Total No. of Questions—**5**] [Total No. of Printed Pages—**4+1**

Seat No.	

[4968]-2004

BCA (Semester–II) EXAMINATION, 2016

204 : COMPUTER APLICATIONS IN STATISTICS

(2013 PATTERN)

Time : 3 Hours **Maximum Marks : 80**

N.B. **:—** (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Figures to the right indicate full marks.

(*iv*) Use of calculator is allowed.

1. Attempt any *four* of the following : [4×4=16]

(*a*) Explain the fundamental principles of counting.

(*b*) How many 3-digit numbers can be formed from the digits 1, 2, 3, 4, 5 ? How many of these will be divisible by 5 ?

(*c*) Define uniform distribution. State its mean and variance.

(*d*) Find '*r*' if ${}^{15}P_{r-1} : {}^{16}P_{r-2} = 3 : 4$

(*e*) Determine which of the following. are deterministic or non-deterministic experiments :

(*i*) Number of missed calls receiving on a mobile phone in a day.

(*ii*) Result of an examination.

(*iii*) Circumference of a circle with radius 5 cm.

(*iv*) Time required for completing the given task.

P.T.O.

(*f*) A bag contains 8 black, 3 red and 9 white balls. In how many ways can 3 balls be drawn so that :

(*i*) all are black

(*ii*) the 3 balls are of different colours.

2. Attempt any *four* of the following : [4×4=16]

(*a*) Define binomial distribution. State its mean and variance.

(*b*) There are 3 families, first consisting of 5 members, second of 4 members and third of 3 members. In how many ways can they take seats in a row in theatre so that members of same family are together ?

(*c*) Let A and B be two events on Ω such that $P(A) = 0.6$, $P(B) = 0.5$, $P(A \cap B) = 0.3$. Find :

(*i*) $P(A \cup B)$ (*ii*) $P(A \cap B')$

(*iii*) $P(A' \cup B')$ (*iv*) $P(A' \cap B')$

(*d*) Define the following terms :

(*i*) Sample space (*ii*) Event

(*iii*) Sure event (*iv*) Elementary event.

(*e*) The probability of passing in Statistics practical examination is 60%. Then out of 12 students, find the probability that more than 10 students will pass the examination using binomial distribution.

(*f*) If X following uniform distribution with parameter $n = 10$, then find

(*i*) $P(X \leq 5)$ (*ii*) $P(X > 2)$.

3. Attempt any *four* of the following : [4×4=16]

(*a*) Consider an experiment of rolling of a fair dice. Then identify the distribution of the number that we get on the uppermost face of the dice. Also find its mean and variance.

(*b*) Write a note on Bernoulli distribution.

(*c*) Generate a random sample of size 4 using linear congruential generator

$$X_{i+1} = (4X_i + 7) \bmod 6 \text{ with } X_0 = 3.$$

(*d*) A box contains 12 bulbs of which 4 are defective. Three bulbs are drawn randomly. What is the probability that :

(*i*) All the bulbs are defective ?

(*ii*) At least 2 of the bulbs chosen are defective ?

(*e*) Define the following terms :

(*i*) Probability of an event.

(*ii*) Independence of *two* events.

(*f*) *Five* employees in a company out of 20 are postgraduates. If 3 employees are selected at random from these 20 employees, what is the probability that

(*i*) they all are postgraduates ?

(*ii*) at least one of them is post-graduate ?

4. Attempt any *four* of the following : [4×4=16]

(*a*) Give an example where two mutually exclusive events are also mutually exhaustive events. Is the above statement true in general ? Justify.

(*b*) If mean and variance of binomial distribution are 1.6 and 0.96 respectively, then find the values of n and p.

(*c*) Write down sample spaces for the following :

(*i*) The number of accidents that can occur on the Pune-Mumbai highway every day.

(*ii*) A coin is tossed until a tail or three heads appear.

(*iii*) A three digit number is formed using the digits 1, 2, 3.

(*iv*) The day on which one can get the delivery of the product ordered.

(*d*) The probability that A can shoot at a target is 5/7 and the probability that B can shoot the same target is 3/5. If A and B shoot independently, find the probability that the target is :

(*i*) Not shot at all

(*ii*) Shot by at least one of them.

(*e*) Let X be discrete random variable assuming values 1, 2, 3.....,*n* with equal probabilities :

(*i*) Identify the probability distribution of X.

(*ii*) Find the mean and variance of X.

(*f*) Write a note on pseudo random number generator.

5. Attempt any *two* of the following : [8×2=16]

(*a*) A trader deals in a perishable commodity. The daily demand is a random variable with the following probability distribution.

Demand	1	2	3	4	5
Probability	0.10	0.20	0.30	0.30	0.10

Simulate the demand for different days in a week.

(*b*) At a garage number of cars arriving for repairs (X) is a random variable with binomial distribution having parameters $n = 5$, $p = 0.6$. Simulate number of cars coming for repairs in a week.

(*c*) Simulate the points on the uppermost face of an unbiased coin for 5 throws using uniform distribution.