B.A/B.Sc. 3rd Semester (Honours) Examination, 2019 (CBCS)

Subject : Mathematics

Paper : BMH3SEC12

(Computer Graphics)

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
Notation and symbols have their usual meaning.

Group-A

1. Answer *any five* questions from the following: 2×5=10

(a) What do you mean by raster scan device?

(b) What is GPU? Explain.

(c) What is shadow mask in CRT monitor?

(d) What do you mean by refresh rate of a monitor?

(e) What is viewport?

(f) What is affine transformation?

(g) What is shear transformation?

(h) Suggest four different areas where computer graphics is useful.

Group-B

2. Answer *any two* questions from the following: 5×2=10

(a) Differentiate between CRT and LCD monitors. What is frame buffer? 3+2=5

(b) Differentiate between RGB and CMY colour models. What do you mean by luminocity? 3+2=5

(c) Write boundary fill algorithm. What is scan-line polygon filling? 3+2=5

(d) Prove that two successive rotations are additive (i.e. $R(\theta_2) \cdot R(\theta_1) = R(\theta_1 + \theta_2)$). 4+1=5

Group-C

3. Answer *any two* questions from the following: 10×2=20

(a) Deduce Bresenham's line drawing algorithm for $m < 1$. Why this algorithm is better than DDA line drawing algorithm? 8+2=10

(b) Deduce mid-point circle drawing algorithm. Why mid-point ellipse drawing algorithm is different than mid-point circle drawing algorithm? 8+2=10

(c) Explain general pivot point rotation and derive the corresponding transformation matrix. What do you mean by homogeneous coordinate system? (2+6)+2=10

(d) Explain and write Cohen-Sutherland line clipping algorithm. What is antialiasing effect? 8+2=10

B.A/B.Sc. 3rd Semester (Honours) Examination, 2019 (CBCS)

Subject : Mathematics

Paper : BMH3SEC13

(Object Oriented Programming in C++)

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Notation and Symbols have their usual meaning.

Group-A

1. Answer *any five* questions from the following: 2×5=10

(a) Point out two differences between C and C++ languages.

(b) Differentiate between 'pointer' and 'reference'.

(c) What do you mean by 'scope of a variable'?

(d) What is abstraction?

(e) Can a local variable and a global variable both have same identifier? Give reason in support of your answer.

(f) What is 'inline function'?

(g) What is compiler? Why it is used?

(h) Write two salient features of Object Oriented Programming?

Group-B

2. Answer *any two* questions from the following: 5×2=10

(a) Write a program in C++ to find HCF (GCD) of two numbers. What is recursion? 3+2=5

(b) Write a function in C++ to swap two variables without using any third variable. Who invented C++? In which year it was invented? 3+2=5

(c) Write a function in C++ to find factorial of a given number. What is void pointer? 3+2=5

(d) Write a program in C++ to check whether a given string is palindrome or not. What is exception? 3+2=5

Group-C

3. Answer *any two* questions from the following: 10×2=20

(a) Deduce Bresenham's line drawing algorithm for $m < 1$. Why this algorithm is better than DDA line drawing algorithm? 8+2=10

(b) Deduce mid-point circle drawing algorithm. Why mid-point ellipse drawing algorithm is different than mid-point circle drawing algorithm? 8+2=10

(c) Explain general pivot point rotation and derive the corresponding transformation matrix. What do you mean by homogeneous coordinate system? (2+6)+2=10

(d) Explain and write Cohen-Sutherland line clipping algorithm. What is antialiasing effect? 8+2=10