Ref.No.:Ex/PG/PROD E/ T/116A/2024

M.E. PRODUCTION ENGINEERING FIRST YEAR FIRST SEMESTER EXAMINATION 2024

Subject: ADVANCES IN MANUFACTURING SYSTEMS (PT)

Time: Three Hours **Full Marks: 100**

PART I (60 Marks)

Use Separate Answer Script for Each Part

(Answer any three questions)

1. A) Elucidate the characteristics of an 'Advanced Manufacturing System'. Discuss the role played by each constituents of such a system in manufacturing of precision components.

B) Identify & explain the critical factors that affect the selection of an advance machining process for a set of operations on a work piece of given shape, size and material.

D) Identify the important process parameters of Electro Discharge Machining & state their effect on the quality of machined surface. 5 + 5 + 10

2. A) Distinguish between 'Mechanised' & 'Automated' handling of products. Explain the advantages and limitations of automated product handling.

B) What is an AGVS? State its applications in advanced manufacturing systems & also its advantages over other handling equipments. Briefly explain the 'Traffic Control' and 'Guidance' systems used for AGVS.

C) Explain the operation of a "Walking Beam System". 6+ 10+ 4

3. A) The production details and layout of a Manufacturing plant are given below, Evaluate the yearly product handling cost. Cost of handling may be taken as Rs.25 per meter of travel.

Product No.	Process Sequence	Production Rate/Year	Maximum Quantity that can be moved per trip
1	AGFD	110000	120
2	A BCDFG	90000	95
3	BDFG	200000	205
4	CEFAD	50000	12
5	BGE	80000	100
6	ABDC	120000	200
7	BCEDF	210000	475
8	ACBD	140000	380
9	BCEF	90000	250
10	ABDGFC	210000	675

[Turn over

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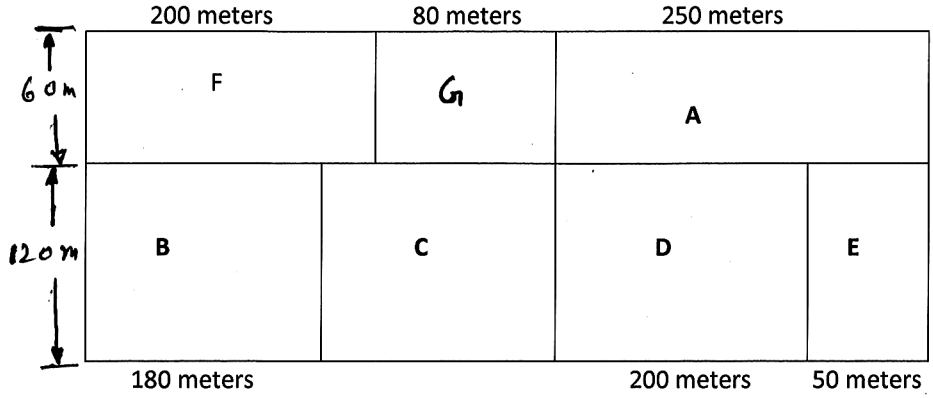
Layout of the Plant



4. B) Discuss the applications of different Robots for product handling purpose in advance Manufacturing Systems.

C) Identify the equipments that are used for product quality evaluation in advanced manufacturing systems. Differentiate between On-line & Off-line inspections. 10 + 3 + 7

4. A) Briefly explain the different methods and mechanisms used for Work part transfer in 'Automated Flow Lines'.

B) Explain the advantages of using a Co-ordinate Measuring Machine (CMM) over other measuring equipments/instruments. Enlist the product features/quality parameters that can be evaluated by a CMM.

10 + 10

5. A) Enlist the major process parameters of Electro Chemical Grinding (ECG) and explain their effects on the quality of the machined surface. Make a comparative analysis of ECM and ECG process with respect to machining rate and surface characteristics.

B) Differentiate between Contact & Non-contact measurement. Give some examples of non-contact measurement.

13 + 7

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M.E. PRODUCTION ENGINEERING FIRST YEAR FIRST SEMESTER EXAMINATION,2024

ADVANCES IN MANUFACTURING SYSTEMS

Full Marks : 100 Time: Three Hour

Answer each part in separate answer script.

PART-II (40 Marks)

Answer any TWO Questions

1. a) Why is EDM process suitable for machining Die?

   b) Why is kerosene not used in WEDM?

   c) Why is LBM suitable for micro-machining?

   d) How is ECDM different from ECM?

   e) Distinguish between rotary USM and stationary USM.

(4 x 5)

2. a) What is Hybrid Machining? Mention different types of Hybrid Machining Process with examples.

   b) Discuss on the working principle with sketch, process parameters, applications and advantages of one hybrid machining process.

(8+12)

3. a) Discuss the functions of components of Tool vibration system in USM with sketch

   b) What are the applications of USM process?

   c) What are the various machining operations those can be performed by laser beam machining system? Discuss with sketches?

(7+5+8)