UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Term Examination, Dec 2019

Course: Business Mathematics and Statistics
Programme: B.Com(Tax)
Max. Marks: 100

Semester: I
Time: 03 hrs
Course Code: DSQT1007

SECTION A

S. No.		Marks	CO
Q 1	Select the most appropriate	**(2x10)**	
	(i) Which of the following(s) is most stable mesures of central tendency? a. the mean b. the median c. the mode d. All		**CO1**
	(ii) A----------is an arrangement of all or part of a set objects in a definite order. a. Function b. Factorial c. Combination d. Permutation		**CO1**
	(iii) If the order of matrix A is mxp and order of matrix B is pxn, then the order of matrix AB is a. mxp b. mxn c. nxm d. mxp		**CO1**
	(iv) Inverse of a square matrix is possible only if its determinant is a.Zero b. Non-zero c. One d. Minus one		**CO1**
	(v) Derivative of 'y' with respect of 'x' represents		**CO1**

a. Rate of change of y with respect to x
b. Rate of change of x with respect to y
c. Distance of y with respect to x
d. None

CO1

(vi) The derivative of a derivative is called_____
a. Anti-derivative
b. Second order derivative
c. Integration
d. First order derivative

CO1

(vii) The variance of a sample of 11 observations equals 16. The standard deviation of the sample equals
a. 0
b. 40
c. 4
d. 16

CO1

(viii) Which of the following is a probability sampling?
a. Quota sampling
b. Systematic
c. Snow ball
d. Purposive

CO1

(ix) Probability is always lies between
a. -1 to 1
b. -1 to 0
c. 0 to 1
d. 0 to 1/2

CO1

(x) Which of the following is not a mesure of dispersion?
a. Range
b. M.D.
c. S.D.
d. Mode

SECTION B		
Attempt any eight questions	**(5x8)**	
Q 2 How many terms of the series 1,6,11,…. Be taken so that their sum is 148.		**CO2**
Q 3 Functions f is defined by		**CO2**

	$f(x) = 1/x + 3x^2$ Find f(-2) and f(1/2)		
Q 4	There are 4 statistics books B_1, B_2, B_3, B_4 . How many different groups of 2 books can be taken from from the 4 books.		**CO3**
Q 5	How scalar matrix is different from square matrix?		**CO1**
Q 6	How many terms of G.P. 1+4+16+64+….. will make the sum 5461 ?		**CO2**
Q 7	Let A=$\begin{pmatrix} 3 & 4 \\ 3 & 2 \end{pmatrix}$, B=$\begin{pmatrix} 1 & 3 \\ -2 & 5 \end{pmatrix}$ Find each of the following: (i) $\dfrac{A}{3} - \dfrac{B}{2}$ (ii) 3A-B		**CO1**
Q 8	Draw the graph of the function f (x)= x^2-2x-1		**CO2**
Q 9	We have observed stock exchange rates for ten days as 85, 86, 87, 88, 89, 88, 91, 92, 93, 89. Compute all measures of central tendency.		**CO2**
Q 10	Find derivative of each of the following functions: $y = \dfrac{x^2-4x-3}{e^x}$ and $y = \dfrac{x^2-3}{x^3-4}$		**CO2**
	SECTION-C		
	Attempt any four questions	**(10x4)**	
Q 11	The probability of student A and student B solving a problem are 0.6 and 0.3 respectively.If the probability of atleast one of them solving is 0.7. Find the chance of both of them solving the problem.		**CO3**
Q 12	The following data corresponds to marks obtained by 200 students in a university examination. Find the average score and S.D. of the scores of these students.		**CO3**

Marks obtained	No. of students

10-20	2
20-30	8
30-40	20
40-50	30
50-60	80
60-70	30
70-80	20
80-90	8
90-100	2
Total	200

Q 13	The following are the marks obtained by B.Com students in mid-term examination of Business Mathematics and Statistics: 23, 50, 38, 42, 63, 75, 12, 33, 26, 39, 35, 47, 43, 52, 56, 59, 64, 77, 15, 21, 51, 54, 72, 68, 36, 65, 52, 60, 27, 34, 47, 48, 55, 58, 59, 62, 51, 48, 50, 41, 57, 65, 54, 43, 56, 44, 30, 46, 67, 53,14,100,79,85,86,92,95,62,40,45,34,32,100,65,54,23,35,76,54 (i) Form the discrete frequency distribution table. (ii) Construct percentage frequency distribution table.	**CO3**
Q 14	Determine the conditions under which the function $y = x^3 + 10x^2 + 25x - 40$ will have (i) a maxima (ii) a minima.Also find out the maximum and minimum value of the function.	**CO2**
Q 15	A transport company uses 3 types of trucks T_1,T_2,T_3 to transport 3 types of vechiles V_1,V_2,V_3. The capacity of each truck in terms of 3 types of vechiles is given below: table below Using matrix method, find the number of trucks of each type required to transport 85,105 and 110 vechicles of V_1,V_2, and V_3 types respestively.	**CO4**

	V_1	V_2	V_3
T_1	1	3	2
T_2	2	2	3
T_3	3	2	2

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SECTION A

S. No.		Marks	CO
Q 1	Select the most appropriate	**(2x10)**	
	(i) Which of the following(s) is most affected by extreme values? a. the mean b. the median c. the mode d. All		**CO1**
	(ii) Combination is also called------------._____. a. Function b. Factorial c. Arrangement d. Selection		**CO1**
	(iii) If the order of matrix A is mxn and order of matrix B is pxn, then the order of matrix AB is a. mxp b. mxn c. nxm d. None		**CO1**
	(iv) In a matrix, A + (B + C) = (A + B) + C = A + B + C. This law is called a.Commutative Law b. Associative Law c. First distributive law d. Second distributive law		**CO1**
	(v) A function is said to be maximum when		**CO1**

a. Second derivative is greater than zero
b. Second derivative is greater than one
c. Second derivative is less than zero
d. Second derivative is equal to zero

(vi) The derivative of a derivative is called_____   **CO1**
a. Anti-derivative
b. Second order derivative
c. Integration
d. First order derivative

(vii) The variance of a sample of 11 observations equals 100. The standard deviation   **CO1**
of the sample equals
a. 100
b. 10
c. 1000
d. 10000

(viii) Which of the following is a non-probability sampling?   **CO1**
a. Cluster
b. Systematic
c. Snow ball
d. Simple random sampling

(ix) Probability is one in case of   **CO1**
a. Certain event
b. Impossible event
c. Independent event
d. Exhaustive event

(x) Which of the following(s) is a mesure of dispersion?   **CO1**
a. Range
b. M.D.
c. S.D.
d. All

SECTION B		
Attempt any eight questions	**(5x8)**	
Q 2	The fourth term of an arithmetic series is 14 and eighth term is 26. Find the sum of first 20 terms.	**CO2**

Q 3	Functions f is defined by $f(x) = 1/x^2 + 3x^2$ Find f(-1) and f(1/2)		CO2
Q 4	What is the chance that a leap year selected at random will contain 53 Sundays?		CO3
Q 5	How diagonal matrix is different from scalar matrix?		CO1
Q 6	The sum of the first 3 terms of a geometric series is 378 . The sum of the first six terms is 3367512 . Find the first term and common ratio.		CO2
Q 7	Let A=$\begin{pmatrix} 2 & 4 \\ 1 & 0 \end{pmatrix}$, B=$\begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$ Find each of the following: (i) $\dfrac{A}{5} - \dfrac{B}{2}$ (ii) 3A-2B		CO1
Q 8	Draw the graph of the function f (x)= x^2-$\dfrac{5x}{2}$ - 2		CO2
Q 9	We have observed stock exchange rates for ten days as 89, 76, 87, 88, 89, 88, 88, 92, 93, 89. Compute all measures of central tendency.		CO3
Q 10	Find integration of the following: y = $\dfrac{x^2-4x-3}{e^x}$ and y = $\dfrac{x^2-3}{x^3-4}$		CO2
SECTION-C			
	Attempt any four questions	**(10x4)**	
Q 11	A university is going to form a committee. A committee of 7 is to be formed from 6 BBA students and 6 B.Com students. If the members of the committee are chosen at random, what is the probability that there will be a majority of BBA students in the committee?		CO3

Q 12	The following data corresponds to marks obtained by 120 students in a university examination. Find the average score and S.D. of the scores of these students.		CO3

Marks obtained	No. of students
25-30	7
30-35	12
35-40	14
40-45	22
45-50	10
50-55	12
55-60	9
60-65	14
65-70	15
70-75	5

Q 13	The following are the marks obtained by B.Com students in mid-term examination of Business Mathematics and Statistics: 23, 50, 38, 42, 63, 75, 12, 33, 26, 39, 35, 47, 43, 52, 56, 59, 64, 77, 15, 21, 51, 54, 72, 68, 36, 65, 52, 60, 27, 34, 47, 48, 55, 58, 59, 62, 51, 48, 50, 41, 57, 65, 54, 43, 56, 44, 30, 46, 67, 53,14,100,79,85,86,92,95,62,40,45 (i) Form the discrete frequency distribution table. (ii) Construct relative frequency distribution table.		CO3

Q 14	Determine the conditions under which the function $y = ax^2 + bx + c$ will have (i) a maxima (ii) a minima.Also find out the maximum and minimum value of the function.		CO2

Q 15	You have Rs 10,000 to invest. You want to invest the money in a stock mutual fund, a bond mutual fund, and a money market fund. The expected annual returns for these funds are given in the table. You want your investment to obtain an overall annual return of 8%. A financial planner recommends that you invest the same amount in stocks as in bonds and the money market combined. How much should you invest in each fund?		CO4