

# CBCS Scheme

15ME62

USN

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**Sixth Semester B.E. Degree Examination, June/July 2018**

**Computer Integrated Manufacturing (Model QP)**

Time: 3 hrs

Max marks: 80

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

<u>Module-1</u>																												
<b>1</b>	<p>a. Explain with neat sketches the fixed, flexible and programmable automations <b>(08 Marks)</b></p> <p>b. The parts produced in a batch manufacturing plant must be processed through an average of six machines. There are 20 new batches of parts launched each week. Other data are as follows. Average operation time: 6 minutes, Average set up time: 5 hours, Average non-operation time: 600 minutes, Average batch size: 50 parts. There are 24 machines in the plant and the plant operates 70 hours per week. Determine) Manufacturing lead time ii) Plant capacity iii) Work in process iv) Plant utilization. <b>(08 Marks)</b></p>																											
<b>OR</b>																												
<b>2</b>	<p>a. Explain general configuration of automated flow lines with a neat sketch. <b>(10 Marks)</b></p> <p>b. A 22 station in line transfer machine has an ideal cycle time of 0.55 min. The probability of station break down is <math>p=0.01</math>. Average downtime = 8 min per line stop. use the upper bound approach and determine: i) Ideal production rate ii) Frequency of line stops iii) Average actual production rate iv) Line efficiency <b>(06 Marks)</b></p>																											
<u>Module-2</u>																												
<b>3</b>	<p>a. Explain with a neat sketch the software configuration of a graphics system. <b>(08 Marks)</b></p> <p>b. Explain the Computer aided design process with a neat block diagram. <b>(08 Marks)</b></p>																											
<b>OR</b>																												
<b>4</b>	<p>a. Explain Retrieval type CAPP system with the help of a block diagram. <b>(08 Marks)</b></p> <p>b. Describe the inputs to the MRP system. <b>(08 Marks)</b></p>																											
<u>Module-3</u>																												
<b>5</b>	<p>a. Define FMS. Explain the types of FMS. <b>(10 Marks)</b></p> <p>b. Enumerate the advantages of group technology. <b>(06 Marks)</b></p>																											
<b>OR</b>																												
<b>6</b>	<p>a. Explain the following terms in line balancing.                      i) Minimum rational Work element ii) Precedence diagram                      iii) Cycle time iv) Balance delay <b>(08 Marks)</b></p> <p>b. A new product is to be assembled in a plant, the data gives the precedence relationship and elemental times</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;">Element</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">7</td> <td style="padding: 5px;">8</td> </tr> <tr> <td style="padding: 5px;">Time 'T<sub>e</sub>' (min)</td> <td style="padding: 5px;">1.0</td> <td style="padding: 5px;">0.5</td> <td style="padding: 5px;">0.8</td> <td style="padding: 5px;">0.3</td> <td style="padding: 5px;">1.2</td> <td style="padding: 5px;">0.2</td> <td style="padding: 5px;">0.5</td> <td style="padding: 5px;">1.5</td> </tr> <tr> <td style="padding: 5px;">Immediate predecessor</td> <td style="padding: 5px;">-</td> <td style="padding: 5px;">-</td> <td style="padding: 5px;">1,2</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">3,4</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5,6,7</td> </tr> </table> <p>Using largest Candidate rule method,                      i) Construct the precedence diagram for this job</p>	Element	1	2	3	4	5	6	7	8	Time 'T <sub>e</sub> ' (min)	1.0	0.5	0.8	0.3	1.2	0.2	0.5	1.5	Immediate predecessor	-	-	1,2	2	3	3,4	4	5,6,7
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		ii) If the ideal cycle time is to be 1.5 min, what is the minimum number of work stations required? iii) Calculate the balance delay	(08Marks)
<b>Module-4</b>			
7	a	Explain the fundamental steps involved in development of part programming for milling and turning.	(08Marks)
	b	Write the Part program to turn the profile of the part as shown in fig.1	(08Marks)
fig.1			
<b>OR</b>			
8	a	Explain the different configurations of robot with neat sketches	(10Marks)
	b	Explain the following with reference to precision of robot a) Spatial resolution ii) Accuracy iii) Repeatability	(06Marks)
<b>Module-5</b>			
9	a	Explain with a neat sketch the Sheet lamination process.	(08 marks)
	b	Explain with a neat sketch the Direct energy deposition technique.	(08 marks)
<b>OR</b>			
10	a	Define IOT. Explain the applications of IOT in manufacturing.	(08 marks)
	b	What are the components of Industry 4.0? Explain.	(08Marks)