BBA in TM, 4th Sem.   Date: March 11, 2024 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Mid-Semester Examination   Summer Semester, A.Y. 2022-2023
Course Code : Math 4461   Time : 1.5 Hours
Course Title : Business Statistics   Full Marks   : 75

Answer **all the 3 (three)** questions. All questions carry equal marks. Marks of each question are
written in the right margin and corresponding CO and PO are written within brackets.

1. a)	Why do you think standard deviation is the best measure of dispersion? Describe the characteristics and limitations of mean, median, mode, and geometric mean.	13	(CO1) (PO1)
b)	Write short notes for each of the following: i. Inferential Statistics ii. Interval level data iii. Frequency Distribution iv. Chebyshev's theorem v. Least Square Method. vi. Steam-and-Leaf Displays	12	(CO1) (PO1)

2. The following data give the weekly amounts spend on groceries for a   25   (CO1)
    sample of 40 households: (PO1)

271	363	159	76	227	337	295	319
279	205	279	266	199	177	162	232
192	181	321	309	246	278	50	41
116	100	151	240	474	297	170	188
429	294	570	342	279	235	434	123

Requirements:
  i.   Develop a frequency distribution from the above data and determine
       mean, median, and standard deviation from the frequency
       distribution. (12)
  ii. Portray the frequency distribution as a cumulative frequency
       polygon and determine 40% of households spend how much
       money. (06)
  iii. Determine whether there is any outlier in the dataset and find out the
       skewness of the distribution. Interpret the results. (07)

3. a)	Describe different rules of addition and multiplication.	08	(CO1) (PO1)
b)	The credit department of Lion's Department Store in Anaheim, California, reported that 30 percent of their sales are cash or check, 30 percent are paid with a credit card and 40 percent with a debit card. It is noteworthy that 20 percent of the cash or check purchases, 90 percent of the credit card purchases, and 60 percent of the debit card purchases are for more than $50. Ms. Tina Stevens just purchased a new dress that cost $120. What is the probability that she paid cash or check?	06	(CO1) (PO1)

c) Last month, the National Association of Theater Managers conducted a survey of 500 randomly selected adults. The survey asked their age and the number of times they saw a movie in a theater. The results are summarized in the following table: **06 (CO1) (PO1)**

Movies Per Month	Less than 30 (B₁)	Age 30 up to 60 (B₂)	60 or Older (B₃)	Total
0 (A₁)	15	50	10	75
1 or 2 (A₂)	25	100	75	200
3,4, or 5 (A₃)	55	60	60	175
6 or More (A₄)	5	15	30	50
Total=	100	225	175	500

Determine the probability of:

   i.   Selecting an adult whose age is less than 60 years or has attended 1 or 2 movies.

   ii. Selecting an adult who attended 3 or more movies per month or 60 years of age or older.

   iii. Selecting an adult who attended 3,4 or 5 movies per month and is 60 years of age or older.

d) The Pitney Pipe Company is one of several domestic manufacturers of PVC pipe. The quality control department sampled 600 ten-foot lengths. At a point 1 foot from the end of the pipe, they measured the outside diameter. The mean was 13.0 inches and the standard deviation 0.1 inches. If the shape of the distribution is not known, at least what percent of the observations will be between 12.85 inches and 13.15 inches? **05 (CO1) (PO1)**