Total No. of Questions : 4]

SEAT No. :

PB66

[Total No. of Pages :1

[6268]- 261

S.E. (Robotics & Automation) (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) ***Assume suitable data, if necessary.***
3) ***Figures to the right side indicates full marks.***
4) ***Neat diagrams must be drawn whenever necessary.***
5) ***Use of calculator is allowed.***

Q1) a) What is computer graphics? State the applications of computer graphics. **[7]**

b) Calculate the angle between two vectors. **[8]**

$\hat{i} - 2\hat{j} + 3\hat{k}$

$3\hat{i} - 2\hat{j} + \hat{k}$

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) 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]**

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

Q4) a) Given a 3D Triangle with coordinate points A (3,4,1), B (6,4,2), C (5,6,3). Apply the reflection on the XZ plane and find out the new coordinates of the object. **[8]**

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

ꕥ ꕥ ꕥ