15. (a) Discuss how the parts are classified using the group technology GT.

Or

(b) List and describe the different types of material handling devices used in a FMS with neat sketches.

PART C — (1 × 15 = 15 marks)

16. (a) With a suitable example, analyze the benefits of the CAD/CAM system after implementation of it over the convensional system which had been followed for long time in a cutting tool manufacturing company. Assume suitable data wherever required.

Or

(b) A two wheeler manufacturing company plans to design and manufacture five models of electrical bikes. It has also a plan to implement the group technology. Design a group technology system with suitable diagrams for the above problem. Assume data wherever needed.

———————————

Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 20864

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2022.

Sixth/Seventh Semester

Mechanical Engineering

ME 8691 – COMPUTER AIDED DESIGN AND MANUFACTURING

(Common to Mechatronics Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How does IT facilitate concurrent engineering?

2. List any four software packages used for both CAD and CAM.

3. What is meant by the term continuity conditions in CAD?

4. How half spaces are used to develop primitives in solid modeling?

5. What are the various methods for checking the IGES standard?

6. Write the applications of CALS standard.

7. Why servomotor is used for axes feed drive?

8. What are the following G and M functions for a machining centre? G17, G30, M19, M06.

9. What is cellular manufacturing?

10. How does a turning centre differ from a FMC?

PART B — (5 × 13 = 65 marks)

11. (a) List and describe various activities involved in the product cycle development with suitable diagram.

Or

(b) With an example, elaborate the steps involved in implementation of CAM in a manufacturing industry.

12. (a) A B-Spline curve is defined by the points P1[1, 1], P2[5, 5], P3[8, 5], P4[4, 3]

    (i) Plot the curve (10)

    (ii) Find the tangent to the curve at $u = 0.25$. (1.5)

    (iii) Find the normal to the curve at $u = 0.25$. (1.5)

Or

(b) Discuss in detail about the basic elements and building operators of B-Rep scheme required for building the following solid model Fig. 1.
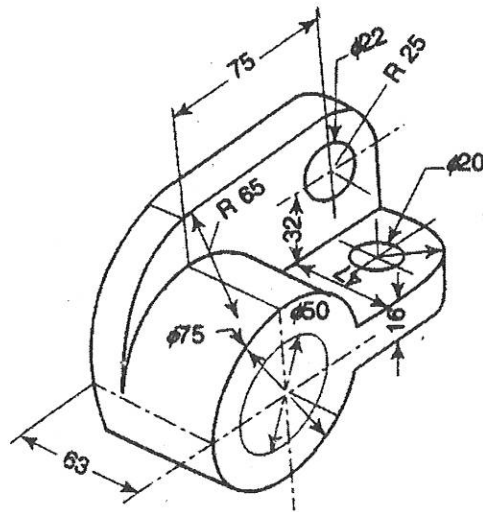

Fig. 1

13. (a) How would you transfer the data between dissimilated CAD/CAM system? Discuss the same.

Or

(b) Describe briefly the architecture of the following data exchange formats :

    (i) STEP (7)

    (ii) PDES (6)

14. (a) For the following component shown in Figure 2. Make a part program for the vertical machining centre. Clearly show the set point and axes on the sketch of the part. Assume the size of the blank is 162 × 92 × 10. All dimensions are in mm.
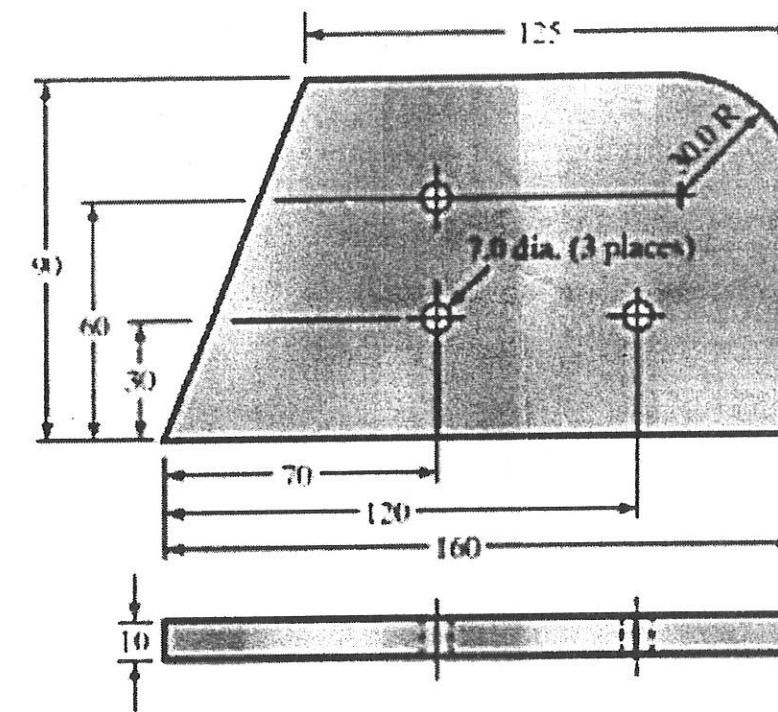

Fig. 2

Or

(b) Write a CNC program for machining the component shown in Figure 3. Assume that the workpiece is having size of ϕ 108 mm × 60 mm.
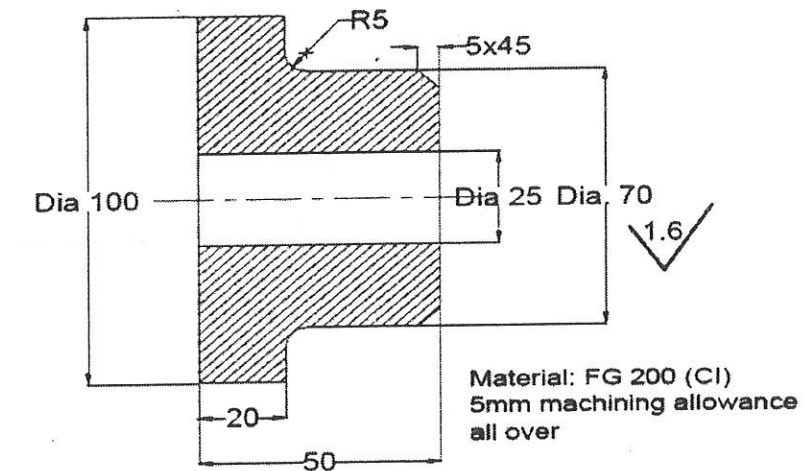

Fig. 3