Ref. No. Ex/PG/PROD E/T/ 116A/2018

MASTER OF PRODUCTION ENGINEERING 1st SEMESTER EXAMINATION 2018

Subject: Advances In Manufacturing Systems

Time : Three Hours | Use Separate Answer Script for Each Part | Full Marks: 100

PART I (60 for Part I)

Answer Any *Three* Questions

1(a)	What are the constituent elements of an 'Advanced Manufacturing System'? Explain the role played by each one of them in manufacturing of precision components.	(5)
(b)	Differentiate between Subtractive & Additive manufacturing. Discuss the limitations of non-conventional machining processes.	(4)
(c)	What is a Hybrid machining process? State the charecteristics and applications of such processes.	(4)
(d)	Explain the mechanism of material removal and applications of Electro Chemical Grinding (ECG) process. Also enlist its process parameters.	(7)
2(a)	What is a 'Burr'? Discuss the need for deburring. Identify the different deburring processes. Discuss the advantages of Electro-chemical dedburring over other deburring processes.	(7)
(b)	Explain the scheme of Electro-chemical deburring. Identify the process parameters and state their effect on deburring rate.	(6)
(c)	Identify the important process parameters of Laser drilling process and explain their effect on machining rate and generated hole quality.	(7)
3(a)	Identify the equipments that are used for Product quality evaluation in advanced manufacturing systems. Differentiate between Contact & Non-contact measurement.	(10)
(b)	Briefly describe the features of a Co-ordinate Measuring Machine (CMM) and explain its operation.	(10)
4(a)	Differentiate between Mechanised and Automated product handling.	(4)
(b)	Discuss the different applications of Robots in product handling.	(5)
(c)	What is an 'Automated Transfer Line'? Draw neat sketch of a Walking Beam System and explain its operation.	(11)
5.(a)	What is an AGVS? What are the different types of AGVS used in industrial product handling? Discuss the Vehicle Routing methods adopted in 'AGVS'.	(10)
(b)	Evaluate the monthly Product handling cost of a Manufacturing plant whose layout & production details are given in Fig.1. Cost of handling is Rs.15 per meter of travel. Maximum number of parts that can be moved per trip is 12.	(10)

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PART I (60 for Part I)

Production Details

Product No.	Process Sequence	Production Rate/Month
1	B D F G A	5200
2	A B C E F G	1500
3	B D C F G	2000
4	C E F D	1050
5	B G E C	1900
6	A B D F	3000
7	B C E G D	2300
8	A C B D F	4200
9	B C D E	1700
10	A B D F	3000

Layout of the Plant

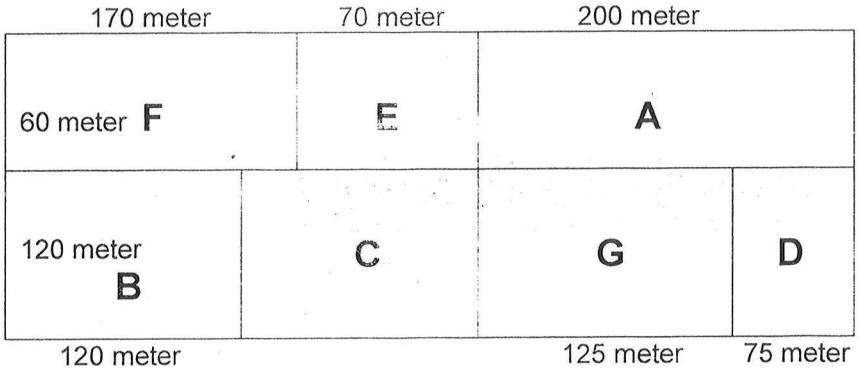

FIG.1

M.E. PRODUCTION ENGINEERING FIRST YEAR FIRST SEMESTEREXAMINATION 2018

ADVANCES IN MANUFACTURING SYSTEMS

Time: Three Hours Full Marks: 100

Use a separate Answer Script for each part

PART-II (40 Marks)

Answer any TWO questions

6. a) What are the classifications of advanced machining processes?

b) What is Hybrid Machining? Give examples of it.

c) Discuss on the working principle of Electrochemical Discharge Machining (ECDM) Process with suitable sketch. What are the various applications of ECDM process?

(6+4+10)

7. a) Discuss on the working principle of Abrasive Water Jet Machining (AWIM) system with a suitable sketch. State the advantages of AWJM process over Water Jet Machining (WJM) and Abrasive Jet Machining (AJM).

b)) State the functions of components of Tool vibration system in USM with sketch. State the advantages of Rotary USM over stationary USM. What are the various applications of USM process?

(10+10)

8. a) State the laser generation principle with sketch.

b) Discuss on the working principle of Nd:YAG or Fibre Laser beam machining system with sketch.

c) What are the applications of laser in micro-manufacturing?

(6+8+6)

9. a) Discuss on the working principle, process parameters, applications and limitation of Wire cut electric discharge machining with sketch. Why is EDM process preferred in Die making?

b) What are the applications of electron beam in manufacturing applications?

c) Distinguish between transferred and non-transferred plasma arc machining system with sketches.

(10+5+5)
