Name ___________________ Section______ Roll No.__________

CRPF PUBLIC SCHOOL, ROHINI, DELHI

MID-TERM EXAMINATION (2025-26)

MATHEMATICS (SET- A)

CLASS - XII

SOLUTIONS

Time Allowed: 3 hrs **Maximum Marks: 80**

General Instructions:

1. This Question paper contains - **five sections** A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.

2. Section A has **18 MCQ's and 02 Assertion Reasoning based questions** of 1 mark each.

3. Section B has **5 Very Short Answer (VSA)-type questions** of 2 marks each.

4. Section C has **6 Short Answer (SA)-type questions** of 3 marks each.

5. Section D has **4 Long Answer (LA)-type questions** of 5 marks each.

6. Section E has **3 source based/case based/passage based/integrated units of assessment** (4 marks each) with sub parts.

SECTION – A (MCQ) 1 Mark Questions	
Q1	(A) one-one but not onto
Q2	(D) 11
Q3	(A) identity matrix
Q4	(B) -48
Q5	(D) $\left[-\frac{1}{2}, \frac{1}{2}\right]$
Q6	(C) $\frac{\pi}{3}$
Q7	(B) 512
Q8	(B) $n \times m$
Q9	(B) skew-symmetric matrix
Q10	(B) 2
Q11	(D) $-2\sqrt{2}$
Q12	(C) $f(x)$ is continuous but not differentiable, at $x = 0$ and $x = 1$.
Q13	(C) $-2\sqrt{\pi}$
Q14	(B) Zero (0)

Q15	(C) $\dfrac{e^x}{x+6} + C$
Q16	(B) $\dfrac{1}{2}$
Q17	(B) 4
Q18	(C) at the corners of the feasible region

Assertion Reasoning Based Questions

Given below are two statements: one is labelled as **Assertion A** and other is labelled as **Reason R.** In the light of the above statements, choose the ***most appropriate*** answer from the options given below

(A) Both **A** and **R** are correct and **R** is the correct explanation of **A**
(B) Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**
(C) **A** is correct but **R** is not correct
(D) **A** is not correct but **R** is correct

Q19	(C) Assertion (A) is true, but Reason (R) is false.
Q20	(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

SECTION – B (Very Short Answer (VSA)-type questions) 2 Marks Each

Q21

$$\sin^{-1}\left[k\tan\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right] = \frac{\pi}{3}$$

$$\Rightarrow \sin\sin^{-1}\left[k\tan\left(2\times\frac{\pi}{6}\right)\right] = \sin\frac{\pi}{3}$$

$$\Rightarrow k\tan\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$$

$$\Rightarrow k\times\sqrt{3} = \frac{\sqrt{3}}{2} \qquad \therefore k = \frac{1}{2}.$$

Q22

$$A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix} \Rightarrow A^2 = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$$

$$\Rightarrow A^2 = \begin{bmatrix} 5 & -4 \\ -4 & 5 \end{bmatrix} \qquad \text{...(i)}$$

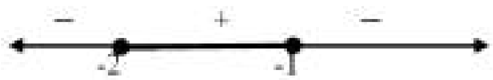
$$\text{Now, } 4A - 3I = 4\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix} - 3\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$\Rightarrow 4A - 3I = \begin{bmatrix} 5 & -4 \\ -4 & 5 \end{bmatrix} \qquad \text{...(ii)}$$

From (i) and (ii), we get

$A^2 = 4A - 3I$

Q23	$f(x)$ is continuous at $x = \frac{\pi}{2}$ $\Rightarrow \lim_{x\to\frac{\pi}{2}^-} f(x) = \lim_{x\to\frac{\pi}{2}^+} f(x) = f\left(\frac{\pi}{2}\right)$ $\Rightarrow \lim_{h\to 0} \frac{k\cos\left(\frac{\pi}{2}-h\right)}{\pi - 2\left(\frac{\pi}{2}-h\right)} = 3$ $\Rightarrow \frac{k}{2}\lim_{h\to 0}\frac{\sin h}{h} = 3$ $\Rightarrow \frac{k}{2} = 3 \Rightarrow k = 6$	1 ½ ½
	OR	
	$y = \tan^{-1}\left(\frac{1+\sin x}{\cos x}\right) = \tan^{-1}\left(\tan\left(\frac{\pi}{4}+\frac{x}{2}\right)\right)$ $= \frac{\pi}{4}+\frac{x}{2}$ $\Rightarrow \frac{dy}{dx} = \frac{1}{2}$	1 ½ ½
Q24	$\frac{dr}{dt} = 3$ cm/s and $\frac{dh}{dt} = -5$ cm/s $V = \pi r^2 h$ $\Rightarrow \frac{dv}{dt} = \pi\left(2r\frac{dr}{dt}\right)h + \pi r^2\frac{dh}{dt}$ $\Rightarrow \left.\frac{dV}{dt}\right]_{r=4,h=7} = 4\pi\left(2\times 3\times 7 + 4\times(-5)\right) = 4\pi\times 22 = 88\pi\ \text{cm}^3/\text{s}$	½ 1 ½
	OR	
	$y = -x^3+3x^2+9x-30$ Slope of the curve, $m = \frac{dy}{dx} = -3x^2+6x+9$ $\Rightarrow \frac{dm}{dx} = -6x+6$ For maximum/ minimum slope, put $\frac{dm}{dx} = 0$ $\Rightarrow x = 1$ As $\frac{d^2m}{dx^2} = -6 < 0 \therefore m$ is maximum at $x = 1$ Maximum slope $= -3(1)^2+6(1)+9 = 12$	½ ½ ½ ½
Q25	Let $\cot x = t$, then $-\text{cosec}^2 x dx = dt$ $\therefore \int\frac{\sqrt{\cot x}}{\sin x\cos x}dx = \int\frac{\sqrt{\cot x}}{\cot x}\text{cosec}^2 x\,dx = -\int\frac{\sqrt{t}}{t}dt = -\int\frac{1}{\sqrt{t}}dt$ $= -2\sqrt{t}+C$ $= -2\sqrt{\cot x}+C$	
	SECTION – C (Short Answer (SA)-type questions) 3 Marks Each	
Q26	$\sec^2(\tan^{-1}3) + \text{cosec}^2(\cot^{-1}2) = 1+\tan^2(\tan^{-1}3) + 1 + \cot^2(\cot^{-1}2)$ $= 1+3^2+1+2^2 = 15$	2 1

	OR $\cot^{-1}\left(\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right)$ $=\cot^{-1}\left(\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right)\times\frac{\left(\sqrt{1+\sin x}+\sqrt{1-\sin x}\right)}{\left(\sqrt{1+\sin x}+\sqrt{1-\sin x}\right)}$ $=\cot^{-1}\left[\frac{2+2\cos x}{2\sin x}\right]=\cot^{-1}\frac{1+2\cos^2\frac{x}{2}-1}{2\sin\frac{x}{2}.\cos\frac{x}{2}}$ $=\cot^{-1}\left(\cot\frac{x}{2}\right)=\frac{x}{2}$ $\left[\cot^{-1}(\cot x)=\theta\forall\theta\in(0,\pi)\right]$	
Q27	Let $y=u+v\Rightarrow\frac{dy}{dx}=\frac{du}{dx}+\frac{dv}{dx}$, where $u=x^{\tan x}, v=\frac{\sqrt{x^2+1}}{2}$ $u=x^{\tan x}\Rightarrow\log u=\tan x\log x$, differentiating with respect to 'x', we get $\Rightarrow\frac{1}{u}\frac{du}{dx}=\frac{\tan x}{x}+\sec^2 x\log x$ $\Rightarrow\frac{du}{dx}=u\left(\frac{\tan x}{x}+\sec^2 x\log x\right)=x^{\tan x}\left(\frac{\tan x}{x}+\sec^2 x\log x\right)$ $v=\frac{\sqrt{x^2+1}}{2}\Rightarrow\frac{dv}{dx}=\frac{2x}{4\sqrt{x^2+1}}=\frac{x}{2\sqrt{x^2}}$ $\Rightarrow\frac{dy}{dx}=x^{\tan x}\left(\frac{\tan x}{x}+\sec^2 x\log x\right)+\frac{x}{2\sqrt{x^2+1}}$	½ ½ ½ 1 ½
Q28	f '(x) = -6x² – 18x – 12 f '(x) = 0 gives x = -2, -1 sign of f '(x)  f(x) is increasing in $(-2,-1)$ f(x) is decreasing in $(-\infty,-2)$ *and* $(-1,\infty)$	1 1 ½ ½

Q29

$$\int \frac{x^2}{(x^2+4)(x^2+9)}dx = \int \frac{(x^2+9)-9}{(x^2+4)(x^2+9)}dx$$

$$= \int \left[\frac{(x^2+9)}{(x^2+4)(x^2+9)} - \frac{9}{(x^2+4)(x^2+9)}\right]dx$$

$$= \int \frac{1}{(x^2+4)}dx - \frac{9}{5}\int \left[\frac{1}{(x^2+4)} - \frac{1}{(x^2+9)}\right]dx$$

$$= \frac{1}{2}\tan^{-1}\frac{x}{2} - \frac{9}{5}\left[\frac{1}{2}\tan^{-1}\frac{x}{2} - \frac{1}{3}\tan^{-1}\frac{x}{3}\right] + c$$

$$= -\frac{2}{5}\tan^{-1}\frac{x}{2} + \frac{3}{5}\tan^{-1}\frac{x}{3} + c.$$

Q30

$$|x^3 - x| = |x(x-1)(x+1)|$$

$$= \begin{cases} -(x^3 - x), & if\ -2 < x < -1 \\ x^3 - x, & if\ -1 < x < 0 \\ -(x^3 - x), & if\ 0 < x < 1 \end{cases}$$

$$\int_{-2}^{1} |x^3 - x|\,dx = \int_{-2}^{-1}(x - x^3)\,dx + \int_{-1}^{0}(x^3 - x)\,dx + \int_{0}^{1}(x - x^3)\,dx$$ 1

$$= \left[\frac{x^2}{2} - \frac{x^4}{4}\right]_{-2}^{-1} + \left[\frac{x^4}{4} - \frac{x^2}{2}\right]_{-1}^{0} + \left[\frac{x^2}{2} - \frac{x^4}{4}\right]_{0}^{1}$$ 1

$$= \left[\left(\frac{1}{2} - \frac{1}{4}\right) - (2 - 4)\right] + \left[0 - \left(\frac{1}{4} - \frac{1}{2}\right)\right] + \left[\left(\frac{1}{2} - \frac{1}{4}\right) - 0\right]$$

$$= \frac{9}{4} + \frac{1}{4} + \frac{1}{4} = \frac{11}{4}$$ 1

OR

$$I = \int_0^\pi \frac{x\sin x}{1+\cos^2 x}dx \qquad ...(i)$$

$$= \int_0^\pi \frac{(\pi - x)\sin(\pi - x)}{1+\cos^2(\pi - x)}dx$$

$$I = \int_0^\pi \frac{(\pi - x)\sin x}{1+\cos^2 x}dx \qquad ...(ii)$$ ½

Adding (i) and (ii)

$$2I = \int_0^\pi \frac{\pi\sin x}{1+\cos^2 x}dx$$ ½

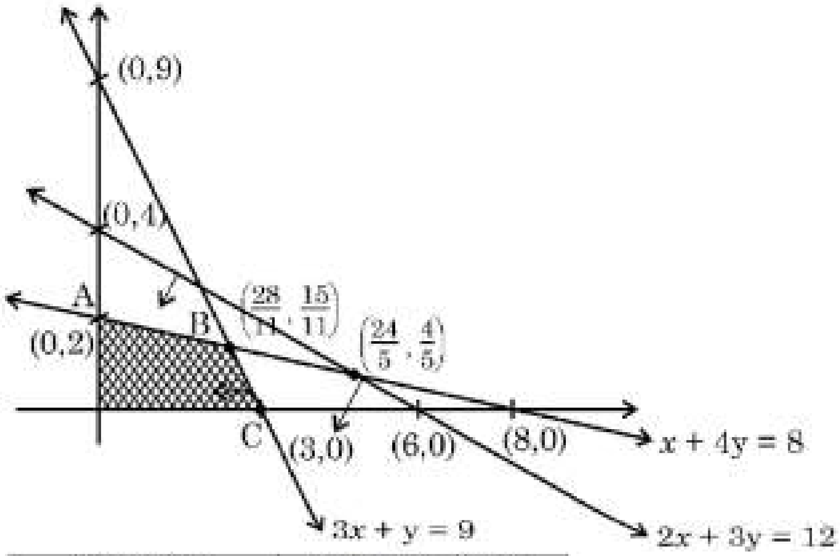
$$\Rightarrow I = \frac{\pi}{2}\int_0^\pi \frac{\sin x}{1+\cos^2 x}dx$$ ½

Put $\cos x = t \Rightarrow -\sin x\,dx = dt$

$$I = -\frac{\pi}{2}\int_1^{-1}\frac{dt}{1+t^2}$$ ½

$$= \pi\left[\tan^{-1} t\right]_0^1 = \frac{\pi^2}{4}$$ 1

Q31



Correct graph with shading 2

Corner Point	Value of $Z = 2x + 3y$
$O(0,0)$	0
$A(0,2)$	6
$B\left(\frac{28}{11}, \frac{15}{11}\right)$	$\frac{101}{11}$ Maximum
$C(3,0)$	6

For correct table 1

$Z_{max} = \frac{101}{11}$ when $x = \frac{28}{11}, y = \frac{15}{11}$

SECTION – D (Long Answer (LA)-type questions) 5 Marks Each

Q32

$|A| = 3(-3) - 2(-26) + 1(19) = 62 \neq 0 \Rightarrow A^{-1}$ exists. ½

$$\text{cofactor Matrix} = \begin{bmatrix} -3 & 26 & 19 \\ 9 & -16 & 5 \\ 5 & -2 & -11 \end{bmatrix}$$

$$adjA = \begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & -2 \\ 19 & 5 & -11 \end{bmatrix}$$ 2

$$A^{-1} = \frac{1}{62}\begin{bmatrix} -3 & 9 & 5 \\ 26 & -16 & -2 \\ 19 & 5 & -11 \end{bmatrix}$$ ½

	Given system of equations can be written as $A'.X = B$ where $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}, B = \begin{bmatrix} 14 \\ 4 \\ 0 \end{bmatrix}$ Now, $A'.X = B \Rightarrow X = (A')^{-1}.B$ $\Rightarrow X = (A^{-1})'.B = \frac{1}{62}\begin{bmatrix} -3 & 26 & 19 \\ 9 & -16 & 5 \\ 5 & -2 & -11 \end{bmatrix}\begin{bmatrix} 14 \\ 4 \\ 0 \end{bmatrix}$ $= \frac{1}{62}\begin{bmatrix} 62 \\ 62 \\ 62 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ $\Rightarrow x = 1, y = 1, z = 1$	 ½ ½ 1
	OR	
	$\mathrm{BA} = \begin{bmatrix} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 6 \end{bmatrix} = 6\mathrm{I}$ Given system is $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 4 \\ 0 & 1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -1 \\ 20 \\ 8 \end{bmatrix}$ i.e., BX = C say so $X = B^{-1}C$ $= \frac{1}{6}AC$ $= \frac{1}{6}\begin{bmatrix} 2 & 2 & -4 \\ -4 & 2 & -4 \\ 2 & -1 & 5 \end{bmatrix}\begin{bmatrix} -1 \\ 20 \\ 8 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ x = 1 , y = 2, z = 3	2 1 1 ½ ½
Q33	**(a)** $x\sqrt{1+y} + y\sqrt{1+x} = 0$ $\Rightarrow x\sqrt{1+y} = -y\sqrt{1+x}$ $\Rightarrow x^2(1+y) = y^2(1+x)$ $\Rightarrow (x-y)(x+y) + xy(x-y) = 0$ $\Rightarrow (x-y)(x+y+xy) = 0$ $x \neq y \Rightarrow x + y + xy = 0$ $\Rightarrow y = \frac{-x}{1+x}$ $\Rightarrow \frac{dy}{dx} = \frac{-1}{(1+x)^2}$	 ½ 1 ½ 1

	(b) $y = (\tan^{-1} x)^2$ $\Rightarrow \frac{dy}{dx} = 2(\tan^{-1} x) \times \left(\frac{1}{1+x^2}\right)$ $\Rightarrow (1+x^2)\frac{dy}{dx} = 2\tan^{-1} x$ $\Rightarrow (1+x^2)\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} = 2 \times \frac{1}{1+x^2}$ $\therefore (1+x^2)^2 \frac{d^2y}{dx^2} + 2x(1+x^2)\frac{dy}{dx} = 2$.	
Q34	$f(x) = -\frac{3}{4}x^4 - 8x^3 - \frac{45}{2}x^2 + 105$	
	$f'(x) = -3x^3 - 24x^2 - 45x$ and $f''(x) = -9x^2 - 48x - 45$	**(1)**
	$f'(x) = 0 \Longrightarrow x = 0$ or $x^2 + 8x + 15 = 0$	
	i.e., $x = 0, -3, -5$	**(1)**
	At $x = 0, f''(0) < 0 \Longrightarrow 0$ is a point of local maxima	**(1)**
	At $x = -3, f''(-3) > 0 \Longrightarrow -3$ is a point of local minima	**(1)**
	At $x = -5, f''(-5) < 0 \Longrightarrow -5$ is a point of local maxima	**(1)**

Q35	Let $I=\int \frac{(3\cos x-2)\sin x}{5-\sin^2 x-4\cos x}dx$ $\Rightarrow I=\int \frac{(3\cos x-2)\sin x}{5-(1-\cos^2 x)-4\cos x}dx$ $\Rightarrow I=\int \frac{(3\cos x-2)\sin x}{\cos^2 x-4\cos x+4}dx$ Put $\cos x=t \Rightarrow \sin x dx=-dt$ $\therefore I=-\int \frac{(3t-2)}{t^2-4t+4}dt$ Let $3t-2=A\frac{d}{dt}(t^2-4t+4)+B$ $\Rightarrow 3t-2=A(2t-4)+B$ On comparing the like terms, we get $2A=3,\ B-4A=-2$ $\therefore A=\frac{3}{2},\ B=4$ So, $I=-\left[\frac{3}{2}\int \frac{(2t-4)}{t^2-4t+4}dt+\int \frac{4}{t^2-4t+4}dt\right]$ $\Rightarrow I=-\left[\frac{3}{2}\int \frac{(2t-4)}{t^2-4t+4}dt+\int \frac{4}{(t-2)^2}dt\right]$ $\Rightarrow I=-\left[\frac{3}{2}\log\left\|t^2-4t+4\right\|-\frac{4}{t-2}\right]+c$ $\Rightarrow I=\frac{4}{\cos x-2}-\frac{3}{2}\log\left\|\cos^2 x-4\cos x+4\right\|+c$ Therefore, $I=\frac{4}{\cos x-2}-\frac{3}{2}\log\left\|5-\sin^2 x-4\cos x\right\|+c$. **OR** Let $I=\int(\sqrt{\tan x}+\sqrt{\cot x})\,dx$ $=\int\left(\sqrt{\frac{\sin x}{\cos x}}+\sqrt{\frac{\cos x}{\sin x}}\right)dx=\int\frac{\sin x+\cos x}{\sqrt{\sin x\cos x}}dx$ $=\sqrt{2}\int\frac{\sin x+\cos x}{\sqrt{2\sin x\cos x}}dx$ $=\sqrt{2}\int\frac{\sin x+\cos x}{\sqrt{1-(1-\sin 2x)}}dx$ $=\sqrt{2}\int\frac{\sin x+\cos x}{\sqrt{1-(\sin x-\cos x)^2}}dx$ Put $\sin x-\cos x=t\Rightarrow(\cos x+\sin x)\,dx=dt$ $\therefore I=\sqrt{2}\int\frac{dt}{\sqrt{1-t^2}}=\sqrt{2}\sin^{-1}t+C$ $=\sqrt{2}\sin^{-1}(\sin x-\cos x)+C$

SECTION – E (Case Study questions) 4 Marks Each

Q36

$(i)\ R_4$	**1**
$(ii)\ R_5$	**1**
$(iii)(a)\ R_1$ **and** R_3	**1+1**
OR	
$(iii)(b)$ **Required pairs to be added to make the relation** R_2 **as an equivalence relation are:** $(1,1),(2,2),(3,3),(2,1),(3,1)$ **and** $(2,3)$	**2**

Q37

(i) Let x and y be the number of girl students and that of meritorious achievers respectively.
Then $3000x + 4000y = 180000$ i.e., $3x + 4y = 180$ and $x + y = 50$.

Clearly, $\begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 180 \\ 50 \end{bmatrix}$

(ii) As $\begin{vmatrix} 3 & 4 \\ 1 & 1 \end{vmatrix} = 3 - 4 = -1 \neq 0$ so, the system of matrix equations so obtained is consistent.

(iii) We have $\begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 180 \\ 50 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}^{-1}\begin{bmatrix} 180 \\ 50 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{-1}\begin{bmatrix} 1 & -4 \\ -1 & 3 \end{bmatrix}\begin{bmatrix} 180 \\ 50 \end{bmatrix} = \begin{bmatrix} 20 \\ 30 \end{bmatrix}$

By equality of matrices, we get $x = 20,\ y = 30$.

$\therefore$ The no. of scholarships given to the girl students is 20 and that of meritorious achievers is 30.

OR

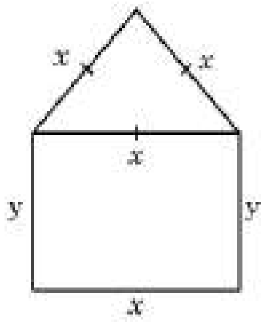
(iii) We have $\begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 180 \\ 50 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 & 4 \\ 1 & 1 \end{bmatrix}^{-1}\begin{bmatrix} 180 \\ 50 \end{bmatrix}$

$\Rightarrow \begin{bmatrix} x \\ y \end{bmatrix} = \frac{1}{-1}\begin{bmatrix} 1 & -4 \\ -1 & 3 \end{bmatrix}\begin{bmatrix} 180 \\ 50 \end{bmatrix} = \begin{bmatrix} 20 \\ 30 \end{bmatrix}$

By equality of matrices, we get $x = 20,\ y = 30$.

$\therefore$ The no. of scholarships given to the girl students is 20 and that of meritorious achievers is 30.
When amount of scholarship is interchanged i.e., when the amount of scholarship given to each girl child is ₹4000 and that of meritorious achievers is ₹3000; then monthly expenditure incurred by the school will be ₹ $20 \times 4000 + 30 \times 3000 =$ ₹ $80000 + 90000 =$ ₹ 170000.

Q38	(i) Perimeter $(P) = 3x + 2y = 12$	1
		
	(ii) Area $(A) = xy + \frac{\sqrt{3}}{4}x^2$	
	$= x\left(\frac{12-3x}{2}\right) + \frac{\sqrt{3}}{4}x^2$	
	$= 6x - \frac{3}{2}x^2 + \frac{\sqrt{3}}{4}x^2$	1
	$(iii)(a)\ \frac{dA}{dx} = 6 - 3x + \frac{\sqrt{3}}{2}x$	½
	For maximum light, $\frac{dA}{dx} = 0$	
	$\Rightarrow 6 - 3x + \frac{\sqrt{3}}{2}x = 0 \Rightarrow x = \frac{12}{6-\sqrt{3}}\, m$	½
	Also, $\frac{d^2A}{dx^2} = -3 + \frac{\sqrt{3}}{2} < 0 \therefore A$ is maximum when $x = \frac{12}{6-\sqrt{3}}\, m$	½
	Now, $y = \frac{12-3x}{2} = 6 - \frac{3}{2}\left(\frac{12}{6-\sqrt{3}}\right) = \frac{18-6\sqrt{3}}{6-\sqrt{3}}\, m$	½
	OR	
	$(iii)(b)\ xy + \frac{\sqrt{3}}{4}x^2 = 50$	½
	$\Rightarrow y = \frac{50}{x} - \frac{\sqrt{3}}{4}x$	1
	Now, $P = 3x + 2y$	
	$= 3x + 2\left(\frac{50}{x} - \frac{\sqrt{3}}{4}x\right) m$	½