1T01434 - S.E.(Mechanical) Engineering)(SEM-IV)(Choice Based) ((R-20-21) (C Scheme) / 41224 - CAD/CAM   QP CODE : 10030669   DATE: 17/05/2023

Duration: 3hrs   **[Max Marks: 80]**

N.B.: (1) Question No 1 is Compulsory.
      (2) Attempt any three questions out of the remaining five.
      (3) All questions carry equal marks.
      (4) Assume suitable data, if required and state it clearly.

1   Attempt any FOUR   **[20]**
   a   What are the applications of 3D solid CAD model.
   b   Determine the coordinate of a 3D point P (5, 7, 9) when rotated by 30 degree in CCW direction about Z axis.
   c   Explain the use of RP in biomedical field.
   d   Briefly explain the elements of NC Machine Tool System with neat sketch.
   e   Compare Bezier Curve and B-Spline Curve.

2 a   A cubic Bezier curve is defined by the control points as (20,20), (60,80), (120,100) and (150, 30). Find the equation of the curve and its midpoint.   **[10]**
   b   Explain Fused Deposition modelling with its advantages, disadvantages and applications.   **[10]**

3 a   A triangle PQR with vertices P (2,5), Q (6,7) and R (2,7) is to be reflected about the line y=0. 5x+3.Determine (i) the concatenated transformation matrix and (ii) co-ordinates of the vertices for the reflected triangle.   **[10]**
   b   Explain the major steps involved in rapid prototyping, list the various rapid prototyping techniques and explain any one of them with neat sketch in brief.   **[10]**

4 a   Explain in brief the elements of CNC machine tool system. Write down advantages, limitations and applications of CNC machine tool system.   **[10]**
   b   Write short note on 3D printing with neat sketch.   **[10]**

5 a   Write complete part programing for the forged component shown in following figure by taking finishing cut of 1 mm.   **[10]**
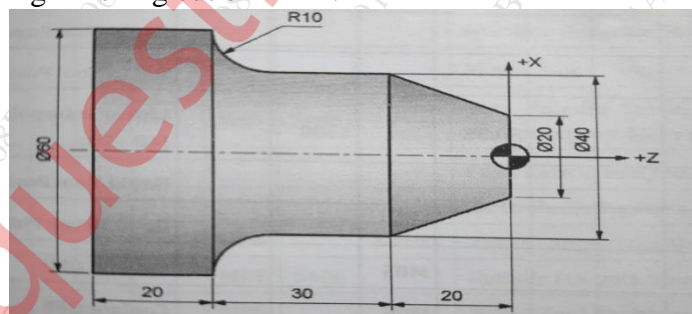
   b   Explain the process of obtaining CAD solid model of body parts using CT output data.   **[10]**

6 a   Explain in brief Augmented Reality (AR) and Virtual Reality (VR).   **[10]**
   b   Explain the concept of homogeneous co-ordinate system and its significance.   **[10]**

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