


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2022			
Course: Remedial Mathematics		Duration : 1.5 Hours	
Semester: I		Max. Marks: 35	
Program: B. Pharma			
Course Code: BP106RMT			
Instructions: Attempt all questions			
SECTION A (1Qx10M=10 Marks)			
Attempt 1 out of 2			
S. No.		Marks	COs
Q 1	<p>The total number of units of three products $P = 9, Q = 52$ & $R = 0$ that processed by three machines A, B and C is given by the matrix</p> $ \begin{matrix} & A & B & C \\ P & \begin{bmatrix} 1 & 1 & 1 \\ 2 & 5 & 7 \\ 2 & 1 & -1 \end{bmatrix} \\ Q & \\ R & \end{matrix} $ <p>Determine the time taken by each machine to process the product P, Q and R.</p>	10	CO5
Q 2	<p>Hassel Balch was studying the carbon dioxide that dissolves in the blood and the model of the pH of the blood in this situation is $pH = 6.1 + \log\left(\frac{800}{x}\right)$, where x is the partial pressure of carbon dioxide in the arteries, measured in torr. Find the partial pressure of carbon dioxide in the arteries if the pH is 7.2.</p>	10	CO5
SECTION B (5Qx5M=25 Marks)			
Attempt 5 out of 7			
		Marks	COs
Q 1	Verify the differential equation $(xy^2 + x)dx + yx^2dy = 0$ is exact.	5	CO3
Q 2	If $y = 2x^5 + 3x^4 - 4x^3 + x^2 - 6$, find $\frac{d^4y}{dx^4}$	5	CO3
Q 3	Obtain the following integral: $\int (8x - 12)(4x^2 - 12x)^4 dx$	5	CO2
Q 4	Determine the value of x if slope is 2 and points are (2,2) and (x, 6), hence find the equation of line passing through these points.	5	CO2

Q 5	Find the Laplace transform of $f(t) = \begin{cases} t, & 0 < t < 3 \\ 6, & t > 3 \end{cases}$	5	CO3
Q 6	There are two families <i>A</i> and <i>B</i> and there are 4 men, 6 women and 2 children in family <i>A</i> and 2 men, 2 women and 4 children in family <i>B</i> . The recommended daily allowance for calories is- Man 2400, Women 1900, child 1800 and Protein for man 55 <i>gm</i> , women 45 <i>gm</i> and child 33 <i>gm</i> . Represent the above information by matrices. Using matrix multiplication, calculate the total requirement of calories and proteins for each of the two families.	5	CO4
Q 7	Find the value of x , if $\log(x + 5) + \log(x - 5) = 4\log 2 + 2\log 3$	5	CO1