Roll No. 7.18.27.1031....

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CBC-1954-U

M.C.A. Third Semester

(End Semester)

Examination, Dec.-2019

COMPUTER SCIENCE AND APPLICATIONS

Paper : CSA-CC-325

(Probability, Statistics and Combinatories)

Time : Three Hours] [Maximum Marks : 60

Note :– The question paper is divided into **three** sections. Attempt questions as per direction. Attempt questions as per instructions in each section. Calculator is allowed.

[P. T. O.

SECTION - A

(Objective Type Questions) 1×10=10

Note :– Choose the correct answer —

1. (1) If $P(A)=P(B)=P(C)$ holds then :

(a) If is sure that events will be mutually exhaustive

(b) It is sure that events will be equally likely

(c) Events will not be exhaustive

(d) Events will not be independent

(2) If $S=\{1, 2, 3, 4, 5, 6\}$, Event $A=\{1, 2, 3\}$ Event $B=\{2, 3, 4\}$. Then $P(A/B)$ will be :

(a) $1/3$

(b) $2/3$

(c) $4/6$

(d) $5/6$

(3) A variable is called random variable if :

(a) It is a real valued function

(b) It has domain as sample space

(c) It has range as real line

(d) It has all above

(4) If

x	: 1,	2,	3,	4
$P(x)$	: 0.3	0.2	0.1	0.4

the value of E (x^3) will be : (closest answer)

(a) 24.2

(b) 26.3

(c) 28.6

(d) 30.2

(5) If x : 1, 2, 3, 4, 5 and y : 1, 2, 3, 4, 5, then correlation between x & y will be :

(a) –1

(b) 0

(c) +1

(d) +0.5

(6) If all values in a data set are same then its standard deviation will be :

(a) 0

(b) – 1

(c) + 1

(d) + 2

(7) Permutation is used for :

(a) Arrangements of non-distinct objects

(b) Arrangements of distinct objects

(c) Selection of non-distinct objects

(d) Selection of distinct object

(8) If 6 boys of a school are to be placed at 4 identical chairs then how many ways it can be :

(a) 360

(b) 300

(c) 30

(d) 15

(9) The value of $\left[{}^{3}p_{2} + {}^{6}c_{3} + {}^{4}c_{2}\right]$ will be : (find closed one) :

(a) 30.5

(b) 27.5

(c) 36.5

(d) 25.5

(10) The value of ${}^{3}c_{0} + {}^{3}c_{1}x + {}^{3}c_{2}x^{2}$ at $x=2$ will be :

(a) 19

(b) 20

(c) 22

(d) 16

SECTION - B

(Short Answer Type Questions) 4×5=20

Note :– Attempt any **four** questions. Each question carries **five** marks.

1. If $S=\{1, 2, 3, 4\}$ construct two independent events.

2. If $S=\{1, 2, 3, 4, 5, 6\}$ construct two events A and B such that $P\left(\frac{A}{B}\right)=1$.

3. If $f(x)=Kx^3+x^2+x$; $0<x<1$; at what value of K the $f(x)$ will be probability density function of random variable X.

4. Let data is 1, 2, 1, 2, 1, 2, 1, 2. Calculate the variance of the data.

5. Prove that ${}^{N-n}C_r = {}^{N-n}C_{N-n-r}$ holds

6. There are five balls to be placed in three bowls. How many cases possible when—

   Case I : When balls are of different colour and bowls are also different.

   Case II : When balls are of different colour and bowls are same type.

SECTION - C

(Long Answer Type Questions) 3×10=30

Note :– Attempt any **three** questions. Each question carries **ten** marks.

1. State and prove the followings—
   (a) Law of Addition of probabilities
   (b) Law of multiplication of probabilities
   (c) Bayes theorem

2. Compare discrete and continuous random variables with examples—

   Let x : 5 10 15 20 25

   $P(x)$: K 2K 3K 4K 5K

   At what K, the $P(x)$ will be p.m.f. of discrete random variable . Find $E(x)$ = ?

3. Discuss measures of central tendency and measure of dispersion.
   Calculate standard deviations of following data :

X	F
10-20	5
20-30	7
30-40	11
40-50	15
50-60	8

4. Write a note on generating function of combinations.

5. Discuss the distribution of distinct and non-distinct objects.

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