Statistics Question Bank

Second Paper

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Contents

Chapter 1

Probability

1.1 Creative Questions

1. **It is observed that in a college, there are 100 students, of whom 30 play football, 40 play cricket, and 20 play both.**

   (a) What is the range of probability? 1

   (b) What is the relationship between independence and mutual excluvity? 2

   (c) Are the probabilities of playing cricket and that of football independent? Prove. 3

   (d) If a student is selected randomly, and if he does not play cricket, what is the probability that he plays football? 4

2. **Sakib has recently graduated from the University of Dhaka. he applies to two firms - EduCube & Digic- for a Data Analyst job. The probability of hiring by EduCube is 0.8 and by Digic is 0.4. The probability that none hires is 0.5.**

   (a) What is a sample space? 1

   (b) Explain how to find $P(\bar{A} \cap B)$ using Venn Diagram. 2

   (c) Find the probability of hiirng by by Digic but not by EduCube. 3

   (d) Find the probability that no firm will reject him. 4

3. **Recently there is an increase in the number of electronic medias in Bangladesh. A professor stated in the class room that very few people now resort to print media for news. A research indicates 70% people collect news from electronic media, 60 % from print media, and 50 % from both.**

   (a) What is an impossible event? 1

   (b) Write the event "None of the two occurs" in two different notations. 2

   (c) What is the probability of getting news from at most one type of media? 3

   (d) Is the professor correct in his/her statement? Analyze. 4

1.2 Short Questions

1. Question 1

2. Question 2

3. Question 3

4. Question 4

Chapter 2

Random Variable and Probability Function

2.1 Creative Questions

1. **The probability density function of a continuous random variable is**

$$f(x) = \begin{cases} kx^2 + kx + \frac{1}{8}, & 0 \leq x \leq 2 \\ 0, & otherwise \end{cases}$$

   (a) What is a continuous random variable? 1

   (b) Find the value of k 2

   (c) Find the probability that the values of x would lie between1 and 3. 3

   (d) Find the 40th percentile of the distribution and explain. 4

2.2 Short Questions

1. What is a continuous random variable? 1
2. Question 1
3. Question 1
4. Question 1

Chapter 3

Mathematical Expectation

3.1 Creative Questions

3.2 Short Questions

Chapter 4

Binomial Distribution

4.1 Creative Questions

4.2 Short Questions

Chapter 5

Poisson Distribution

5.1 Creative Questions

1. **In winter, the probability that it rains on a particular day is 0.015. An analyst observes 100 winter days.**

   (a) What is an experiment? 1

   (b) When can the Poisson distribution be approximated by the Binomial distribution? 2

   (c) Find, using Binomial distribution, the probability that it would not rain at all on the observed days. 3

   (d) Find the probability in 3(c) using Poisson distribution. 4

5.2 Short Questions

Chapter 6

Normal Distribution

6.1 Creative Questions

6.2 Short Questions

Chapter 7

Index Number

7.1 Creative Questions

7.2 Short Questions

Chapter 8

Sampling

8.1 Creative Questions

8.2 Short Questions

Chapter 9

Vital Statistics

9.1 Creative Questions

1. **For projection of population in a future time period, demographers use simple, geometric or exponential growth technique. Each method has its advantages and disadvantages.**

   (a) What is geometric growth? 1

   (b) In geometric growth method, obtain the formula for time required for the population to get doubled [denote rate as r]. 2

   (c) In exponential method, how much unit of time is required for the population to get tripled? 3

   (d) For projecting (predicting future values), is geometric growth method better than the exponential method? Justify. 4

9.2 Short Questions

Conclusion

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