

Jaypee University of Information Technology, Wanknaghat

TEST-1 Examination - September 2017

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

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

Instructions: ALL questions are compulsory.

1. DeCenzo Specialty Food and Beverage Company has been serving a cola drink with an additional flavoring, Cola-Plus, that is very popular among its customers. The company is interested in customer preferences for Cola-Plus versus Coca-Cola, Pepsi, and a lemonlime beverage. They ask 100 randomly sampled customers to take a taste test and select the beverage they preferred most. The results are shown in the following table:

Beverage	Number
Cola-Plus	40
Cola-Cola	25
Pepsi	20
Lemon-Lime	15
Total	100

Develop a suitable graph (histogram/bar) to depict the information.

(3 Marks)

2. A shortage of candidates has required school districts to pay higher salaries and offer extras to attract and retain school district superintendents. The following data show the annual base salary (\$1000s) for superintendents in 20 districts in the greater Rochester, New York, area. Use 7 classes of 150-159, 160-169, and so on in answering the questions.

187	184	174	185
175	172	202	197
165	208	215	164
162	172	182	156
172	175	170	183

(a) Construct a frequency distribution.

(b) What percentage of the superintendents make more than \$200,000?

(3 Marks)

3. The Air Transport Association of America publishes figures on the busiest airports in the United States. The following frequency distribution has been constructed from these figures for a recent year. Assume these are population data.

No. of passengers Arriving and Departing (millions)	No. of Airports (f)
20-30	8
30-40	7
40-50	1
50-60	0
60-70	3
70-80	1

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Suppose that $\mu = 38$, calculate the variance. (3 Marks)

4. The results of a national survey showed that on average, adults sleep 6.9 hours per night. Suppose that the standard deviation is 1.2 hours. Use Chebyshev's theorem to calculate the percentage of individuals who sleep between 4.5 and 9.3 hours. (2 Marks)
5. At a private hospital, there is some concern about the high turnover of nurses. A survey was done to determine how long (in months) nurses had been in their current positions. The responses (in months) of 20 nurses were 2, 5, 5, 6, 7, 7, 8, 9, and 10. Suppose that $Q_1 = 5$, $Q_2 = 7$, $Q_3 = 8.5$. (2 Marks)
- (a) Find the interquartile range.
- (b) Make a box-and-whisker plot.
6. A bag contains 6 white and 9 black balls. Four balls are drawn at a time. Find the probability for the first draw to give 4 white and the second to give 4 black balls in case of balls being not replaced before the second draw. (2 Marks)

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