Unit-1 $\Rightarrow$ 5 marks

Unit-2 $\Rightarrow$ 5 marks + 5 marks

Unit-3 $\Rightarrow$ 10 marks + 5 marks

Unit-4 $\Rightarrow$ 10 marks + 5 marks

Unit-5 $\Rightarrow$ 10 marks + 5 marks

Unit-6 $\Rightarrow$ 5 marks + 5 marks

And additional one question for 5 marks maybe asked from any of above all Units.

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$\Rightarrow$ Total 75 marks

Numerical Method Possible Numbering Scheme:

Unit 1 → 10 marks

Unit 2 → 20 marks

Unit 3 → 10 marks

Unit 4 → 15 marks

Unit 5 → 10 marks

Unit 6 → 5 marks
_____
70 marks

⇒ Additional one 5 marks question maybe asked from any chapters among chapter 1, 3, 4 and 5. Then, finally it becomes 75 marks.

⇒ 10 marks 3 questions maybe asked from any chapters except last Unit 6.

⇒ Among total of 75 marks 15 to 20 marks is asked for theory, algorithm & Program.

Unit-1

1. What is a computer graphics? Explain in detail about the application of computer graphics.

2. What do you mean by refresh rate of a display device? Write short note about shadow mask method.

3. CRT, it's types with architecture.

4. Differences between raster and random display systems.

5. Differences between beam penetration method and shadow mask method.

6. Short note on graphics software and Software Standards.

Unit-2

1. DDA line drawing algorithm.

2. Mid-point circle algorithm.

3. Differences between DDA and Breshman line drawing algorithm.

4. How can a polygon surface be filled using flood fill approach?

Unit-3

~~1. How can po~~

1. What is homogenous coordinate system. Explain 2D shears.

2. How to animate two dimensional figure using transformations? ~~Example of~~ Explain with example.

3. Two dimensional transformations and numericals related to them.

4. Window to viewport coordinate transformation with example.

5. Liang-Barsky line clipping.

6. Sutherland-Hodgeman Polygon clipping algorithm.

7. Cohen-Sutherland line clipping [lesser imp maybe because asked past year].

Unit-4

1. 3D transformations [mostly Scaling, Reflection & Shearing] and numericals related to 3D transformations.
2. Projection concept and it's types. (orthographic, parallel and prespective).

Unit-5

1. Write short note on polygon tables and polyon mesh.
2. How curves be generated? Explain it with any suitable algorithm.
3. Explain about parametric and bezier curve.
4. Explain fractals and it's applications.

Unit-6

1. What are the key issues prevalent in producing a virtual reality scene? Describe Binary space partition tree.
2. Write short note on octree representation.
3. Explain boundry representation with advantages and disadvantages.
4. Write short note on Sweep representations.

Unit-7

1. Write short note on depth sorting method (Painter's Algorithm).
2. Differences between Z-buffer and A-buffer method.
3. Explain in detail about plain equation method. Explain which algorithm is better for hidden surface removal.
4. Explain scan-line method.
5. Write short note on ray-tracing method and octree method.

Unit-8

1. How polygons can be clipped? Why is phong shading also called Normal Vector Interpolation scheme? Explain.

2. Explain ambient light, diffuse reflection and specular reflection with examples.

3. Why shading is required in the computer graphics? Explain in detail about constant intensity shading.

4. Explain Gourad shading.

5. Differences between Gourad shading and Phong shading.

Unit-9

1. Explain augemented reality and ~~virtuality~~ virtual reality.

2. What are the advantages and disadvantages of VR. Explain VR applications in computer graphics.

3. Explain types of Virtual Reality.

4. Write short note on 3D positional tracking and key components in virtual reality system.

Unit-10

1. How does a polygon can be created in OpenGL? Illustrate with an example.

2. Why OpenGh is needed. Explain OpenGh color commands.

3. Write short note on callback functions.

4. How can we create lines and polygons in OpenGL explain.

Unit-1

1. What is ADT? How it is different from data type? What are the benefits of using ADT?

2. Short note on big O notation and dynamic memory allocation.

3. What do you mean by complexity of algorithms? Describe time complexity and space complexity.

4. Define algorithm. What is good algorithm?

5. Define worst, best and average case complexity of algorithms. ~~and desc~~ Explain with suitable example

Unit-2

1. How can you use stack to evaluate a postfix expression? Explain.

2. How can you use stack to convert infix expression to postfix expression?

3. Compare stack with queue and discuss stack as ADT.

~~4. Explain postfix evalu~~

4. How can you convert from infix to postfix notation?

Unit-3

(leave as option hand)

1. Write a program to implement circular queue.

2. What is priority queue. What are the advantages of priority queue over linear queue? Describe insertion and deletion process of elements from priority queue.

3. What is queue? What are the drawbacks of linear queue over circular queue?

4. Define circular queue? What are the primitive operations of queue.

DSA

Unit-4

1. Define recursive algorithm. How do you implement recursive GCD algorithm?

2. How do you implement recursive algorithms while writing computer programs.

3. What ~~is no~~ are advantages and disadvantages of recursive programming? Write a C program to find GCD of two numbers using recursion.

4. What is recursion? Write an algorithm for finding Fibonacci series using recursion.

5. State TOH problem. Write recursion tree when no. of disks are four.

Unit-5

1. What is linked list? Explain different types of linked lists. Discuss algorithms for inserting and deleting a node at front position of the linked list.

2. What are benefits of using linked list over array? How can you insert a node in a singly linked list?

3. Write a complete program in C to demonstrate the use of linked list implementation of stack.

4. What is main advantage and disadvantage of using doubly linked list over singly linked list?

5. How can you delete a note node in a singly ~~and~~ linked list.

Unit-6

1. Hand-test selection-sort algorithm with the data given below:-
   56, 23, 14, 20, 65, 7, 8, 14, 15, 25. [Model-set solution kec page no. 16]

2. What is stable sort? List out recursive sorting algorithms and describe quick sort in detail.

3. Why sorting is important in computer science? Describe any one of the best sorting technique with suitable example.

4. Quick sort and Heap sort technique [Also Merge sort]

Unit-7

1. Discuss binary search algorithm. What is time complexity of this algorithm?

2. What are the benefits of using hashing? How do you choose a hash function?

3. What do you mean by hash collision? Explain hash collision resolving techniques with suitable example.

4. What is hash function? Show that quadratic hashing with suitable example.

5. What is hash table? Explain rehasing with suitable example.

Unit-8

1. Define graph. Discuss Dijkastra's algorithm for finding shortest path in a graph.

2. How do you balance a binary tree? Discuss.

3. Discuss depth-first search in a graph with example. [Past year asked maybe less imp]

4. Write short note and properties of spanning tree.

5. Discuss breadth first traversal of a graph with suitable example

6. Describe Prism's and Kruskal's algorithm with suitable example.

7. Show binary tree as an ADT. Construct AVL tree of following data items.

$$A[\ ] = [4, 5, 6, 22, 3, 9, 34, 11, 89, 2, 10, 17, 24]$$

8. Describe strong and weakly connected graphs with examples. What is weighted graph?

Unit-1

1. What is overflow? Explain overflow detection process with signed and unsigned number addition with suitable example.

2. Explain Error detection code with example.

3. Differences between parity checker and parity generator.

4. Differences between fixed point representation and floating point representation.

Unit-2

1. Write down arithmetic microoperations and design a 4-bit binary adder-subtractor.

2. Applications of Logical Microoperations with example.

3. Explain Arithmetic Logic Shift Unit.

4. What do you mean by shift microoperation? Explain.

5. What do you mean by logic microoperations? Explain.

6. ~~Differences between logic micro~~

Unit-3

1. What is meant by instruction set completeness? Is instruction set of basic computer complete? Discuss instruction cycle of basic computer with flowchart.

2. What is the purpose and advantage of common bus system? Explain common bus system of basic computer.

3. What do you mean by instruction format? Explain.

4. Interrupt cycle flowchart and flowchart for basic computer.

5. Differentiate between direct and indirect addressing modes.

6. What are input-output instructions of basic computer.

CA

Unit-4

1. What is general organization of microprogram control unit? Explain major steps when design of microprogram control unit.

2. What is meant by address sequencing. Draw diagram of address sequences.

3. What are the differences between Hardwired control unit and microprogrammed control unit.

4. Explain about mapping of instruction and subroutines.

5. Explain microinstruction format.

Unit-5

1. Addressing Modes [Numerical Question Type].

2. Explain different types of CPU organizations with suitable figures.

3. Short note on register overlapped windows.

4. Differences between CISC and RISC architecture.

Unit-6

1. What is concept behind pipelining? Discuss different types of pipeline conflicts and their possible solutions briefly.

2. Addressing modes [Numerical Questions Type]

2. What is space-time diagram? Discuss pipeline speedup equation.

4. Explain CISC and RISC architecture with example.

3. Differences between CISC and RISC architecture

4. What is Instruction Pipeline? Explain with the help of space-time diagram.

5. What is parallel processing? Explain flynns classification of computers.

6. Short note on register overlapped windows.

Unit-7

✓1. Booth Multiplication Algorithm. [Past year asked 5 marks] ⎫ Flowchart
✓2. Division Algorithm [Restoring & Non-Restoring] ⎬ and
Numerical

(Most Imp) ← past year asked less Imp

Unit-8

✓1. Define priority interrupt. Explain Daisy-chaining method of handling interrupt priority.

✓2. Write short note on Input-Output process.

✓3. What is input output interface? Differentiate between Input-output bus and memory bus?

4. Differentiate between I/O bus and interface modules

5. What are the major differentiate between Input-output processor (IOP) and direct memory access (DMA).

[solution in old 13 gold page no. 124]

Unit-9

✓1. What is cache mapping? Explain direct mapping with suitable example.

✓2. Explain mapping process. Differentiate between direct mapping and associate mapping.

3. Write short note on associative memory and set-associative mapping.

4. Write short note on Hit and Mess Ratio.

5. Why memory hierarchy is required? Explain RAM and ROM chips with the help of it's function table.