. For an intrastate trade, if the GST rate is x%, then the CGST rate is :

(A) $2x$% (B) $\frac{x}{2}$% (C) $\frac{x}{3}$% (D) nil

3. Two isosceles right triangles:

(A) are always similar (B) need not to be similar

(C) are always congruent (D) all the above

4. The mean proportion between 6 and 24 is :

(A) 144 (B) 12 (C) 30 (D) 18

5. Kavita has a recurring deposit account in a bank for 4 years and monthly installment is ₹2400. If the rate of interest is 4% p.a., then the interest earned by Kavita at the time of maturity is:

(A) ₹9,000 (B) ₹9,350 (C) ₹9,400 (D) ₹9,408

6. The solution set of $8 < 5(x + 1) - 2$, $x \in R$ is :

(A) $\{x > 1, x \in R\}$ (B) $\{x < 1, x \in R\}$ (C) $\{x \geq 1, x \in R\}$ (D) $\{x \leq 1, x \in R\}$

7. If the pth term of an AP is $7p + 1$, then the first term of the AP is :

(A) 7 (B) 8 (C) 9 (D) –7

8. In ΔABC, $BM \perp AC$ and $CN \perp AB$, then :

(A) $AB \times AN = AC \times AM$ (B) $AB \times BN = AC \times MN$

(C) $AB \times AC = AN \times BC$ (D) $AM \times AN = AB \times BC$

9. If $-12 \leq 3 - 4x \leq 11$, $x \in N$, then the solution set is :

(A) {0, 1, 2, 3} (B) {1, 2, 3, 4} (C) {0, 1, 2, 3, 4} (D) {1, 2, 3}

10. The discriminant of $3x^2 - 4x + 8 = 0$ is :

(A) 80 (B) –80 (C) $\sqrt{-80}$ (D) $\sqrt{80}$

11. On dividing ₹4760 between A and B in the ratio 2 : 5, the share of A is :

(A) ₹1,360 (B) ₹3,400 (C) ₹3,500 (D) ₹3,550

12. If $(x - 2)$ is a factor of $x^3 + 2x^2 - mx + 10$, then the value of m is :

(A) 10 (B) 11 (C) 12 (D) 13

13. If $2x$, $x + 1$ and $3x - 1$ are in AP, then :
(A) $x = 0$ (B) $x = -1$ (C) $x = 1$ (D) $x = 2$

14. The roots of $2x^2 - 5x + 4 = 0$ are :
(A) rational and unequal (B) irrational and unequal
(C) imaginary (D) none of these

15. The order of a matrix A is 2×3. The order of $-3A$ is :
(A) 2×3 (B) 3×2 (C) 2×1 (D) 1×3

16. On dividing $f(x)$ by $(2x - 3)$, the remainder is :
(A) $f(2)$ (B) $f\left(\frac{3}{2}\right)$ (C) $f\left(\frac{2}{3}\right)$ (D) $f\left(\frac{-3}{2}\right)$

SECTION-B (12 Marks)

[6 × 2]

17. Seema deposits ₹1800 per month in a recurring deposit account for 2 years at 9% p.a. The amount of interest she will receive at the time of maturity is :
(A) ₹4,000 (B) ₹4,050 (C) ₹4,250 (D) ₹4,250

18. $(x + 1)$ is a factor of :
(A) $-x^3 + x^2 - x + 1$ (B) $x^3 - x^2 + x - 1$ (C) $x^3 + x^2 - x - 1$ (D) all the above

19. A shopkeeper in Jaipur sold a necklace to a consumer in Jaipur for ₹82,400. If the rate of GST is 18%, then IGST is :
(A) ₹7,416 (B) ₹14,832 (C) ₹15,256 (D) nil

20. If $-8 \leq 3x + 1 < 10$, $x \in R$, then the solution set is :
(A) $\{-3 \leq x < 3, x \in R\}$ (B) $\{-2 < x \leq 3, x \in R\}$
(C) $\{-4 \leq x \leq 3, x \in R\}$ (D) $\{-3 \leq x \leq 3, x \in R\}$

21. If $a : b = 5 : 2$, then, $\frac{a - b}{b}$ is equal to :
(A) $\frac{7}{2}$ (B) $\frac{3}{5}$ (C) $\frac{3}{2}$ (D) $\frac{2}{3}$

22. The transpose of the matrix $\begin{bmatrix} 2 & -1 & 4 \\ 0 & 5 & 3 \\ 1 & 1 & 6 \end{bmatrix}$ is :
(A) $\begin{bmatrix} 2 & -1 & 4 \\ 1 & 1 & 6 \\ 0 & 5 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 2 & 0 & 1 \\ -1 & 5 & 1 \\ 4 & 3 & 6 \end{bmatrix}$ (C) $\begin{bmatrix} 2 & 1 & 0 \\ -1 & 1 & 5 \\ 4 & 6 & 3 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 5 & 3 \\ 1 & 1 & 6 \\ 2 & -1 & 4 \end{bmatrix}$

SECTION-C (12 Marks)

[3 × 4]

23. The equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots.
(i) How many values exist for k?
(A) 1 (B) 2 (C) 3 (D) 0

(ii) The whole number value of k is :

(A) 5 (B) 3 (C) 2 (D) 1

(iii) The roots of the equation are :

(A) $\frac{1}{3}, \frac{1}{3}$ (B) $\frac{-1}{3}, \frac{-1}{3}$ (C) 2, 2 (D) 4, 4

(iv) The discriminant of the quadratic equation is :

(A) +ve (B) −ve (C) 0 (D) imaginary

24. In an AP, first term is 3, last term is 83 and sum of the terms is 903.

(i) Common difference of the AP is :

(A) 4 (B) 5 (C) 6 (D) 7

(ii) Number of terms in the AP is :

(A) 15 (B) 18 (C) 20 (D) 21

(iii) Second last term of the AP is :

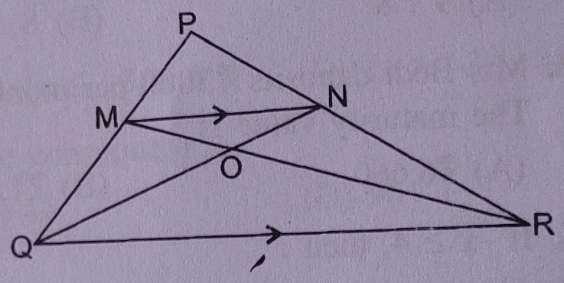
(A) 78 (B) 79 (C) 80 (D) 81

(iv) The sum of first 10 terms of the AP is : [1]

(A) 400 (B) 410 (C) 420 (D) 430

210

25. In the figure, MN || QR and $\frac{QM}{PM} = \frac{3}{2}$.



(i) ΔOMN is similar to :

(A) ΔORQ (B) ΔOQR (C) ΔQOR (D) ΔROQ

(ii) QR : MN is equal to :

(A) 7 : 4 (B) 2 : 5 (C) 5 : 2 (D) 2 : 3

(iii) ΔPQR is similar to :

(A) ΔPMN (B) ΔPNM (C) ΔMPN (D) ΔMNP

(iv) The two triangles in (iii) above are similar by :

(A) SSS similarity (B) SAS similarity (C) AA similarity (D) none of these

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