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

CLASS: BE   SEMESTER:VI/ADD
BRANCH: PRODUCTION ENGG.   SESSION : SP/2019

SUBJECT : PE6007 MANUFACTURING AUTOMATION AND ROBOTICS

TIME: 1.5 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) Identify three situations in which manual labor is preferred over automation.   [3]
    (b) What is the difference between a closed-loop control system and an open-loop control   [2]
         system?

Q2 (a) What is safety monitoring in an automated system?   [2]
    (b) What is flexible automation and what are some of its features?   [3]

Q3 (a) What is numerical control? What are the three basic components of an NC system?   [3]
    (b) What is the difference between point-to-point and continuous path control in a motion [2]
         control system?

Q4   Write a part program to machine the finished part shown in Fig 1 from a billet of size [5]
         10x100x12mm size. Use cuter radius compensation. Take depth of cut 2 mm. On the right
         side of each block, write the explanation of each block, in short.
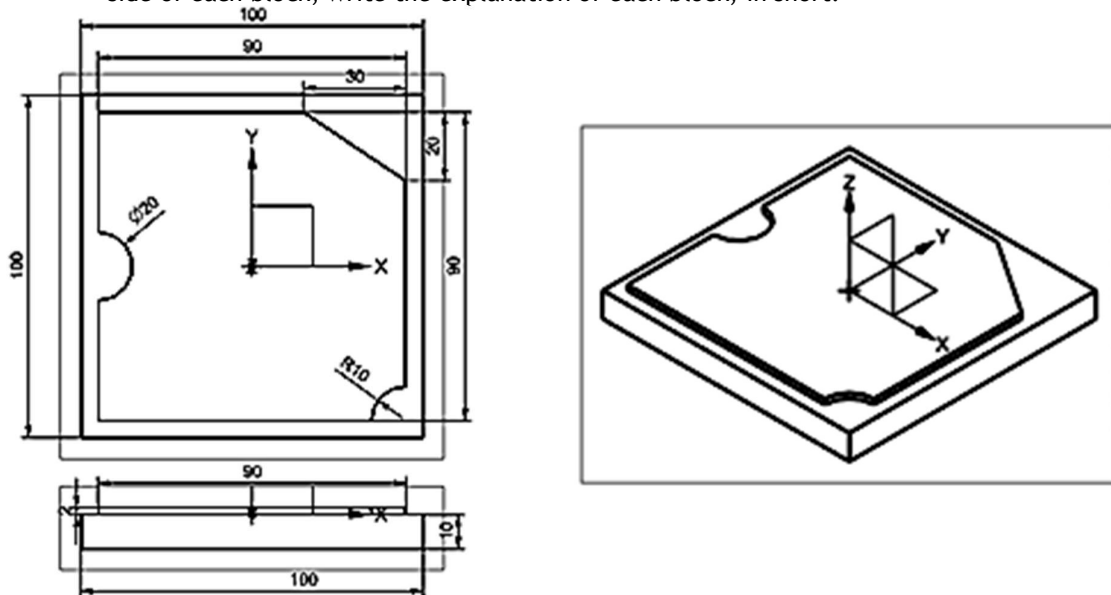

Fig 1: The finished part

Q5 (a) What is adaptive control? Explain how adaptive control with constraints (ACC) works.   [3]
    (b) What is PLC? What are the main components of PLC?   [2]

Q6 (a) What is an automated production line?   [2]
    (b) Enlist the conditions under which automated production lines are appropriate.   [3]

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