Name:
Enrolment No:

UNIVERSITY OF PETROLEUM & ENERGY STUDIES

End Semester Examination – December 2022

Program: BBA **Semester: I**
Subject/Course: Business Mathematics **Max. Marks: 100**
Course Code: DSQT1001 **Duration: 3 Hours**

Q.No.	Section A	10Q×2M=20M	COs
	Question	**Marks**	**COs**
1	A^c = ? (a) ∪ – A (b) A^c (c) ∪ (d) A	2	CO 1
2	Which of the following two sets are equal? (a) A = {1, 2} and B = {1} (b) A = {1, 2} and B = {1, 2, 3} (c) A = {1, 2, 3,4} and B = {2, 1, 3,4} (d) A = {1, 2, 4} and B = {1, 2, 3}	2	CO 1
3	If A = {5, 6, 7,8} and B = {7, 8, 9} then A ∪ B is equal to (a) {5, 6, 7, 8, 9} (b) {5, 6, 7} (c) {7, 8, 9} (d) None of these	2	CO 1
4	If A and B are square matrices, then (AB)' = (a) B'A' (b) A'B' (c) AB' (d) A'B'	2	CO 1
5	If $\begin{bmatrix} 2-x & 2 \\ 8 & 6 \end{bmatrix} = \begin{bmatrix} 4 & 2 \\ 8 & 6 \end{bmatrix}$ then x = (a)±6 (b) 6 (c) -2 (d) 7	2	CO1

6	Next term of the AP 2, 6, 10, ……. is (a) 7 (6) 6 (c) 14 (d) 2	2	CO1
7	if p – 1, p + 3, 3p – 1 are in AP, then p is equal to (a) 4 (b) -4 (c) 2 (d) -2	2	CO1
8	If f(x) = (x + 1)/x, then derivative of f(x) is (a) 1/x (b) -1/x (c) $-1/x^2$ (d) $1/x^2$	2	CO1
9	$\int 1.dx$ = (a) x + k (b) 1 + k (c) x^2 + k (d) log x + k	2	CO1
10	$\int \frac{dx}{\sqrt{x}}$ = (a) √x + k (b) 2√x + k (c) x + k (d) $23x^{3/2}$ + k	2	CO1
	Section-B	4Q×5M=20M	
11	Differentiate: $(ax^2+bx+c)(bx+c)$	5	CO 2
12.	The first term of a GP is 1. The sum of the third term and fifth term is 90. Find the common ratio of GP.	5	CO 2
13.	In a survey of 500 students, it was found that 300 had taken mathematics, 200 had taken physics, and 100 had taken mathematics & physics. Find the number of students that had i) only mathematics iii) only physics	5	CO 2
14.	iv) A manufacturing company finds that the daily cost of producing x items of a product is given by C(x)= 240x+8000. If each item is sold for Rs. 400, find the minimum number that must be produced and sold daily to ensure no loss.	5	CO 3

Q.No.	**Section-C**	3Q×10M=30M	
15	If A= $\begin{bmatrix}4 & 2\\6 & 1\end{bmatrix}$ & B= = $\begin{bmatrix}1 & -2\\0 & 8\end{bmatrix}$ Verify that $AB^T = B^T A^T$	10	CO 3
16	Find the inverse of the given matrix $\boldsymbol{A} = \begin{bmatrix}\mathbf{1} & \mathbf{0} & \mathbf{2}\\ \mathbf{2} & \mathbf{-1} & \mathbf{3}\\ \mathbf{4} & \mathbf{1} & \mathbf{8}\end{bmatrix}$	10	CO 3
17	The average cost function (AC) for a product is given by AC =0 .006$x^2 - 0.02x$-30 + $\frac{5000}{x}$; where x is the output. Find (i) the marginal cost function (ii) the marginal cost when 50 units are produced.	10	CO3
Q.No.	**Section-D**	2Q×15M=30M	
18	The demand function for a product marketed by a company is p= $\frac{80-x}{4}$;where x is the number of units and p is the price per unit. At what value of x will there be maximum revenue? What is this maximum revenue?	15	CO4
19	Solve the following system of equation with help of appropriate method. $3x + y + 2z = 2$ $2x - 3y - z = 2$ $x + 2y + z = -1$	15	CO4