Code No: 54001 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, December - 2017
PROBABILITY AND STATISTICS
(Common to CE, CHEM, IT, PTM)

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

Answer any five questions
All questions carry equal marks
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1.a) State and prove Baye's theorem.
b) If a bank receives on the average of 3 bad cheques per day. What is the probability that it will receive i) 4 cheques per day ii) 8 bad cheques over any three consecutive days. [7+8]

2. Show that for normal distribution the quartile deviation, mean deviation and standard deviation are approximately 10:12:15. [15]

3.a) Discuss various types of alternative hypothesis with suitable example.
b) A random sample of boots worn by 40 combat soldiers in a desert region showed an average life of 1.08 years with a standard deviation of 0.05 years. Under standard conditions the boots are known to have an average life of 1.28 years. Is there reason to assert at a level of significance of 0.05 that use in the desert causes the mean life of such boots to decrease? [7+8]

4.a) Construct 95% confidence interval for the true proportion of computer literates if 47 out of 150 persons from rural areas are computer literates.
b) In a certain city 125 men in a sample of 500 were found to be smokers. In another city, the number of smokers was 375 in a random sample of 1000. Does this indicate that there is a greater population of smokers in the second city than in the first? [7+8]

5.a) Discuss various types of alternative hypothesis with suitable example.
b) The average weekly losses of man hours due to strikes in an institute before and after a disciplinary program was implemented are as follows

Before	45	73	46	124	33	57	83	34	26	17
After	36	60	44	119	35	51	77	29	24	11

Is there reason to believe that the disciplinary program is effective at 0.05 LOS. [7+8]

6. Twenty five pairs of value of variates X and Y led to the following results N = 25, $\sum x = 127$, $\sum y = 100$, $\sum x^2 = 760$, $\sum y^2 = 449$, $\sum xy = 500$. A subsequent scrutiny showed that two pairs of values were copied down as (8, 14) and (8, 6) instead of (8, 12) and (6, 8). Find correct value of r and correct lines of regression. [15]

7.a) Discuss basic queuing process.
b) Show that for a single service station, Poisson arrivals and exponential service time, the probability that exactly n calling units are in the queuing system is $P_n = (1-\rho)\rho^n$, $n \geq 0$, where ρ is the traffic intensity. [7+8]

8. Three boys A, B, C are throwing a ball to each other. B always throws the ball to C; C always throws the ball to A; but A is just a likely to throw the ball to C as to B. Show that the process is Markovian. Find the transition matrix and classify the states. Do all the states are ergodic? [15]

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