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P.E.S. College of Engineering, Mandya - 571 401 (An Autonomous Institution affiliated to VTU, Belgaum) Seventh Semester, B.E Mechanical Engineering Semester End Examination; Dec 2015 Computer Integrated Manufacturing								
Time: 3 hrs	Max. Marks: 100							
	cting at least TWO full questions from each part . PART - A							
1 a. Define Automation. Briefly explain the v graphically.	arious types of Automation systems. Represent them 10							
b. An average of 15 new orders is started	through a certain factory each month. Each order							

- b. All average of 15 new orders is started through a certain factory each month. Each order consists of 45 parts to be processed through 25 machines in the factory. The operation time is 15 min. The non-operation time average to be 10 hrs and setup time is 5 hrs. There were 35 10 numbers of workstations in the factory. The plant operates 200 hrs/month. Determine;
 i) Manufacturing lead time ii) Plant capacity iii) Utilization iv) WIP v) TIP ratio.
- i) interference in the interview of the interview interv
- 2 a. Define Automated flow line. What are its objectives?
 - b. What is buffer storage? What are the reasons for use of buffer storage in a flow line?
 - c. Explain three main functions used to control the operation of an automated flow line.
- 3 a. Explain the concept of upper bound approach and lower bound approach. How to mathematically express the frequency of the line stoppage 'F' with reference to automated 10 flow line?
 - Operation Process Time (Min) Station Di 1 Load part 0.78 0 Drilling 2 1.25 0.02 3 Reaming 0.90 0.01 4 Tapping 0.85 0.04 5 Milling 1.32 0.01 6 Unloading 0.45 0
 - b. A transfer machine has six stations that function as follows :

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Average downtime per occurrence = 8.0 min. The transfer time is 0.18 min. Solve the problem only by assuming that each station brake down causes damage to the work part that must be removed. Determine;

- i) Proportion downtime ii) Average actual production rate
- iii) How many hours of operation are required to produce 20,000 parts?

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4 a. Explain the following :

- i) Minimum rational work element
- iii) Cycle time
- b. The following list defines the precedence relationships and element Time for a new product:

Element	1	2	3	4	5	6	7	8	9	10
T _e (min)	0.5	0.3	0.8	0.2	0.1	0.6	0.4	0.5	0.3	0.6
Immediate Predecessor	-	1	1	2	2	3	4, 5	3, 5	7, 8	6, 9

ii) Precedence Diagram

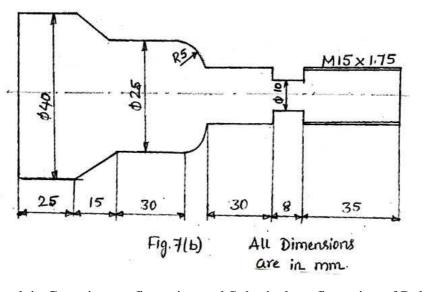
iv) Balance Delay

Construct the precedence diagram. If the ideal cycle time T_C is 1.0 min, What is the minimum number of stations required to balance the line?

PART - B

5	a.	With neat sketches explain dial type assembly system and carousel automated assembly	12					
		system.						
	b.	With neat sketch explain escapement and placement devices.	8					
6	a.	Define CAPP. With block diagram explain variant type of CAPP.	10					
	b.	Briefly explain with block diagram various inputs to MRP system.	10					
7	a.	With flow chart explain the steps involved in the development of a part program.	8					
	b.	Prepare the manual part program for the part shown in Fig. 7(b). Assume suitable data for						

machining parameters and tooling.



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- 8 a. With sketches explain Cartesian configuration and Spherical configuration of Robots.
 - b. Explain the following :

i) Types of Robot Motion ii) Robot Sensors

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