GURUDAS COLLEGE

Internal Examination, 2020

B.Sc Semester-II, STATISTICS (General)

Paper-CC2/GE-2

F.M-50 Date-11.12.20 Time-1.30 hrs

Group-A (IA)

Answer any five questions. Choose the correct answer. 5x2

1.(a) If A and B are mutually exclusive events, then

(i) P(AUB)=P(A).P(B) (ii) P(AUB)=P(A) + P(B) (iii) P(AUB)=0

(b) A coin is tossed three times. The total number of sample points in the sample space is

(i) 6 (ii) 8 (iii) 3 (iv) 9

(c) Three letters are written and put at random inside three addressed envelopes. The probability that the letters go into right envelopes (i)1/27 (ii)1/6 (iii)1/9 (iv)none of these

(d) Two cards are drawn from a pack of 52 cards. The probability of both being aces is

(i)1/26 (ii)1/221 (iii)1/2 (iv)2/13

(e) Let X be a random variable with probability distribution function $f(x) = 0.2$ for $|x|<1$

$= 0.1$ for $1 < |x| < 4$

$= 0$ otherwise

Then probability $P(0.5 < x < 5)$ is

(i) 0.3 (ii) 0.5 (iii) 0.4 (iv) 0.8

(f) X is a variate between 0 and 3. The value of $E(X^2)$ is

(i) 8 (ii) 7 (iii) 27 (iv) 9

Group-B (Theory)

2.(a) Give the classical definition of Probability and its limitation. 2+2

(b) Give the Axiomatic definition of Probability. 3

3.(a) A and B are two independent events such that $P(A^c)=0.7$, $P(B^c)=k$ and $P(AUB)=0.8$

Find the value of k. 3

(b) Prove that $P(\cap A_i) \geq \sum P(A_i)-(n-1)$, where i=1 to n. 3

4. (a) Define random variable and expectation of a random variable. 2+2

(b)Write down the properties of distribution function. 2

5. (a) If X and Y are independent random variables, then show that $E(XY) = E(X).E(Y)$. 3

(b) If X is a random variable then show that $Var(aX+b) = a^2 Var(X)$, where a and b are constants. 3

Group-C (Practical)

6. There are three candidates A, B and C for the position of Principal of a College; their chances of getting the appointment are in the proportion 4 : 2 : 3 respectively. The probability that A if selected would introduce Environment Club in the College is 0.3. The probability of B and C doing the same are respectively 0.5 and 0.8. (i) What is the probability that there will be an Environmental club in the College?

(ii) If Environmental Club is introduced in the College, then what is the probability that C is the Principal? 4+4

7. The diameter, say X, of an electric cable, is assumed to be a continuous random variable with pdf

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

(i) Check that the above fulfil the properties of pdf.

(ii) Obtain the expression of cdf.

(iii) Determine the number k such that $P(X<k) = P(X>k)$. 7