

Code No: R05210501

R05**Set No. 2****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****PROBABILITY AND STATISTICS****Common to Information Technology, Computer Science And Engineering,
Computer Science And Systems Engineering****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions
All Questions carry equal marks**

1. (a) A lady stenographer claims that she can take dictation at the rate of 118 words per minute can we reject her claim on the basis of 100 trials in which she demonstrates a mean of 116 words and a S.D of 15 words.
- (b) In a large consignment of oranges a random sample of 64 oranges revealed that 14 oranges were bad. If it reasonable to ensure that 20% of the oranges are bad? [8+8]
2. (a) Using recurrence formula find the probabilities when $x=0,1, 2, 3, 4$ and 5 :
If the mean of Poisson distribution is 3.
- (b) If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3 kgs how many students have masses.
 - i. Greater then 72 kg
 - ii. Less than or equal to 64 kg
 - iii. Between 65 and 71 kg inclusive [8+8]

3. The following is the distribution of hourly number of trucks arriving at a company's warehouse;

No.of Trucks	0	1	2	3	4	5	6	7	8
Frequency	52	151	130	102	45	12	5	1	2

Find the mean of this distribution, and using it as parameter λ , fit a Poisson distribution. Test for goodness of fit at the 0.05 level of significance? [16]

4. (a) Calculate the coefficient of correlation for ranks if the marks in two subjects x and y are given below.
 $(x,y) = (5,8); (10,3); (6,2); (3,9); (19,12); (5,3); (6,17); (12,18); (8,22); (2,12); (10,17); (19,20)$
- (b) If $x=2y+3$ and $y=kx+6$ are the regression lines of x, y and y on x respectively
 - i. shown that $0 \leq k \leq 1/2$
 - ii. If $k = 1/8$, find r and $(\bar{x}, \bar{y})$ [8+8]
5. (a) Find the most possible values of x and y from the following equations

$$x - 5y + 4 = 0, \quad 2x - 3y + 5 = 0$$

$$x + 2y - 3 = 0, \quad 4x + 3y + 1 = 0$$

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- (b) Fit a curve of the form $y = ae^{bx}$ for the following data [8+8]

x	1	2	3	4	5	6
y	1.6	4.5	13.8	40.2	125	300

6. (a) If X and Y are discrete random variables and K is a constant then prove that.
- $E(X + K) = E(X) + K$
 - $E(X+Y) = E(X) + E(Y)$
- (b) Out of 800 families with 5 childrens each, how many would you expect to have
- 3 boys
 - At least one boy. [8+8]
7. (a) What is the probability that X will be between 75 and 78 if a random sample of size 100 taken from an infinite population has mean 76 and variance 256.
- (b) Write about
- Null hypothesis
 - Type I & type II errors. [8+8]
8. (a) If $A_1, A_2, \dots, A_n$, are n events then prove that
- $$P\left(\bigcap_{i=1}^n A_i\right) \geq \sum_{i=1}^n P(A_i) - (n-1)$$
- (b) Companies B_1, B_2, B_3 produce 30%, 45%, 25% of the cars respectively. It is known that 2%, 3%, 2% of these cars produced from B_1, B_2, B_3 are defective.
- What is the probability that a car purchased is defective.
 - If a car purchased is found to be defective what is the probability that this car is produced by the company B. [6+10]

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R05**Set No. 4****II B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010****PROBABILITY AND STATISTICS**

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[8+8]

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[6+10]

5. (a) If X and Y are discrete random variables and K is a constant then prove that.

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- i. $E(X + K) = E(X) + K$
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R05**Set No. 1**

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R05**Set No. 3**

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 ii. If a car purchased is found to be defective what is the probability that this car is produced by the company B . [6+10]
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