

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Term Examination, December 2021

Course: Quantitative Methods

Programme: MBA(LSCM)

Max. Marks: 100

Semester: I

Time: 03 hrs

Course Code: DSQT 7001

SECTION A

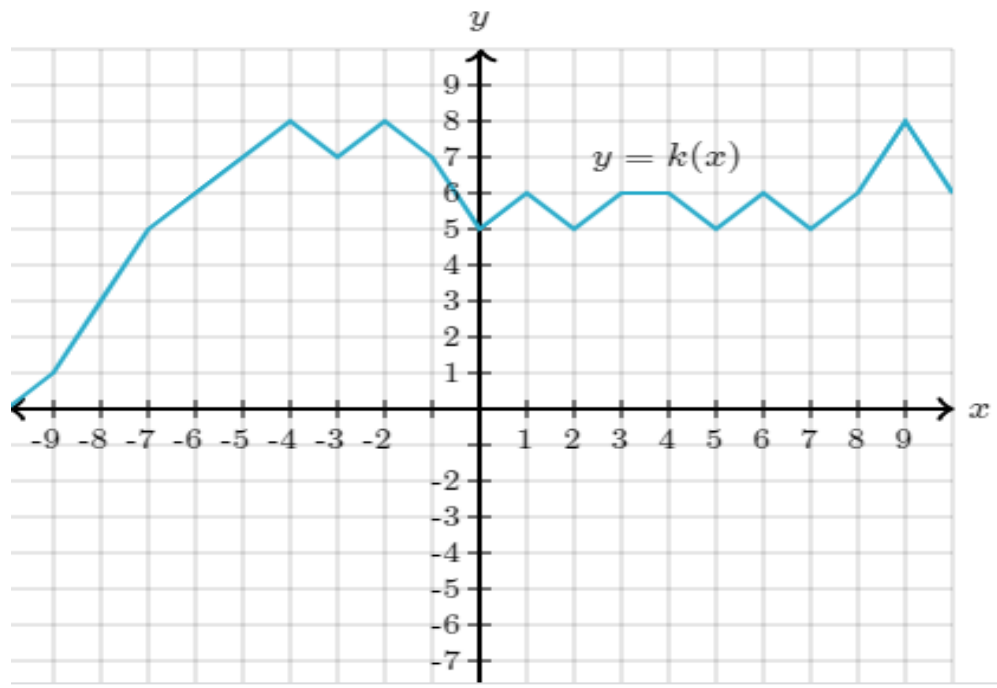
Each Question will carry 2 Marks

S. No.		Marks	CO
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Q 1.	Select the most appropriate	(2x10)	
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- i. Which of the relations below is a function?
 - a. $\{(2,3), (3,4), (5,1), (6,2), (2,4)\}$
 - b. $\{(2,3), (3,4), (5,1), (6,2), (7,3)\}$
 - c. $\{(2,3), (3,4), (5,1), (6,2), (3,3)\}$
 - d. All

ii. Find out the value of y if x= -1



CO1

CO1

<p>iii. Given $f(x) = 2x + 3$ and $g(x) = -x^2 + 5$, find $(g \circ f)(-1)$. a. 20 b.-10 c.-2 d. 10 e. None</p>		CO1
<p>vi. Find the 10th term of the arithmetic progression 1, 3.5, 6, 8.5, ... a.23.5 b.22.5 c.23 d.22</p>		CO1
<p>v. Functions of statistics consists of a. Collection of data b. Tabulation of data c. Analysis of data d. Interpretation of results Which one is correct? i. only c ii both a & c iii. a, b & c iv. All of the above v. None</p>		CO1
<p>vi. Which of the following descriptive statistics is least affected by adding an outlier to a data set? a. the mean b. the median c. the range d. the standard deviation</p>		CO1
<p>vii. If a data set has an even number of observations, the median a. can not be determined b. is the average value of the two middle items c. must be equal to the mean d. is the average value of the two middle items when all items are arranged in ascending order e. None of the above answers is correct</p>		CO1
<p>viii. In a sample of 800 students in a university, 160, or 20%, are Business majors. Based on the above information, the school's paper reported that "20% of all the students at the university are Business majors." This report is an example of a. a sample b. a population c. statistical inference d. descriptive statistics</p>		CO1

	<p>ix. A statistics professor asked students in a class their ages. On the basis of this information, the professor states that the average age of all the students in the university is 21 years. This is an example of</p> <p>a. a census b. descriptive statistics c. an experiment d. statistical inference e. None of the above answers is correct</p> <p>x. The variance of a sample of 81 observations equals 64. The standard deviation of the sample equals</p> <p>a. 0 b. 4096 c. 8 d. 6,561</p>		<p>CO1</p> CO1
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SECTION B

	Each question will carry 5 marks	(5x4)																							
Q 2.	<p>A company has two sections with 40 and 65 employees respectively. Their average weekly wages are \$450 and \$350. The standard deviation is 7 and 9. (i) Which section has a larger wage bill?. (ii) Which section has larger variability in wages?</p>		CO2																						
Q 3.	<p>Find correlation coefficient between the marks obtained by 10 students in the mid-term(X) & end-term(Y) examination in Quantitative Methods?</p> <table border="1"> <tr> <td>X</td><td>23</td><td>20</td><td>19</td><td>17</td><td>16</td><td>28</td><td>24</td><td>25</td><td>27</td><td>22</td> </tr> <tr> <td>Y</td><td>30</td><td>28</td><td>27</td><td>41</td><td>36</td><td>45</td><td>46</td><td>44</td><td>43</td><td>39</td> </tr> </table>	X	23	20	19	17	16	28	24	25	27	22	Y	30	28	27	41	36	45	46	44	43	39		CO2
X	23	20	19	17	16	28	24	25	27	22															
Y	30	28	27	41	36	45	46	44	43	39															
Q 4.	<p>Assume that the chance of a traffic accident in a day in a street of Delhi is 0.006. If there are 2500 such streets in the whole city, how many days out of total of 500 days can we expect in the city,</p> <p>(i) No accident (ii) More than two accidents</p>		CO2																						
Q 5.	<p>Decide whether these variables are qualitative or quantitative, and if they are quantitative, whether they are discrete or continuous</p> <ol style="list-style-type: none"> 1. Number of babies born in a day. 2. Blood group of a person. 3. Time needed to solve a problem. 4. Number of questions in an exam. 5. Temperature of a person. 		CO2																						

SECTION-C

Each Question carries 10 Marks

10x3

Q 6. The four variables shown in the data set below are set up to represent a fictitious study of gender, weight and fitness score. The variables include gender, ranking, weight and score. In this example, gender is coded as m or f (recoded as 1 or 2 for computations), weight is the participant's weight, score is a value that the participant scored in a fitness test and rank is their ranking based on that score

Gender	Ranking	Weight	Score
m	1	200	95
m	2	110	92
f	3	103	91
f	4	145	90
f	5	130	88
m	6	180	82
m	7	170	80
f	8	90	75
f	9	102	70
m	10	225	60
m	11	225	59
m	12	108	55
f	13	108	55
m	14	108	55
m	15	167	50

CO3

EACH OF THE VARIABLES IS EXAMINED IN THE CHART BELOW:

Statistics

			GENDER	RANKING	SCORE	WEIGHT
N	Valid	Statistic	15	15	15	15
	Missing	Statistic	0	0	0	0
Mean	Statistic		1.40	8.0000	73.1333	144.7333
	Std. Error		.13	1.1547	4.1928	12.0224
Median	Statistic		1.00	8.0000	75.0000	130.0000
Mode	Statistic		1	1.00 ^a	55.00	108.00
Std. Deviation	Statistic		.51	4.4721	16.2387	46.5625
Variance	Statistic		.26	20.0000	263.6952	2168.0667
Skewness	Statistic		.455	.000	-.085	.625
	Std. Error		.580	.580	.580	.580
Kurtosis	Statistic		-2.094	-1.200	-1.753	-1.037
	Std. Error		1.121	1.121	1.121	1.121
Range	Statistic		1	14.00	45.00	135.00
Minimum	Statistic		1	1.00	50.00	90.00
Maximum	Statistic		2	15.00	95.00	225.00

a. Multiple modes exist. The smallest value is shown

Answer the following questions:

- (i) What type of data does gender represent?
- (ii) Is this data set skewed in each case? If so, in which direction?
- (iii) What about kurtosis in each case?

Q 7. At the beginning of the 2019-20 academic year the number of years the full-time teaching faculty had been at Southwestern were:

13, 5, 20, 1, 8, 0, 3, 9, 31, 8, 2, 16, 1, 3, 19, 9, 0, 6, 8, 0, 3, 10, 18, 24, 5, 11, 15, 4, 4, 4, 36, 5, 4, 5, 3, 0, 3, 9, 17, 0, 13, 4, 15, 8, 5, 20, 19, 24, 6, 6, 9, 0, 37

- a. What is the mean?
- b. What is the median?
- c. Which is a better measure of the center of the data set? Why?

Q 8. Calculate the rank correlation between the marks obtained by 10 students in internal (X) and end term (Y) examination in QM.

X	40	37	40	70	85	40	32	60	72	85
Y	60	45	60	72	37	60	45	73	49	60

CO3

CO3

SECTION-D

Each Question carries 15 Marks

(15x2)

Q 9.

A study was made by a retail merchant to determine the relation between weekly advertising expenditure and sales. The following data were recorded:

Adv. Cost	5	4	8	7	3	0	2	6	5
Sales	10	8	12	11	6	6	10	6	8

(i) Plot scatter diagram. What does the scatter diagram indicate about the relationship between adv. cost and sales?

(ii) Find the regression line to predict weekly sales from adv. cost.

(iii) Estimate the weekly sales when adv. cost is 12.

CO4

Q 10.

Construct a discrete frequency distribution and relative frequency distribution table. Also construct continuous frequency distribution table with suitable class interval size of marks obtained by 50 students of a class are given below:

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

CO4