	Class: Integrated M. Sc.	**Semester:** VI	**Branch:** Computer Science	**Marks**
	SUBJECT: Computer Graphics	**CODE:** CSC-001	**Faculty:** Mamta Rani	**60**
	Assessment: EoSE	**Date:** 28\01\20	**Time:** 10-1 am	

SECTION A

In Section A, do **any five** questions. Each question is of **3 marks**.

Q-1. Write line DDA algorithm.

Q-2. Give Flood fill algorithm with explanation.

Q-3. Suppose an RGB raster system is to be designed using an 8-inch by 10-inch screen with a resolution of 100 pixels per inch in each direction. If we want to store 6 bits per pixel in the frame buffer, how much storage (in bytes) do we need for the frame buffer?

Q-4. Show that the two consecutive translations are additive in nature.

Q-5. Define fractals. Give properties of fractals.

Q-6. List methods of generation of fractals with example of each method.

SECTION B

In Section B, do **any three** questions. Each question is of **15 marks**.

Q- 7. Do all parts.   [3 x 5 = 15]

(a) Differentiate between raster scan and random scan display techniques.

(b) What is the fraction of the total refresh time per frame spent in retrace of the electron beam for a non-interlaced raster system with a resolution of 1280 by 1024, a refresh rate of 60 Hz, a horizontal retrace time of 5 microseconds, and a vertical retrace time of 500 microseconds?

(c) Describe raster scan display. Write a note on interlacing technique also.

(d) Consider two raster systems with resolutions of 640 by 480 and 1280 by 1024. How many pixels could be accessed per second in each of these systems by a display controller that refreshes the screen at a rate of 60 frames per second? What is the access time per pixel in each system?

(e) Give Boundary- Fill Algorithm with explanation.

Q- 8. Do all parts.

(a) Derive decision parameter and initial parameter for mid-point circle algorithm.   [6]

(b) Write a note on trackball, space ball and Mouse input devices.   [3]

(c) Derive decision parameter and initial parameter for line Bressenhem's algorithm.   [6]

Q- 9. Do all parts.

(a) Derive transformation matrix for scaling about a fixed point.   [3]

(b) Write Cohen Sutherland algorithm for line clipping in detail.   [4]

(c) Take a square of length 1 having coordinates A(0, 0), B(1, 0), C(0, 1) and D(1, 1). Apply shear in y-direction by factor ½ and get the new values of all the four coordinates.   [4]

(d) Derive transformation equations for oblique parallel projection projection.   [4]

Q-10. Do all parts.

   (a) Describe Hodgman-Sutherland algorithm for polygon clipping.   [4]

   (b) Explain symmetries. What kind of symmetry does a fractal object hold?   [4]

   (c) Show the method of construction of Koch curve. Calculate its dimension.   [4]

   (d) Give classification of fractals on the basis of self-similarity.   [3]

Q - 1. Give a comparison between Raster scan display and Random scan display.   [**Marks 4**]

Q - 2. Suppose there is a system with 12 inch by 14 inch video monitor that can display 120 pixels per inch. If memory is organized in one byte words, the starting frame buffer address is 0, and each pixel is assigned 4 bits of storage, what is the frame buffer address of the pixel with screen coordinate (x, y)?   [**Marks 4**]

Q - 3. For a medium resolution display of 640 pixels by 480 lines refreshing 60 frames per second, the video controller fetches 16 bits in one memory cycle. RAM chips have cycle times around 200 ns. How many memory cycles will be needed for displaying 16 bits per pixels in one second?   [**Marks 2**]

Q – 4. Use the midpoint method and symmetry considerations to draw the parabola

$$x = y^2 - 5$$

over the interval $- 10 \leq x \leq 10$. Write the complete algorithm.   [**Marks 10**]

CENTRAL UNIVERSITY OF RAJASTHAN

(EOSE EXAMINATION JAN 2021)

CLASS   : Integrated M.Sc.   SEMESTER: V
BRANCH : CS
SUBJECT CODE & NAME : CSC-315   &   SOFTWARE ENGINEERING
TIME: 3 HOUR   MAX MARKS : 60

INSTRUCTIONS:
1. **The question paper contains two sections.**
2. **Candidates must attempt all section.**
3. **The missing data, if any, may be assumed suitably.**
4. **Before attempting the question paper, be sure that you got the correct question paper**
5. **Marks for each question are given in front of each question.**
6. **Section A, attempt only 5 questions. In section B, attempt only 3 questions.**

SECTION-A [Maximum Marks – 15]

In section A, attempt only 5 questions.

Q1. Why are models important in software engineering work? Are they always necessary? Are there qualifiers to your answer about necessity?   [3]

Q2.
(a) You have been given the responsibility to elicit requirements who tells you he is too busy to meet with you. What should you do?   [1.5]
(b) Why is maintenance of software important? Discuss some of the problems that are faced during maintenance of software.   [1.5]

Q3. Quality and reliability are related concepts but are fundamentally different in a number of ways. Discuss the differences.   [3]

Q4. Identify the main motivation and goals behind the development of the RAD model. How does the model help achieve the identified goals?   [3]

Q5. Give reasons why requirements elicitations and analysis is a difficult phase in requirements engineering process.
                                                                                                                                                                                    [3]
Q6. What difficulties might be faced if no life cycle model is followed for a certain large project?   [3]

SECTION-B [Maximum Marks – 45]

Attempt any three questions from section B.

Q-1
(i) "Quality of planning effort plays a vital role in the success or failure of the project". Justify this statement. Explain the contents of system-Level development plan.   [5]

(ii) What problems may appear if a large program is developed without structured programming techniques?   [5]

(iii)Draw a systematic diagram to represent the iterative waterfall model of software development. On your diagram represent: [2.5*2=5]
    (a) The phase entry and exit criteria for each phase.
    (b) The deliverables that need to be produced at the end of each phase.

Q-2

(i) Consider the example of metro railway. Suppose there is a provision of buying a smart card by paying cash whose value is loaded on smart card. Passenger is not required to stand in the queue to buy ticket against cash, he can walk up to an automatic ticket vending machine, feed his journey details, automatic ticket vending machine calculates fare, he swipes off his smart card, ticket fare is deducted from his pre-loaded smart card

and ticket is generated. Passenger tears off the ticket from printer and walks away. Construct the above situation in a sequence diagram? [5]

(ii) Assume that the size of an organic type software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 15,000/- per month. Determine the effort required to develop the software product and the nominal development time. [5]

(iii) Suppose that a basic project was estimated to be 400 KLOC. Calculate effort & time for each of 3 modes of development: [5]
    (a) Organic
    (b) Semi-detached
    (c) Embedded

Q-3

(i) At present in the Office work at Computer Science Department carried out through manual by two office clerks, a store keeper and two attendants. You have to develop automation software of office work at Computer Science Department. Define all the steps consider in requirement gathering for automation of above said work. [5]

(ii) A software for an academic institution to automate its: Course Registration and grading, fee collection, staff salary, purchase and store inventory. The software would be developed by tailoring a similar software that was developed for another educational institution (a) 70% reuse (b) 10% new code and 20% modification. You have to suggest a suitable life cycle model for the above-mentioned problem with an explanation. [5]

(iii) As testing proceeds more and more bugs are discovered, how to know when to stop testing? [2]

(iv) Consider the case of mobile phone vendor: [3]
    (a) A new mobile operating system by upgrading the existing operating system
    (b) Needs to work well efficiently with 4G systems
    (c) Power usage minimization
    (d) Directly upload backup data on a cloud infrastructure maintained by the mobile phone vendor.
        Suggest suitable life cycle model for the above case.

Q-4

(i) Suppose bus transport company wish to implement Cloak Room Project where it wants to allow the passengers to book cloak room in advance. Write feasibility study report including objectives, background (e.g. existing services), organize knowledge (identify stakeholders), and list out requirements. [5]

(ii) How can you make a good Software requirements specification (SRS), define all the steps involved in SRS with a proper example. [5]

(iii) Draw Use Case Diagram for given scenario. Video store information system supports the following business functions: [5]
    (a) Recording information about videos the store owns
      • This database is searchable by staff and all customers
    (b) Information about a customer's borrowed videos
      • Access by staff and customer. It involves video database searching.
    (c) Staff can record video rentals and returns by customers. It involves video database searching.
    (d) Staff can maintain customer and video information.
    (e) Managers of the store can generate various reports.

*** 21th January 2021 ***