

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]

- The order of transpose of a matrix of order 3×2 is :
(A) 2×3 (B) 3×2 (C) 2×2 (D) 3×3
- Which of the following is a direct tax?
(A) Sales Tax (B) Wealth Tax
(C) Excise Duty (D) Entertainment Tax
- If in triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$, then, they will be similar if :
(A) $\angle A = \angle C$ (B) $\angle B = \angle C$ (C) $\angle B = \angle D$ (D) $\angle C = \angle D$
- The third proportional to 4 and 8 is :
(A) 16 (B) 64 (C) 32 (D) 8
- A man deposits ₹1000 per month in a recurring deposit account for 2 years. If the rate of interest is 6% p.a., then the interest earned at the time of maturity is :
(A) ₹1,000 (B) ₹1,200 (C) ₹1,500 (D) ₹1,800
- If $-a \geq 10$, then :
(A) $a \geq 10$ (B) $a \geq -10$ (C) $a \leq 10$ (D) $a \leq -10$
- If a, b, c are in AP, then :
(A) $a = \frac{b+c}{2}$ (B) $b = \frac{a+c}{2}$ (C) $c = \frac{a+b}{2}$ (D) none of these
- The perimeter of two similar triangles are 32 cm and 24 cm. If one side of first triangle is 16 cm, then the corresponding side of the second triangle is :
(A) 10 cm (B) 12 cm (C) 15 cm (D) 18 cm
- For the inequality $-2 < x \leq 2$, $x \in \mathbb{R}$, the solution set is represented as :

(A)

(C)

(B)

(D)
- The discriminant of $x^2 - 5x + 8 = 0$ is :
(A) +ve (B) -ve (C) 0 (D) imaginary
- If $1 : 3 :: x : 7$, then the value of x is :
(A) 7 (B) 3 (C) 2 (D) $2\frac{1}{3}$

12. When the polynomial $f(x)$ is divided by $5x$, then the remainder is :

(A) $f(5)$

(B) $f(0)$

(C) $f\left(\frac{1}{5}\right)$

(D) $f\left(-\frac{1}{5}\right)$

13. The n th term of the AP $-5, -8, -11, \dots$ is:

(A) $3n + 2$

(B) $3n - 2$

(C) $-2 - 3n$

(D) $2n - 3$

14. The quadratic equation whose roots are -1 and -4 , is :

(A) $x^2 + 5x + 4 = 0$

(B) $x^2 - 5x + 4 = 0$

(C) $x^2 - 5x - 4 = 0$

(D) $x^2 + 5x - 4 = 0$

15. If A is a matrix of order 2×3 and B is a matrix of order 3×2 , then :

(A) AB exists

(B) BA exists

(C) both AB and BA exist

(D) none of these

16. If $x^3 - 5x^2 + 4x - 1$ is divided by $(x - 1)$, then the remainder is :

(A) 0

(B) 1

(C) -1

(D) 2

SECTION-B (12 Marks)

[6 × 2]

17. Sanjana deposited ₹4000 per month in a recurring deposit account for $1\frac{1}{2}$ years. If the rate of interest is 8% p.a., then the amount of interest at the time of maturity is :

(A) ₹4,560

(B) ₹4,650

(C) ₹4,700

(D) ₹4,850

18. If $(x - 4)$ is a factor of $x^2 - 3x + m$, then the value of m is :

(A) -4

(B) 2

(C) -3

(D) 4

19. An article is sold from Kanpur (UP) to Rudrapur (Uttarakhand) for ₹10,000 and then from Rudrapur to Nainital (Uttarakhand) at a profit of ₹3000. If the rate of GST is 12%, then net GST paid by the dealer in Rudrapur is :

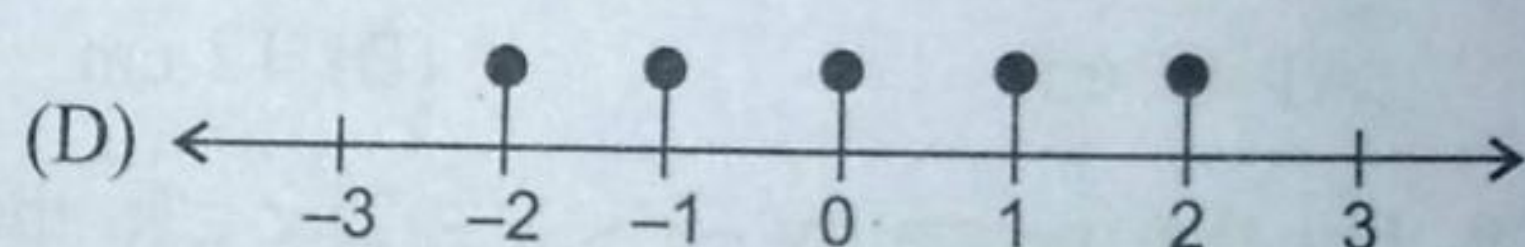
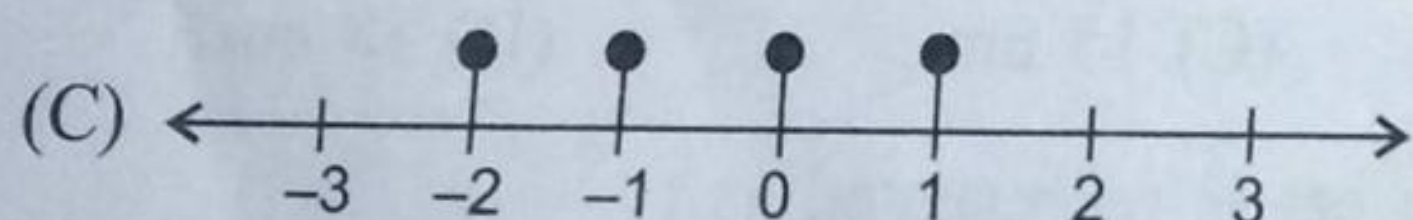
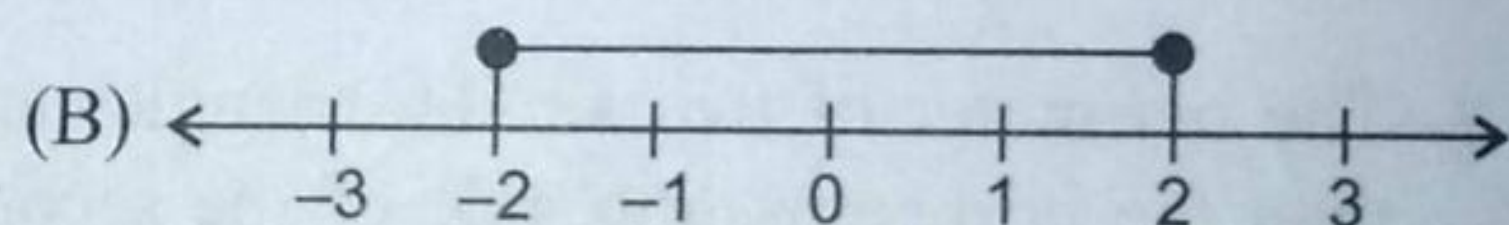
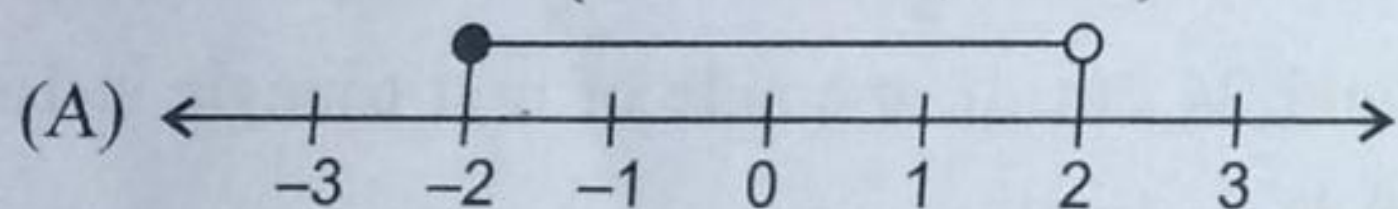
(A) ₹300

(B) ₹360

(C) ₹1560

(D) ₹780

20. The solution set $\{-2 \leq x < 2, x \in I\}$ can be represented on the number line as :



21. The mean proportion between $\sqrt{26} - \sqrt{17}$ and $\sqrt{26} + \sqrt{17}$ is :

(A) 3

(B) 9

(C) 4

(D) 8

22. The value of the product $\begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} 2 & -1 \\ 4 & 1 \end{bmatrix}$ is :

(A) $\begin{bmatrix} 2 & -1 \\ 16 & 1 \end{bmatrix}$

(B) $\begin{bmatrix} 2 & 16 \\ -1 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 16 & 2 \\ 1 & -1 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & 1 \\ -5 & 8 \end{bmatrix}$

SECTION-C (12 Marks)

[3 × 4]

23. The quadratic equation $kx^2 - 6x - 2 = 0$ has real roots.

(i) The smallest integer value of k is :

(A) -3

(B) -4

(C) -1

(D) 2

(ii) The smallest value of k , where k is a whole number, is :

(A) 0

(B) 1

(C) 2

(D) 3

(iii) For $k = 1$, the roots are :

(A) $-3 \pm \sqrt{11}$

(B) $3 \pm \sqrt{11}$

(C) $2 \pm \sqrt{11}$

(D) $-2 \pm \sqrt{11}$

(iv) For $k = -1$, the roots are :

(A) $-3 \pm \sqrt{7}$

(B) $3 \pm \sqrt{7}$

(C) $2 \pm \sqrt{5}$

(D) $-2 \pm \sqrt{3}$

24. For an AP, $S_n = 3n^2 + 5n$ and $t_k = 164$.

(i) The first term of the AP is :

(A) 10

(B) 9

(C) 8

(D) 7

(ii) The common difference of the AP is :

(A) 6

(B) 15

(C) -6

(D) 4

(iii) The value of k is :

(A) 20

(B) 25

(C) 26

(D) 27

(iv) The sum of first 20 terms of the AP is :

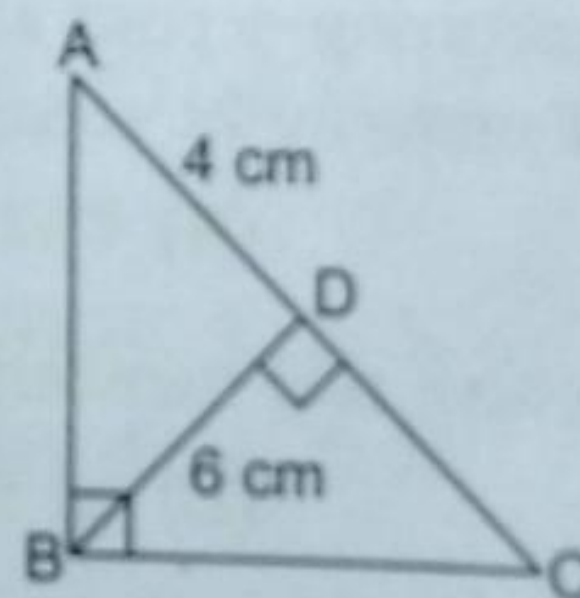
(A) 1300

(B) 1250

(C) 1200

(D) 1190

25. In the figure, $\angle ABC = \angle ADB = 90^\circ$,
AD = 4 cm and BD = 6 cm.



(i) $\triangle ABC$ is similar to :

(A) $\triangle BCD$

(B) $\triangle BDC$

(C) $\triangle CDB$

(D) $\triangle CBD$

(ii) The length of CD is :

(A) 9 cm

(B) 8 cm

(C) 7.5 cm

(D) 7 cm

(iii) $\triangle ABD$ is similar to :

(A) $\triangle ACB$

(B) $\triangle BCA$

(C) $\triangle ABC$

(D) $\triangle CBA$

(iv) The length of BC is :

(A) $\sqrt{110}$ cm

(B) $\sqrt{91}$ cm

(C) $\sqrt{117}$ cm

(D) $\sqrt{120}$ cm