Q. Code:143575

Reg. No. | | | | | | | | | | | | | |

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2023

Second Semester

IR22204 – FLEXIBLE MANUFACTURING SYSTEM

(Industrial Automation and Robotics)

(Regulation 2022)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Apply the concepts of PPC and GT to the development of FMS.	**2**
CO 2	Discuss the planning and scheduling methods used in manufacturing systems.	**3**
CO 3	Identify various workstations, system support equipment.	**2**
CO 4	Identify hardware and software components of FMS.	**3**
CO 5	Summarize the concepts of modern manufacturing such as JIT, supply chain management and lean manufacturing etc.	**2**

PART- A (20 x 2 = 40 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define the term "Flexibility" in FMS.	**1**	**2**
2.	What is the importance of routing flexibility in an automobile industry?	**1**	**2**
3.	What is the role of robots in a FMS?	**1**	**2**
4.	What is the use of a diagraph?	**1**	**3**
5.	What do you mean by a Workstation in FMS?	**2**	**2**
6.	Differentiate between supervised and unsupervised computer control.	**2**	**3**
7.	Define the term DNC.	**2**	**3**
8.	What is the use of dedicated satellite computer in FMS?	**2**	**2**
9.	Name any two factors to be considered for FMS simulation.	**3**	**2**
10.	How to plan for FMS database prior to simulation?	**3**	**2**
11.	What are the bottlenecks of FMS simulation?	**3**	**2**
12.	Name any 4 types of data's in FMS database.	**3**	**2**
13.	What is a part machine indicator matrix in GT context?	**4**	**3**
14.	Define ROC algorithm.	**4**	**3**
15.	What is the importance of part family?	**4**	**2**
16.	Define the term cellular manufacturing.	**4**	**3**
17.	Write any two advantages of RGV over AGV.	**5**	**2**
18.	What is meant an expert system in FMS environment?	**5**	**2**
19.	Enumerate the characteristics of a prismatic component.	**5**	**3**
20.	Define the term "Factories of Future".	**5**	**2**

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21. (a)	Explain the concept of knowledge based scheduling system with a schematic diagram.	**(10)**	**1**	**3**

(OR)

(b)	Explain in details about flexibility in FMS.	**(10)**	**1**	**3**
22. (a)	Discuss the role of supervisory computer control in FMS environment for better agility.	**(10)**	**2**	**3**
	(OR)			
(b)	With neat schematic diagram, explain how a computer can control the work centre and assembly line indigenously?	**(10)**	**2**	**3**
23. (a)	Elaborate the steps involved to perform the FMS plant simulation.	**(10)**	**3**	**3**
	(OR)			
(b)	How the data flows in FMS configuration? Explain the role of refresh rate in FMS database.	**(10)**	**3**	**3**
24. (a)	In an automobile industry the following machine shop layout was found. Apply rank order clustering algorithm and design a new layout as per cellular manufacturing concept.	**(10)**	**4**	**3**

	Parts								
Machines	P1	P2	P3	P4	P5	P6	P7	P8	P9
M1			1	1	1				
M2	1	1					1	1	1
M3						1	1	1	
M4	1	1		1					
M5			1		1				
M6		1						1	1
M7	1		1	1					
M8		1				1		1	1

	(OR)			
(b)	Explain the Holier method 1 algorithm to rearrange the shop floor layout in group technology.	**(10)**	**4**	**3**
25. (a)	Differentiate AGV and RGV in context of material handling in FMS.	**(10)**	**5**	**3**
	(OR)			
(b)	Explain the role of AI and expert system in FMS decision making aspects.	**(10)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	Evaluate the digraph in Fig.1and write its inference. Also discuss about the required scheduled time to complete the entire assembly.	**(10)**	**2**	**5**

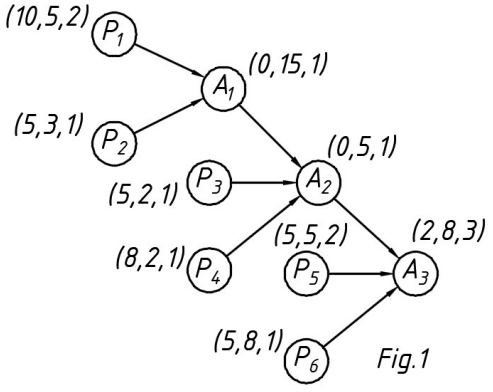

Fig.1