**Q3** (12 Marks) For the following data represent the GPA (X) for 15 students at KFUPM and their seniority (V).

| X | 1.9 | 2.3 | 2.5 | 2.0 | 2.0 | 2.6 | 3.0 | 2.5 | 2.7 | 2.6 | 2.8 | 1.5 | 2.2 | 1.9 | 1.5 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| V | J | F | Se | So | Se | F | J | Se | J | Se | Se | So | Se | Se | So |

**2**  a. Construct a bar chart for the variable V.

**8**  b. Construct a box plot for the variable X and comment on the shape of the graph.

**2**  c. Find the appropriate measure of central tendency for the variable V.

$a - f$



The Graph is

b. Graph left skewed & No outliers.

$IQR = 0.7$

1.5, 1.5, 1.9, 1.9, 2.0, 2.0, 2.2, 2.3, 2.5, 2.5, 2.6, 2.6, 2.7, 2.8, 3
min ... Q1 ... Q2 ... Q3 ... max

$LL = 1.9 - 1.05$
$= 0.85$

$UL = 2.6 + 1.05$
$= 3.65$

c. It is the mode which is Se.

**Q4** (5 Marks)  A store manager tracks the number of customer complaints each week.  The following data reflect a random sample of ten weeks.

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 19 | 4 | 6 | 8 | 9 | 6 | 4 | 0 | 3 |

Find the range, variance and standard deviation of the number of customer complaints.

<u>Show the details of your work.</u>

① Range = Max - Min = 19 - 0 = 19

③ Variance = 27.7729

① Standard Deviation = 5.27

**Q5** (5 Marks)  The following data reflect the number of customers who test drove new cars each day for a sample of 20 days at a car dealership in Dammam.

5 7 2 9 4 9 7 10 4 7 5 6 4 0 7 6 3 4 14 6

Construct the relative frequency histogram and comment on the distribution of the number of cars sold.

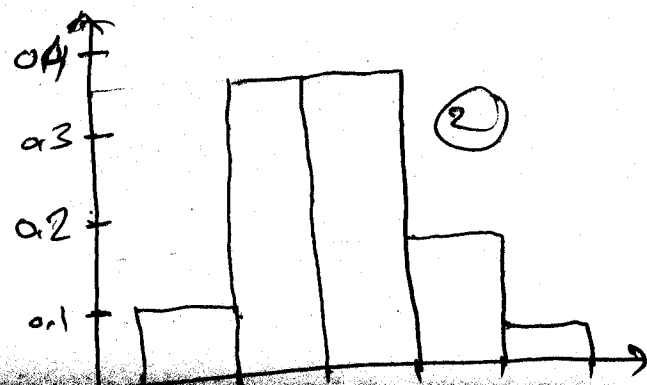First construct a frequency distribution:

① $n = 5.3 \approx 5$

② Range = 14

③ Interval width = $\frac{14}{5} = 2.8 \approx 3$

③

| classes | f | c.f | rf |
|---|---|---|---|
| [0-3) | 2 | 2 | 0.1 |
| [3-6) | 7 | 9 | 0.35 |
| [6-9) | 7 | 16 | 0.35 |
| [9-12) | 3 | 19 | 0.15 |
| [12-15) | 1 | 20 | 0.05 |
| Total | 20 | | 1 |

**Q6 (6 Marks)** Answer <u>any two</u> of the following for 3 marks each

1. A recent study in the restaurant business determined that the mean tips for male waiters per hour of work are \$6.78 with a standard deviation of \$1.65. The mean tips per hour for female waiters are \$7.86 with a standard deviation of \$2.20. Based on this information, which waiters have more stable tips? Explain.

$$CV(male) = \frac{1.65}{6.78} \times 100 = 24.34\,\%$$

$$CV(female) = \frac{2.20}{7.86} \times 100 = 28\,\%$$

So, the MALE waiters have MORE stable tips.

2. Give three reasons for drawing a sample rather than examining the whole population of interest.

1. Save time, effort and cost.

2. Difficulty to reach all pop. elements.

3. Some elements of a pop. can b e DAMAGED.

3. The number of days that homes stay on the market before they sell in Jeddah is bell-shaped with a mean equal to 56 days. Further, 95 percent of all homes are on the market between 40 and 72 days. Based on this information, what is the standard deviation for the number of days that houses stay on the market in Jeddah?

$$\mu = 56$$

$$(\mu - 2\sigma, \mu + 2\sigma) = (40, 72)$$

$$56 - 2\sigma = 40 \Rightarrow 56 - 40 = 2\sigma$$

$$\frac{16}{2} = 2\sigma \Rightarrow \boxed{\sigma = 8}$$

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