Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Examinations (Online Mode), Jan-Feb 2021

Course: Remedial Mathematics **Semester:** I
Program: B.Pharma **Time:** 90 min
Course Code: BP106RMT **Max. Marks:** 35

SECTION - A **1 x 10 = 10 Marks**

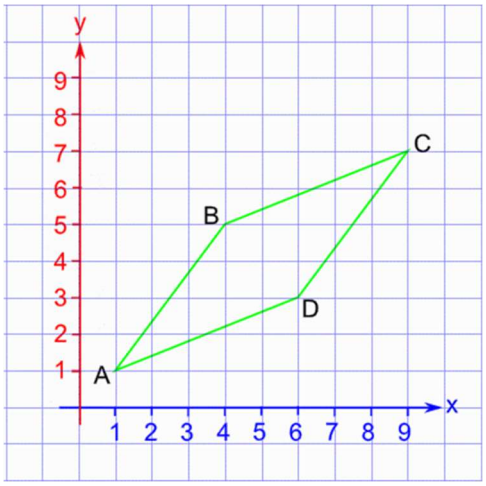
1. Answer any ONE question from Q1 and Q2.
2. Instruction: Answer on a separate white sheet, upload the solution as image.

Q 1	If $A = \begin{bmatrix} 2 & 1 & 3 \\ 3 & 1 & 2 \\ 1 & 2 & 3 \end{bmatrix}$, verify that $A\ (adj\ A) = (adj\ A)\ A = \lvert A \rvert I_3$	CO1
Q 2	Resolve $\frac{2x-1}{(x-1)(x+2)(x-3)}$ into partial fractions.	CO1

SECTION – B **5 x 5 = 25 Marks**

1. Answer any FIVE questions from Q3-Q9. Each question will carry 5 marks
2. Instruction: Answer on a separate white sheet, upload the solution as image.

Q 3	Find k so that $lim_{x\to 2} f(x)$ exists, where $$f(x) = \begin{cases} 2x+3 & if\ x \le 2 \\ x+k & if\ x > 2 \end{cases}$$	CO3
Q 4	Using Integration by parts, prove that $$\int (1-x^2) sin2x\ dx = \frac{2x^2-3}{4}\cos 2x - \frac{x}{2}\sin 2x + C$$	CO2
Q 5	Show that $3\log 4 - 2\log 6 + \log(18)^{\frac{3}{2}} = \log(96\sqrt{2})$.	CO1
Q 6	Consider the system of equations $2x - y + 6z = 10;\ -3x + 4y - 5z = 11;$ $8x - 7y - 9z = 12$. Find the values of x, y and z using Cramer's rule.	CO1

Q 7	What is the perimeter of the parallelogram given below:  	CO3
Q 8	Prove that the equation $3x(xy-2)dx+(x^3+2y)dy=0$ is exact and hence find its solution.	CO4
Q 9	After the intravenous injection of a drug to a patient, it distributes and also eliminates in the body as a first order kinetics set into the differential equation $\frac{dX}{dt}=-kX$ where X is the total amount of drug in the body of a patient at time t. Using Laplace transformation, prove that the solution of the differential equation is $X=X_0e^{-kt}$.	CO5