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

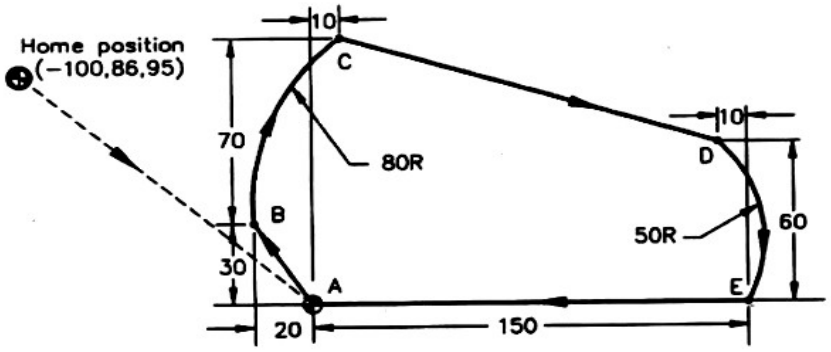
CLASS: B.TECH **SEMESTER : VII**
BRANCH: PRODUCTION **SESSION : MO/2023**

SUBJECT: PE402 AUTOMATION IN MANUFACTURING

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)	Describe in detail the evolution of manufacturing from craft to empirical art to predictable science. Justify your answer with neat sketches and examples.	[3]	01	02
Q.1(b)	Write down the major elements and criteria for the choice and implementation of automation in any manufacturing unit.	[3]	01	01
Q.1(c)	What leads to the development of NC? Illustrate with an example, explain the operation of an NC machine tool system	[4]	01	03
Q.2(a)	Identify the various basic components of an NC machine tool, giving in brief the function of each component with the help of a block diagram.	[5]	02	02
Q.2(b)	Write Down the NC Part Programming of the following component using Absolute or Incremental methods. All dimensions in cm. Assume cutter dia and other data required (if missing).	[5]	02	06



Q.3(a)	What are the basic components of a PLC?	[2]	03	02
Q.3(b)	Explain the servo motors. Explain the advantages and disadvantages of servo motors.	[4]	03	04
Q.3(c)	Explain the various types of sensors and the working principle of any three.	[4]	03	04
Q.4(a)	Name six typical products that are made by automated assembly.	[2]	04	02
Q.4(b)	Interpretate four conditions (with example) under which automated assembly technology should be considered.	[4]	04	03
Q.4(c)	What are some of the objectives and reasons behind company decisions to automate their storage operations? Name the ten objectives and reasons.	[4]	04	02
Q.5(a)	Explain some of the design requirements of CIM. Give a systematic procedure for planning and implementation of a CIM.	[4]	05	04
Q.5(b)	Define FMS and describe under what circumstances it can be applied in manufacturing.	[3]	05	02
Q.5(b)	Explain static and dynamic aspects of an FMS.	[3]	05	04

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