BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

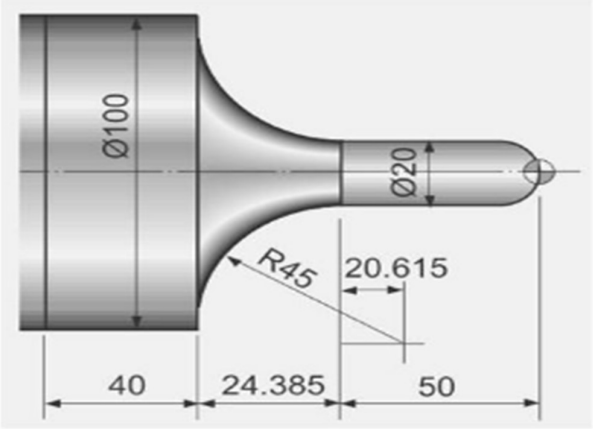
CLASS: BTECH **SEMESTER: VII**
BRANCH: PRODUCTION AND INDUSTRIAL ENGG. **SESSION: MO/2024**

SUBJECT: PE401 COMPUTER INTEGRATED MANUFACTURING & CYBER-PHYSICAL SYSTEMS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Write down the major Criteria for the choice and implementation of automation in any manufacturing unit.	[5]	01	01
Q.1(b)	Explain the three basic elements of an automated system and also demonstrate the five levels of automation in a production plant.	[5]	01	03
Q.2(a)	Explain all NC programming code (i) G11 (ii) G90 (iii) G17 (iv) G54 (v) G40 (vi) G49 (vii) G80 (viii) G93 (ix) G74 (x) G60	[5]	02	02
Q.2(b)	Write Down the NC Part Programming of the following component using Absolute & Incremental method. All dimensions in mm. Assume cutter dia & Other data required.	[5]	02	01



Q.3(a)	What are the basic components of a PLC? Explain the various types of sensors and the working principle of any three.	[5]	03	02
Q.3(b)	Explain the servo motors. Explain the advantages and disadvantages of servo motors.	[5]	03	02

PTO

Q.4(a)	Define FMS and describe under what circumstances it can be applied in manufacturing.	[5]	04	01
Q.4(b)	Analyse the role of Reconfigurable Manufacturing Systems (RMS) in today's rapidly changing market. Examine the relationship between Cellular Manufacturing and Lean Manufacturing principles.	[5]	04	04
Q.5(a)	Discuss the primary characteristics of the Fourth Industrial Revolution and how it differs from the previous industrial revolutions. Discuss the concept of a "Smart Factory" and its key components.	[5]	05	02
Q.5(b)	Discuss the role of IoT in enabling predictive maintenance and its advantages over traditional maintenance strategies. Evaluate the impact of big data and predictive analytics on demand forecasting and inventory management within supply chains.	[5]	05	02

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