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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: BBA LLB (Hons.) Banking and Finance, Int BBA (LLB), Int BCom (LLB)

Semester – I

Subject (Course): Quantitative Techniques for Decision Making

Max. Marks 100

Course Code : CLNL1005 **Duration : 3 Hrs**

No. of page/s: 3

(Scientific calculators are allowed for the examination)

Section A

1. If $y = \log(x^3 e^x)$, Find $\frac{dy}{dx}$. (2)

2. If $A = \begin{matrix} 2 & 1 & 4 \\ 4 & 1 & 5 \end{matrix}$ and $B = \begin{matrix} 3 & -1 \\ 2 & 2 \\ 1 & 3 \end{matrix}$, Find AB. (2)

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3. Find the 10th term of an AP with first term 5 and common difference 2. (2)

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4. Find the value of $\int_0 (3x^4 + 2x^2)dx$. (2)

5. Compute the value of (7! – 5!). (2)

Section B

(Answer any three)

6. Solve the following equation

$$\begin{vmatrix} 3x-8 & 3 & 3 \\ 3 & 3x-8 & 3 \\ 3 & 3 & 3x-8 \end{vmatrix} = 0. \quad (10)$$

7. Find the rank of the following matrix:

$$\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}. \quad (10)$$

8. Find the extremum for the function $y = x^3 + 10x^2 + 25x - 40$. (10)

9. Determine the conditions under which the function $y = ax^2 + bx + c$ will have (i) a maxima (ii) a minima. (where a and b are constants) (10)

Section C

10. Find the sum 1+3.5+6+8.5+…+101. (5)

11. The sum to infinity of a GP is six times the first term. Find the common ratio. (5)

12. Evaluate the following integrals

(i) $\int x^2 e^{-2x}\, dx$ (2.5)

(ii) $\int \frac{x+1}{\sqrt{x^2+2x+6}}\, dx$ (2.5)

(use substitution $x^2 + 2x + 6 = t^2$)

13. How many 3 digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 assuming repetition of the digits is allowed. (5)

Section D

14. How many terms in the GP

$$1, 1.1, 1.21, 1.331, \ldots$$

will be needed so that the sum of the first n terms is greater than 40? (10)

15. Evaluate

(i) $\int \frac{e^x(1+x^2)}{(1+x)^2} dx$ (5)

(ii) $\int \frac{4+4x-x^2}{(x+1)(x^2-4)} dx$ (5)

16. In how many ways can the letters of the word "PERMUTATIONS" be arranged if

(i) the word starts with P and end with S.

(ii) vowels are all together. (10)

17. The sum of three numbers which are consecutive terms of an AP is 21. If the second number is reduced by 1 and the third is increased by 1, three consecutive terms of a GP are obtained. Find these numbers. (10)

**********Best of Luck **********