

O.K. *[Signature]*
16/9/26

MARKING SCHEME
ALL INDIA SECONDARY SCHOOL EXAMINATION, 2027
Sample Question Paper (2026-27)
Subject: Mathematics and Computing (175)

Q.No.	Expected Answer/ Value Points	Distribution of Marks
Section A		
1.	(b) $\frac{1}{2}$	1
2.	(a) $\frac{5}{3}$	1
3.	(c) $\frac{\pi}{180}$	1
4.	(c) Acharya Pingala	1
5.	(c) $2! \times 8!$	1
6.	(b) Paracetamol	1
7.	(a) 4	1
8.	(d) $\frac{1}{3}$	1
9.	(d) $\frac{1}{2}$	1
10.	(b) If a number is not prime, then it is not odd.	1
11.	(c) $x^2 + y^2 - 4x - 5y = 0$	1
12.	(b) Bijective	1
13.	(a) 0	1
14.	(d) $\frac{\pi}{3}$	1
15.	(c) Assertion (A) is true, but Reason (R) is false.	1
16.	(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).	1
Section B		
17.	(i) $\rightarrow$ (c) (ii) $\rightarrow$ (a) (iii) $\rightarrow$ (d) (iv) $\rightarrow$ (b)	$\frac{1}{2} \times 4 = 2$
18.	(a) Let slope of other line = $m_1 = m$ Slope of line = $m_2 = 2m$ $\tan \theta = \left \frac{m_2 - m_1}{1 + m_1 m_2} \right $ $\tan \theta = \left \frac{2m - m}{1 + 2m^2} \right $ $\pm \frac{1}{3} = \frac{m}{2m^2 + 1}$ $m = 1, -1, \frac{1}{2}, -\frac{1}{2}$ Slope of the lines are	1

Q.No.	Expected Answer/ Value Points	Distribution of Marks
	1,2; -1, -2; $\frac{1}{2}$, 1 and $-\frac{1}{2}$, -1	1
	OR (b) Intercept form of equation of line is $\frac{x}{a} + \frac{y}{a} = 1$ $x + y = a \dots (1)$ It passes through the point (3, -2) so $3 - 2 = a$ $a = 1$ Put this value in equation (1) So required equation of straight line is $x + y = 1$	1 $\frac{1}{2}$ $\frac{1}{2}$
19.	Roster form : $R = \{(4, -2), (4, 2), (1, -1), (1, 1), (0, 0)\}$ Domain = $\{0, 1, 4\}$ Codomain = Z Range = $\{-2, -1, 0, 1, 2\}$	$\frac{1}{2} \times 4 = 2$
Section C		
20.	(a) In the word 'SOCIETY' there are 7 letters which can be arranged in a row by 7! Ways. In the word 'SOCIETY' there are three vowels O, I, E. When we put three vowels together then favourable outcomes are $5! \times 3!$ Required Probability = $\frac{5! \times 3!}{7!}$ $= \frac{3 \times 2 \times 1}{7 \times 6} = \frac{1}{7}$	1 1 1
	OR (b) Total tickets numbered from 1 to 20 are 20. 2 tickets are drawn at random, so total possible outcomes are ${}^{20}C_2$. Tickets having prime number 2, 3, 5, 7, 11, 13, 17, 19 = 08 Favourable outcomes in selecting both tickets having prime numbers ${}^8C_2$. Required Probability $\frac{{}^8C_2}{{}^{20}C_2} = \frac{8 \times 7}{20 \times 19}$ $= \frac{14}{95}$	1 1 1
21.	Equation of line passes through the point of intersection of two lines $x + 2y = 5$ and $3x + 2y = 17$ is $x + 2y - 5 + \lambda(3x + 7y - 17) = 0 \dots (1)$ $(1 + 3\lambda)x + (2 + 7\lambda)y = 5 + 17\lambda$ $(2 + 7\lambda)y = -(1 + 3\lambda)x + 5 + 17\lambda$ $y = \frac{-(1 + 3\lambda)}{(2 + 7\lambda)} + \frac{5 + 17\lambda}{2 + 7\lambda}$ Slope of this line is $m_1 = -\frac{(1+3\lambda)}{2+7\lambda}$ Slope of given line $4x + 3y - 8$ is $m_2 = -\frac{4}{3}$ Lines are perpendicular so $m_1 m_2 = -1$ $-\frac{(1 + 3\lambda)}{2 + 7\lambda} \times -\frac{4}{3} = -1$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

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	$4 + 12\lambda = -6 - 21\lambda$ $\lambda = \frac{-10}{33}$ From (1) $x + 2y - 5 - \frac{10}{33}(3x + 7y - 17) = 0$ $33x + 66y - 165 - 30x - 70y + 170 = 0$ $3x - 4y + 5 = 0$ Hence, required line equations is $3x - 4y + 5 = 0$	1 1/2
22.	(a) $f(x) = \sin 2x$ Using first principle $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{\sin 2(x+h) - \sin 2x}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{\sin(2x+2h) - \sin 2x}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{2 \cos\left(\frac{2x+2h+2x}{2}\right) \sin\left(\frac{2x+2h-2x}{2}\right)}{h}$ $f'(x) = \lim_{h \rightarrow 0} 2 \cos(2x+h) \frac{\sin h}{h}$ $= 2 \cos 2x \times 1$ $= 2 \cos 2x$	1/2 1 1 1/2
	OR (b) $f(x) = \tan x$ Using first principle $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}$ $f'(x) = \lim_{h \rightarrow 0} \frac{\tan(x+h) - \tan x}{h}$ $= \lim_{h \rightarrow 0} \frac{\frac{\sin(x+h)}{\cos(x+h)} - \frac{\sin x}{\cos x}}{h}$ $= \lim_{h \rightarrow 0} \frac{\sin(x+h) \cos x - \cos(x+h) \sin x}{\cos(x+h) \cos x h}$ $= \lim_{h \rightarrow 0} \frac{\sin(x+h-x)}{h \cos(x+h) \cos x}$ $f'(x) = \lim_{h \rightarrow 0} \frac{\sin h}{h} \times \frac{1}{\cos(x+h) \cos x}$ $f'(x) = \frac{1}{\cos^2 x} = \sec^2 x$	1/2 1 1 1/2
23.	$R = \{(l_1, l_2) \in L \times L : l_1 \text{ is parallel to } l_2\}$ Reflexive: Relation R is reflexive because every line in the coordinate plane is parallel to itself. So $l_1, l_1 \in R$ for every $l_1 \in L$ Symmetric: Let $(l_1, l_2) \in R$ $\Rightarrow$ line l_1 is parallel to l_2	1/2

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	$\Rightarrow$ line l_2 is parallel to l_1 $\Rightarrow (l_2, l_1) \in R$ so R is symmetric. Transitive: Let $(l_1, l_2) \in R, (l_2, l_3) \in R$. Line l_1 is parallel to l_2 and line l_2 is parallel to l_3 $\Rightarrow$ line l_1 is parallel to l_3 $\Rightarrow (l_1, l_3) \in R$ so R is transitive. Because R is reflexive, symmetric and transitive so R is an equivalence relation.	1 1 $\frac{1}{2}$																									
24.	(a) $S = \frac{3}{5} + \frac{4}{5^2} + \frac{3}{5^3} + \frac{4}{5^4} + \dots$ to $2n$ terms $= \left(\frac{3}{5} + \frac{3}{5^3} + \dots + n \text{ term} \right) + \left(\frac{4}{5^2} + \frac{4}{5^4} + \dots + n \text{ term} \right)$ $= \frac{\frac{3}{5} \left[1 - \left(\frac{1}{5^2} \right)^n \right]}{1 - \frac{1}{5^2}} + \frac{\frac{4}{5^2} \left[1 - \left(\frac{1}{5^2} \right)^n \right]}{1 - \frac{1}{5^2}}$ $= \frac{\frac{3}{5} \left[1 - \frac{1}{5^{2n}} \right]}{1 - \frac{1}{25}} + \frac{\frac{4}{25} \left[1 - \frac{1}{5^{2n}} \right]}{1 - \frac{1}{25}}$ $= \left[1 - \frac{1}{5^{2n}} \right] \left[\frac{3}{5} \times \frac{25}{24} + \frac{4}{25} \times \frac{25}{24} \right]$ $= \left(1 - \frac{1}{5^{2n}} \right) \left(\frac{95}{120} \right)$ $= \frac{19}{24} \left(1 - \frac{1}{5^{2n}} \right)$	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ 1																									
	OR (b) $t_n = 2n^2 - n + 5$ $\sum t_n = 2 \sum n^2 - \sum n + 5n$ $= \frac{2n(n+1)(2n+1)}{6} - \frac{n(n+1)}{2} + 5n$ $= \frac{2n(n+1)(2n+1) - 3n(n+1) + 30n}{6}$ $= \frac{2n(2n^2 + 3n + 1) - 3n^2 - 3n + 30n}{6}$ $= \frac{4n^3 + 6n^2 + 2n - 3n^2 - 3n + 27n}{6}$ $= \frac{4n^3 + 3n^2 + 29n}{6}$	$\frac{1}{2}$ $1\frac{1}{2}$ 1																									
25.	<table><tr><th>p</th><th>q</th><th>$p \leftrightarrow q$</th><th>$(p \leftrightarrow q) \wedge p$</th><th>$(p \leftrightarrow q) \wedge p \Rightarrow q$</th></tr><tr><td>F</td><td>F</td><td>T</td><td>F</td><td>T</td></tr><tr><td>F</td><td>T</td><td>F</td><td>F</td><td>T</td></tr><tr><td>T</td><td>F</td><td>F</td><td>F</td><td>T</td></tr><tr><td>T</td><td>T</td><td>T</td><td>T</td><td>T</td></tr></table>	p	q	$p \leftrightarrow q$	$(p \leftrightarrow q) \wedge p$	$(p \leftrightarrow q) \wedge p \Rightarrow q$	F	F	T	F	T	F	T	F	F	T	T	F	F	F	T	T	T	T	T	T	$2\frac{1}{2}$
p	q	$p \leftrightarrow q$	$(p \leftrightarrow q) \wedge p$	$(p \leftrightarrow q) \wedge p \Rightarrow q$																							
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	Fourth and second columns of the table Shows that when $(p \leftrightarrow q) \wedge p$ is true then q is also true. So, $(p \leftrightarrow q) \wedge p \Rightarrow q$	$\frac{1}{2}$																																				
26.	(a) $f(x) = \begin{cases} 2x - 1, x < 1 \\ 2x + 1, x \geq 1 \end{cases}$ Left hand derivative of f at $x = 1$ is $Lf'(1) = \lim_{h \rightarrow 0} \frac{f(1-h) - f(1)}{-h}$ $= \lim_{h \rightarrow 0} \frac{2(1-h) - 1 - 3}{-h}$ $= \lim_{h \rightarrow 0} \frac{-2h - 2}{-h}$ $= \lim_{h \rightarrow 0} \left(-2 - \frac{2}{h}\right) = \text{Not defined}$ Right hand derivative of f at $x = 1$ is $Rf'(1) = \lim_{h \rightarrow 0} \frac{f(1+h) - f(1)}{h}$ $= \lim_{h \rightarrow 0} \frac{2(1+h) + 1 - 3}{h} = 2$ Here $Lf'(1) \neq Rf'(1)$ So f is not differentiable at $x = 1$	$1\frac{1}{2}$																																				
	OR (b) $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{x - \frac{\pi}{4}}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} \left[\sin x \cdot \frac{1}{\sqrt{2}} - \cos x \cdot \frac{1}{\sqrt{2}} \right]}{x - \frac{\pi}{4}}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} \left[\sin x \cos \frac{\pi}{4} - \cos x \sin \frac{\pi}{4} \right]}{x - \frac{\pi}{4}}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sqrt{2} \sin \left(x - \frac{\pi}{4} \right)}{\left(x - \frac{\pi}{4} \right)}$ $= \sqrt{2} \times 1 = \sqrt{2}$	1 $\frac{1}{2}$ 1 $\frac{1}{2}$																																				
27.	<table border="1"><tr><td>*</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td>2</td><td>1</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>3</td><td>1</td><td>2</td><td>3</td><td>3</td><td>3</td></tr><tr><td>4</td><td>1</td><td>2</td><td>3</td><td>4</td><td>4</td></tr><tr><td>5</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr></table> (i) $(3 * 5) * 2$ $= 3 * 2$ $= 2$	*	1	2	3	4	5	1	1	1	1	1	1	2	1	2	2	2	2	3	1	2	3	3	3	4	1	2	3	4	4	5	1	2	3	4	5	1
*	1	2	3	4	5																																	
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Q.No.	Expected Answer/ Value Points	Distribution of Marks
	(ii) $2 * (3 * 5)$ $= 2 * 3$ $= 2$ (iii) $(3 * 5) * (2 * 3)$ $= 3 * 2$ $= 2$	1 1
28.	(a) $\sqrt{3} \cos x + \sin x = \sqrt{2}$ Dividing both sides by $\sqrt{(\sqrt{3})^2 + 1^2}$ means 2 $\frac{\sqrt{3}}{2} \cos x + \frac{1}{2} \sin x = \frac{1}{\sqrt{2}}$ $\cos x \cos \frac{\pi}{6} + \sin x \sin \frac{\pi}{6} = \frac{1}{\sqrt{2}}$ $\cos \left(x - \frac{\pi}{6} \right) = \frac{1}{\sqrt{2}}$ $\cos \left(x - \frac{\pi}{6} \right) = \cos \frac{\pi}{4}$ $x - \frac{\pi}{6} = 2n\pi \pm \frac{\pi}{4}$ $x = 2n\pi + \frac{\pi}{6} \pm \frac{\pi}{4}$ $x = 2n\pi + \frac{5\pi}{12} \quad \text{OR} \quad x = 2n\pi - \frac{\pi}{12}$ where $n \in \mathbb{Z}$	1/2 1 1/2 1
	OR (b) $\sin x = \frac{1}{4}, x \in \text{II quadrant}$ $\left(\frac{1}{4} \right)^2 + \cos^2 x = 1$ $\cos^2 x = 1 - \frac{1}{16} = \frac{15}{16}$ $\cos x = \pm \frac{\sqrt{15}}{4}$ Because $x \in \text{II quadrant}$ so $\cos x = -\frac{\sqrt{15}}{4}$ As $x \in \text{II quadrant}$ so $\frac{x}{2} \in \text{I quadrant}$ So $\tan \frac{x}{2}$ will be positive. $\tan \frac{x}{2} = \sqrt{\frac{1 - \cos x}{1 + \cos x}}$ $\tan \frac{x}{2} = \frac{1 + \frac{\sqrt{15}}{4}}{1 - \frac{\sqrt{15}}{4}} = \sqrt{\frac{4 + \sqrt{15}}{4 - \sqrt{15}}}$	1 1/2 1/2

Q.No.	Expected Answer/ Value Points							Distribution of Marks
	$= 4 + \sqrt{15}$							1
29.	$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$ $A = \{2, 3, 4, 7, 9, 11\}$ $B = \{1, 3, 5, 9, 11, 12\}$ (i) $A \cup B = \{1, 2, 3, 4, 5, 7, 9, 11, 12\}$ (ii) $A \cap B = \{3, 9, 11\}$ (iii) $A \Delta B = (A \cup B) - (A \cap B)$ $= \{1, 2, 4, 5, 7, 12\}$							1 1 1
Section D								
30.	Age (in years)	(f) no. of persons	C.I.	C.F.	x	x - M	f x - M	3
	16-20	5	15.5-20.5	5	18	21	105	
	21-25	6	20.5-25.5	11	23	16	96	
	26-30	12	25.5-30.5	23	28	11	132	
	31-35	13	30.5-35.5	36	33	6	78	
	36-40	20	35.5-40.5	56	38	1	20	
	41-45	19	40.5-45.5	75	43	4	76	
	46-50	16	45.5-50.5	91	48	9	144	
	51-55	9	50.5-55.5	100	53	14	126	
		100					777	
$\text{Median} = M = l + \frac{\frac{N}{2} - c}{f} \times h$ $= 35.5 + \frac{50 - 36}{20} \times 5$ $= 35.5 + \frac{70}{20} = 35.5 + 3.5 = 39 \text{ years}$ Mean deviation about median = MD(M) $= \frac{\sum f x - M }{\sum f} = \frac{777}{100}$ $= 7.77 \text{ years}$								1
31.	(a) LHS $C_0 + 2C_1 + 3C_2 + \dots + (n + 1)C_n$ $= (C_0 + C_1 + C_2 + \dots + C_n) + (C_1 + 2C_2 + \dots + nC_n)$ $= \left(1 + n + \frac{n(n-1)}{2} + \dots + 1\right) + (C_1 + 2C_2 + \dots + nC_n)$ $= (1 + 1)^n + (n + n(n - 1) + \dots + n)$ $= 2^n + n(1 + 1)^{n-1}$ $= 2^n + n2^{n-1}$							1 1 1 1 1
OR								
(b) In the expansion of $\left(\sqrt[3]{2} + \frac{1}{\sqrt[3]{3}}\right)^n$ the general term is $T_{r+1} = nC_r (\sqrt[3]{2})^{n-r} \left(\frac{1}{\sqrt[3]{3}}\right)^r$ 7 th term from beginning = $T_7 = nC_6 (\sqrt[3]{2})^{n-6} \left(\frac{1}{\sqrt[3]{3}}\right)^6$								1

Q.No.	Expected Answer/ Value Points	Distribution of Marks
	7th term from end = $t_7 = n_{c_6} (1/\sqrt[3]{3})^{n-6} (\sqrt[3]{2})^6$ It is given $T_7: t_7 = 1:6$ $\frac{n_{c_6} (\sqrt[3]{2})^{n-6} \left(\frac{1}{\sqrt[3]{3}}\right)^6}{n_{c_6} \left(\frac{1}{\sqrt[3]{3}}\right)^{n-6} (\sqrt[3]{2})^6} = \frac{1}{6}$ $(\sqrt[3]{2})^{n-12} \left(\frac{1}{\sqrt[3]{3}}\right)^{12-n} = \frac{1}{6}$ $(\sqrt[3]{2} \cdot \sqrt[3]{3})^{n-12} = \frac{1}{6}$ $(6)^{\frac{n-12}{3}} = 6^{-1}$ $\frac{n-12}{3} = -1$ $n = 9$	1 1 1 1
32.	Let M be the set of students who had taken mathematics. P be the set of students who had taken physics. C be the set of students who had taken chemistry. $n(U) = 25, n(M) = 15, n(P) = 12, n(C) = 11$ $n(M \cap C) = 5, n(M \cap P) = 9, n(P \cap C) = 4$ $n(M \cap P \cap C) = 3$ (i) $n(M \cup P \cup C) = n(M) + n(P) + n(C) - n(M \cap C) - n(M \cap P) - n(P \cap C) + n(M \cap P \cap C)$ $= 15 + 12 + 11 - 5 - 9 - 4 + 3$ $= 41 - 18 = 23$ (ii) Number of students who had only one of the subject $= n(M \cup P \cup C) - n(M \cap C) - n(M \cap P) - n(P \cap C) + 2n(M \cap P \cap C)$ $= 23 - 5 - 9 - 4 + 6$ $= 29 - 18 = 11$ (iii) Number of students who had taken none of the subject $= n(U) - n(M \cup P \cup C)$ $= 25 - 23 = 02$	2 2 1
33.	(a) $LHS \quad 4 \sin \alpha \sin \beta \sin \gamma$ $= 2(2 \sin \alpha \sin \beta) \sin \gamma$ $= 2[\cos(\alpha - \beta) - \cos(\alpha + \beta)] \sin \gamma$ $= 2 \cos(\alpha - \beta) \sin \gamma - 2 \cos(\alpha + \beta) \sin \gamma$ $= \sin(\alpha - \beta + \gamma) - \sin(\alpha - \beta - \gamma) - \sin(\alpha + \beta + \gamma) + \sin(\alpha + \beta - \gamma)$ $= \sin(\alpha - \beta + \gamma) - \sin[-(\beta + \gamma - \alpha)] - \sin(\alpha + \beta + \gamma) + \sin(\alpha + \beta - \gamma)$ $= \sin(\gamma + \alpha - \beta) + \sin(\beta + \gamma - \alpha) - \sin(\alpha + \beta + \gamma) + \sin(\alpha + \beta - \gamma)$ $= RHS$ OR (b) $LHS \sin^3 x + \sin^3 \left(x + \frac{2\pi}{3}\right) + \sin^3 \left(x + \frac{4\pi}{3}\right)$	1 1 1 1 1

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	$\because \sin 3 \theta = 3 \sin \theta - 4 \sin^3 \theta$ $\sin^3 \theta = \frac{3 \sin \theta - \sin 3 \theta}{4}$ $= \frac{3 \sin x - \sin 3x}{4} + \frac{3 \sin \left(x + \frac{2\pi}{3}\right) - \sin 3\left(x + \frac{2\pi}{3}\right)}{4} + \frac{3 \sin \left(x + \frac{4\pi}{3}\right) - \sin 3\left(x + \frac{4\pi}{3}\right)}{4}$ $= \frac{1}{4} \left[3 \sin x - \sin 3x + 3 \times 2 \sin \left(\frac{2x + \frac{6\pi}{3}}{2}\right) \cos \left(\frac{2\pi}{2}\right) - \sin(3x + 4\pi) - \sin(3x + 2\pi) \right]$ $= \frac{1}{4} \left\{ 3 \sin x - \sin 3x + 3 \left[\sin \left(x + \frac{4\pi}{3}\right) + \sin \left(x + \frac{2\pi}{3}\right) \right] - \left[\sin \left(3x + \frac{12\pi}{3}\right) + \sin \left(3x + \frac{6\pi}{3}\right) \right] \right\}$ $= \frac{1}{4} \left[3 \sin x - \sin 3x + 6 \sin(x + \pi) \cos \frac{\pi}{3} - \sin 3x - \sin 3x \right]$ $= \frac{1}{4} \left[3 \sin x - \sin 3x - 6 \sin x \times \frac{1}{2} - 2 \sin 3x \right]$ $= \frac{1}{4} [3 \sin x - 3 \sin 3x - 3 \sin x]$ $= -\frac{3}{4} \sin 3x = RHS$	1½ 1 1 1 ½										
	Section E											
34.	(i) Standard equating of given parabola is $x^2 = 4ay$ (ii) Given parabola is passing through the point (2.5, 10) (iii) $x^2 = 4ay$ It passes through the point (2.5, 10) $(2.5)^2 = 4a(10)$ $a = \frac{2.5 \times 2.5}{40} = \frac{25}{10} \times \frac{25}{10} \times \frac{1}{40} = \frac{5}{32}$ So equation of given figure is $x^2 = 4\left(\frac{5}{32}\right)y$ $x^2 = \frac{5}{8}y$ $8x^2 = 5y$	1 1 1 1										
35.	(i) <table> <tr> <th>Part A</th> <th>Part B</th> </tr> <tr> <td>9 - 1 = 8</td> <td>6 - 1 = 5</td> </tr> <tr> <td>2</td> <td>4</td> </tr> <tr> <td>3</td> <td>3</td> </tr> <tr> <td>4</td> <td>2</td> </tr> </table>	Part A	Part B	9 - 1 = 8	6 - 1 = 5	2	4	3	3	4	2	1
Part A	Part B											
9 - 1 = 8	6 - 1 = 5											
2	4											
3	3											
4	2											

Q.No.	Expected Answer/ Value Points	Distribution of Marks										
	Required number of ways of selecting questions $= {}^8C_2 \times {}^5C_4 + {}^8C_3 \times {}^5C_3 + {}^8C_4 \times {}^5C_2$ $= \frac{8!}{2!6!} \times \frac{5!}{4!1!} + \frac{8!}{3!5!} \times \frac{5!}{3!2!} + \frac{8!}{4!4!} \times \frac{5!}{2!3!}$ $= \frac{8 \times 7 \times 5}{2} + \frac{8 \times 7 \times 6}{3 \times 2 \times 1} \times \frac{5 \times 4}{2 \times 1} + \frac{8 \times 7 \times 6 \times 5}{4 \times 3 \times 2 \times 1} \times \frac{5 \times 4}{2 \times 1}$ $= 140 + 560 + 700$ $= 1400$ (ii) <table><tr><th>Part A</th><th>Part B</th></tr><tr><td>$9 - 2 = 7$</td><td>$6 - 2 = 4$</td></tr><tr><td>1</td><td>3</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>1</td></tr></table> Required number of ways of selecting question $= {}^7C_1 \times {}^4C_3 + {}^7C_2 \times {}^4C_2 + {}^7C_3 \times {}^4C_1$ $= \frac{7!}{1!6!} \times \frac{4!}{3!1!} + \frac{7!}{2!5!} \times \frac{4!}{2!2!} + \frac{7!}{3!4!} \times \frac{4!}{1!3!}$ $= 7 \times 4 + \frac{7 \times 6 \times 4 \times 3}{2 \times 2} + \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times 4$ $= 28 + 126 + 140$ $= 294$	Part A	Part B	$9 - 2 = 7$	$6 - 2 = 4$	1	3	2	2	3	1	1 1 1 1
Part A	Part B											
$9 - 2 = 7$	$6 - 2 = 4$											
1	3											
2	2											
3	1											

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