Jaypee University of Information Technology, Waknaghat

TEST-1 Examination - September 2016

Course Title: Probability and Statistics
Course Code: 10B11MA311
Semester: IV

Program: B.Tech (BI/BT)
Marks: 15 marks
Time: 1 hour

Instructions: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. The frequency distribution of weight in grams of mangoes of a given variety is given below.

Weight (grams)	410-419	420-429	430-439	440-449	450-459	460-469	470-479
No. of Mangoes	14	20	42	54	45	18	7

   Calculate the arithmetic mean, median and mode.   (4 Marks)

2. Draw a histogram from the following table and measure the *modal* value.   (2 Marks)

Size	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	5	11	19	21	16	10	8	6	3	1

3. A random experiment has a sample space $\Omega = \{a, b, c\}$. Suppose that $\mathbb{P}(\{a, c\}) = \frac{5}{8}$ and $\mathbb{P}(\{b, c\}) = \frac{7}{8}$. Use the axioms of probability to find the probabilities of the elementary events.   (2 Marks)

4. Suppose there are fair coins and two types of biased coins in a bag. The numbers of them in the bag are 4, 5, and 6 and the probabilities of tossing a head using each types are 0.5, 0.3, and 0.6 respectively. If a coin is drawn randomly from the bag and tossed, what is the probability of tossing a head?   (3 Marks)

5. Consider the density function of *lifetime* **X** of a certain type of electronic device:

$$f(x) = \begin{cases} \frac{10}{x^2} & , \quad x \geq 10 \\ 0 & , \quad x < 10 \end{cases}$$

   (a) Find $\mathbb{P}(\mathbf{X} > 20)$.

   (b) What is the *cumulative distribution function* of **X**?   (4 Marks)

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