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Total No. of Pages : 03

Total No. of Questions : 09

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

**QUALITY IMPROVEMENT TOOLS**

**Subject Code : IEM-304**

**Paper ID : [61014]**

**Time : 3 Hrs.**

**Max. Marks : 40**

**INSTRUCTIONS TO CANDIDATES :**

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

**SECTION-A**

**Q1. Answer briefly :**

- a. Enlist the elements of effective problem solving.
- b. Write various technique of brainstorming.
- c. What do you mean by attribute data?
- d. What is role of stratification in data analysis?
- e. Write advantage of Histogram.
- f. Discuss the steps in construction of pareto diagram.
- g. How creativity is related with quality?
- h. What do you mean by charter and mission statement?

### SECTION-B

- Q2. An institution has analyzed the last 2 years data and observed that the result of their students in particular discipline has declined by 20%. Explore the causes of poor result performance 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. You need to go through the following steps for getting a hotel room booking through their online database. Draw a detailed flow diagram showing the process steps given using all standard symbols. Also suggest any improvement in the process flow.
- Determine your budget.
  - Think about your required accommodations during your stay.
  - Identify your ideal location or area.
  - Search for hotels online.
  - Compare hotels using discounted search tools.
  - Call the hotel to get a better rate.
  - Reserve the room online.
  - Pay for the room with your credit/debit card.
  - Confirm the room is booked.
  - Read over your receipt to confirm that everything is correct.
- Q4. Test score for a college statistics class held during the day are :
- 99; 56; 78; 55.5; 32; 90; 80; 81; 56; 59; 45; 77; 84.5; 84; 70; 72; 68; 32; 79; 90
- Test score for a college statistics class held during the evening are :
- 98; 78; 68; 83; 81; 89; 88; 76; 65; 45; 98; 90; 80; 84.5; 85; 79; 78; 98; 79; 81; 25.5
- Find the smallest and largest value, the median, and first and third quartile for the day class
  - Find the smallest and largest value, the median, and first and third quartile for the evening class
  - Construct a box-plot for each data set and state which box plot has the wider spread for the middle 50% of the data.

Q5. A team identified eight types of surgical setup errors, and collected data on the frequency of each type (see table). Identify the “vital few” factors that contributed to errors during surgical setup with the help of Pareto diagram.

Error Type	Frequency
Wrong supplier	67
Excess count	10
Too few count	10
Wrong size	24
Wrong sterile instrument set	17
Missing item	8
Damaged item	6
Others	2

Q6. Matt sells ice-creams at outdoor events. He often buys too much or too little ice-cream from the wholesalers, so does not make as much profit as he would like. He decides to record how many icecreams he sells over a number of days, to see whether there is a link between the temperature and number of ice-creams sold. The table below represents the data collected for 12 days.

<b>Temp. (°C)</b>	21	26	15	24	18	29	20	27	23	17	30	19
<b>Number of icecreams sold</b>	70	86	50	80	59	96	66	92	74	54	100	62

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. Discuss various data collection methods in detail. Also discuss methods of interpreting collected data and validating the results.
- Q8. Differentiate between creativity and innovation.
- Q9. What are high level flow diagrams? Explain with examples.