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Question Paper Code : 41399

04/05/18
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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Fifth/Seventh Semester
Mechanical Engineering
ME 6501 – COMPUTER AIDED DESIGN
(Common to Mechanical Engineering (Sandwich)/Manufacturing Engineering/
Mechatronics Engineering)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What are the advantages of concurrent engineering ?
2. What is meant by concatenation transformation ?
3. List out the various Bezier curves based on control points.
4. What is the use of surface patch ?
5. What is the need of visualization ?
6. Mention the two approaches to hidden surface removal.
7. List out techniques of assembly modeling.
8. Define tolerance stack-up.
9. List out the international organizations involved to develop the graphics standards.
10. What is the objective of GKS-3D standard ?

PART – B

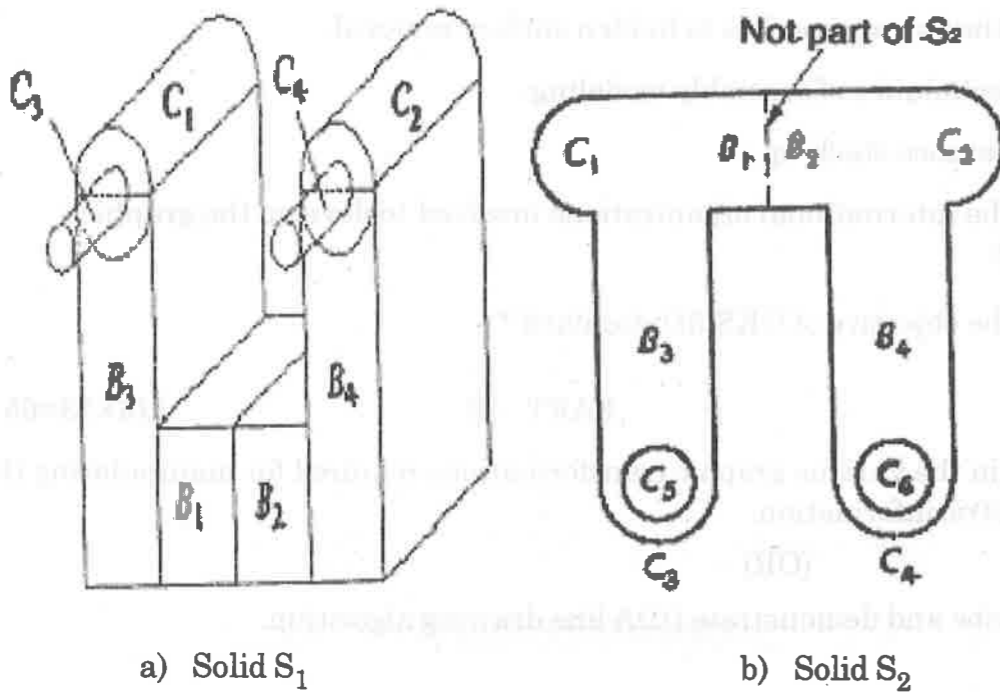
(5×13=65 Marks)

11. a) Explain the various graphic transformations required for manipulating the geometric information. (13)
- (OR)
- b) Describe and demonstrate DDA line drawing algorithm. (18)

12. a) Briefly discuss about the Bezier surface and composite surface. (13)
(OR)
b) Discuss the most commonly used solid entities with help of neat sketch. (13)
13. a) Explain the area oriented algorithm for hidden line removal. (13)
(OR)
b) Explain the techniques of Phong shading and Gouraud shading. (13)
14. a) Explain the following mating conditions require to assembling two parts. (13)
i) Coincident and concentric
ii) Parallel and tangent
(OR)
b) Describe the various mass properties on CAD/CAM systems. (13)
15. a) List and discuss the major available modules in CAD software packages. (13)
(OR)
b) i) Explain IGES File Structure with examples. (7)
ii) Explain the concept of Product Data Exchange using STEP in detail. (6)

PART - C (1×15=15 Marks)

16. a) Sketch the CSG tree for each of the two solids shown below.



The solid S_2 is divided symmetrically and it consist of four blocks (B_1 to B_4) and six cylinder (C_1 to C_6). The dashed line shown inside S_2 in the figure (b) is not part of S_2 . It is a hypothetical line that uses to divide the top part of S_2 into two blocks, B_1 and B_2 . (15)

(OR)

- b) A cubic Bezier curve is defined by coordinates $P_0 = [2 \ 2 \ 0]^T$, $P_1 = [2 \ 3 \ 0]^T$, $P_2 = [3 \ 3 \ 0]^T$ and $P_3 = [3 \ 2 \ 0]^T$. Find the equation of the resulting Bezier curve. Also find the points on the curve for $u = 0, 0.25, 0.5, 0.75$ and 1 . (15)