BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/2022)

CLASS: **B.TECH** **SEMESTER: VII**
BRANCH: **PRODUCTION** **SESSION: MO/2022**

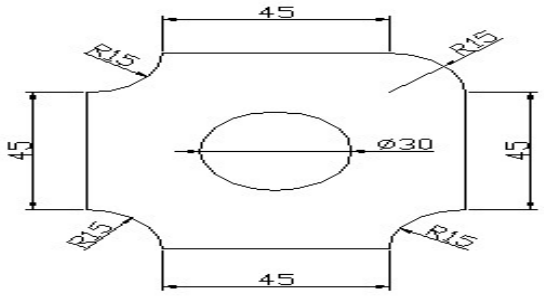
SUBJECT: PE402 AUTOMATION IN MANUFACTURING

TIME: **03 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*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

Q.1(a) Explain the concept and features of the factory of the future. [2]
Q.1(b) Explain various types of automation as a function of product variety and production volume. [3]
Q.1(c) Describe in detail the evolution of manufacturing from craft to empirical art to predictable science. Justify your answer with neat sketches and examples. [5]

Q.2(a) Explain with neat sketches point-to-point, straight-cut, and continuous path systems. [2]
Q.2(b) 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. [3]
Q.2(c) Write Down the NC Part Programming of the following component using Absolute & Incremental methods. All dimensions in cm. Assume cutter dia & other data required. [5]



Q.3(a) Explain the various types of magnetic sensors and the working principle [2]
Q.3(b) Define the pump and state the purpose of the pump in the hydraulic system & also classify pumps. [3]
Q.3(c) Demonstrate the Programmable Logic Controllers. What are the components of the PLC? Explain the Ladder Logic Diagram. [5]

Q.4(a) Demonstrate the types of automated storage and retrieval systems with suitable examples. [2]
Q.4(b) Explain the different types of AGVS and also demonstrate the system design of AGVS. [3]
Q.4(c) Explain the transfer machining briefly and also discuss the advantages and disadvantages of Transfer Machines with suitable examples. [5]

Q.5(a) What are the benefits offered by FMS to the manufacturing industry? Explain. [2]
Q.5(b) Explain some of the design requirements of CIM. Give a systematic procedure for planning and implementation of a CIM. [3]
Q.5(c) How to design cells for Cellular Manufacturing? What do you need in order to implement Cellular Manufacturing? [5]

:::::23/11/2022:::::M