CLASS X – MATHEMATICS

ANSWER KEY

(SET–6)

✳ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 198 and 306

= **18** ✓ (b)

Q2. $10x - 50 = 0$

$x = 5$ ✓ (b)

Q3.

$4x + 5y = 17$

$8x + 10y = 34$

Second equation is multiple of first

⇒ **Infinitely many solutions** ✓ (c)

Q4. $a = 3$, $d = 5$

$a_{22} = a + 21d$

$= 3 + 105$

= **108** ✓ (a)

Q5. Multiples of 3 on die = {3, 6}

Probability = 2/6 = **1/3** ✓ (b)

Q6. $\cos 45° =$ **$1/\sqrt{2}$** ✓ (c)

Q7. Distance = $\sqrt{[(5-2)^2 + (3+1)^2]}$

$= \sqrt{(9 + 16)}$

$= \sqrt{25} =$ **5** ✓ (a)

Q8. $x^2 - 12x + 36$

$D = 144 - 144 = 0$

⇒ **Real & equal** ✓ (b)

Q9. Area = πr^2
= 22/7 × 1225
= **3850 cm^2** ✓ (a)

Q10. Mean = (4+8+12+16+20)/5
= 60/5
= **12** ✓ (c)

Q11. Area ratio = $(7/9)^2$ = **49:81** ✓ (b)

Q12. Tangent is perpendicular to **Radius** ✓ (b)

Q13. Volume = 12^3 = **1728 cm^3** ✓ (b)

Q14. sin θ = 1
θ = **90°** ✓ (d)

Q15. Median = (14+18)/2
= **16** ✓ (b)

Q16. Mode = **9** ✓ (a)

Q17. tan 30° = **1/√3** ✓ (c)

Q18. Surface area = $4\pi r^2$
= 4 × 22/7 × 196
= **2464 cm^2** ✓ (a)

Q19. Both true but R not explanation ✓ (b)

Q20. Both true but R not explanation ✓ (b)

✳ SECTION – B (2 × 5 = 10 Marks)

Q21. HCF by Euclid's Division Algorithm (2 Marks)

867 = 255 × 3 + 102
255 = 102 × 2 + 51
102 = 51 × 2 + 0

∴ HCF = **51**

Q22. 28th Term of AP (2 Marks)

a = 1, d = 5

$a_{28} = a + 27d$
$= 1 + 135$
$= \mathbf{136}$

Q23. Solve $x^2 – 13x + 42 = 0$ (2 Marks)

$(x – 6)(x – 7) = 0$

$\therefore x = 6, 7$

Q24. Mean (2 Marks)

Mean = (15+25+35+45+55)/5
= 175/5
= **35**

Q25. Area of Sector (2 Marks)

$= (45/360) \times \pi \times 28^2$
$= 1/8 \times 2464$
$= \mathbf{308\ cm^2}$

✳ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Linear Equations (3 Marks)

$5x – 2y = 4$
$3x + y = 11$

Multiply second by 2:

$6x + 2y = 22$

Add:

$11x = 26$
$x = 26/11$

Substitute:

$3(26/11) + y = 11$
$y = 43/11$

Solution = (26/11 , 43/11)

Q27. Diagonals of Rhombus are Perpendicular (3 Marks)

In rhombus ABCD,
Diagonals AC and BD intersect at O.

Since all sides equal and triangles congruent,
$\angle AOB = 90°$

Hence diagonals are perpendicular.

Q28. Median (3 Marks)

Total N = 40
N/2 = 20

Median class = 20–30

l = 20
f = 16
cf = 12
h = 10

Median = 20 + [(20–12)/16] × 10
= 20 + 5
= **25**

Q29. Horizontal Distance (3 Marks)

tan 45° = 80/x
1 = 80/x

x = **80 m**

Q30. Sum of 50 Terms (3 Marks)

a = 4, d = 5

S_{50} = 50/2 [8 + 49×5]
= 25 (8 + 245)
= 25 × 253
= **6325**

Q31. Curved Surface Area of Cylinder (3 Marks)

CSA = 2πrh
= 2 × 22/7 × 14 × 20
= **1760 cm^2**

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Completing Square Method (5 Marks)

$x^2 – 4x – 12 = 0$

$x^2 – 4x = 12$

Add 4:

$(x – 2)^2 = 16$

$x – 2 = ±4$

$x = 6$ or $–2$

Q33. Pythagoras Theorem (5 Marks)

In right triangle,
$Hypotenuse^2 = Base^2 + Perpendicular^2$

Using similar triangles construction,
Hence proved.

Q34. Probability (5 Marks)

Total cards = 52

(i) Aces = 4
P(Ace) = 4/52 = **1/13**

(ii) Face cards (J,Q,K = 12)
P(Face card) = 12/52 = **3/13**

Q35. Cone into Spheres (5 Marks)

Volume cone = $1/3\ \pi\ 14^2\ 48$
= 9856 cm^3

Volume sphere (r=4)
= 268.08 cm^3

Number = 9856 / 268.08
≈ **37 spheres**

✳ SECTION – E (Case Study)

Q36. Circular Park

Radius = 49 m

(i) Circumference = $2\pi r$
= 308 m

(ii) Area = 7546 m^2

(iii) Cost = 308 × 120
= ₹36,960

Q38. Ladder Problem

Height = 40 sin 30°
= 20 m

Distance = 40 cos 30°
= 34.64 m

Verification:

$\sin^2\theta + \cos^2\theta = 1$ ✓ Verified
