22657

24225

3 Hours / 70 Marks   Seat No.

Instructions –   (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **Attempt any FIVE of the following:**   **10**

a) Define work study. State it's types.

b) Define :–

i)   Event

ii)   Activity.

c) State the types of display.

d) State any four objective of inspection.

e) Define quality of conformance.

f) Define :–

i)   Median

ii)   Mode

g) State benefits of Statistical Quality Control. (Any four)

P.T.O.

Marks

2. **Attempt any THREE of the following:** **12**

a) Explain basic steps in Method Study.

b) Explain factors affecting process planning.

c) Define anthropometry and explain it's types.

d) Explain 'Cost of Quality and value of Quality' with the help of graph.

3. **Attempt any THREE of the following:** **12**

a) Prepare Material type flow process chart for a 'Task of Watering the Garden'.

b) Explain the symbols used in process chart. (Any four)

c) Prepare operation sheet and sequence of operation by taking suitable example. (Assume suitable cutting parameter.) Refer Figure No. 1.
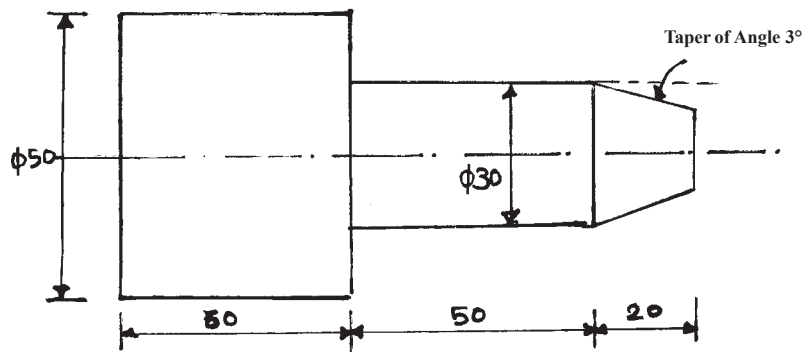

Fig. No. 1

d) Explain the role of Ergonomics in environmental Man-Machine Relationship.

4. **Attempt any THREE of the following:** **12**

a) Explain concept of 'Line Balancing' with example.

b) Explain types of control used in ergonomics. (Any four)

c) Explain need of Ergonomics.

d) Compare between inspection and quality control.

Marks

e) In a lot of 50 pieces, each subgroup is of 5 pieces and for 10 subgroups $\overline{X}$ and R values for the length of pieces are given into below table. Draw proper control chart and conclude.

Sr. No.➝	1	2	3	4	5	6	7	8	9	10
$\overline{X}$	2.12	1.99	1.80	2.00	1.99	2.45	1.85	1.70	1.98	2.30
R	0.03	0.01	0.02	0.04	0.02	0.01	0.05	0.04	0.06	0.03
$A_2 = 0.577$, $D_3 = 0$, $D_4 = 2.11$, $d_2 = 2.362$										

5. Attempt any TWO of the following: 12

a) Shop floor activity consist of three elements. Find standard time for activity. The allowance are given as percentages of Basic Time.

Element	Observed time (Min.	Rating	Allowance
I	1	100%	20%
II	2	110%	15%
III	3	120%	10%

b) Explain Cause Effect Diagram, Histogram, Pareto chart with sketch.

c) The design specification for component are 100 ± 0.5 mm, whereas process average is 99.9 and standard deviation is 0.18. Identify process capability and conclude it.

6. Attempt any TWO of the following: 12

a) Explain need of inspection in Industries.

b) Explain double sampling plan with suitable example.

c) Following are the inspection results of soldered PCB boards for 6 days. Draw proper control chart and conclude.

Day	1	2	3	4	5	6	7
No. of PCB checked	20	25	22	20	25	24	23
Defects found	4	3	2	3	2	4	2

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