

HALF YEARLY EXAM DEC-22

STD:10 (MATHS) ANSWER KEY.

- | | |
|-------------------|--------------------|
| 1. c) 3 | 8. b) 25 sq. units |
| 2. a) 7 | 9. b) (-2, 0) |
| 3. c) 3 | 10. b) 3/2 |
| 4. d) 4.5 | 11. a) 12 |
| 5. b) 5 | 12. d) 3:1:2 |
| 6. d) Row Matrix | 13. a) 0 |
| 7. d) $5\sqrt{2}$ | 14. a) $P(A) > 1$ |

15. $A = \{1, 2, 3\}$, $B = \{2, 3, 5\}$ ———— ①
 $A \times B = \{(1, 2), (1, 3), (1, 5), (2, 2), (2, 3), (2, 5), (2, 7), (3, 2), (3, 3), (3, 5), (3, 7)\}$
 $B \times A = \{(2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (5, 1), (5, 2), (5, 3), (7, 1), (7, 2), (7, 3)\}$ ———— ①

16. $(0, 0)$, $a = b$, $(1, 2) \Rightarrow (2a + b) = 1$ ———— ①
 Soln: $a = b = \frac{1}{3}$ ———— ①
 $(-1, 2)$, $-a + b = 2$, $(1, 0) \Rightarrow a + b = 0$
 $a = -1$, $b = 1$

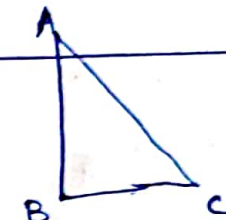
17. $13824 \Rightarrow 2^9 \times 3^3$ ———— ①
 $13824 \Rightarrow 2^a \times 3^b \Rightarrow a = 9$, $b = 3$ ———— ①

18. $n = \left(\frac{l-a}{d}\right) + 1$, $n = \frac{111-3}{3} + 1$ ———— ①
 $a = 3$, $d = 3$, $l = 111$, $n = 37$ ———— ①

19. $y^2 = +25$, $y^2 - 25 = 0$ ———— ①
 $y = \pm 5$ ———— ①

20. $A^T = \begin{bmatrix} 5 & -\sqrt{7} & 8 \\ 2 & 0.7 & 3 \\ 2 & 5/2 & 1 \end{bmatrix}$, $(A^T)^T = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{7} & 0.7 & 5/2 \\ 8 & 3 & 1 \end{bmatrix}$ ———— ①
 $(A^T)^T = A$ ———— ①

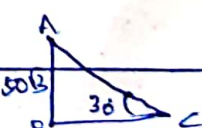
21. $AC^2 = AB^2 + BC^2$ ———— ①
 $= 7^2 + 4^2$
 $= 65$
 $8^2 < 65 < (8.1)^2$
 $AC \approx 8.1$ Feet ———— ①



22. $m = -\frac{1}{2}$, $(-2, a)$, $(9, 3)$ ———— ①
 $\frac{a-3}{-2-9} = -\frac{1}{2}$ ———— ①
 $a = \frac{17}{2}$ ———— ①

23. Case (i) $m_1 = -\frac{2}{3}$, $m_2 = -\frac{4}{6}$ ———— 1/2
 $m_1 = m_2$ Parallel ———— 1/2
 Case (ii) $fx + by + 18 = 0$ ———— 1/2

24. $h = 50\sqrt{3}$ ———— ①
 $\theta = 30^\circ$ ———— ①
 $\tan 30 = \frac{50\sqrt{3}}{x}$
 $x = 150$ m ———— ①



25. $\pi r^2 = 1386$ sq meter _____ ①
 TSA = $3(\pi r^2)$
 $= 3(1386)$
 $= 4158 \text{ m}^2$ _____ ①

26. $R = 36.8$ _____ ①
 $L = 36.8 + 13.4$ _____ ①
 $S = 13.4$
 $L = R + S$, $R = L - S$, $L = R + S = 50.2$ _____ ①

27. $S = \{HH, HT, TH, TT\}$, $n(S) = 4$ _____ ①
 $A = \{HT, TH\}$, $n(A) = 2$
 $P(A) = \frac{1}{2}$ _____ ①

28. Volume of Sphere = Surface Area of Sphere
 (Compul Sorry)
 $\frac{4}{3}\pi r^3 = 4\pi r^2$ _____ ①
 $r = 3$ units, $d = 6$ units _____ ①

29. $A = \{0, 1\}$, $B = \{2, 3, 4\}$, $C = \{3, 5\}$ _____ ①
 $B \cup C = \{2, 3, 4, 5\}$ _____ ①
 $A \times (B \cup C) = \{(0, 2), (0, 3), (0, 4), (0, 5), (1, 2), (1, 3), (1, 4), (1, 5)\}$ _____ ①
 $A \times B = \{(0, 2), (0, 3), (0, 4), (1, 2), (1, 3), (1, 4)\}$ _____ ①
 $A \times C = \{(0, 3), (0, 5), (1, 3), (1, 5)\}$ _____ ①
 $(A \times B) \cup (A \times C) = \{(0, 2), (0, 3), (0, 4), (0, 5), (1, 2), (1, 3), (1, 4), (1, 5)\}$ _____ ①
 $A \times (B \cup C) = (A \times B) \cup (A \times C)$ _____ ①

30. $f(x) = 2x + 3$, $g(x) = 1 - 2x$, $h(x) = 3x$ _____ ②
 $g \circ h(x) = 1 - 6x$ _____ ①
 $f \circ (g \circ h)(x) = 5 - 12x$ _____ ①
 $f \circ g(x) = 5 - 4x$ _____ ①
 falseah $(f \circ g) \circ h(x) = 5 - 12x$ _____ ①
 $f \circ (g \circ h) = (f \circ g) \circ h$ _____ ①

31. $a - 3d + a - d + a + d + a + 3d = 28$ _____ ①
 $4a = 28$
 $a = 7$ _____ ①
 $(a - 3d)^2 + (a - d)^2 + (a + d)^2 + (a + 3d)^2 = 276$
 $4a^2 + 20d^2 = 276$
 $d = \pm 2$ _____ ②
 $1, 5, 9, 13$ (or) $13, 9, 5, 1$ _____ ①

32. $10^2 + 11^2 + \dots + 24^2 = (1^2 + 2^2 + \dots + 24^2) - (1^2 + 2^2 + \dots + 9^2)$ _____ ①
 $= \frac{24(25)(49)}{6} - \frac{9 \times 16 \times 19}{6}$ _____ ①
 $= 4900 - 285$
 $= 4615 \text{ cm}^2$ _____ ③

33. $8x^2 - x + 1$ _____ ①
 $8 \begin{array}{r} 64 - 16 \quad 17 - 2 \quad 1 \\ 64 \\ \hline -16 \quad 17 \\ -16 \quad 1 \\ \hline 16 - 2 \quad 1 \\ 16 - 2 \quad 1 \\ \hline 0 \end{array}$ _____ ①
 $\sqrt{P(x)} = |8x^2 - x + 1|$ _____ ①
 $16 - 2 \cdot 1$ _____ ②

34. $A^2 = \begin{bmatrix} 8 & 5 \\ -5 & 3 \end{bmatrix}$ ————— ②

$5A = \begin{bmatrix} 15 & 5 \\ -5 & 10 \end{bmatrix}$ ————— ①

$7I = \begin{bmatrix} 7 & 0 \\ 0 & 7 \end{bmatrix}$ ————— ①

$A^2 - 5A + 7I_2 = 0$ ————— ①

35. BPT
Statement: ————— ①

Given diagram? ————— ①

To prove, construction? ————— ①

Proof: ————— ③

36. $(5, 6), (5, 11), (-5, 12), (-4, 3)$ A, B, C, D ————— ①

$A = \frac{1}{2} \begin{bmatrix} x_1 & x_2 & x_3 & x_1 \\ y_1 & y_2 & y_3 & y_1 \end{bmatrix}$ ————— ①

$A = \frac{1}{2} \{ 109 + 49 \}$ ————— ①

$A = 74$ sq units ————— ②

37. (i) $y = -0.1x + 1$
Put $x = 0$, $y = 1$ mB ————— ②

(ii) Put $y = \frac{100 - 45}{100}$, $= 0.25$, $x = 7.5$ sec ————— ②

(iii) $y = 0$, $x = 10$ sec ————— ①

38. Diagram ————— ①

$\tan 30^\circ = \frac{12}{x}$ ————— ②

$x = 12\sqrt{3}$ m ————— ②

$\tan 60^\circ = \frac{h}{12\sqrt{3}}$ ————— ②

$h = 40$ m ————— ②

39. $h = 45$ cm, $R = 28$ cm, $r = 7$ cm ————— ①

$V = \frac{1}{2} \pi h [R^2 + r^2 + Rr]$ sq units ————— ①

$= 48510$ sq units ————— ③

40. Cone ————— ①

radius = r ————— ①

height = h ————— ①

Cylinder ————— ①

radius = $2r$ ————— ①

height = H ————— ①

Volume of cylinder = Volume of cone ————— ①

$\pi R^2 h = \frac{1}{2} \pi r^2 H$ ————— ①

$x^2 r^2 H = \frac{r^2 h}{3}$ ————— ①

$H = \frac{h}{3x^2}$ units ————— ①

41. $n(S) = 36$ ————— ①

Even number on the first dice $n(A) = 18$ ————— ②

Sum of face is 8 $n(B) = 5$ ————— ①

Common for A and B = 3 ————— ①

$P(A \cup B) = \frac{18 + 5 - 3}{36} = \frac{5}{9}$ ————— ①

42

$a^2 = 6.25$

$a = 2.5 \text{ cm}$

There are a^2 in a side . $8a = 2.5 \times 8$
8sq
 $= 20 \text{ cm}$

width is 2cm

length of a side = $20 + 4 = 24 \text{ cm}$

Compul sory

W. 43

a)

Two tangent

Rough Diagram

Fair Diagram

Verification

Construction

b)

Construction of a triangle (Altitude)

Rough Diagram

Fair Diagram

Construction

44.

a)

$xy = k$

Indirect Variation

(i) $k = 360$

(ii) $x = 12, y = 30$

Scale, Graph

Graph

b)

$x = -4, -3, -2, -1, 0, 1, 2, 3, 4$

$y = 10, 4, 0, -2, -2, 0, 4, 10, 14$

$y = x^2 + x - 2$

$0 = x^2 + x - 2$

Solution $[-2, 1]$

$y = 0$

Scale

Graph

Parabola

Straight line