



Final Term Exam - Semester Fall-2016

Course Title:	Statistics and Probability Theory	Course Code:	MTTH-262 (Credit Hours: 03.0)
Course:	Dr. Tajammal Hussain, Dr. Farukh Shehzad	Programme:	B.C.S
Semester:	4 th	Batch:	SP15
Time Allowed:	180 Minutes	Section:	A, B & C
Student's Name:		Maximum Marks:	50
		Reg.	XJIT/

Important Instructions / Guidelines:

- Attempt all questions.

(4+4=08)

Question No. 1:

When a computer disk manufacturer tests a disk, it writes to the disk and then tests it using a certifier. The certifier counts the number of missing pulses or errors. The number of errors on a test area on a disk has a Poisson distribution with parameter (mean) 0.2.

- What is the probability that test areas have atleast two errors?
- What percentage of test areas has two or fewer errors?

(5+5=10)

Question No. 2:

The probability of a successful optical alignment in the assembly of an optical data storage product is 0.8. Assume that the trials are independent.

- What is the probability that the third successful alignment requires exactly four trials?
- What is the probability that the first successful alignment requires exactly four trials?

(7+2=09)

Question No. 3:

A study was made on the amount of converted sugar in a certain process at various temperatures. The data were coded and recorded as follows:

Temperature, x	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Convert Sugar, y	8.1	7.8	8.5	9.8	9.5	8.9	8.6	10.2	9.3	9.2	10.5

- Estimate the linear regression line and interpret the estimated values of slope and intercept.
- Predict the amount of converted sugar produced when the coded temperature is 1.85.

Question No. 4:

Total compilation time of a computer program follows Gamma distribution with parameters $\alpha = 3$ and $\beta = 5$. Compute the probability for a computer program to be compiled is less than 15 minutes.

(5)

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1678.49

286.35 - 272.25

Question No. 5:

(4+4=8)

The diameter of the dot produced by a printer is normally distributed with a mean diameter of 0.002 inch and a standard deviation of 0.0004 inch.

- What is the probability that a diameter is between 0.0014 and 0.0026?
- Determine the interval of diameter such that the probability in the interval of diameters is 0.90.

(10)

Question No. 6:

The number of concurrent users for some internet service provider has always averaged 5000 with a standard deviation of 800. After an equipment upgrade, the average number of users at 100 randomly selected moments of time is 5200. Does it indicate, at a 5% level of significance, that the mean number of concurrent users has increased? Assume that the standard deviation of the number of concurrent users has not changed.