



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; Dec. - 2015

Computer Aided Design and Manufacturing

Time: 3 hrs

Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.
ii) Assume suitably missing data if required.

UNIT - I

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|------|---|----|
| 1 a. | Explain the role of computers in Design and Manufacturing. | 5 |
| | b. Describe the revision of product cycle for a computerized manufacturing environment. | 10 |
| | c. What are the benefits of CAD and CAM? | 5 |
| 2 a. | Differentiate between primary and secondary storage devices. | 5 |
| | b. With a neat diagram explain the image generation using raster scan method. | 8 |
| | c. Explain with neat sketch the working of drum type plotter. | 7 |

UNIT - II

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|------|--|----|
| 3 a. | Describe the five functions of graphics package in a CAD system. | 6 |
| | b. A triangle is defined in a 2D ICG system by its vertices (0, 2) and (0, 3) and (1, 2). Perform the following transformations on this triangle and plot the graph, | |
| | i) Translate triangle in space by 2 units in the X - direction and 5 units in the Y - direction | |
| | ii) Scale the original triangle by a factor 1.5 | 14 |
| | iii) Scale the original triangle by a factor of 1.5 in the X - direction and 3.0 in the Y - direction | |
| | iv) Rotate the original triangle by 45° (CCW) about the origin. | |
| 4 a. | List the different solid modeling approaches used in a CAD system and explain any two approaches in detail. | 10 |
| | b. Explain the IGES format with different sections in it and their purpose. | 6 |
| | c. What are different synthetic wire frame entities used for wire frame modeling write their salient features? | 4 |

UNIT - III

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|------|---|---|
| 5 a. | What are the Basic elements of an NC system? | 6 |
| | b. Explain with neat sketch the NC coordinate system for turning and milling. | 6 |
| | c. What is DNC system? Explain the function of a computer in a DNC system. | 8 |
| 6 a. | What is meant by tool presetting explain? | 6 |
| | b. Explain the operation of a drum type ATC. | 6 |

- c. What is a CNC machining centre? Explain with neat sketch any one of the CNC machining centre. 8

UNIT - IV

- 7 a. Explain the different types of NC words used in part programming. 8
- b. The details of a component to be machined as shown in Fig. 7(b). The machining involves profile milling and drilling. For both the operations take speed = 500 rpm, feed = 75 mm/min. Assuming a suitable thickness, write the part program for machining the component. 12

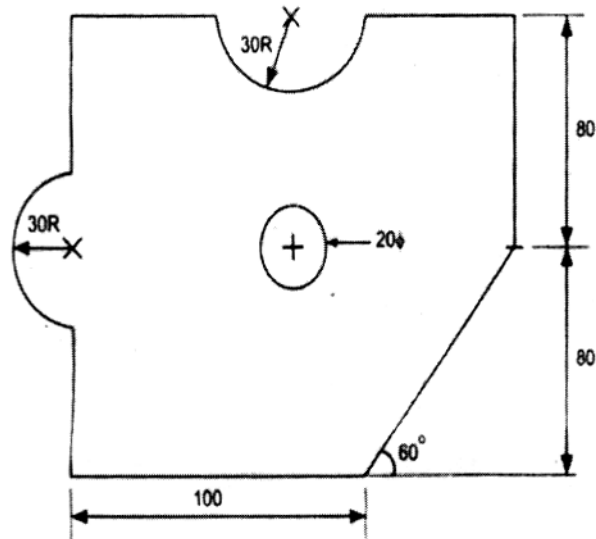


Fig Q 7(b)

- 8 a. What are the steps involved in manual part programming? 6
- b. With a suitable example explain the part program for step turning, facing and contour turning. 14

UNIT - V

- 9 a. What is meant by Group Technology? Explain the importance of Group Technology in the present day manufacturing. 6
- b. Explain the Process type and Group Technology Layout of machines. 6
- c. What are the components of an FMS and explain them briefly? 8
- 10 a. With a neat diagram explain the basic robot motions and degrees of freedom. 8
- b. Explain the different physical configurations of robot. 12

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