Code No: R05220101 **R05** **Set No. 2**

II B.Tech II Semester Examinations,November 2010
PROBABILITY AND STATISTICS
Common to CE, ME, CHEM, MECT, MEP, BT, AME

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) A normal population has a mean of 0.1 and a S.D of 2.1. Find the probability that the mean of simple sample of 900 members will be negative.
   (b) If the distribution of all weights of all men traveling by train from Hyderabad to Delhi has a mean of 70 kgs and a standard deviation of 4 kgs, what is the probability that the combined gross weight of 36 such men is more than 300 kgs. [8+8]

2. (a) The following data pertain to the demand for a product (in thousands of units) and its price (in cents) charged in five different market areas:

Price (x)	20	16	10	11	14
Demand	22	41	120	89	56

   Fit a straight line of the form $y = a_o + a_1 x$ to the above data
   (b) Fit the model $y = ax^b$ to the following data: [8+8]

x:	1	2	3	4	5	6
y:	2.98	4.26	5.21	6.10	6.80	7.50

3. (a) The equations of two regression lives are 4x-5y+33=0 and 20x-9y-107=0. If the variance of y is 16
      i. Find $(\overline{x}, \overline{y})$
      ii. The correlation coefficient between x and y
      iii. Standard deviation of x
   (b) The angle between the two regression lines is tan^{-1} 1/4 coefficient of correlation is 2/3 given that S.D of y is multiple of S. D of x, find the ratio $\frac{\sigma y}{\sigma x}$ [8+8]

4. (a) Suppose 2% of the people on the average are left handed. Find
      i. the probability of finding 3 or more left handed
      ii. the probability of finding ≤ 1 left handed.
   (b) The mean and standard deviation of a normal variate are 8 and 4 respectively find
      i. P($5 \leq x \leq 10$)
      ii. P($x \geq 5$) [8+8]

5. (a) A B and C in order toss a coin. The first one to toss a head wins the game. What are their probabilities of winning, assuming that the game may continue indefinitely?

(b) State and prove Baye's theorem. [8+8]

6. (a) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the proportion.

   (b) A social worker believes that fewer than 25% of the couples in a certain area are ever used any form of birth control. A random sample of 120 couples was contacted. Twenty of them said that they have used. Test the belief if social worker at 0.05 level. [8+8]

7. A die is thrown 60 times with the following results.

Face	1	2	3	4	5	6
Frequency	8	7	12	8	14	11

Test the goodness of fit at 5% level. [8+8]

8. (a) If X and Y are discrete random variables and K is a constant then prove that.
   i. E (X + K) = E(X) + K
   ii. E(X+Y) = E(X) + E(Y)

   (b) Out of 800 families with 5 childrens each, how many would you expect to have
   i. 3 boys
   ii. At least one boy. [8+8]

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Code No: R05220101 **R05** **Set No. 4**

II B.Tech II Semester Examinations,November 2010
PROBABILITY AND STATISTICS
Common to CE, ME, CHEM, MECT, MEP, BT, AME

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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   (b) Out of 800 families with 5 childrens each, how many would you expect to have
   i. 3 boys
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4. (a) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the proportion.
   (b) A social worker believes that fewer than 25% of the couples in a certain area are ever used any form of birth control. A random sample of 120 couples was contacted. Twenty of them said that they have used. Test the belief if social worker at 0.05 level. [8+8]

5. (a) A B and C in order toss a coin. The first one to toss a head wins the game. What are their probabilities of winning, assuming that the game may continue indefinitely?
   (b) State and prove Baye's theorem. [8+8]

Code No: R05220101 **R05** **Set No. 4**

6. (a) The equations of two regression lives are 4x-5y+33=0 and 20x-9y-107=0. If the variance of y is 16
   i. Find $(\overline{x}, \overline{y})$
   ii. The correlation coefficient between x and y
   iii. Standard deviation of x

   (b) The angle between the two regression lines is tan^{-1} 1/4 coefficient of correlation is 2/3 given that S.D of y is multiple of S. D of x, find the ratio $\frac{\sigma y}{\sigma x}$ [8+8]

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   Test the goodness of fit at 5% level. [8+8]

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Code No: R05220101 **R05** **Set No. 1**

II B.Tech II Semester Examinations,November 2010
PROBABILITY AND STATISTICS
Common to CE, ME, CHEM, MECT, MEP, BT, AME
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Code No: R05220101 **R05** **Set No. 3**

II B.Tech II Semester Examinations,November 2010
PROBABILITY AND STATISTICS
Common to CE, ME, CHEM, MECT, MEP, BT, AME

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