

**B. Tech. SEM -I (Computer Science & Business Systems) (CBCS  
Course) : WINTER - 2018**

**SUBJECT: STATISTICS – I**

Day: Saturday  
Date: 24/11/2018

**W-2018-2255**

Time: 10.00 AM TO 01.00 PM  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

**Q.1** Explain primary data in detail. (10)

**OR**

**Q.1** Explain statistical population and sample. (10)

**Q.2** Draw a histogram, frequency polygon and frequency curves from the following data (10)

| Class     | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
|-----------|------|-------|-------|-------|-------|-------|
| Frequency | 8    | 12    | 26    | 20    | 16    | 6     |

**OR**

**Q.2** With usual notations, derive Spearman's rank correlation coefficient (10)

$$R = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n^3 - n}$$

**Q.3** What is cluster sampling? (10)

**OR**

**Q.3** What is systematic random sampling? (10)

**Q.4** Find the moment generating function of normal distribution. (10)

**OR**

**Q.4** Derive  $r^{\text{th}}$  raw moment of F-distribution with  $n_1$  and  $n_2$  degrees of freedom. (10)  
Hence find mean and variance of the distribution.

**P. T. O.**

- Q.5 a)** A bag contains 5 white and 3 black balls and 4 balls are successively drawn out and not replaced. What is the probability that they are alternately of different colors? **(05)**
- b)** From a deck of cards, 3 cards are drawn one by one without replacement. Find the probability that each time it is a card of spade. **(05)**

**OR**

- Q.5 a)** Bag first contains 6 blue and 4 red balls. Bag second contains 2 blue and 6 red balls. Bag third contains 1 blue and 8 red balls. A bag is chosen at random, a ball is drawn randomly from this bag. It turns out to be blue. Find the probability that bag first was chosen. **(05)**
- b)** A pair of unbiased dice is rolled. If the sum of 8 has appeared, find the probability that one of the dice shows 3. **(05)**
- Q.6 a)** If the sum of the mean and variance of a binomial distribution for 5 trials is 1.8, find the distribution. **(05)**
- b)** Find the recurrence formula for the probabilities of binomial distribution. **(05)**

**OR**

- Q.6 a)** If  $X \rightarrow N(\mu, \sigma^2)$  and **(05)**  
$$f(x) = \frac{1}{2\sqrt{2\pi}} e^{-\frac{1}{8}(x^2 - 6x + 9)}$$
find the mean and variance.
- b)** Define t- distribution with n degrees of freedom. Also find the value of variance. **(05)**

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