U7790

Reg. No.: .....

Name:.....

University of Kerala

First Semester Degree Examination, November 2024
Four Year Under Graduate Programme
Discipline Specific Core Course
Statistics
UK1DSCSTA109 Descriptive Statistics And Probability
Academic Level: 100-199

Time:1½ Hours **Max.Marks:42**

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
6 Marks. Time: 6 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	The average of the absolute differences of observations from a constant is called	Remember	CO 2
2.	If mean >Median>Mode, then the skewness is ……..	Understand	CO 3
3.	Say TRUE or FALSE: Mutually exclusive events are always independent	Understand	CO 4
4.	If S is the sample space, P the probability measure and B, the sigma field of events, (S,P,B) is called ……	Understand	CO 6
5.	A random variable taking uncountable values is called	Understand	CO 5
6.	If X and Y are two independent variables, E (XY) is	Remember	CO 10

Part B.
Answer All Questions Short Answer. 2 Marks Each.
8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	What are different sources of primary data	Understand	CO 1
8.	The mean and median of a frequency distribution are 23.2 and 25.5 respectively. Find the approximate value of its mode. Calculate Pearson's coefficient of skewness if the standard deviation is 4.5	Apply	CO 3
9.	If a person draws a card from a pack of 52 cards, what is the probability that card is either ace or a king	Apply	CO 5
10.	If X is a discrete random variable that takes values 1, 2, · · · , n with equal probabilities 1/n, find mean of X.	Apply	CO 10

Part C.

Answer all 4 Questions, choosing among options (A or B)within each question.

Long Answer. 7 marks each. 28 Marks. Time: 60 Minutes

<table>
<tr><th>Qn. No.</th><th>Question</th><th>Cognitive Level</th><th>Course Outcome (CO)</th></tr>
<tr><td rowspan="2">11.</td><td>A. Calculate the quartile deviation for the following data of annual income of families in thousands of rupees.
Income : <499 500-999 1000-1999 2000-2999 >3000
No.of families: 5 25 40 20 10</td><td>Evaluate</td><td>CO 3</td></tr>
<tr><td>B. Calculate Pearson’s coefficient of skewness for the following distribution.
<table><tr><td>Variable</td><td>0-5</td><td>5-10</td><td>10-15</td><td>15-20</td><td>20-25</td><td>25-30</td><td>30-35</td></tr><tr><td>Frequency</td><td>3</td><td>5</td><td>9</td><td>15</td><td>21</td><td>10</td><td>7</td></tr></table>.</td><td>Evaluate</td><td>CO 3</td></tr>
<tr><td rowspan="2">12.</td><td>A.
i) A bag contains 3 red and 6 white and 7 blue balls. What is the probability that two balls drawn are white and blue.
ii) There is a group of 40 people of whom 20 are engineers under 30 years of age and 10 are engineers over 30.Of the remaining 10 non engineers 4 are under 30.If a person is selected at random from the group, what is the probability that the person is an engineer or a person over 30?.</td><td>Apply</td><td>CO 5</td></tr>
<tr><td>B. A letter of the english alphabet is chosen at random. calculate the probability that the letter so chosen is a) vowel b)precedes m and is a vowel c)follows m and is a vowel</td><td>Apply</td><td>CO 5</td></tr>
<tr><td rowspan="2">13.</td><td>A. A. For a random experiment, the sample space S= {1,2,3,4,5,6}, A={1,2,3}, and B={3,4,5,6}. Write down the events
(a) A^C (b) B^C (c) AUB (d) A∩B (e) (f) $\left(A^C UA\right)$</td><td>Evaluate</td><td>CO 4,5</td></tr>
<tr><td>B. From a city population , the probability of selecting (i). a male or a smoker is 7/10 , (ii). a male smoker is 2/5 and a male if a smoker is already selected is 2/3. Find the probability of selecting
(a) a non-smoker
(b). a male
(c). a smoker if a male is first selected</td><td>Evaluate</td><td>CO 4,5</td></tr>
<tr><td rowspan="2">14.</td><td>A. i) State Bayes theorem.
ii) The probabilities of X,Y and Z becoming managers are 4/9,2/9 and 1/3 respectively. The probabilities that the bonus scheme will be introduced if X,Y and Z becomes managers are 3/10,1/2 and 4/5 respectively. The Bonus scheme was introduced. What is the probability that X was the emanager?</td><td>Apply</td><td>CO 7, 8, 9</td></tr>
<tr><td>i) B. What are the properties of the pdf, f(x) of a random variable X?
ii) The probability density function of a random variable X is $f(x)=ae^{-ax}, x>0$. Find the moment generating function of X and hence the first two raw moments?</td><td>Apply</td><td>CO 7, 8, 9</td></tr>
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