CAD/CAM/CIM
BE-ME
Sem VII

21/11/2014

QP Code : 15279

04 Hrs **[100 Marks]**

N.B.:
(1) **Question No.1 is compulsory**
(2) Attempt any **four** questions out of remaining **six** questions
(3) Figures to right indicate full marks
(4) Assume suitable data if **necessary**.
(5) Notations carry usual meaning.

Q.1 (A) Write short note on significance of rapid prototyping in product development and testing. 06

(B) Write short note on automated material handling and storage systems. 07

(C) Find the equation of a Bezier curve which is defined by the four points as $P_0(2,2,0)$, $P_1(2,3,0)$, $P_2(3,3,0)$ and $P_3(3,2,0)$ and also find the points on the curve for u=0, 0.25, 0.5, 0.75, and 1. 07

Q.2 (A) Write a part program using G and M codes for finishing a forged component as shown in Figure 1. Assume the speed and feed on the turning center as 500 rpm and 0.3 mm/rev respectively. Furthermore, assume 1mm material is to be removed radially from external diameter. 10

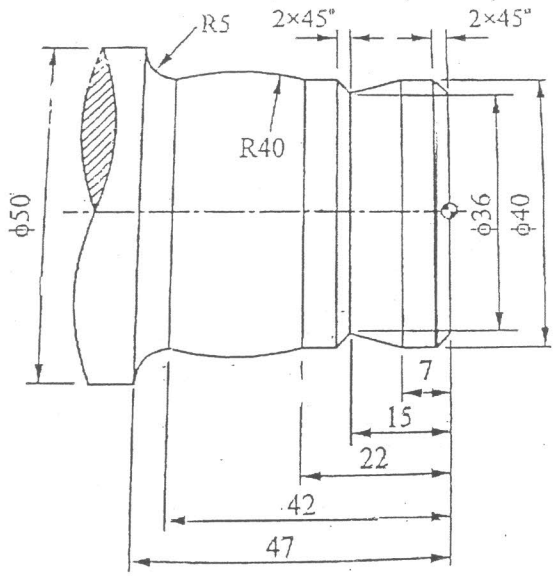

Figure 1

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(B) A triangle PQR has its vertices at P (0,0), Q(4,0) and R (2,3). It is to be translated by 4 units in X direction, and 2 units in Y direction, then it is to be rotated in anticlockwise direction about the new position of point R through 90 degrees. Find the new position (vertices) of triangle. 10

Q.3(A) Select at least an 8 member team and mention their role to form a "Concurrent Engineering Team" for design and development of a "Computer Table" which can house a "Monitor", "CPU", "Key Board", "Mouse", "DVD box of 100 units", "Printer cum scanner", "note pad and pen stand". 10

Enlist all possible activities involved in design and development of the computer table, and the use of various "Concurrent Engineering Tools". Develop the organization structure, communication path etc to design and development of the product.

(B) Explain with block diagram Computer Aided Quality Control (CAQC) in detail 10

Q.4 (A) Write short note on (i) Product life cycle (ii) Visual realism 10

(B) Write a complete APT program (geometric and motion commands) to machine the outline of the geometry as shown in Figure 2. The component is 5 mm tick. The end mill used is 5 mm in diameter. Consider spindle speed as 1000 rpm and feed as 0.3 mm/rev. Assume suitable data if necessary. 10

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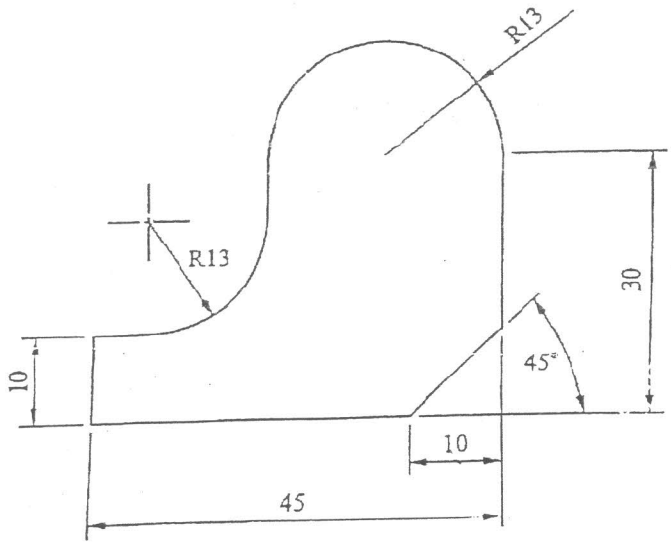

Figure 2

Q. 5 (A) Write a program in object oriented language for 2D transformation which include functions for the following operations: (i) rotation @ y-axis (ii) scaling 10

(B) Explain significance of (i) Data capture techniques and (ii) Socio-techno-economic aspects with respect to Computer Integrated Manufacturing (CIM) and technology driven practices 10

Q.6 (A) Explain retrieval type process planning system and its benefits 08

(B) List benefits of using Artificial Intelligence in design of component 06

(C) Write short note on design for assembly and disassembly 06

Q.7 Write short note on

A. Adaptive control in manufacturing 08

B. Wire frame modeling 06

C. Light and shade ray tracing 06
