

17609

15162

3 Hours / 100 Marks

Seat No.

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

Marks

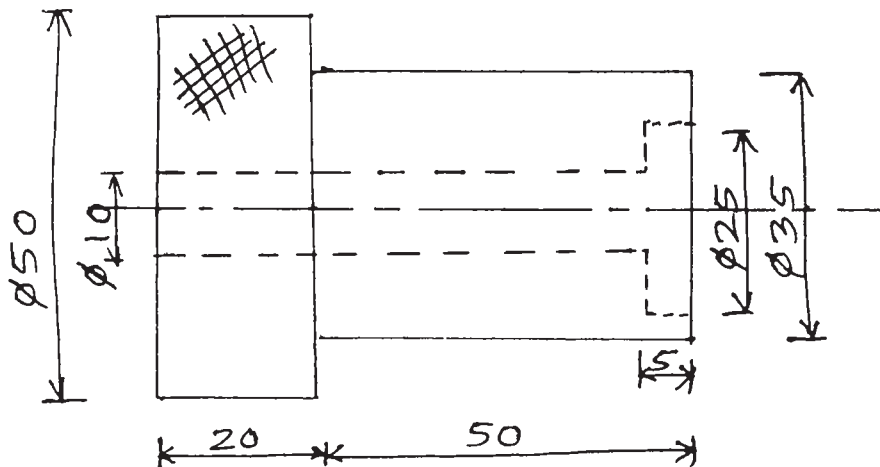
1. a) Attempt any THREE of the following: 12
- (i) Define productivity. Explain labour productivity with example.
 - (ii) Explain the concept of production system with proper input output model.
 - (iii) Compare Job and Batch production system with respect to:
 - (1) Equipments
 - (2) Investment
 - (3) Labour
 - (4) Examples of products.
 - (iv) What is line balancing? Why it is necessary?
- b) Attempt any ONE of the following: 6
- (i) Draw the layout of two wheeler service station. Justify the type of layout you have adopted.
 - (ii) Explain how Gantt chart is used in project planning with proper example.

P.T.O.

2. Attempt any TWO of the following:

16

- a) Enlist any four factors which affect selection of material handling system. Explain which type of material handling system is suitable for:
- (i) Unloading two wheelers from truck
 - (ii) Stacking of pallets in store racks.
- b) State the information required to do process planning. What is working drawing?
- c) Prepare operation process sheet and decide sequence of operation for the component shown in Figure No. 1. Assume suitable material and cutting conditions.

Fig. No. 13. Attempt any FOUR of the following:

16

- a) Write any one application for each of following material handling equipments:
- (i) Bucket conveyors
 - (ii) Fork lift trucks
 - (iii) Jib crane
 - (iv) Gravity chutes

- b) Define process planning. Enlist various steps in process planning.
- c) What are the factors to be considered to determine stages of inspection during process planning.
- d) Explain the design principles of plant layout.
- e) Write any four objectives of method study.
- f) Draw the labelled sketch of leaf jig.
4. a) **Attempt any THREE of the following:** **12**
- (i) What is ejector? State its necessity in the design of jigs and fixtures.
- (ii) Explain the concept of Kaizen with example.
- (iii) Enlist any four basic components used in robotic systems also write their functions.
- (iv) What is lean manufacturing? State its advantages.
- b) **Attempt any ONE of the following:** **6**
- (i) Draw the two handed process chart for an activity of replacing the old battery of mobile handset.
- (ii) Describe pull type of JIT system with an example.
5. **Attempt any FOUR of the following:** **16**
- a) Differentiate between jig and fixture with respect to:
- (i) Definition
- (ii) Cost
- (iii) Construction
- (iv) Application
- b) Enlist general principles of jig and fixture design.
- c) Explain string diagram with sketch.
- d) Describe the vacuum actuated grippers with example.
- e) Describe cylindrical body and arm assembly robot with neat sketch.
- f) Write the classification of sensors used in robotics.

6. Attempt any TWO of the following:

- a) Enlist the various functions of PPC.

Describe:

- (i) Scheduling
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- (ii) Routing in details

- b) A particular activity on the shop floor consists of three elements. Calculate standard time for the activity. Total allowances are given as percentage of normal

Elements	I	II	III
Observed time (min)	1.20	0.50	0.80
Rating factor (%)	80	90	75
Total Allowances (%)	22	19	20

- c) Describe any two joint types used in robotic arm and wrist.
