

# 22657

**21222**

**3 Hours / 70 Marks**

Seat No.

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15 minutes extra for each hour

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) 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) State the need of inspection.
- b) Define Ergonomics.
- c) Draw the symbol of following therbling
- (i) Transport loaded
- (ii) Search
- d) Define process planning.
- e) State different SQC tools. (Any two)
- f) State any two symbols use in process chart.
- g) State the quality characteristics. (Any two)

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain the concept of line balancing.
  - b) Explain Man-machine relationship in terms of ergonomics.
  - c) Compare acceptance sampling with 100% inspection.  
(Four points)
  - d) Explain relation between 'cost of quality' and 'value of quality' with help of graph.
- 3. Attempt any THREE of the following:** **12**
- a) Enlist the allowances consider while calculating standard time and explain any one.
  - b) Draw OC curve and explain the producer's risk and consumer's risk.
  - c) Differentiate inspection and quality control. (Four points)
  - d) Apply principles of Ergonomics for design of control members like push button and knobs.
- 4. Attempt any THREE of the following:** **12**
- a) Explain importance of TQM.
  - b) Construct two handed process chart for assembly of nut, bolt and washers.
  - c) Write any two advantages and limitations of ISO 9000.
  - d) Differentiate between variable control chart and attribute control chart based on any four parameters.
  - e) Prepare operation process sheet and sequence of operation for step turning operation on lathe machine.

**5. Attempt any TWO of the following:****12**

- State and explain in brief any six ergonomics consideration in design of machine element.
- Explain critical path method with suitable example and write its applications.
- In a manufacturing process following observations are recorded. Draw appropriate control chart and conclude.

Sample No.	Defective found out of 50
1	4
2	5
3	0
4	3
5	2
6	5
7	1
8	6

**6. Attempt any TWO of the following:****12**

- Prepare outline process chart for replacement of four wheeler tyre with use of jack.
- Explain 5S technique with suitable example.
- Following are the inspection result of casting for a shift. Draw appropriate control chart and write your conclusion.  
Given

$$A2 = 0.58, \quad d3 = 0, \quad d4 = 2.11$$

Time (hrs)	7 to 8 am	8 to 9 am	9 to 10 am	10 am to 11 am	11 am to 12 pm	12 to 1 pm	1 to 2 pm	2 to 3 pm
No. of defects casting	08	07	09	06	04	05	04	06
Casting inspected	300	350	400	400	350	350	350	320