

Code No: RT22051

R13
SET - 1

II B. Tech II Semester Supplementary Examinations, April-2018
PROBABILITY AND STATISTICS
 (Com. to CSE, IT, CHEM, PE, PCE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART-A

1. a) if X is a normal variate then Find (i) $P(z < -1.78)$ (ii) $P(-0.8 < z < 1.53)$
 b) The mean and variance of binomial distribution are 4 and 3 respectively.
 Find $P(X \geq 1)$.
 c) Explain the stratified sampling with a suitable example.
 d) A random sample of size 100 has S.D of 5 .what is the maximum error with 95% confidence
 e) Write about major classification of correlation?
 f) What is the use of control charts? Draw a typical control chart. (4M+4M+3M+4M+3M+4M)

PART-B

2. a) The probability density function of a variate X is

X	0	1	2	3	4	5	6
$P(X)$	K	3K	5K	7K	9K	11K	13K

- (i) Find $P(x < 4)$, $P(3 < x \leq 6)$.
- (ii) What will be the minimum value of K so that $P(X \leq 2) > 0.3$
- b) In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with average life of 2040 hours and S.D of 60 hours . Estimate the number of bulbs likely to burn for
 - i) More than 2150 hours,
 - ii) Less than 1950 hours and
 - iii) More than 1920 hours and but less than 2160 hours. (8M+8M)

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3. a) Calculate $E(X)$, $E(X^2)$, $E(X - \bar{X})^2$ from the distribution given below.

X	1	2	3
P(X)	1/5	3/10	1/2

- b) Define Moment generating function and its properties. (8M+8M)

4. a) A random samples of size 25 from a normal population has the mean $\bar{x} = 47.5$ and the standard deviation is equal to 8.4. Does this information tend to support or refute the claim that the mean Of population is $\mu = 42.5$

- b) Three masses are measured as 62.34, 20.48, 35.97 kgs with S.D 0.54, 0.21, 0.46 kgs respectively. Find mean and standard deviation of the sum of the masses (8M+8M)

5. a) Two independent samples of 8 and 7 items respectively has the following values

Sample1	11	11	13	11	15	9	12	14
Sample2	9	11	10	13	9	8	10	----

Is the difference between the mean of samples significant?

- b) A sample of 26 bulbs gives a mean life of 990 hours with a S.D of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours is the sample not up to the standard. (8M+8M)

6. a) Calculate Karl Pearson's correlation coefficient for the following paired data.

X	28	41	40	38	35	33	40	32	36	33
Y	23	34	33	34	30	26	28	31	36	38

- b) Fit a parabola of the form $y = a + bx + cx^2$ to the following data (8M+8M)

x	1	2	3	4	5	6	7
y	23	5.2	9.7	16.5	29.4	35.5	54.4

7. Construct a control chart for men and the range for the following data on the basis of fuses, sample of being taken every hour (each set of 5 has been arranged in ascending order of magnitude). Comment on whether the production seems to be under control, assuming that these are the first data.

42	42	19	36	42	51	60	18	15	69	64	61
65	45	24	54	51	74	60	20	30	109	90	78
75	68	80	69	57	75	72	27	39	113	93	94
78	72	81	77	59	78	95	42	62	118	109	109
87	90	81	84	78	132	138	60	84	153	112	136

(16M)