

Name:  
Enrolment No:



UNIVERSITY WITH A PURPOSE

**UNIVERSITY OF PETROLEUM & ENERGY STUDIES**

**End Semester Examination (Online) – Jan, 2021**

**Program: BBA OG**  
**Subject/Course: Business Mathematics**  
**Course Code: DSQT 1001**

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

**Section-A**

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) <i>None of the above</i>	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	<p>The value of <math>{}^5C_3</math> will be equal to</p> <p>(a) <math>{}^5C_2</math></p> <p>(b) <math>\frac{5!}{3!}</math></p> <p>(c) <math>\frac{5.4}{3.2.1}</math></p> <p>(d) 20</p>	5	CO4
<b>Section-B</b>			
7	<p>If <math>A = \begin{bmatrix} 2 &amp; -4 &amp; 3 \\ 1 &amp; 3 &amp; 5 \end{bmatrix}</math> and <math>B = \begin{bmatrix} 1 &amp; 3 \\ -3 &amp; 4 \\ -2 &amp; 2 \end{bmatrix}</math> then find <math> AB </math>.</p>	10	CO1
8	<p>Which term of the series <math>8, 4\sqrt{2}, 4, 2\sqrt{2}, \dots</math> is <math>\frac{1}{64\sqrt{2}}</math>. Also find the sum up to first 6 terms of the given series.</p>	10	CO2
9	<p>Calculate the derivative of <math>e^{\frac{x+7}{7x-1}}</math> using chain rule.</p>	10	CO2
10	<p>If <math>I = \begin{bmatrix} 1 &amp; 0 \\ 0 &amp; 1 \end{bmatrix}</math>, <math>A = \begin{bmatrix} 0 &amp; 1 \\ 0 &amp; 0 \end{bmatrix}</math> show that <math>(aI+bA)^3 = a^3I + 3a^2bA</math>.</p>	10	CO3
11	<p>Calculate the value of <math>\int \frac{3x}{(x-1)(x-2)(x-3)} dx</math>.</p>	10	CO3
<b>Section-C</b>			
12	<p>(a). Find the local maxima and local minima for the function <math>f(x) = x^3 - 6x^2 + 9x + 15</math>. Also find the local maximum and local minimum values.</p> <p style="text-align: center;">‘or’</p> <p>Solve the following using Cramer’s Rule.</p> $\begin{aligned} 2X + Y + Z &= 7 \\ 3X - Y - Z &= -2 \\ X + 2Y - 3Z &= -4 \end{aligned}$ <p>(b). In how many ways can the letters of the word “FARIDABAD” can be arranged.</p> <p>(c). Find the integral of <math>\frac{ax^{\alpha-1}}{bx^{\beta-2}}</math>.</p>	10	CO4