

Name:

Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Term Examination, December 2021**

**Course: Business Mathematics**

**Programme: Int.BBA MBA**

**Max. Marks: 100**

**Semester: I**

**Time: 03 hrs**

**Course Code: DSQT1001**

**SECTION A**

**Each Question will carry 2 Marks**

S. No.		Marks	CO
Q 1.	Select the most appropriate	(2x10)	
	1. The value of a determinant is not affected by the interchange of_____ ? a. Rows b. Columns c. both a and b d. None		CO1
	2. A square matrix is said to be symmetric matrix if a. $A = A^T$ b. $A \neq A^T$ c. $A \leq A^T$ d. $A \geq A^T$		CO1
	3. If the order of matrix A is 4x3 and order of matrix B is 3x4, then the order of matrix AB is a. 4x4 b. 3x3 c. 4x3 d. 3x4		CO1
	4. Which of the following(s) is a set ? a. People in a class: { Aman, Banty, Harsh } b. Classes offered by a department: { GM, EM, TM, E&IB } c. Sets can contain non-related elements: { 3, a, red, Mumbai } d. All of the above		CO1

	<p>5. If <math>y = ax</math>, then second derivative of <math>y</math> is</p> <p>a. 0 b. <math>a</math> c. <math>a/2</math> d. 1</p> <p>6. The 7th term of the GP <math>2, -6, 18, \dots</math> is</p> <p>a. 1458 b. -1458 c. 1478 d. None</p> <p>7. Which of the following(s) matrix property is correct?</p> <p>a. <math>A + B = B + A</math> b. <math>k(A + B) = kA + kB</math> c. <math>(-1)A = -A</math> d. All of the above</p> <p>8. Which of the following(s) is not correct with respect to set ?</p> <p>a. Sets do not have duplicate elements b. Order does matter c. Sets are usually represented by a capital letter d. All of the above</p> <p>9. For a set <math>S = \{1, c, a, b\}</math> which of the following is incorrect?</p> <p>a. <math>a \in S</math> b. <math>c \in S</math> c. <math>1 \in S</math> d. <math>5 \in S</math></p> <p>10. Which of the following is correct in case of sequence?</p> <p>a. It is finite only b. It is infinite only c. Finite and infinite d. None</p>		<p>CO1</p> <p>CO1</p> <p>CO1</p> <p>CO1</p> <p>CO1</p> <p>CO1</p>
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**SECTION B**

	<p><b>Each question will carry 5 marks</b></p>	<p><b>(5x4)</b></p>	
<p>Q 2.</p>	<p>Let <math>A = \begin{pmatrix} 3 &amp; -4 \\ 0 &amp; 2 \end{pmatrix}</math>, <math>B = \begin{pmatrix} 1 &amp; 3 \\ -2 &amp; 0 \end{pmatrix}</math></p> <p>Find each of the following:</p> <p>(i) <math>A - \frac{B}{2}</math> (ii) <math>3A - B/2</math></p>		<p>CO2</p>

Q 3.	If $A = \begin{bmatrix} 2 & -1 \\ 3 & 5 \end{bmatrix}$ then verify that $A^{-1}A = I$		CO2
Q 4.	Find derivative of each of the following functions : $y = \frac{x^2-4x-3}{7+e^x}$ and $y = \frac{ax-b}{d-cx}$		CO2
Q 5.	The 10 <sup>th</sup> term of an A.P. is 30 and 16 <sup>th</sup> term is 60. Find the (i) 18 <sup>th</sup> term (ii) nth term		CO2
<b>SECTION-C</b>			
	<b>Each Question carries 10 Marks</b>	<b>10x3</b>	
Q 6.	How matrix is different from determinant.Explain with eaxmples.Solve the following equations by using inverse matrix method. $x - 2y + z = 4$ $x - y - z = -2$ $2x + y + z = 5$		CO3
Q 7.	Solve the following system of equations, using cramer's rule: $X + 2Y + 3Z = -5$ $3X + Y - 3Z = 4$ $-3X + 4Y + 7Z = -7$		CO3
Q 8.	Evaluate the following integrals: (i) $\int \frac{px^{b-1}}{qx^{a-2}} dx$ (ii) $\int (x \exp(x^2)) dx$		CO3
<b>SECTION-D</b>			
	<b>Each Question carries 15 Marks</b>	<b>(15x2)</b>	
Q 9.	The total cost function of a firm is given by $C = x^3/3-5x^2+28x+10$ where C is the total cost and x is the output of the product. A tax at the rate of \$2 per unit of product is imposed and the producer adds it to his cost. If the market demand function is given by $p = 2530 - 5x$ , where p is the price per unit of output, find the profit maximizing output and price.		CO4

Q 10.	There are 50 apple trees in an orchard. Each tree produces 800 apples. For each additional tree planted in the orchard, the output per tree drops by 10 apples. How many trees should be added to the existing orchard in order to maximize the total output of trees?		<b>CO4</b>
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