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B.Tech. Ind. Engg. & Mgt. (Spl. in TQM) PT (Sem.-3)

QUALITY IMPROVEMENT TOOLS

Subject Code : IEM-304

M.Code : 61014

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. Attempt Any EIGHT questions from SECTION-A carrying TWO marks each.
2. Attempt Any FOUR questions out of SIX questions from SECTION-B carrying SIX marks each.

SECTION-A

Q1. Answer briefly :

- a. What do you know by creative thinking?
- b. Write various objectives of project-by-project approach.
- c. What is the role of flow diagram in problem solving? Discuss.
- d. Discuss some situations where brainstorming technique can be applied.
- e. What do you mean by variable data?
- f. Discuss the use of scatter diagram.
- g. Write disadvantages of Histogram.
- h. When can pareto diagram be used? Explain.
- i. How creativity is different from innovation? Discuss.
- j. Write various steps involved in problem solving approach.

SECTION-B

- Q2. An institution has analyzed the last 2 years data and observed that the placement of their students in particular discipline has declined by 20%. Explore the causes of declined placement of the students using cause and effect diagram. Once the causes are available also analyze the causes and give suggestions to improve the performance of students.
- Q3. An industry has to go through the following steps for manufacturing and introducing a new product to the market. Draw a detailed flow diagram showing the process steps given using all standard symbols. Also suggest any improvement in the process flow.
- Product Concept
 - Research
 - Product design development
 - Research and development of the final design
 - Computer-aided design
 - Computer-aided manufacturing
 - Prototype Testing
 - Manufacturing
 - Assembly
 - Feedback and Testing
 - Product Development
 - Final Product
- Q4. The following data set shows the heights in inches for the boys in a class of 40 students
- 66; 66; 67; 67; 68; 68; 68; 68; 69; 69; 69; 70; 71; 72; 72; 72; 73; 73; 74
- The following data set shows the heights in inches for the girls in a class of 40 students
- 61; 61; 62; 62; 63; 63; 63; 65; 65; 65; 66; 66; 66; 67; 68; 68; 68; 69; 69; 69;
- Construct a box plot using a graphing calculator for each data set and state which box plot has the wider spread for the middle 50% of the data.

- Q5. A survey carried out for improving customer service at a restaurant identified ten types of complaints, and collected data on the frequency of each type (see table). Identify the “vital few” factors that contributed to poor customer base of the restaurant with the help of Pareto diagram.

Compliant Type	Frequency
Too noisy	27
Overpriced	789
Food is tasteless	65
Food not fresh	9
Food is too salty	15
Not clean	30
Unfriendly staff	12
Wait time is more	109
Uncomfortable atmosphere	45
Small portions	621

- Q6. A chemical engineer would like to determine if a relationship exists between the extrusion temperature and the strength of a certain formulation of plastic. He oversees the production of 15 batches of plastic at various temperatures and records the strength results as shown in the table.

Temperature (°C)	120	125	130	135	140	145	150	155	160	165
Strength (N/m ²)	18	22	28	31	36	40	47	50	52	58

Draw scatter diagram between these two variables and answer following questions :

- Does there appear to be a relationship between the study variables?
 - Classify the relationship as: Linear, curvilinear, no relationship.
 - Classify the correlation as positive, negative, or no correlation.
 - Classify the strength of the correlation as strong, moderate, weak, or none.
- Q7. Explain the importance of graph and charts in data collection. What is missing or erroneous data? Also discuss steps to improve representativeness of collected data.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.