

# CBCS Scheme

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16MCM22

Second Semester M.Tech. Degree Examination, June/July 2017

## Flexible Manufacturing System

Time: 3 hrs.

Max. Marks: 80

*Note: Answer FIVE full questions, choosing one full question from each module.*

### Module-1

- 1 a. List and explain the components of flexible manufacturing system. (10 Marks)  
b. Explain flexible and rigid manufacturing with examples. (10 Marks)

OR

- 2 a. Describe economic and social aspects of flexible manufacturing system. (10 Marks)  
b. Explain the concept of group technology with respect to manufacturing. (10 Marks)

### Module-2

- 3 a. With neat block diagram, explain the architecture of typical FMS system. (10 Marks)  
b. Explain the levels of automation from device to enterprise level. (10 Marks)

OR

- 4 a. Explain distributed numerical control with block diagram. (10 Marks)  
b. Illustrate network topology and factory network with respect to FMS. (10 Marks)

### Module-3

- 5 a. Explain the analysis of operations on a single machine, two machine and three machine flow scheduling. (06 Marks)  
b. List any four scheduling rules of FMS. (04 Marks)  
c. Discuss about tool management of FMS. (06 Marks)

OR

- 6 a. Briefly explain scheduling 'n' operations on 'n' machines. (06 Marks)  
b. Consider a job shop scheduling problem with four jobs and three machines. The routes and processing times (in the usual notation) for the jobs are:

J1 = M1(8), M2(9), M3(12)

J2 = M3(9), M2(9), M1(10)

J3 = M3(8), M1(10), M2(10)

J4 = M1(12), M3(11), M2(8).

Solve the job shop scheduling problem using SPT rule as the dispatching rule and FIFO as tie breaking rule. Find the make span mean flow time and utilization of machine. (10 Marks)

### Module-4

- 7 a. Write a short note on modern cutting tool and tool materials. (10 Marks)  
b. Explain the following with respect to tools of FMS:  
i) Tool monitoring  
ii) Presetting  
iii) Offsetting of tool (10 Marks)

OR

- 8 a. With a neat sketch, explain the tool changing process in ATC system. (10 Marks)  
b. With an example, explain tool length and tool radius compensation. (10 Marks)

**Module-5**

- 9 a. Illustrate the following terminologies of fixturing in FMS:  
i) Pallet changer  
ii) Pallet pool  
iii) Standard fixtures (10 Marks)  
b. With an example, explain modular fixturing system. (10 Marks)

OR

- 10 a. Justify the use of group technology in fixture design. (10 Marks)  
b. List and explain fixturing components. (04 Marks)  
c. Characterize computer aided fixture design. (06 Marks)

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