CBCS SCHEME

15ME62

USN ☐☐☐☐☐☐☐☐☐☐

Sixth Semester B.E. Degree Examination, June/July 2019
Computer Integrated Manufacturing

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define automation. Explain different types of automation.   (08 Marks)
   b. Explain the product life cycle mathematical models.   (08 Marks)

OR

2 a. What is buffer storage? What are the reasons for implementing buffer storage in an automated production line?   (04 Marks)
   b. Explain Upper bound approach in analysis of flow line without storage buffer.   (03 Marks)
   c. A 20 station transfer line has two stages of 10 stations each. The ideal cycle time of each stage is 1.2 min, all the stations in the line have the same probabilities of stopping, $p = 0.005$. Assume that the downtime 8 min is constant when a breakdown occurs. Using upper bound approach, compute the line efficiency for the buffer stage capacities of (i) $b = 0$ (ii) $b = \infty$ (iii) $b = 10$ (iv) $b = 100$.   (09 Marks)

Module-2

3 a. Explain the design process using computer aided design with a neat block diagram.   (09 Marks)
   b. Explain scaling in geometric models transformations.   (07 Marks)

OR

4 a. Explain generative type process planning system and list the advantages of CAPP. (08 Marks)
   b. Write a note on Material Requirement Planning and shop floor control.   (08 Marks)

Module-3

5 a. Explain Flexible Manufacturing Cell with a sketch.   (06 Marks)
   b. State and explain the components of Flexible Manufacturing System.   (10 Marks)

OR

6 a. Briefly explain the following: i) Minimum rational work element   ii) Precedence diagram
      iii) Cycle time   (06 Marks)
   b. In a plant a product is to be assembled as per the following information: (10 Marks)

Elements	Time (Te) min	Immediate Predecessor
1	5	-
2	3	1
3	8	1
4	2	2
5	1	2
6	6	3
7	4	4, 5
8	5	3, 5
9	3	7, 8
10	6	6, 9

   i)   Construct the precedence diagram.
   ii) If the cycle time is 10 min. what is the number of stations required?
   iii) Compute the balance delay of the line by using Largest Candidate Rule method.

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Module-4

7 a. What do you mean by cutter radius compensation in CNC programming? Briefly explain. **(02 Marks)**

b. Write different M-codes used in programming and their functions. **(04 Marks)**

c. Write a turning centre part program for the part shown in Fig.Q7(c). Use one finish cut and rest rough cut to remove the material. Use the following information.

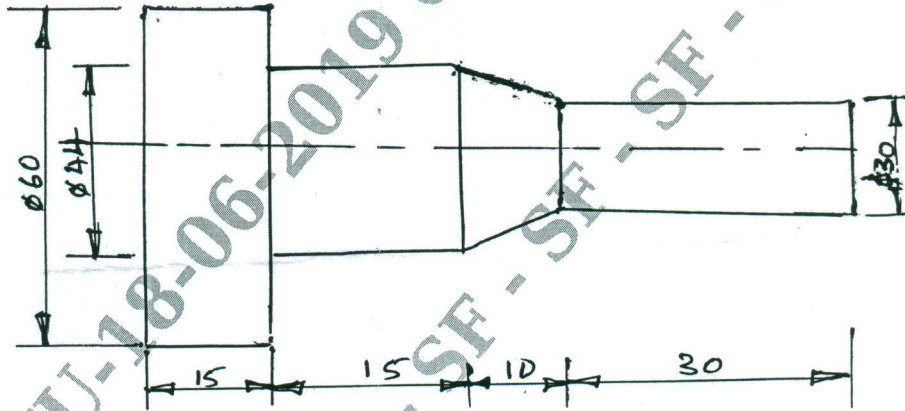| Operation	Tool No.	Onset Register	Cutting speed (m/min)	Feed (mm/rev)
Rough cut	T01	10	200	0.4
Finishing	T02	12	300	0.2

Fig.Q7(c) **(10 Marks)**

OR

8 a. Sketch and explain common robot configurations. **(10 Marks)**

b. Mention the different types of grippers. **(02 Marks)**

c. Explain lead through method of robot programming. **(04 Marks)**

Module-5

9 a. What is additive manufacturing? Explain the basic principles involved in additive manufacturing. **(10 Marks)**

b. List the advantages of additive manufacturing. **(06 Marks)**

OR

10 a. Write a note on Internet of Things. **(08 Marks)**

b. How these AM processes are carried out:
i) Binder Jetting
ii) Direct energy Deposition
iii) Material Jetting
iv) Hybrid Manufacturing **(08 Marks)**

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