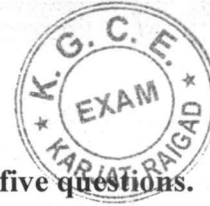


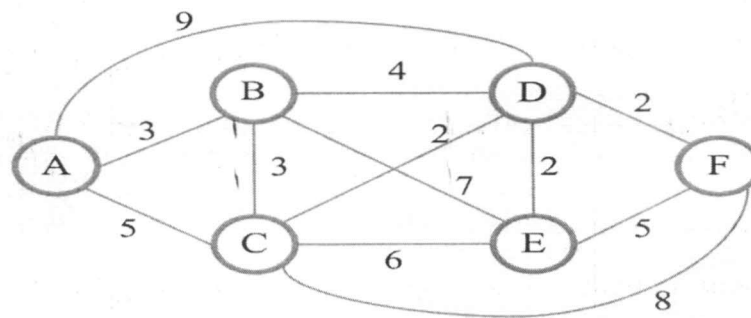
(3 Hours)

Total Marks: 80



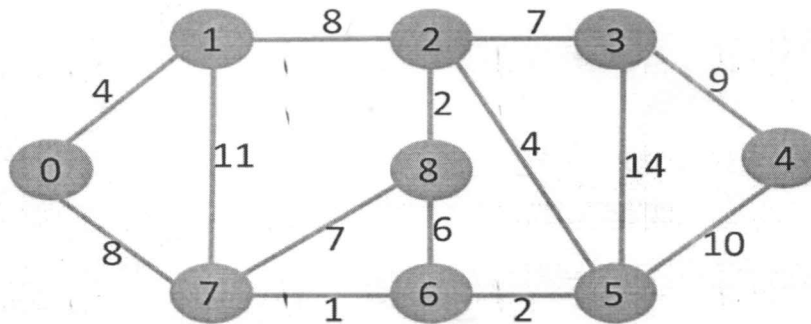
- N.B.: (1) Question No. 1 is compulsory.
 (2) Attempt any three questions out of remaining five questions.

- Q1. a) Sort the following numbers using Merge Sort. Also derive the time complexity of Merge Sort. (10)
 70, 20, 30, 40, 10, 50, 60
 b) Explain different string matching algorithms. (10)
- Q2. a) Write an algorithm to find minimum and maximum value using divide and conquer and also derive its complexity. (10)
 b) Find the shortest path from source vertex A using Dijkstra's algorithm



- Q3. a) Write an algorithm for sum of subsets. Solve the following problem. (10)
 $M=30$ $W=\{5, 10, 12, 13, 15, 18\}$
 b) Explain optimal storage on tape with example. (10)
- Q4. a) Find an optimal solution to the knapsack instance $n=5, m=60$ (10)
 profit= $\{30, 20, 100, 90, 160\}$
 weight= $\{5, 10, 20, 30, 40\}$
 b) Explain longest common subsequence with example. (10)

- Q5. a) Find the Minimum Spanning Tree of the following graph using prim's algorithm



- b) Explain flow shop scheduling with example. (10)
- Q7. Write note on (any two): (20)
 a) Strassen's matrix multiplication.
 b) 15-puzzle problem.
 c) Job sequencing with deadlines.
 d) N-Queen problem.

[Time: 3 Hours]

[Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question number one is compulsory.

2. Attempt any three from remaining five questions.

3. Assume any suitable data if necessary and justify the same.



- Q.1**
- State the various applications of computer graphics. Explain anyone in detail **05**
 - List the various 2 D transformations used in graphics systems. Explain anyone in detail **05**
 - Specify the mechanism of converting window to viewport coordinate transformation **05**
 - Explain the various polygon rendering models used in computer graphics. **05**
- Q.2**
- Rasterize a line segment using Bresenham's line drawing algorithm where starting coordinates of line segment are $P_1(5,5)$ and ending coordinates are $P_2(13,9)$. Further differentiate between DDA and Bresenham's line drawing algorithm. **10**
 - Define Boundary and Flood fill mechanism. Explain 8-connected flood fill mechanism in detail. **10**
- Q.3**
- State the how the visible surface detection algorithms are classified. Explain Back Surface detection method in detail with an example **10**
 - Explain mid-point circle drawing algorithm. Using mid-point circle algorithm plot the circle whose radius = 10 units. **10**
- Q.4**
- Explain Cohen Sutherland line clipping algorithm. Apply the algorithm to line with coordinates $p_1(x_1,y_1) = (2, 2)$ and $p_2(x_2,y_2) = (12, 9)$ against the window $(x_{wmin}, y_{wmin}) = (4, 4)$ and $(x_{wmax}, y_{wmax}) = (9, 8)$. **10**
 - Define what is meant by Bezier curve. Explain its properties and further differentiate between Bezier and B spline curve. **10**
- Q.5**
- Explain Parallel and Perspective "projection? Derive the matrix for perspective projection **10**
 - Explain Sutherland Hodgman polygon clipping algorithm with example. Also clearly state its drawback **10**

Q.6 Write short notes on (Any Two)

- a) Illumination models
- b) Half tone and Dithering techniques
- c) Fractals
