CLASS X – MATHEMATICS

ANSWER KEY

(SET–5)

❋ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 180 and 324
= **36** ✓ (c)

Q2. $8x - 32 = 0$
$x = 4$ ✓ (b)

Q3.
$5x + 3y = 19$
$10x + 6y = 38$
Second equation is multiple of first
⇒ **Infinitely many solutions** ✓ (c)

Q4. $a = 7, d = 5$
$a_{20} = a + 19d$
$= 7 + 95$
= **102** ✓ (a)

Q5. Multiples of 4 on die = {4}
Probability = 1/6 ✓ (a)

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

Q7. Distance $= \sqrt{[(4-1)^2 + (2+2)^2]}$
$= \sqrt{(9 + 16)}$
$= \sqrt{25} = 5$ ✓ (a)

Q8. $D = 4 - 20 = -16$
⇒ **Not real** ✓ (c)

Q9. Area $= \pi r^2$
$= 22/7 \times 196$
= **616 cm^2** ✓ (a)

Q10. Mean = (3+6+9+12+15)/5

= 45/5

= **9** ✓ (b)

Q11. 6:9 = 2:3

Area ratio = $(2/3)^2$ = **4:9** ✓ (b)

Q12. Lengths of tangents = **Equal** ✓ (a)

Q13. Volume = $\pi r^2 h$

= 22/7 × 49 × 14

= **2156 cm³** ✓ (a)

Q14. $\tan \theta = \sqrt{3}$

θ = **60°** ✓ (c)

Q15. Median = (12+16)/2

= **14** ✓ (b)

Q16. Mode = **5** ✓ (b)

Q17. $\cos^2\theta + \sin^2\theta$ = **1** ✓ (b)

Q18. Surface Area = $6a^2$

= 6 × 100

= **600 cm²** ✓ (a)

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

Q20. Both true & R correct explanation ✓ (a)

✳ SECTION – B (2 × 5 = 10 Marks)

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

405 = 252 × 1 + 153
252 = 153 × 1 + 99
153 = 99 × 1 + 54
99 = 54 × 1 + 45
54 = 45 × 1 + 9
45 = 9 × 5 + 0

∴ HCF = **9**

Q22. 30th Term of AP (2 Marks)

a = 2, d = 5

a_{30} = a + 29d
= 2 + 145
= 147

Q23. Solve x^2 – 10x + 21 = 0 (2 Marks)

(x – 3)(x – 7) = 0

∴ x = 3, 7

Q24. Mean (2 Marks)

Mean = (8+16+24+32+40)/5
= 120/5
= 24

Q25. Area of Sector (2 Marks)

= (60/360) × π × 21^2
= 1/6 × 1386
= 231 cm^2

✶ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Linear Equations (3 Marks)

3x + 4y = 18
2x – y = 1

Multiply second by 4:

8x – 4y = 4

Add:

11x = 22
x = 2

Substitute:

2(2) – y = 1

y = 3

Solution = (2 , 3)

Q27. Angle at Centre is Double Angle at Circumference (3 Marks)

In circle,

$\angle AOC = 2\angle ABC$

Using isosceles triangle properties and exterior angle theorem,
Hence proved.

Q28. Median (3 Marks)

Total N = 37
N/2 = 18.5

Median class = 20–30

l = 20
f = 14
cf = 14
h = 10

Median = 20 + [(18.5–14)/14] × 10
= 20 + 3.21
= **23.21**

Q29. Horizontal Distance (3 Marks)

$\tan 30° = 70/x$

$1/\sqrt{3} = 70/x$

$x = 70\sqrt{3}$
= **121.24 m**

Q30. Sum of 35 Terms (3 Marks)

a = 5, d = 4

S_{35} = 35/2 [10 + 34×4]

= 35/2 (10 + 136)

= 35/2 × 146

= **2555**

Q31. Curved Surface Area of Cone (3 Marks)

$l = \sqrt{(7^2 + 25^2)}$

$= \sqrt{(49 + 625)}$

$= \sqrt{674}$

CSA = πrl

$= 22/7 × 7 × \sqrt{674}$

$= \mathbf{22\sqrt{674} \ cm^2}$

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Quadratic Formula (5 Marks)

$2x^2 – 9x + 7 = 0$

$x = [9 ± \sqrt{(81 – 56)}]/4$

$= [9 ± 5]/4$

x = 7/2 or 1

Q33. Basic Proportionality Theorem (5 Marks)

If a line parallel to one side divides other two sides proportionally,

Then AD/DB = AE/EC

Hence proved.

Q34. Probability (5 Marks)

Total balls = 15

(i) Blue = 5/15 = **1/3**

(ii) Not green = 11/15

Q35. Sphere into Cubes (5 Marks)

Volume sphere = 4/3 π 14^3
= 11494.7 cm^3

Volume cube = 2^3 = 8 cm^3

Number = 11494.7 / 8
≈ 1437 cubes

✳ SECTION – E (Case Study)

Q36. Circular Ground

Radius = 42 m

(i) Circumference = 2πr
= 264 m

(ii) Area = 5544 m^2

(iii) Cost = 264 × 100
= ₹26,400

Q38. Ladder Problem

Height = 30 sin 45°
= 21.21 m

Distance = 30 cos 45°
= 21.21 m

Verification:

$1 + \tan^2\theta = \sec^2\theta$ ✓ Verified