

17609

16117

3 Hours / 100 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers 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. a) **Attempt any THREE of the following:** **12**
 - (i) Define production and list the types of production system.
 - (ii) How productivity is measured? Explain any one method of productivity measurement.
 - (iii) Explain techniques for improving productivity.
 - (iv) Define dispatching and list any two functions of dispatching department.

- b) **Attempt any ONE of the following:** **6**
 - (i) Discuss in brief important factors to be considered while making 'site selection' for a new industry/plant.
 - (ii) Explain the concept of line balancing. State its importance and objectives.

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- 2. Attempt any TWO of the following:** **16**
- a) Name different types of material handling equipments used in industry. Explain any one with neat sketch.
 - b) State and explain the various factors affecting process planning.
 - c) How inspection stages are determined? State the significance of operation sheet.
- 3. Attempt any FOUR of the following:** **16**
- a) State different types of plant layout. Explain any one type.
 - b) State and explain the basic principle to be followed to develop a good plant layout.
 - c) Explain in brief steps involved in process planning.
 - d) State and explain how the different operations can be combined?
 - e) What are the objectives of method study.
 - f) Differentiate between Jig and Fixture.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Explain any two clamping devices with neat sketch.
 - (ii) Explain the concept of ERP.
 - (iii) Explain the concept of continuous improvement (Kaizen).
 - (iv) Explain Robot Anatomy and structure with sketch.
- b) Attempt any ONE of the following:** **6**
- (i) Construct two handed process chart for the assembly of Nut and Bolt with summary.
 - (ii) Explain pull and push types of manufacturing system.

5. Attempt any FOUR of the following:**16**

- a) Explain 3-2-1 principle of location with suitable example.
- b) State and explain the general principle of Jig Fixture design.
- c) What is meant by '5S'? State meaning of each "S" in detail.
- d) Explain spherical configuration with sketch.
- e) Explain the tactile sensors in robots.
- f) What are grippers? Explain vacuume actuated gripper in brief.

6. Attempt any TWO of the following:**16**

- a) Explain the GANTT CHART used in production planning and control. State its advantages and disadvantages.
- b) A shop floor activity consists of three elements. Calculate the standard time for the activity. The various allowances are given as percentage of normal time.

Elements	A	B	C
Observed time (min)	1.25	1.2	2.85
Rating factor (%)	90	115	85
Relaxation allowances (%)	12	13	8
Delay allowance (%)	3	6	5
Personal allowance (%)	8	6	4

- c) What are actuators? Explain mechanical and hydraulic actuators type with advantages and disadvantages.
