J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA, FARIDABAD

B. TECH. 6TH SEMESTER MECHANICAL ENGINEERING (UNDER CBS)

NUMERIC CONTROL OF MACHINE TOOLS AND ROBOTICS (MU-304)

Time: 3 Hours | Max. Marks: 60

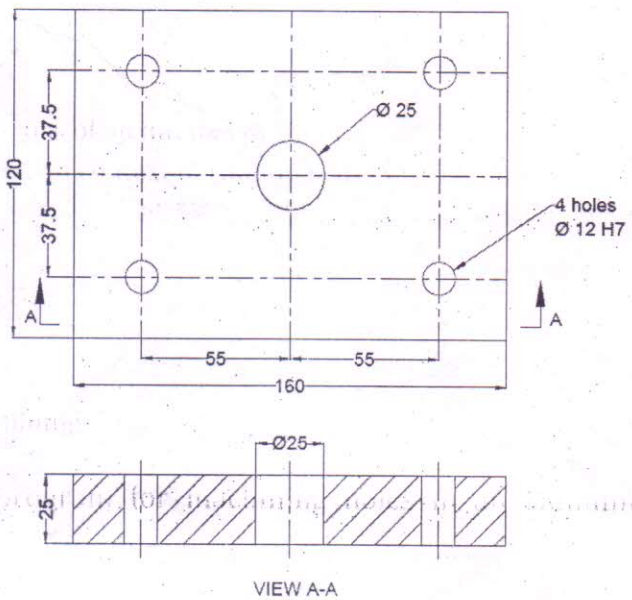
Note:
1. *It is compulsory to answer the questions of Part -1.*
2. *Answer any four questions from Part -2 in detail.*
3. *Different parts of the same question are to be attempted adjacent to each other.*
4. *Support your answer with neat sketches, wherever necessary.*

PART -1

Q1	(a)	What is the need of NC coordinate system?	(2)
	(b)	State the different methods of specifying origin (zero point) in an NC system?	(2)
	(c)	Why NC machines cannot be used in all industries?	(2)
	(d)	What are the main parts of a DNC system?	(2)
	(e)	State the various diagnostic capabilities available in a CNC system.	(2)
	(f)	State the main difference between direct numerical control and distributed numerical control system.	(2)
	(g)	What are the functions of a computer in the computer assisted part programming?	(2)
	(h)	What are the different types of command statements used in APT language.	(2)
	(i)	State the characteristics of an intelligent robot.	(2)
	(j)	Define work envelope in context of robotic system.	(2)

PART -2

Q2	(a)	Discuss the main features of CNC machining centres which contribute for higher productivity.	(5)
	(b)	Explain the differences and applications of absolute and incremental programming system in CNC machining.	(5)
Q3		Prepare a part program for machining holes in an aluminium component as shown in figure given below:	(10)



Q4		What is Adaptive control? Explain different types of adaptive control systems. Also, explain the operation of an ACC system.	(10)

Q5	Discuss the characteristics, letter coding system of EIA and ISO coding system.	(10)
Q6	Discuss different types of joints related to the robotic system. Also, explain the various methods of programming the robot.	(10)
Q7	Write short notes on the following: (i) Physical configurations of distributed numerical control system (ii) Steps in NC manufacturing	(10)

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