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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech II Year II Semester Supplementary Examinations October-2020**

**PROBABILITY AND STATISTICS**

(Common to CE, EEE, ME.CSE, CSIT & AGE)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

**UNIT-I**

- 1** Two dice are thrown. Let  $X$  assign to each point  $(a,b)$  in  $S$  the maximum of its  $s$  numbers i.e,  $X(a,b)=\max(a,b)$ . Find the probability distribution.  $X$  is a random variable with  $X(s)=\{1,2,3,4,5,6\}$ . Also find the mean and variance of the distribution. **12 M**

**OR**

- 2** The diameter of an electric cable say  $X$  is assumed to be a continuous random variable **12 M**  
with p.d.f. of  $f(x)=\begin{cases} kx(1-x^2), & 0 \leq x \leq 1 \\ 0, & \text{elsewhere} \end{cases}$ . Find the value of  $k$  and  
 $P(0 \leq x \leq 1/2)$ ,  $P(x \geq 1/4)$ .

**UNIT-II**

- 3 a** Ten coins are thrown simultaneously. Find the probability of getting at least (i) **7M**  
seven heads and (ii) six heads.  
**b** If 3 of 20 tyres are defective and 4 of them are randomly chosen for inspection, **5M**  
what is the probability that only one of the defective tyre will be included.

**OR**

- 4** Find the mean and variance of a Normal distribution in which 31% of items are under **12 M**  
45 and 8% are over 63.

**UNIT-III**

- 5 a** A sample of 900 members has a mean of 3.4 cms and S.D 2.61 cms. Is the sample **6M**  
from a large population of mean 3.25 cm and S.D 2.61 cms. If the population is normal and its mean is unknown find the 95% fiducial limits of true mean.  
**b** In a big city 325 men out of 600 men were found to be smokers. Does this **6M**  
information support the conclusion that majority of men in this city are smokers?

**OR**

- 6** Producer of gutkha claims that the nicotine content in his gutkha on the average is **12 M**  
1.83mg. Can this claim accepted if a random sample of 8 gutkha of this type have the nicotine contents of 2.0, 1.7, 2.1, 1.9, 2.2, 2.1, 2.0, 1.6 mg's? Use a 0.05 level of significance.

**UNIT-IV**

- 7** A manager of a merchandizing firm wishes to test whether its three salesmen A, B, **12 M**  
make sales of the same size or whether they differ in their selling abilities. During a week have been 14 sale calls; A made 5 calls, B made 4 calls and C made 5 calls. Followi weekly sales record (in Rs.) of three salesmen:

A	500	400	700	800	600
B	300	700	400	600	-
C	500	300	500	400	300

Perform the analysis of variance and draw your conclusion.

**OR**

- 8 a Define R.B.D and L.S.D. 5M  
b Describe briefly the technique of ANOVA for Two-way classification. 7M

**UNIT-V**

- 9 The table below gives the sample means and ranges for ten samples, each of size 5. 12 M  
Construct the control charts for mean and range and test whether the process is control or not.

Mean ( $\bar{x}$ )	4.98	4.92	5.02	4.98	4.98	5.08	5.04	4.95	4.95	4.92
Range (R)	0.3	0.2	0.4	0.1	0.4	0.2	0.7	0.4	0.4	0.5

**OR**

- 10 a Write the constructions of mean, range, p and c –charts. 7M  
b Write the causes of variations. 5M

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