Total No. of Questions : 4]

SEAT No. :

PD62

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S.E. (Robotics & Automation Engineering) (Insem)

COMPUTER GRAPHICS FOR ROBOTICS

(2019 Pattern) (Semester-IV) (211512)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***All questions are compulsory i.e. Solve Q.1 or Q.2, Q.3 or Q.4.***
2) ***Figures to the right side indicates full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data,if necessary.***

Q1) a) If a line is drawn from (2, 3) to (6, 15) with use of DDA. How many points will needed to generate such line? **[8]**

b) What is Computer graphics? State the applications of computer graphics. **[7]**

OR

Q2) a) Calculate the points between the starting coordinates (9, 18) and ending coordinates (14, 22) by using Bresenham line drawing algorithm. **[7]**

b) Explain the following terms: **[8]**

i) Pixels

ii) Frame Buffer

iii) Aspect Ratio

iv) Resolution

Q3) a) In 2D transformation given a triangle with points (1, 1), (0, 0) and (1, 0). Apply shear parameter 2 on X axis and 2 on Y axis and find out the new coordinates of the object. **[8]**

b) Explain perspective projection with its types. **[7]**

OR

P.T.O.

Q4) a) Find a transformation of triangle A(1,0), B(0,1), C(1,1) by: **[8]**

i) Rotating 45° about the origin and then translating one unit in x and y direction.

ii) Translating one unit in x and y direction and then rotating 45º about the origin.

b) Obtain the 3D transformation matrix for forward kinematic analysis of a spherical robot. **[7]**