UNIVERSITY OF PETROLEUM & ENERGY STUDIES
End Semester Examination (Online) – Jan, 2021

Program: B.Com
Subject/Course: Business Mathematics
Course Code: DSQT 1001

Semester: I
Max. Marks: 100
Duration: 3 Hours

<div align="center">Section-A</div>

Q.No	Question	Marks	COs
1.	Discuss the difference between Arithmetic Progression and Geometric Progression.	5	CO1
2.	If A=$\begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix}$ and B=$\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$ then which of the following are incorrect. (a) $(A + B)' = A' + B'$ (b) $(kA)' = \frac{1}{k} A'$ (c) $(A')' = A$ (d) $(AB)' = A'B'$	5	CO1
3	If $\begin{vmatrix} 4 & x \\ -3 & 5 \end{vmatrix} = 8$ then find the value of x.	5	CO1
4	If u and v are the functions of x then by quotient rule of differentiation (a) $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{\frac{d}{dx}u + \frac{d}{dx}v}{v^2}$ (b) $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{d}{dx}u - u\frac{d}{dx}v}{v^2}$ (c) $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u\frac{d}{dx}v + v\frac{d}{dx}u}{v^2}$ (d) $None\ of\ the\ above$	5	CO2
5	Value of $\int ax^n dx$ (a) $nax^{n-1} + c$ (b) $a\frac{x^{n+1}}{n+1} + c$ (c) $a\frac{nx^{n-1}}{n-1} + c$ (d) $\frac{x^{n+1}}{n+1} + c$	5	CO3

6	The value of $^5C_3$ will be equal to (a) $^5C_2$ (b) $\frac{5!}{3!}$ (c) $\frac{5.4}{3.2.1}$ (d) 20	5	CO4

Section-B

7	If $A = \begin{bmatrix} 2 & -4 & 3 \\ 1 & 3 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ -3 & 4 \\ -2 & 2 \end{bmatrix}$ then find $|AB|$.	10	CO1
8	Which term of the series 8, $4\sqrt{2}$, 4, $2\sqrt{2}$…………….. is $\frac{1}{64\sqrt{2}}$. Also find the sum up to first 6 terms of the given series.	10	CO2
9	Calculate the derivative of $e^{\frac{x+7}{7x-1}}$ using chain rule.	10	CO2
10	If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $A = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ show that $(aI+bA)^3=a^3I+3a^2bA$.	10	CO3
11	Calculate the value of $\int \frac{3x}{(x-1)(x-2)(x-3)} \, dx$.	10	CO3

Section-C

12	(a). Find the local maxima and local minima for the function f(x)=x³-6x²+9x+15. Also find the local maximum and local minimum values.
	 'or'
	 Solve the following using Cramer's Rule.
	     2X+Y+Z= 7
	     3X-Y-Z= -2
	     X+2Y-3Z= -4
	
	 (b). In how many ways can the letters of the word "FARIDABAD" can be arranged.
	
	 (c). Find the integral of $\dfrac{ax^{\alpha-1}}{bx^{\beta-2}}$.
		10
		
		 5
		
		 5
			CO4