ALPHA COLLEGE OF ENGG & TECH

ODD SEM 2018

ASSIGNMENT 1

SUB : CAM (2171903)   7TH ME A,B

CH -1 Computer Aided Manufacturing

CH-4 Group Technology

NO	QUESTION	YEAR	MARKS
1	What are the objectives of CIM? Which major functional areas of the manufacturing enterprise considered for achieving CIM objectives? What are the benefits of CIM?	May-2012	7
2	What is Group Technology? What are the advantages of GT in manufacturing?	May-2012, May-2018	3, 7
3	Explain following with reference to Group Technology: (i) Coding structures in GT (ii) Composite part	May-2012	7
4	List types of manufacturing systems and compare each with respect to flexibility, variety and production quantity. Also state potential benefits of CIM.	Nov-2011	7
5	What is group technology? Explain opitz classification and coding system in brief	Nov-2011, Jan-2013, Dec-2013, May-2017	7
6	What is part classification and coding requirements in GT. Explain OPTIZ system of coding?	May-2013	4, 7
7	Explain in detail composite part.	Dec-2013, May-2013	7
8	Explain the concept and scope of CIM. Also explain the benefits of CIM.	May-2017	7
9	Discuss the components of CIM systems with the help of CIM wheel.	May-2017	7
10	Explain the role of management and manufacturing in CIM.		
11	What is group technology? Differentiate between product layout and group technology layout.		
12	Explain different part coding methods in GT.		
13	Differentiate between conventional manufacturing process and computer integrated manufacturing process.		
14	Explain the different methods of part-family formation.		
15	Explain MICLASS Coding system and DCLASS Coding system.	Nov-2017	3
16	Explain various method of cellular manufacturing.	Nov-2017	7
17	Write the guideline for implementing GT.		
18	Describe about Production flow analysis.		

| 19 | What is Part Family? List different methods used to make part families and explain each in brief. | May-2018 | 4 |

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ASSIGNMENT 2

SUB : CAM (2171903)   7TH ME A,B

CH -2 NC/CNC Machines

NO	QUESTION	YEAR	MARKS
1	Explain the classification of NC/CNC machines based on control system features.	Nov-2011, Dec-2013, May-2013, May-2017	7
2	What are the basic components of numerical control system? Draw and discuss function of each component.	Jan-2013, May-2015, Dec-2015	7
3	Explain the axes designation rules for machine tools employing rotating tools. Sketch a vertical and horizontal machining centre and designate its axes.	June-2012, May-2013, May-2015	7
4	Explain various types of tape readers with sketch used in NC machines.	Nov-2011	7
5	Write a short note on recirculating ball screw used in CNC machines with sketch.	June-2012, Nov-2011, Dec-2015, May-2016, May-2017 , Nov-2017	3, 7
6	What are the different ways of defining circle, using geometry statements of APT language?	Dec-2013, May-2013	7
7	Explain the following methods for repetitive part programming: (a) Subroutines (b) Do loops (c) Canned Cycles Explain with illustration: (i) Drilling canned cycle (ii) Parametric subroutine (iii) Fixed zero and floating zero.	Nov-2011, May-2016	7
8	Explain any four canned cycles.	June-2014, Dec-2013, May-2013, May-2015, Nov-2017	7
9	What is a motion statement in APT language? Explain with suitable example the format of motion statements.	Nov-2011, May-2013, Nov-2017	7

10	What are the different geometric statements used to write part program using APT? Discuss each statement with a suitable example.	Nov-2011, Jan-2013, Dec-2015, May-2016	7
11	What are the auxiliary statements in APT language? Explain with suitable Examples any four auxiliary commands.	May-2013	7
12	Classify CNC machine tools on the basis of : (i) Type of feedback system (ii) Type of tool motion control	Jan-2013	7
13	What is tool compensation? Explain tool length and cutter radius compensation.	Dec-2014, May-2015, May-2017, Nov-2017	7
14	Explain the feedback system of NC/CNC machine.	Dec-2014, May-2016	7
15	What do you mean by geometry statement in ATP? Explain with suitable example, the format of geometry statements.	Dec-2014	7
16	Explain in brief Programmable Logic Controllers.	Dec-2014,June-2014,Dec-2013, May-2013	7
17	Write a manual part program for the component shown in the figure 1.	Nov-2011	7
18	Write a manual part program for profile milling and hole drilling using a machining centre for a component shown in figure 2. Show the part zero.	June-2012	7
19	Write a manual part program for turning a job shown in figure 3. The raw material is M.S. bar of size f 90mm x112 mm long. The sequence of operations to be performed and relevant machining parameters are given in the table below. Show the part zero and state the canned cycle used for rough turning.	June-2012	7
20	Explain axis identification for Lathe, Milling & Drilling machines with neat sketches.	May-2016	7
21	What is meant by adaptive control? Explain any one type of adaptive control. What are the advantages of adaptive control?	Nov-2016	7
22	Explain Co-ordinate Measuring Machine.	Nov-2016, May-2017	7

Op. No.	Operation	Tool No.	Feed rate (mm/rev)	Speed
10	Facing	01	0.1	180 m/min
20	Rough Turning (Use canned cycle)	02	0.2	700 rpm
30	Finish Turning	02	0.1	180 m/min

Basic Geometry to be Machined

All dimensions are in mm
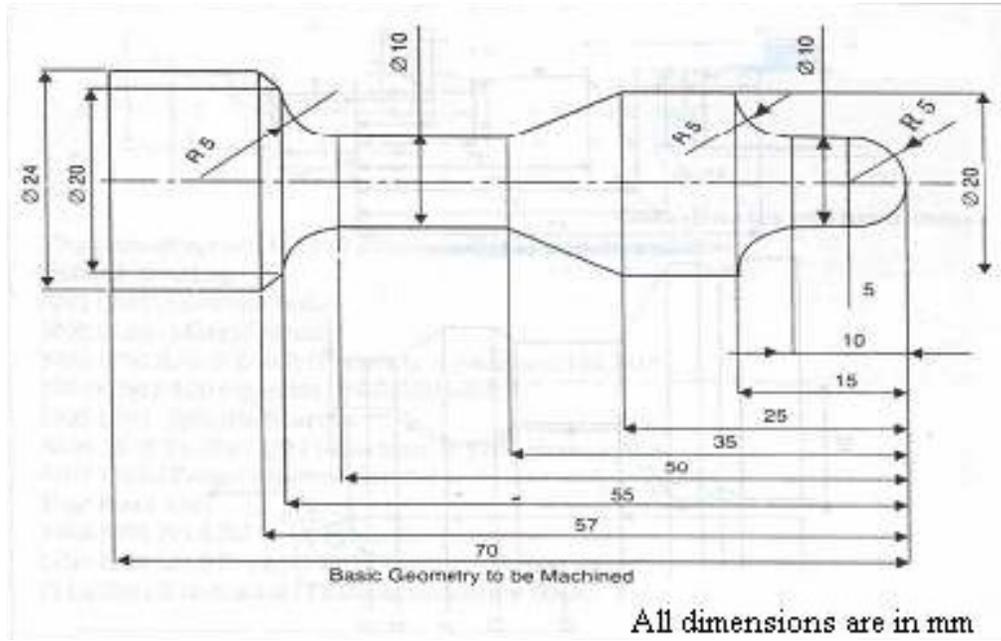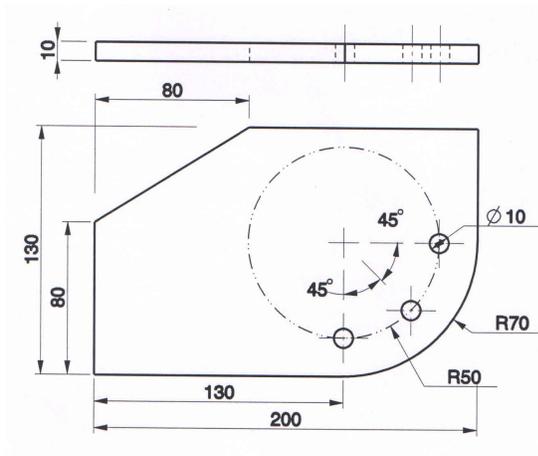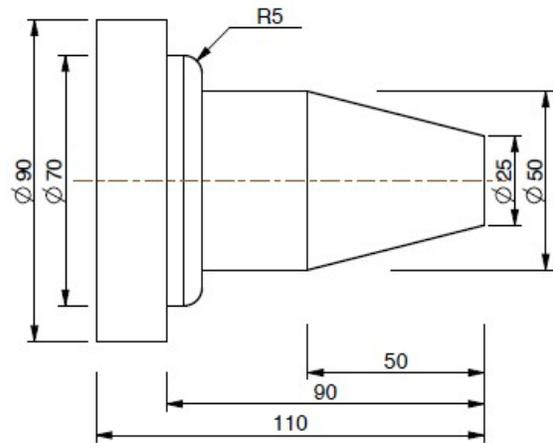
Figure 1

Figure 2

Figure 3

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ASSIGNMENT 3

SUB : CAM (2171903)   7TH ME A,B

CH-5 Flexible Manufacturing System (FMS)

NO	QUESTION	YEAR	MARKS
1	Enlist benefits of flexible manufacturing system.	Jan-2013	7
2	What is FMS? Explain the basic components of FMS. Draw different FMS layout.	June-2012, May-2015, May-2017, Nov-2017, May-2018	4, 7
3	Explain the types of flexibilities in FMS and discuss the factors on which these flexibilities depend.	Jan-2013, May-2013, Nov-2017	7
4	Describe with neat sketch AS/RS system used in FMS.	Nov-2011, Jan-2013, May-2013, June-2014, Dec-2013, May-2016, May-2017, Nov-2017, May-2018	7
5	What is an AGV? What are different types of AGVs? What are the benefits of using AGVs?	June-2012, Nov-2016, May-2018	7
6	Explain the role of CMM in Computer Aided Quality Control. What are different elements of a CMM?	June-2012	7
7	Explain tool supply system in FMS.	Dec-2013	7
8	What is FMS? Explain any three flexibilities associated with FMS.	Nov-2011, Dec-2014, June-2014, May-2018	7
9	What are the objectives of FMS? Describe the various layouts used in FMS.	Dec-2014	7
10	Write a short note on Automated Guided Vehicles associated with FMS.	Nov-2011, June-2014, Nov-2017	4, 7
11	Explain JIT technique used in auto industries.	June-2014, Dec-2013	7
12	List types of Manufacturing systems and compare each with respect to flexible, variety and production quantity.	Nov-2011	7
13	Compare FMS with transfer lines and CNC on the basis of:		

	(a) Volume; and (b) Variety of parts produced		
14	Explain the various linear and rotary workpiece transfer mechanisms used in FMS.		
15	State and explain the different tool management systems used in FMS.		
16	What is tool supply system? State and explain the various methods used for tool wear.		
17	What are different methods of tool monitoring? Explain.		
18	What is tool-wear monitoring? State and explain the various methods used for tool wear monitoring.		
19	Explain cellular manufacturing and different types of machine cell designs.	May-2017	7
20	Give advantages, limitations and applications of FMS.	Nov-2016	7

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ASSIGNMENT 4

SUB : CAM (2171903)   7TH ME A,B

CH-6 Robot Technology

NO	QUESTION	YEAR	MARKS
1	Enlist and explain different elements of a robot.	June-2012, Dec-2014, Nov-17	3, 7
2	Sketch and explain cylindrical and polar configurations of industrial robots showing work envelope.	June-2012	7
3	Explain on-line and off-line programming methods of robots. State advantages and disadvantages of each.	June-2012, June-2014, May-2016	7
4	Explain commonly used robot programming language with illustration	Nov-11, Jan-13	7
5	Define robot. Select most suitable robot configuration for following aspects with justification; (i) Maximum accuracy requirements (ii) Minimum space requirements (iii) Automobile Car body painting	Nov-11	7
6	Explain in brief Economic Evaluation of investment in robotic Installation.	May-13, Dec-13, June-2014	7
7	What are the different types of drives used in robot?	May-13, May-2017	7
8	Discuss various applications of robots.	May-13	7
9	Explain the term "Work Volume" with respect to robots.	Jan-13	7
10	Draw neat sketches and explain various robot configurations.	Jan-13, May-2015, Nov-2016	7
11	Draw a vertically articulated robot. Explain its working showing work envelope, degree of freedom and discuss its applications.	Nov-17	7

12	Explain various sensors and actuators used in robots.	Dec-13, June-2014, May-2015, Dec-2015	7
13	What is end effector? Explain the different type of end effectors used in robot.	Nov-2016	7
14	Sketch and explain cylindrical and SCARA configuration of industrial robot, showing work envelope.	Dec-2014, Nov-17	4, 7
15	What are the different types of gripper used in robot? Explain any two in detail.	Dec-2014, Nov-17	4, 7
16	Which parameters are to be considered for robot specification and selection of robot? Explain in details.	Dec-2014, Nov-2016	7
17	What do you mean by precision & accuracy in context of robotics? Explain with neat sketch. State various applications of robots.	May-2015	7
18	Differentiate between a SCARA and a gantry robot.	May-2017	7
19	List various power source, transducers used in robot arm.	May-18	7
20	Describe the terms with reference to Robot: 1. Payload, 2. Work envelop, 3. Wrist motions: Roll, Pitch and Yaw	May-18	3
21	Select a Robot configuration for loading and unloading a part from CNC turning center and place it in a rack near to the machine. Draw neat sketch of the configuration and define degree of freedom of each joint. Assume suitable data as required. Also justify your selection over other options.	May-18	7

SUBJECT IN CHARGE   HOD

NO	QUESTION	YEAR	MARKS
1	Process rationalization and standardization is a benefit derived from CAPP. Explain.	Jan-2013, May-18	7
2	List the various models of CIM. Explain anyone in detail.	Jan-2013, Dec-2013	7
3	Explain with neat diagram retrieval type CAPP.	Jan-2013, May-2013, June-2014, Nov-17	7
4	Explain with neat diagram generative type CAPP.	Jan-2013, May-16	7
5	Discuss the concept of CIM wheel and state potential benefits of CIM.	Dec-2014	7
6	Distinguish between variant and generative type CAPP stating their advantages.	Dec-2014, May-2015	7
7	Elaborate the role of elements of CIM with the help of CIM wheel.	May-2015, Nov-16	7
8	Describe computer integrated production management.	Dec-2013, Nov-17	7
9	Explain the variant type CAPP system. State the benefits and limitations of variant type CAPP systems.	June-2012	7
10	What are the major functions of process planning? What are the main problems associated with manual process planning?	June-2012	7
11	Discuss the concept of CIM wheel and explain the importance of integrating the enterprise included therein.	June-2012, Nov-17	7
12	Discuss different elements of CIM with neat sketch	May-16, May-18	7
13	Define Mechatronics? Explain benefits & applications of Mechatronics in Manufacturing.	May-16	7
14	Justify the need of CAM in today's era.	May-18	7

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ASSIGNMENT 6

SUB : CAM (2171903)   7TH ME A,B

CH-3 PLC

CH-7 Integrated Production Management System

NO	QUESTION	YEAR	MARKS
1	Explain in brief Programmable Logic Controllers.	Dec-2014, Nov-17	7
2	Explain the role of CMM in Computer Aided Quality Control. What are different elements of a CMM?	June-2012, Nov-16, May-17	7
3	Describe the different manufacturing systems along with their relevance in terms of productivity using a sketch.	May-2015	7
4	Explain JIT technique.	Dec-13, May-14, Dec-15, May-18	4, 7
5	What are the essential elements of a PLC system?	May-17	7
6	Explain the concept of expert system in manufacturing.		
7	What is computer integrated production management system? Explain with neat flow chart.	May-2013, Dec-13, May-14, Nov-17	7
8	Explain MRP-I and MRP-II in detail.	Dec-2014, June-2014, Dec-2013, Nov-17	7
9	What are the objectives of MRP system? State the various input to MRP system.	May-2015, May-18	3, 7
10	What are the typical outputs from MRP system? Prepare a sample output report of MRP system.	May-2015	7
11	Explain the inputs of MRP system in brief.	May-2013, May-2015	7
12	What is the difference between MRP-I & MRP-II?	May-2013	7
13	Explain problems with traditional PPC.		
14	Define PLC. Discuss the relay device components used in it.	Nov-17	3
15	What is PLC? List and discuss its applications in various industries.	May-18	4
16	Product P is assembled out of 2 units of S1 and 1 unit of	May-18	3

| | S2. Both S1 and S2 are subassemblies. S1 is made of 2 unit of C1 and 2 units of C3. S2 is made of 1 units of C1 and 2 unit of C2. Draw product tree structure diagram. | | |

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