

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December -2019

Course: Business Mathematics

Semester: I

Program: BBA LM

Course code: DSQT1001

Time: 03 Hours

Max. Marks: 100

Instructions:

SECTION A

		Marks	CO
Q	Choose an appropriate answer.		
1.	<p>I. The members of the set $S = \{x \mid x \text{ is the square of an integer and } x < 50\}$ is</p> <p>(a) $\{0, 2, 4, 5, 9, 49, 12\}$ (b) $\{0, 1, 4, 9, 16, 25, 36, 49\}$ (c) $\{1, 4, 9, 16, 25, 36\}$ (d) $\{0, 1, 4, 9, 16, 25, 36, 49\}$</p> <p>II. If A and B are two matrices, then which of the following property is true?</p> <p>(a) $A + B \neq B + A$ (b) $(A^t)^t \neq A$ (c) $AB \neq BA$ (d) all are true</p> <p>III. We can add two matrices having real numbers A and B if their</p> <p>(a) order is same (b) rows are same (c) columns are same (d) elements are same</p> <p>IV. Derivative of $\log x$ is</p> <p>(a) 1 (b) $1/x$ (c) $1/\log x$ (d) None of the above</p> <p>V. Value of $\int ax^n dx$</p> <p>(a) $a\left(\frac{x^{n+1}}{n+1}\right) + c$</p>	20	CO1

	<p>(b) $nax^{n-1} + c$</p> <p>(c) $a\left(\frac{nx^{n-1}}{n-1}\right) + c$</p> <p>(d) Can't determined</p> <p>VI. If $x, x+2, 2x$ are in arithmetic progression, then the value of x can be</p> <p>(a) 1</p> <p>(b) 4</p> <p>(c) Both (a) and (c)</p> <p>(d) Can't determine</p> <p>VII. If $\begin{vmatrix} x & 2 \\ 4 & 3 \end{vmatrix} = \begin{vmatrix} 1 & 2 \\ 2 & 8 \end{vmatrix}$, then value of x will be</p> <p>(a) 3</p> <p>(b) 1</p> <p>(c) The given relation is not true</p> <p>(d) Can't determine</p> <p>VIII. If u and v are the functions of x then by product rule of differentiation</p> <p>(a) $\frac{d}{dx}(u \cdot v) = \frac{d}{dx}u + \frac{d}{dx}v$</p> <p>(b) $\frac{d}{dx}(u \cdot v) = \frac{d}{dx}u - \frac{d}{dx}v$</p> <p>(c) $\frac{d}{dx}(u \cdot v) = u \frac{d}{dx}v + v \frac{d}{dx}u$</p> <p>(d) $\frac{d}{dx}(u \cdot v) = u \frac{d}{dx}u + v \frac{d}{dx}v$</p> <p>IX. Marginal cost is equal to</p> <p>(a) Rate of change of total cost</p> <p>(b) Rate of change of average cost</p> <p>(c) Both (a) & (b)</p> <p>(d) None of these</p> <p>X. If a, b, c are in geometric progression, then which of the following is true</p> <p>(a) $2b=a+c$</p> <p>(b) $b^2=a+c$</p> <p>(c) $b^2=ac$</p> <p>(d) None of the above</p>		
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SECTION B

Q	Solve any four questions.		
2.	Find the rank of the matrix $A = \begin{bmatrix} 1 & 3 & 4 & 3 \\ 3 & 9 & 12 & 3 \\ 1 & 3 & 4 & 1 \end{bmatrix}$.	5	CO2
3.	Explain the importance of mathematics in business.	5	CO4

4.	Find the derivative of $\left(x + \frac{1}{3}\right)(x - 7)$ using product rule.	5	CO1
5.	Find two terms between $\frac{1}{3}$ and $\frac{1}{81}$ such that the series are in G.P.	5	CO4
6.	Integrate the function $ax^2 + bx + d$ with respect to x , where a , b and d are constants.	5	CO1
SECTION-C			
Q	Answer any four questions.		
3.	Find the local maximum and minimum values of the function $(2x^2 - 3x + 5)$.	7.5	CO3
4.	Find elasticity of demand of the function $x=100-5p$ at $p=15$.	7.5	CO2
6.	Find the second order derivative of $\left(4x^3 + \frac{3}{2}x^2 - \frac{2}{9}x + 4\right)$.	7.5	CO2
7.	Find the sum of first 10 terms of an increasing arithmetical progression, the sum of whose first 3 terms is 27 and the sum of their squares is 275.	7.5	CO4
8.	Find elasticity of the function $y=a\sqrt{x-b}$.	7.5	CO2
SECTION-D			
Q	Answer the following question.		
9.	Integrate the following. a) $\int 2x(x + 4)dx$ b) $\int_0^1(x^2 + 1)dx$	10	CO2
10.	A manufacturer produces two types of products X and Y. Each products is first processed in machine M_1 and then sent to another machine M_2 for finishing. Each unit of X requires 20 minutes time on machine M_1 and 10 minute time on machine M_2 , whereas each unit of Y requires 10 minutes time on machine M_1 and 20 minutes time on machine M_2 . The total time available on each machine is 600 minutes and is fully utilized in the production of X and Y. Calculate the number of units of two types of products produced by constructing a matrix equation of the form $AX=B$ and then solve it by using Cramer rule.	10	CO3
11.	(a) If $y=\frac{x}{x+2}$ find $\frac{dy}{dx}$. (b) If $y= (2x^2 + 3x-2)^7$ then find $\frac{dy}{dx}$ using chain rule.	10	CO2

