

**F.Y.B.SC. (COMPUTER SCIENCE) SEM –II (2014 COURSE) :**  
**SUMMER - 2018**

**SUBJECT : COMPUTER ORIENTED STATISTICAL TECHNIQUES – II**

Day :	<b>Saturday</b>	<b>S-2018-0842</b>	Time : <b>03.00 PM TO 05.00 PM</b>
Date :	<b>28/04/2018</b>		Max. Marks : <b>40</b>

**N. B. :**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labelled diagram **WHEREVER** necessary.
- 4) Use of logarithmic tables, statistical tables, pocket calculator is **ALLOWED**.

**Q. 1** Attempt **ANY TWO** of the following: **(10)**

- a) Explain deterministic and non deterministic experiments with illustration.
- b) Two cards are drawn from a well shuffled pack of playing cards. Determine the probability that:
  - i) both are aces    ii) both are spades    iii) both belongs to same suit
- c) For a discrete random variable (r.v.),  $E(X) = 10$ ,  $\text{Var}(X) = 25$ . Find the positive values of a and b such that  $Y = aX - b$  has mean 0 and variance 1.

**Q. 2** Attempt **ANY TWO** of the following: **(10)**

- a) For an event A defined on sample space  $\Omega$ , prove the following:
  - i)  $P(A') = 1 - P(A)$     ii)  $P(\phi) = 0$     iii)  $0 \leq P(A) \leq 1$ .
- b) Of the 100 people in a certain village, 40 always tells the truth and remaining always lie. A sample of 10 persons is chosen from these people, what is the probability that the sample will contain
  - i) three liars,                      ii) at least one liar.
- c) Let  $X \rightarrow N(2, 25)$ . Find : i)  $P(0 < X < 4)$     ii)  $P(|X| > 2)$

**Q. 3** Attempt **ANY TWO** of the following: **(10)**

- a) Explain t- test to test the hypothesis  
 $H_0 : \mu = \mu_0$  against i)  $H_1 : \mu \neq \mu_0$     ii)  $H_1 : \mu > \mu_0$     iii)  $H_1 : \mu < \mu_0$ .
- b) The probability distribution of a r.v. X is:

X	- 2	-1	0	1	2	3
P [X = x]	0.1	k	0.2	2k	0.3	k

Find the value of k and calculate mean and variance of X.

- c) Number of road accidents on a high way during a month follow a Poisson distribution with mean 5. Find the probability that in a certain month number of accidents on the highway will be
  - i) less than 3                      ii) between 3 and 5

**Q. 4** Attempt **ANY FIVE** of the following: **(10)**

- a) State the test based on  $\chi^2$  distribution.
- b) Compute mode of a binomial distribution for
  - i)  $n = 10, p = \frac{1}{3}$ ,    ii)  $n = 11, p = \frac{1}{2}$ .
- c) Define type – I error.
- d) If A and B are independent events with  
 $P(A) = 0.4, P(B) = 0.6$ , then find: i)  $P(A|B)$     ii)  $P(A'|B)$ .
- e) For a continuous r.v.X with probability density function  
 $f(x) = ke^{-\theta x}, x > 0, \theta > 0$ .  
 Find k.
- f) With usual notations, prove that  $E(X^2) \geq (E(X))^2$
- g) Write down the sample space for the experiment “TV viewers were asked to give ratings to 3 programmes”. Also state type of sample space.

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