Printed Pages: 2 **Subject Code:EME-701**

Paper Id: 140713 **Roll No.** | | | | | | | | | | |

B TECH
(SEM-VII) THEORY EXAMINATION 2018-19
COMPUTER AIDED DESIGN

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Differentiate between random scan and raster scan.
b. Define emissive and non-emissive display.
c. What are the functions of graphics package?
d. What do you mean by output primitives?
e. What do you mean by order of continuity of curves?
f. Mention the differences between interpolation and approximation.
g. What is different coordinate system used in Auto cad.
h. Differentiate between plane surface and ruled surface with neat sketch.
i. What are the different types of errors in FEM solutions?
j. State the principal of minimum potential energy.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Write short notes on followings:
(i) Joystick
(ii) Digitizer
b. Explain Bresenham's circle algorithm and plot a pixel position for a circle whose center is (-3,8) and radius 12 unit using midpoint circle algorithm.
c. Write short notes on following:
(i) Properties of Bezier curve
(ii) Properties of Hermite curve
d. What do you mean by solid modelling? What are the techniques of solid modelling used in practice?
e. What do you mean by mesh generation? What are the various mesh generation techniques?

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) What do you understand by computer Integrated Manufacturing (CIM)? Discuss its role or function in product development cycle with suitable block diagram.
(b) Discuss Direct View Storage Tube (DVST) with neat sketches. What are two different technologies used to display color images in screen?

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) A square having end points A (1,1), B (6,1), C (6,6) and D (1,6) is rotated by 50° in clockwise direction keeping point (6,1) fixed. Find the final coordinates of a square.
(b) What are the specifications of good CAD software? Give a typical specification of CAD hardware.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Briefly discuss the generation of 2D curves. What are the difficulties of using non-parametric curves? What advantages does a parametric curve offer for representing curves?

(b) Four vertices of Bezier polygon are $P_0(1,1)$, $P_1(2,3)$, $P_2(4,3)$ and $P_3(3,1)$. Determine and plot seven points on the Bezier curve.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain constructive solid geometry. What is the role of primitives and Boolean operations in CSG? Explain with suitable examples.

(b) Discuss the RGB and CMY model of colour and explain the importance of colour in CAD/CAM application.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) F is the force required to lift mass M by means of weight lifting machine. Determine the relation between F and M using method of least squares. Use the following data.

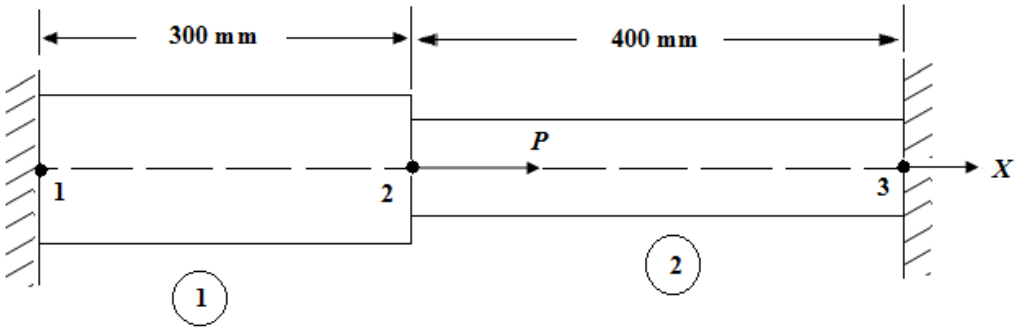
F	12	16	22	26
M	55	75	100	125

(b) Consider the bar shown in Figure. 1. An axial load P = 200 x 10^3 N is applied as shown. Using the penalty approach for handling boundary conditions, do the following:

i. Determine the nodal displacements.

ii. Determine the stress in each material.

Also determine the reaction forces at each end.



Aluminum
$A_1 = 2400\ mm^2$
$E_1 = 70 \times 10^9\ N/m^2$

Steel
$A_2 = 600\ mm^2$
$E_2 = 200 \times 10^9\ N/m^2$

Figure. 1