CODE:1101- AG-2-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

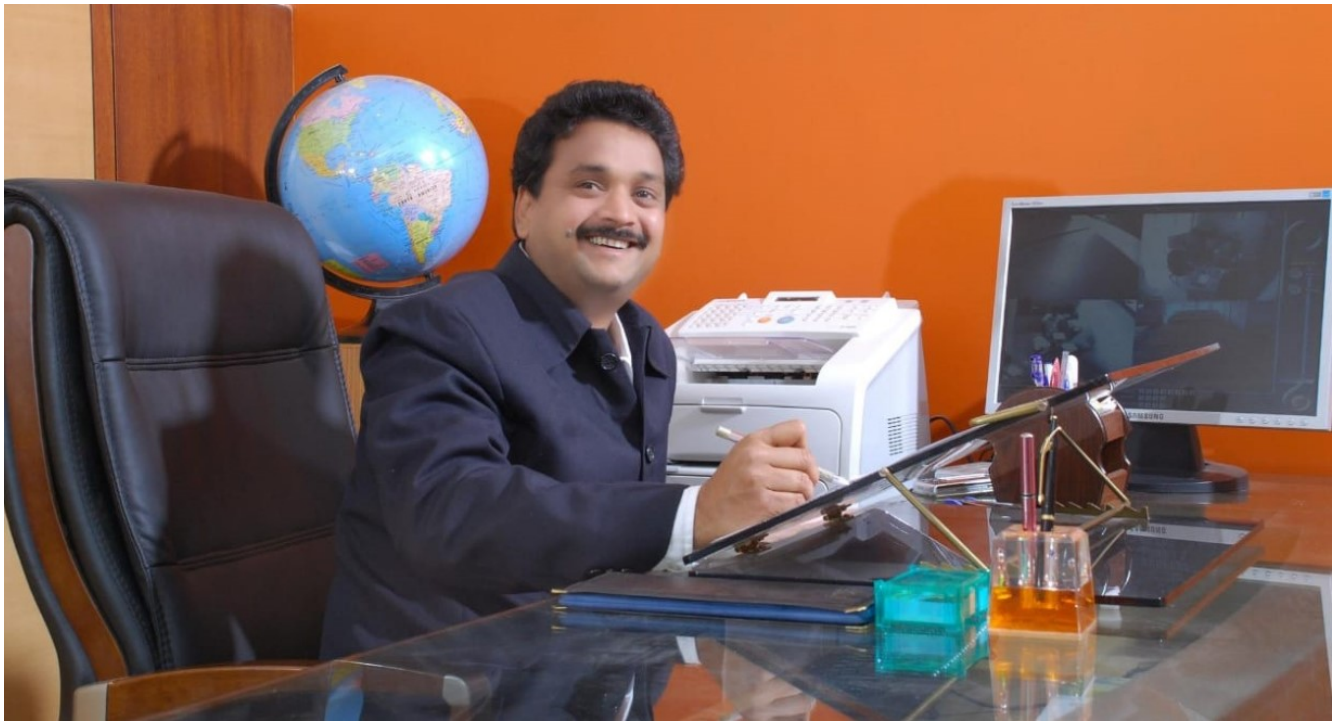
CLASS – XII | **MATHEMATICS**

Sr. No.	SECTION – A (6 X 2=12)	Marks allocated
Q.1	If $\int e^x \sin x \, dx = \frac{1}{2} e^x \cdot a + c$, then find a . OR Evaluate: $\int \sec^3 x \, dx$.	2
Q.2	Find the solution of the differential equation $\frac{dy}{dx} = 1 + x + y + xy$.	2
Q.3	Write down a unit vector in XY-plane, making an angle of 30° with the positive direction of x-axis.	2
Q.4	Find the values of a so that the following lines are skew $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-a}{4}, \frac{x-4}{5} = \frac{y-1}{2} = z,$.	2

Target Mathematics by- Dr.Agyat Gupta
visit us: agyatgupta.com ; Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. : 4010685(O), 7000636110(O) Mobile : 9425109601(P)

Q.5	A coin is tossed and a die is thrown. Find the probability of obtaining a 6 , given that a head came up .	2
Q.6	A speaks truth in 75% of the cases and B in 80% of the cases. In what percentage of the cases are they likely to contradict each other in stating the same fact ?	2
	SECTION – B (3 X 4 = 12)	
Q.7	Evaluate: $\int e^x \frac{(x^2+1)}{(x+1)^2} dx$.	3
Q.8	Solve : $\frac{dy}{dx} = \cos(x+y) + \sin(x+y)$. OR Solve the differential equation: $\frac{dy}{dx} + y \cot x = 2 \cos x$.	3
Q.9	Vectors $\vec{a}, \vec{b}, \vec{c}$ are of the same magnitude and taken pairwise in order form equal angles. If $\vec{a} = \hat{i} + \hat{j}$ and $\vec{b} = \hat{j} + \hat{k}$ find $\vec{c}$.	3
Q.10	If line $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{4}$ and $\frac{x-3}{1} = \frac{y-k}{2} = \frac{z}{1}$ intersect, then find the value of k and hence find the equation of the plane containing these lines. OR Find the equation of a plane passing though the line of intersection of the planes. $x + 2y + 3z = 2$ and $x - y + z = 3$ and at a distance of $\frac{2}{\sqrt{3}}$ units from the points (3, 1, –1) .	3
	SECTION – C (4 X 4 = 16)	
Q.11	Evaluate: $\int_0^{\pi/2} \frac{\cos^2 x \, dx}{1 + 3\sin^2 x}$.	4
Q.12	Using integration, find the area between curves y = x^2 + 1, y = x + 1. OR Using integration, find the area of the triangle bounded by the lines y = 2x + 1, y = 3x +1 and x = 4.	4
Q.13	Find the equation of the plane passing through the line of intersection of the planes x - 2y +z = 1and 2x + y + z = 8 and parallel to the line with direction ratio 1,2,1. Also find the	4

	distance of P(1,-2,-2) from this plane measured along a line parallel to r = t (i – 2j – 5k) .	
Q.14	**CASE – STUDY** A class 40% of the students in mathematics , 25% in biology and15% in both mathematics and biology. A student is selected at random. (i) What is the probability that he study in mathematics, it being given that he study in biology? (ii)What is the probability that he study in biology, it being given that he has study in mathematics?	4
	सपने वो नहीं है जो हम नींद में देखते है, **सपने वो है जो हमको नींद नहीं आने देते।**	



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