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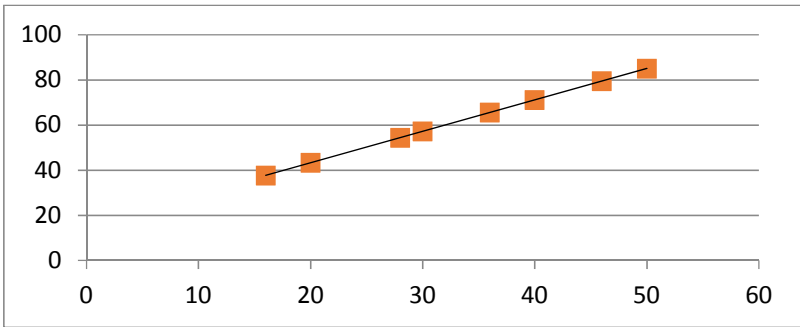


UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Quantitative Methods
Program: MBA BA
Course code: DSQT 7001
Instructions:

Semester: I
Time: 03 Hours
Max. Marks: 100

SECTION A

		Marks	CO
Q 1	Select the most appropriate answer.	2X 10=20	CO ₁
	<p>I. The probability that a ticketless traveler is caught during trip is 0.1. If the traveler makes 4 trips, the probability that he/she will be caught during at least one of the trips is :</p> <p>(a) $1-(0.9)^4$ (b) $(1-0.9)^4$ (c) $1-(1-0.9)^4$ (d) $(0.9)^4$</p> <p>II. What can be the value of R^2 for this given graph</p>  <p>(a) 0.5 (b) 1 (c) -1 (d) Cannot be determined.</p> <p>III. Which one is correct in terms of probability of any event E</p>		

- (a) $0 \leq P(E) \leq 1$
- (b) $0 < P(E) < 1$
- (c) $-1 \leq P(E) \leq 1$
- (d) None of these

IV. What is the range of the given stem and leaf plot ?

Stem	Leaf
2	3 5 5 7 8
3	2 6 6
4	5
5	0

- (a) 5
- (b) 27
- (c) 18
- (d) 25

V. A distribution has a mean of 40 and standard deviation of 5. The value of 68% of the distribution can be found between what two numbers?

- (a) 30 and 50
- (b) 0 and 45
- (c) 0 and 68
- (d) 35 and 45

VI. The limits of Karl pear son's correlation coefficient (r) explains

- (a) Linear Relationship
- (b) Non-linear Relationship
- (c) Any kind of relationship between two variable
- (d) None of these

VII. If two lines of regression cuts each other at angle of 90° , than

- (a) Two variables have perfect positive correlation.
- (b) Two variables have perfect negative correlation.

	<p>(c) Two variables have no correlation. (d) None of these.</p> <p>VIII. If a test was generally very easy except for a few students who had very low scores, then the distribution of scores would be</p> <p>(a) Positively skewed (b) Negatively skewed (c) Not skewed at all (d) None of these</p> <p>IX. The domain and range of the function defined as, $f(x) = \frac{4-x}{x-4}$ is given by</p> <p>(a) Domain= R, Range=R (b) Domain = R-{4}, Range = {-1} (c) Domain = R-{4}, Range = {-1,1} (d) None of these</p> <p>X. Which one is not correct with respect to Normal distribution?</p> <p>(a) Mean=median=mode (b) It is a symmetrical distribution (c) Mean = variance (d) It is a continuous probability distribution</p>		
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SECTION B

Q	Attempt any four questions	5 X 4=20	
2.	A company has 140 employees, of which 30 are supervisors. Eighty of the employees are married, and 20% of married employees are supervisors. If a company employee is randomly selected, what is the probability that the employee is married and supervisor?		CO ₂
3.	Explain, why there are two lines of regression?		CO ₃
4.	Find the domain and range of the function $f(x) = \frac{4-x}{x-4}$		CO ₂
5.	A geometric series has first term 4 and common difference ½. Find (i) 10 th term of the series (ii) Sum of the first 10 terms		CO ₂
6.	Describe the methods of calculating the direction and degree of relationship of two variables		CO ₃

SECTION-C

Q Attempt any four questions : 10 X4=40

7 Calculate Karl Pearson’s correlation coefficient for the given data and comment on it.

X	-3	-2	-1	1	2	3
Y	9	4	1	1	4	9

CO₂

8. Explain the meaning of regression with an example. Find the two lines of regression of Y on X and X on Y from the data given below and estimate the value of Y, if X=14. Also find the value of correlation coefficient between X and Y.

X	1	2	3	4	5
Y	4	6	2	8	6

CO₂

9. A tourist wants to spend his summer vacation in some winter location therefore, he is comparing the annual snowfall for the two ski resort Powder Valley and Mad Mountain. After searching lots of sites on internet he got the data from last 50 years which was plotted as box plot. Analyze the given box plot and help to tourist by summarizing and comparing the amount of annual snowfall for the aforesaid two resort.

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Resort	Min	Q1	Median	Q3	Max
Powder Valley	80	120	180	250	330
Mad Mountain	20	100	230	300	400

CO₂

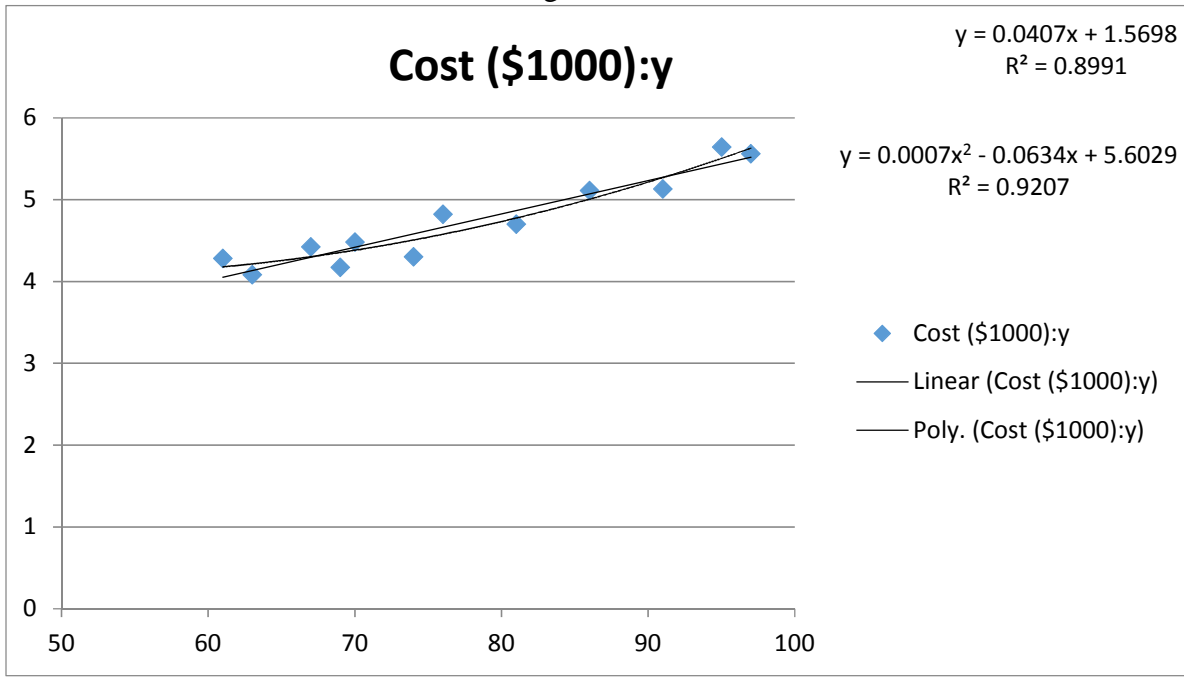
10. The graph is of the Airline cost data (given in table 1), shown in figure 1. Analyze the graph carefully and write the interpretation.

Table: 1

CO₃

Number of Passengers(X)	Cost (\$1000):y
61	4.28
63	4.08
67	4.42
69	4.17
70	4.48
74	4.3
76	4.82
81	4.7
86	5.11
91	5.13
95	5.64
97	5.56

Figure:1



11.

The following data represent the number of passengers per flight in the sample of 50 flights from Dehradun to Varanasi

23	46	66	67	13	58	19	17	65	17
25	20	47	28	16	38	44	29	48	29
69	34	35	60	37	52	80	59	51	33
48	46	23	38	52	50	17	57	41	77

CO₁

45 47 49 19 32 64 27 61 70 19

Find the mean and variance and comment on it.

SECTION-D

Q Answer the Question

20 X1=20

12. **Life with Cell Phone**

As early as 1947 scientists understood the basic concept of a cell phone as a type of two way radio. Seeing the potential of crude mobile car phones, researcher understood that by using a small range of service areas (cells) with frequency reuse, they could increase the capacity for mobile phone usage significantly even though the technology was not then available. During that same year, AT&T proposed the allocation of a large number of radio-spectrum frequencies by the FCC that would thereby make widespread mobile service feasible. At the same time, the FCC decided to limit the amount of frequency capacity available such that only 23 phone conversations could take place simultaneously. In 1968, the FCC reconsidered its position and freed the airwaves for more phones. About this time, AT&T and Bell Labs proposed on the FCC a system in which they would construct a series of many small, low-powered broadcast towers, each of which would broadcast to a “cell” covering a few miles. Taken as a whole, such “cells” could be used to pass phone calls from cell to cell, thereby reaching a large area. The first company to actually produce a cell phone was Motorola, and Dr. Martin cooper, then Motorola and considered the inventor of the first modern portable handset made his first call in the portable cell phone in 1973. By 1977 AT&T a d bell Labs had developed a prototype cellular phone system that was tested in Chicago by 2000 trial customers. After the first commercial cell phone system began operation in Japan in 1979, and Motorola and American Radio developed a second U.S. cell system in 1981, the FCC authorized commercial cellular service in the United States in 1982. By 1987, cell phone subscribers had exceeded one million customers in the United States, and as frequencies were getting crowded, the FCC authorized alternatives cellular technologies, opening up new opportunities for the development. Since that time, researchers have developed a number of advances that have increased capacity exponentially.

Today in the United States, nearly 25% of cell phone owners have only cellular phones, and the trend is rising. According to a Hassis Poll of 9132 surveyed adults, 89% of adults have a cell phone. In an associated Press/America online Pew Poll of 1200 cell phones users, it was discovered that two third of all cell phones user said that it would hard to give up their cell phones, and 26% responded that they cannot imagine life without their cell phones. In spite of American’s growing dependence on their cell phones, not everyone is happy their usages. Almost 9 out of 10 cell users encounter other using their phones in an annoying way. In addition, 28% claim that sometimes they do not drive as safely as they should do because they are using cell

CO₃

phones. Now , there are multiple uses for the cell phone owners in the 18 to 29 age bracket sent text message using their cell phones, 55% take pictures with their phones, 47% play games on the phones, and 28% use the internet through their cell phones.

Answer the following:

- i.** One study reports that nearly 25% of cell phone owners in the United States use only cellular phone (no land line). Suppose you randomly select 20 Americans, what is the probability that more than 2 of the sample use only cell phones?
- ii.** The study also reports that 9 out of 10 cell users encounter others using their phones in an annoying way. Based on this, if you were to randomly select 25 cell phone users, what is the probability that less than 23 reports that they encounter others using their phone in an annoying way?
- iii.** Suppose a survey of cell phone users shows that, on average, a cell phone user receives 3.6 calls per day. If this figure is true, what is the probability that a cell phone user receives no call in a day? What is the probability is the probability that a cell phone user receives 2 or more calls in a day?