CODE:1302- AG-1-IIND TERM-21-22 पजियन क्रमांक **REG.NO:-TMC -D/79/89/36**

General Instructions:

Read the following instructions very carefully and strictly follow them :

1. The question paper consists of 14 questions divided into 3 sections A, B, C.

2. All questions are compulsory.

3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.

4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.

5. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

EXAMINATION 2021 -22(IIND TERM)

Time : 2 Hours | Maximum Marks : 40

CLASS – XII | **MATHEMATICS**

Sr. No.	SECTION – A (6 X 2=12)	Marks allocated
Q.1	Evaluate: $\int \frac{\sqrt{\tan x}}{\sin x \cos x}\,dx$. OR Evaluate: $\int \sqrt{e^x - 1}\,dx$	2
Q.2	Solve the differential equation: $(e^y + 1)\cos x dx + e^y \sin x dy = 0$.	2
Q.3	If $\hat{a}, \hat{b}$ and $\hat{c}$ are mutually perpendicular unit vectors, then find the value of $\lvert 2\hat{a} + \hat{b} + \hat{c} \rvert$.	2
Q.4	Find the angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$.	2
Q.5	Let A and B be independent events such that $P(A \cup B) = .85$ and P (not B) $= 0.65$. Find $P(A)$.	2

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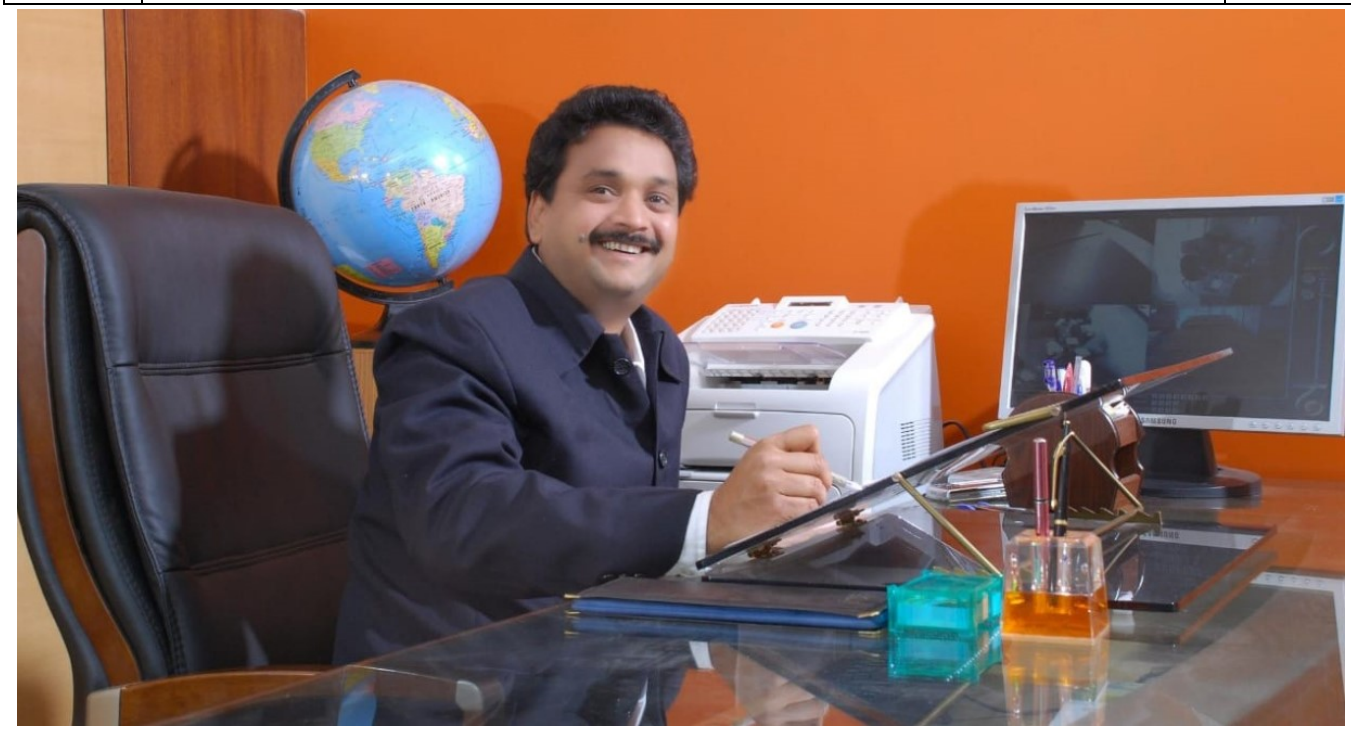
Q.6	Two cards are drawn without replacement from a well shuffled pack of 52 cards. If first drawn card is king find the probability that second drawn is also king **.**	2
	SECTION – B (3 X 4 = 12)	
Q.7	Evaluate: $\int \frac{\sin 4x - 2}{1 - \cos 4x} e^{2x} dx$.	3
Q.8	Solve the differential equation: $(x + \log y)dy + y\,dx = 0$ .OR Solve the differential equation: $x^2 \frac{dy}{dx} = x^2 + xy + y^2$.	3
Q.9	Find the values of 'a' for which the vector $\vec{r} = (a^2 - 4)i + 2j - (a^2 - 9)k$ makes acute angles with the coordinate axes.	3
Q.10	Find the point on the line $\frac{x-1}{2} = \frac{y+2}{3} = \frac{z-3}{6}$ at a distance 3 from the point (1,- 2,3) . . OR From the point P(1, 2, 4), a perpendicular is drawn on the plane 2x + y – 2z + 3 = 0. Find the equation, the length and the co-ordinates of the foot of the perpendicular.	3
	SECTION – C (4 X 4 = 16)	
Q.11	Evaluate : $\int_{-\pi}^{\pi} \frac{2x(1 + \sin x)}{1 + \cos^2 x} dx.$	4
Q.12	Find the area of the region $\{(x, y) : y^2 \geq 6x,\ x^2 + y^2 \leq 16\}$. OR Using integration, find the area in the first quadrant bounded by the curves y = x|x | & circle $x^2 + y^2 = 2$ and y- axis .	4
Q.13	Find the distance of the point (3 , -2, 1) from the plane $3x + y - z + 2 = 0$ measured parallel to the line $\frac{x-1}{2} = \frac{y+2}{-3} = \frac{z-1}{1}$. Also find the foot of the perpendicular from the given point upon the line which is perpendicular to plane .	4
Q.14	**CASE – STUDY** Bag A contains 4 red and 5 black balls, while bag B has 3 red and 7 black balls. One ball is drawn from each bag . Find the probability (i) balls are different color (ii) balls are same color .	4

	सपने वो नहीं है जो हम नींद में देखते है, **सपने वो है जो हमको नींद नहीं आने देते।**	



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