

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:2171903

Date:14/06/2022

Subject Name:Computer Aided Manufacturing

Time:02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

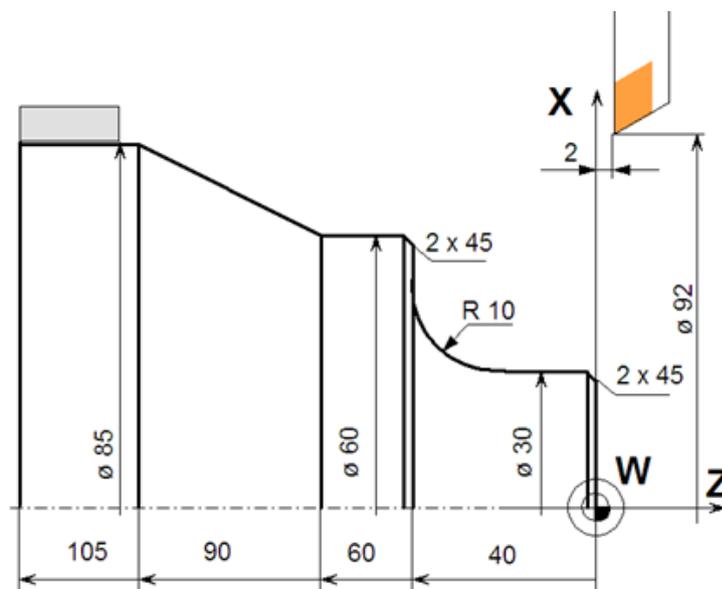
MARKS

- Q.1**
- (a) Write control functions of CNC controller. **03**
 - (b) Explain CIM wheel with a sketch. **04**
 - (c) Designate axes for vertical machining center with neat sketch. State the rules followed by you in sequence. **07**
- Q.2**
- (a) Enlist various compensations used in CNC machines. **03**
 - (b) Explain tool length compensation with neat sketch. **04**
 - (c) Differentiate between modal and non-modal codes. Are M-codes modal or non-modal codes? Write syntax of G90 as a taper turning single pass canned cycle with an example. **07**

OR

- (c) Write a manual part program using G71 canned cycle for a given component. **07**

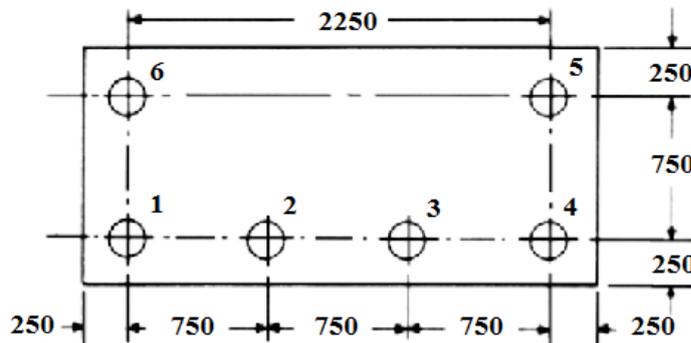
Op. No.	Operation	Tool	Machining parameters		
			Speed (m/min)	Feed (mm/rev)	Depth of cut (mm)
10	Rough Turning	T04	180	0.12	3 (max)
20	Finish Turning	T04	220	0.08	0.5



- Q.3**
- (a) Differentiate between absolute and incremental programming. **03**
 - (b) What is group technology? Define part family. **04**
 - (c) What is Production Flow Analysis (PFA) ? Write various steps to be followed for PFA. **07**

OR

- Q.3** (a) List any three CNC controllers widely used in manufacturing industries. **03**
(b) Differentiate between Variant and Generative CAPP. **04**
(c) Write a part program to perform pocket milling for a component shown below. Write a general syntax of canned cycle used. Highlight the selection of program origin. Depth of hole is 10 mm and $\phi 10$ mm. Assume suitable process parameters and CNC controller. All dimensions are in mm. **07**



- Q.4** (a) Write different types of end effectors used in industrial robots. **03**
(b) State various industrial applications of robots. **04**
(c) What is FMS? Which are various components of FMS? **07**

OR

- Q.4** (a) Mention advantages and limitations of recirculating ball screw used for CNC Machines. **03**
(b) What are the types of flexibility in FMS? Explain any two of them. **04**
(c) Write different types of end effectors used in industrial robots. State various industrial applications of robots. **07**

- Q.5** (a) Enlist seven wastages that have been identified by Japanese manufacturers. **03**
(b) What is AGV? Explain different types of AGV used in FMS. **04**
(c) Which are the various inputs to MRP-I? Write various output of MRP-I. **07**

OR

- Q.5** (a) What are the goals of Just In Time (JIT)? **03**
(b) Write minimum six hardware differences of CNC Lathe over a conventional lathe machine. **04**
(c) Draw a structure of a programmable logic controller in generic form. Explain any one tool for PLC logic design. **07**
