केंद्रीय विद्यालय संगठन ,जयपुर संभाग

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MARKING SCHEME PRACTICE PAPER : 2024-25

कक्षा / CLASS : 10

विषय / SUB: MATHEMATICS BASIC (कोड / CODE : 241)

(SET-B) MAX. MARKS-80

	SECTION-A (EACH QUESTION CARRY 1 MARKS)	
1.	(c)	1
2.	(a)	1
3.	(d)	1
4.	(b)	1
5.	(a)	1
6.	(d)	1
7.	(d)	1
8.	(c)	1
9.	(a)	1
10.	(b)	1
11.	(c)	1
12.	(d)	1
13.	(a)	1
14.	(c)	1
15.	(b)	1
16.	(d)	1
17.	(c)	1
18.	(d)	1
19.	(c)	1
20.	(a)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1
	SECTION-B (EACH QUESTION CARRY 2 MARKS)	
21.	$p(x) = 5x^2 – 4 – 8x = 5x^2 – 8x – 4$ $= 5x^2 – 10x + 2x – 4$ $= 5x(x – 2) + 2(x – 2)$ $= (x – 2) (5x + 2)$ $= 5(x – 2) (x + 25)$ $\therefore$ Zeroes of p(x) are 2 and - 25	½ ½

	Sum of the zeroes = $-\dfrac{\text{Coefficient of } x}{\text{Coefficient of } x^2}$ $\Rightarrow 2 + \left(-\dfrac{2}{5}\right) = \dfrac{-(-8)}{5}$ $\Rightarrow \dfrac{10-2}{5} = \dfrac{8}{5}$ $\Rightarrow \dfrac{8}{5} = \dfrac{8}{5}$ *i.e.,* LHS = RHS $\Rightarrow$ relationship is verified. Product of the zeroes = $\dfrac{\text{Constant term}}{\text{Coeffcient of } x^2}$ $\Rightarrow 2 \times \left(-\dfrac{2}{5}\right) = \left(\dfrac{-4}{5}\right)$ $\Rightarrow \dfrac{-4}{5} = \dfrac{-4}{5}$ *i.e.,* LHS = RHS : $\Rightarrow$ The relationship is verified.	½ ½
22.	$\sin(A + B) = 1 = \sin 90^0$, so $A + B = 90^0$ ……….(i) $\cos(A – B) = \sqrt{3}/2 = \cos 30^0$, so $A – B = 30^0$ ………(ii) From (i) & (ii) ∠A = 60° and ∠B = 30° OR LHS = $\sec^2 A(\sec^2 A – 1)$ = $(1+ \tan^2 A) \tan^2 A$ =RHS	1 1 1 1
23.	For correct proof	2
24.	For correct proof	2
25.	We know that, in 60 minutes, the tip of minute hand moves 360° In 1 minute, it will move = 360°/60 = 6° ∴ From 5:25 pm to 6:00 pm i.e. 35 min, it will move through = 35 × 6° = 210° ∴ Area of swept by the minute hand in 35 min = Area of sector with sectorial angle θ of 210° and radius of 6 cm $= \dfrac{210}{360} \times \pi \times 6^2 = \dfrac{7}{12} \times \dfrac{22}{7} \times 6 \times 6 = 66 \text{ cm}^2$ OR Ans: Perimeter = length of major arc + 2r $= \dfrac{270°}{360°} \times 2 \times \pi r + 2r$ $= \dfrac{3}{2} \times \dfrac{22}{7} \times 42 + 2 \times 42$ $= 198 + 84 = 282$ cm	1 1 1 1
	SECTION-C (EACH QUESTION CARRY 3 MARKS)	

26.	Let $\sqrt{3}$ is rotational number $\therefore \quad \sqrt{3} = \frac{p}{q}$ [plq are co-prime integers & $q \neq 0$] $\Rightarrow \quad 3 = \frac{p^2}{q^2}$ $\Rightarrow \quad p^2 = 3 \times q^2$ ...(1) 3 is a factor of p^2 $\Rightarrow$ 3 is a factor of p ...(2) So $p = 3 \times m$ [m is any integer] (let) $\therefore$ from (1) $9\ m^2 = 3q^2$ $\Rightarrow \quad q^2 = 3m^2$ $\therefore$ 3 is a factor of q^2 $\Rightarrow$ 3 is a factor of q ...(3) From (2) & (3) 3 is a common factor of both p & q It contradicts our supposition that p & q are co-prime integers. Hence are supposition is wrong $\therefore \quad \sqrt{3}$ is irrational Hence proved	½ 1 1 ½
27.	0.2x + 0.3y = 1.3 ... (i) 0.4x + 0.5y = 2.3 ... (ii) For correct answer through any method x = 2 and y = 3 OR (ii) We have, $3x + y = 1 \Rightarrow 3x + y - 1 = 0$ ...(i) $(2k-1)x + (k-1)y = 2k+1$ $\Rightarrow (2k-1)x + (k-1)y - (2k+1) = 0$ ...(ii) Here, $a_1 = 3, b_1 = 1, c_1 = -1$ $a_2 = 2k-1, b_2 = k-1, c_2 = -(2k+1)$ For no solution, we must have $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2} \Rightarrow \frac{3}{2k-1} = \frac{1}{k-1} \neq \frac{1}{2k+1}$ Now, $\frac{3}{2k-1} = \frac{1}{k-1} \Rightarrow 3k - 3 = 2k - 1$ $\Rightarrow 3k - 2k = 3 - 1 \Rightarrow k = 2$ Hence, the given system of equations will have no solutions for k = 2.	1 2 1 1 1

28.	$\alpha+\beta$ =-(-7/2) , $\alpha\beta$ = 3/2 $\alpha^2+\beta^2$= $\{\alpha+\beta\}^2 - 2\alpha\beta$ = $(7/2)^2$ - 2(3/2) = 49/4 - 3 = 37/4	1 1 1
29.	LHS = $(\text{cosec }\theta\text{-cot}\theta)^2$ = $(1/\sin\theta - \cos\theta/\sin\theta)^2$ = $(1-\cos\theta)^2/\sin^2\theta$ $(1\text{-}\cos\theta)^2$ / 1- $\cos^2\theta$ = $(1\text{-}\cos\theta)^2$ / $(1+\cos\theta)(1-\cos\theta)$ $(1\text{-}\cos\theta)/(1+\cos\theta)$	1 1 1
30.	For correct proof OR For correct diagram For correct proof	3 1 2
31.	(i) 1/6 (ii) 1/2 (iii) 1/9	1 1 1
	SECTION-D (EACH QUESTION CARRY 5 MARKS)	
32.	(a)Given: S5 + S7 = 167 ⇒ 5/2[2a + (5 – 1)d] + 7/2 [2a + (7 – 1)d] = 167 … [S<sub<n = n2 (2a + (n – 1)d) ⇒ 5/2[2a + 4d] + 7/2[2a + 6d] = 167 ⇒ 5(a + 2d) + 7(a + 3d) = 167 ⇒ 5a + 10d + 7a + 210 = 167 ⇒ 12a + 31d = 167 Now, S10 = 10/2 (2a + (10 – 1)d) = 235 ⇒ 5[2a + 9d] = 235 ⇒ 10a + 45d = 235 Solving (i) and (ii), we get a = 1 and d = 5 a1 = 1 a2 = a + d ⇒ 1 + 5 = 6 a3 = a + 2d ⇒ 1 + 10 = 11 Hence A.P. is 1, 6, 11 (b) let the angles be a – d, a, a + d; a > 0, d > 0 ∵ Sum of angles = 180° ∴ a – d + a + a + d = 180° ⇒ 3a = 180° ∴ a = 60° …(i) By the given condition a – d = a+d2 ⇒ 2 = 2a – 2d = a + d ⇒ 2a – a = d + 2d ⇒ a = 3d ⇒ d = a3=60∘3 = 20° … [From (i) ∴ Angles are: 60° – 20°, 60°, 60° + 20° i.e., 40°, 60°, 80° OR	½ ½ 1 1 ½ 1½

$x + 3y = 6$

$x = 6 - 3y$

x	6	3	0
y	0	1	2

(6, 0), (3, 1), (0, 2)

$2x - 3y = 12$

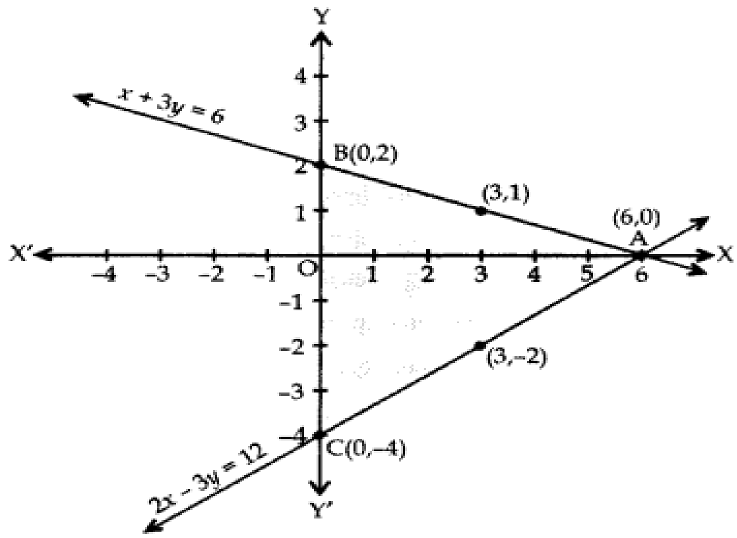
$2x = 12 + 3y$

$x = \frac{12 + 3y}{2}$

x	0	6	3
y	−4	0	−2

(0, −4), (6, 0), (3, −2)

2



2

By plotting points and joining them, the lines intersesct at A(6, 0)

∴ x = 6, y = 0

Line x + 3y = 6 intersects Y-axis at B(0, 2) and Line 2x – 3y = 12 intersects Y-axis at C(0, -4).

Therefore, Area of triangle formed by the lines with y-axis.

Area of triangle

= 1/2 × base × corresponding altitude

= 1/2 × BC × AO = 1/2 × 6 × 6 = 18 sq. units 1

33.	For correct diagram	1
	For correct proof of theorem (BPT)	2
	For correct answer.	2

34.	Radius of the cylindrical part, r= 1.4 cm	
	Length of the cylindrical part , h = (5- 2xx 1.4) cm = 2.2 cm	1
	Volume of one gulabjamun	
	= volume of 2 hemispherical parts + volume of cylinder part	1
	$= \left(2 \times \frac{2}{3}\pi r^3 + \pi r^2 h\right)\left(\frac{4}{3}\pi r^3 + \pi r^2 h\right)$	
	$= \pi r^2\left(\frac{4}{3}r + h\right)$	
	$= \left[\frac{22}{7} \times 1.4 \times 1.4 \times \left(\frac{4}{3} \times 1.4 + 2.2\right)\right] cm^2$	
	$= \left(6.16 \times \frac{12.2}{3}\right) cm^3 = \left(\frac{75.152}{3}\right) cm^3$	
	Volume of 45 gulabjamuns	2
	$= \left(\frac{75.152}{3} \times 45)\right) cm^3 = 1127.28 cm^3$	
	Volume of the syrup = (30 % of 1127.28) cm^3	
	$= \left(\frac{30}{100} \times 1127.\ 28\right) cm^3 = 338.184 cm^3$	
	Hence , 45 gulab jamuns contain approximately $338 cm^3$ of syrup .	1
	OR	
	Radius of the base of cylinder (r) = 2.8 m = Radius of the base of the cone (r)	
	Height of the cylinder (h)=3.5 m Height of the cone (H)=2.1 m. Slant height of conical part	
	(l)=$\sqrt{(r^2 + H^2)}$	
	$=\sqrt{[(2.8)^2 + (2.1)^2]}$	
	$= \sqrt{(7.84 + 4.41)} = \sqrt{12.25} = 3.5$ m	1
	Area of canvas used to make tent = CSA of cylinder + CSA of cone	1
	= 2πrh + πrl = πr(2h + l)= 92.4 msq.	1
	Cost of 1500 tents at ₹120 per sq.m = 1500 × 120 × 92.4 = 1,66,32,000	1
	Share of each school to set up the tents = 16632000/50= Rs.332640	1

35.

Class	Frequency	Cumulative Frequency
65-85	4	4
85-105	x	4 + x
105-125	13	17+ x
125-145	20	37+ x
145-165	14	51+ x
165-185	y	51 + x + y
185-205	4	55 + x + y

1

Median class is "125–145." cf = 17 + x , l = 125 , f = 20 h = 20, N = 68

Median = $l + \left(\frac{\frac{N}{2} - cf}{f}\right) \times h$

2

$\Rightarrow 137 = 125 + \left(\frac{34 - 17 - x}{20}\right) \times 20$

$\Rightarrow 137 - 125 = 17 - x$ 1

$\Rightarrow x = 17 - 12 = 5 \Rightarrow 55 + 5 + y = 68 \Rightarrow y = 8$ 1

SECTION-E (EACH QUESTION CARRY 4 MARKS)

36. a. By distance formula AB= $\sqrt{(3-6)^2+(4-7)^2} = \sqrt{(9+9)} = 3\sqrt{2}$ 1
b. AC= √36=6
c.DB =√36 =6 1

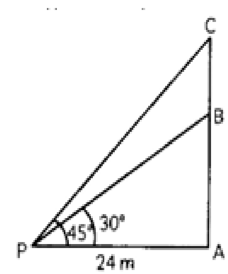
OR

Square 2

37. a. Length of sign board, BC = AC – AB = 24 – 13.84 = 10.16 m 1
b. In ∆APC, cos 45° = AP/AC ⇒ 1/√2 = 24/AC ⇒ PC = 24√2 m 1
c. In ∆APC, tan 30° = AB/AP ⇒ 1/√3 = AB/24 ⇒ AB = 24/√3 m = 13.84 m

OR 2

Considering, the diagram in the above question, AC as the new height of the shop including the sign-board. In ∆APC, tan 45° = AC/AP ⇒ 1 = AC/24 ⇒ AC = 24 cm



38. (a) 250 1
(b) 110 1
(c) 3150 2

OR

11^{TH} year