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**15ME62**

## Sixth Semester B.E. Degree Examination, July/August 2021 Computer Integrated Manufacturing

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions.*

- 1 a. What are the basic types of automation? Explain each type with important features. (08 Marks)  
 b. The average part produced in a certain batch manufacturing plant must be processed through an average eight machines. 20 new batches are launched each week. Average operation time is 6 min, average setup time is 4 hr, average batch size is 20 parts and average non-operation time per batch is 8 hr/machine. There are 20 machines in the plant. The plant operates an average of 56 production hours per week. Scrap rate is negligible. Determine:  
 (i) MLT for an average part  
 (ii) Production rate  
 (iii) Plant capacity  
 (iv) TIP ratio (08 Marks)
  
- 2 a. Explain the automated flow lines with storage buffers. (08 Marks)  
 b. A 16 station transfer line has an ideal cycle time of 1 min and average down time of 5 min per line stop occurrence, and a station failure frequency of 0.01 for all workstations. Assuming infinite buffer capacity, compute the line efficiency and production rate for the following conditions:  
 (i) With no storage buffer  
 (ii) With 3 storage buffer  
 (iii) With 10 storage buffer  
 Also assume that buffer storages are located such that all the downtime frequencies are equal. (08 Marks)
  
- 3 a. Explain the design process using CAD with flow diagram. (08 Marks)  
 b. Explain translation, rotation and scaling of 2-D transformation by showing the positions of coordinates in the drawings. (08 Marks)
  
- 4 a. Explain retrieval CAPP system with flow diagram. (08 Marks)  
 b. What are inputs to the MRP system? Explain each in brief. (08 Marks)
  
- 5 a. Define FMS and explain its basic components in brief. (08 Marks)  
 b. Explain automated storage/retrieval system with its important categories. (08 Marks)
  
- 6 a. Explain the procedure of largest candidate rule and Kilbridge and Westers method of assembly line balancing. (08 Marks)  
 b. What are the computerized line balancing methods? Explain any two in brief. (08 Marks)

- 7 a. Explain the basic components of NC system with block diagram. (08 Marks)  
 b. Write a manual part programme for machining the profile milling and drilling as shown in the Fig.Q7(b).

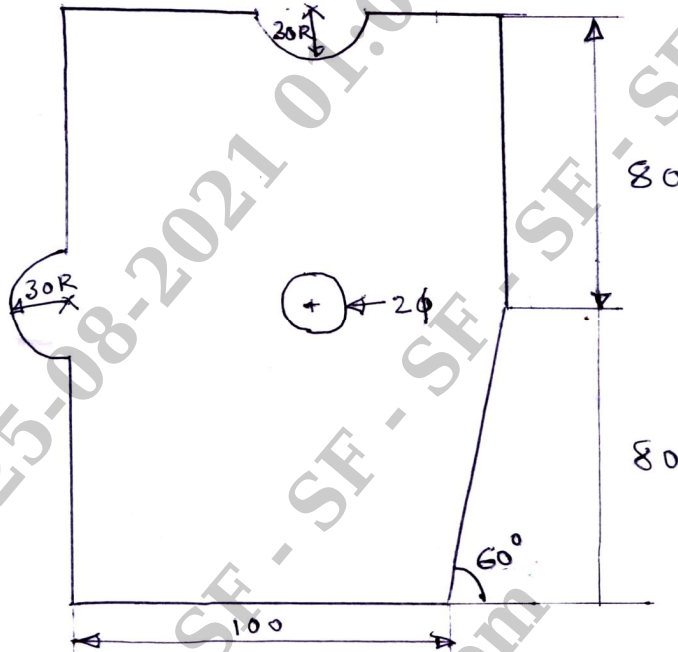


Fig.Q7(b)

Assume a thickness of 20 mm and cutter diameter of 20 mm. Speed = S650 and feed = F575. (08 Marks)

- 8 a. Explain various types of joints and links used in construction of industrial robot with diagrams. (08 Marks)  
 b. Explain various types of End effectors and sensors used in industrial robotics. (08 Marks)
- 9 a. What is additive manufacturing and what are its advantages and disadvantages? (08 Marks)  
 b. With a neat sketch, explain the working principle of binder jetting. (08 Marks)
- 10 a. Explain Industry 4.0 with its applications. (08 Marks)  
 b. Explain Big data and cloud computing for IoT. (08 Marks)

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