Code No: 53014 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
B.Tech II Year I Semester Examinations, December-2014
PROBABILITY AND STATISTICS
(Common to ME, CSE, AME, MIE, MSNT)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1.a) Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if
i) The two cards are drawn together.
ii) The two cards are drawn one after the other with replacement.

b) A random variable X has the following distribution

x	1	2	3	4	5	6	7	8
P(x)	K	2K	3K	4K	5K	6K	7K	8K

Find: i) K ii) $P(X \leq 2)$ iii) $P(2 \leq X \leq 5)$

2.a) Average number of accidents on any day on a national high way is 1.8. Determine the probability that the number of accidents are
i) At least one ii) At the most one

b) The height of 800 students in a class is normally distributed with mean 66 inches and standard deviation 5 inches. Find the number of students.
i) between 65 and 70 inches ii) greater than or equal to 72 inches.

3.a) It is claimed that a random sample of 49 tyres with a mean life of 15200 is drawn from a population of tyres which has a mean life of 15150 km. and a standard deviation of 1200 km. Test the validity of the claim

b) The mean weight of 45 male students is 70 kgs with a standard deviation of 10 where as the mean weight of another set of 80 male students is 68 kgs with a standard deviation of 12. Test the significance between the difference of two means at 5% level

4.a) A die is thrown 256 times. An even digit turns up 150 times can we say that the die is unbiased.

b) In a sample of 500 students 15 use ball pens, and among 800 of another sample 80 use ball pens. Construct large sample 99% confidence interval for the true difference of two proportions.

5. For a random sample of 10 pigs, fed on diet A, the increase in a certain period were 10, 6, 16, 17, 13, 12, 8, 14, 15, 9 Ibs, for another random sample of 12 pigs fed on diet B. The increases in the same period were 7, 13, 22, 15, 12, 14, 18, 8, 21, 23, 10, 17 Ibs. Find if the two samples are significantly different regarding the effect of diet.

6.a) Given the following results for the heights (x) and the weights (y) of 10 policemen mean height is 68 inches and mean weight is 159 lbs, r = 0.5, $\sigma_x = 2.5$ and $\sigma_y = 20$lbs. Find

i) The height of a particular policeman whose weight is 200 lbs

ii) The weight of a particular policeman whose height is 5 feet.

b) The following are the marks obtained by 8 students in Economics and Statistics. Calculate the coefficient of rank correlation.

Economics	78	56	36	66	25	75	82	62
Statistics	84	44	57	58	60	68	62	58

7. A fast food restaurant has one drive window. Cars arrive according to a poisson process. Cars arrive at the rate of 2 per 5 minutes. The service time per customer is 1.5 minutes. Determine

a) The Expected number of customers waiting to be served.

b) The probability that the waiting line exceeds 10

c) Average waiting time until a customer reaches the window to place an order.

d) The probability that the facility is idle.

8. There are three stores of groceries. There will be a shift from one to another. A study was made n January first and it was found that $\frac{1}{4}$ was shopped at store 1, $\frac{1}{3}$ at 2 and $\frac{5}{12}$ at 3. Every month store 1 retain 90% of their customers and 10% transformed t store 2. Store 2 retain 5% of their customers and 85% transformed t store 1 and store 3. Store 3 retain 40% of their customers and 50% transformed t store 1 and10% to store 2.

a) What proportion of customers retain by Feb 1st and March 1st

b) Find the long run proportions.

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