F.Y.B.SC. (COMPUTER SCIENCE) SEM –II (2014 COURSE) :

WINTER - 2017

SUBJECT : COMPUTER ORIENTED STATISTICAL TECHNIQUES – II

Day : **Thursday** Time : **03.00 PM TO 05.00 PM**

Date : **09/11/2017** **W-2017-0742** Max. Marks : 40

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) If A and B are two events defined on sample space Ω, then show that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

b) A discrete random variable X has the probability distribution given by:

X	2	4	6	8	10
P [X = x]	0.08	0.18	0.28	0.29	0.17

Find : **i)** mode **ii)** median **iii)** $P(2 \le X \le 8)$

c) Let A and B be two events associated with a random experiment such that $P(A) = 0.4$, $P(B) = 0.5$, $P(A \cup B) = 0.8$.

Find: $P(A \cap B)$ $P(A' \mid B)$ $P(A' \mid B')$.

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

a) State the properties of normal distribution.

b) *Let* $X \rightarrow \left(10, \frac{1}{2}\right)$. *Find : i)* $P(X = 3)$ *ii) mode of X.*

c) Let X be a Poisson variable with parameter m.

If $P(X = 5) = \frac{3}{10} P(X = 4)$, Find mean and variance of X and $P(X > 3)$.

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

a) Explain χ^2 test of goodness of fit.

b) A sample of 900 ball bearings is found to have average weight of 12.5 gms. Can we assume a sample is coming from a population with mean 13 gms and standard deviation of 1 gm ?

c) A company producing spark plugs claimed that there would be 10 % defective spark plugs. When a sample of 500 was taken 62 were found defective, test correctness of company's claim.

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

a) Define critical region.

b) Explain with illustration 'Event'.

c) If A and B are independent events with $P(A) = 0.6, P(B) = 0.4$, then find $P(A' \cap B)$.

d) State the probability density function of exponential distribution.

e) If X is a continuous random variable with probability distribution

$f(x) = 6x(1 - x)$, $0 \le x \le 1$

$= 0$, *otherwise*

Find mean of X.

f) Write down the sample space and state the type of sample space for the experiment "TV viewers were asked to give ratings to 3 programmes".

g) When we use the t – test ?

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