# University of Mumbai

**Examinations Summer 2022**

Time: 2 hour 30 minutes Max. Marks: 80

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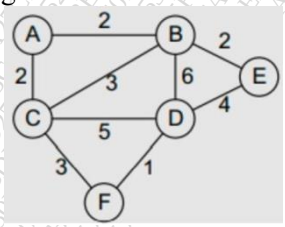
| Q1. | **Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** |
|---|---|
| 1. | Process of inserting an element in stack is called |
| Option A: | Create |
| Option B: | Push |
| Option C: | Evaluation |
| Option D: | Pop |
| | |
| 2. | Consider the usual algorithm for determining whether a sequence of parentheses is balanced. The maximum number of parentheses that appear on the stack AT ANY ONE TIME when the algorithm analyzes: (()(())(())))? |
| Option A: | 1 |
| Option B: | 2 |
| Option C: | 3 |
| Option D: | 4 or more |
| | |
| 3. | Which of the following statements is true? |
| Option A: | Recursion is always better than iteration |
| Option B: | Recursion uses more memory compared to iteration |
| Option C: | Recursion uses less memory compared to iteration |
| Option D: | Iteration is always better and simpler than recursion |
| | |
| 4. | The number of elements in the adjacency matrix of a graph having 7 vertices is |
| Option A: | 7 |
| Option B: | 14 |
| Option C: | 36 |
| Option D: | 49 |
| | |
| 5. | In a max-heap, element with the greatest key is always in the which node? |
| Option A: | Leaf node |
| Option B: | First node of left sub tree |
| Option C: | root node |
| Option D: | First node of right sub tree |
| | |
| 6. | _____ can be found used to find a minimum spanning tree. |
| Option A: | Prim's Algorithm |
| Option B: | Breadth First |
| Option C: | Dijkstra's Algorithm |
| Option D: | Flloyd Warshal Algorithm |
| | |
| 7. | Which data structure is required to evaluate a postfix expression |
| Option A: | Stack |
| Option B: | Queue |
| Option C: | Array |
| Option D: | Linked−list |
| | |
| 8. | A binary tree in which if all its levels except possibly the last, have the maximum number of nodes and all the nodes at the last level appear as far left as possible, is called |
| Option A: | Threaded tree |

| | |
|---|---|
| Option B: | Full binary tree |
| Option C: | Binary Search Tree |
| Option D: | Complete binary tree |
| | |
| 9. | The number of edges from the root to the node is called _____ of the tree. |
| Option A: | Height |
| Option B: | Depth |
| Option C: | Length |
| Option D: | Width |
| | |
| 10. | Which of the following is not a collision resolution technique? |
| Option A: | Rehashing |
| Option B: | Clustering |
| Option C: | Linear Probing |
| Option D: | Quadratic Probing |

| **Q2. (20 Marks)** | **Solve any Two Questions out of Three 10 marks each** |
|---|---|
| A | Explain Doubly ended queue.Explain the variants of Doubly ended queue. |
| B | Explain BFS algorithm using an example of your own. |
| C | Write an algorithm to implement circular linked list. |

| **Q3. (20 Marks)** | **Solve any Two Questions out of Three 10 marks each** |
|---|---|
| A | Find the Minimum spanning tree for the graph shown if figure1 using Prim's and Kruskal's algorithm by showing all the intermediate steps.<br>  <br><br>Figure 1. Graph |
| B | Explain different collision resolution techniques. Insert the following sequence of keys in the hash table with a size of 10 using linear probing**{18,89,21,58,68,11}** |
| C | Explain Heap sort with the help of an example. |

| **Q4. (20 Marks)** | **Solve any Two Questions out of Three 10 marks each** |
|---|---|
| A | What are different tree traversal methods? Create a binary search tree for 16,70,10,30,75,5,12,9 and traverse the tree in in-order, pre-order and post-order. |
| B | Create a B-tree of order 4 with the following keys:<br>60,70,75,51,52,65,68,77,78,79 |
| C | Write an algorithm to convert infix to postfix expression. |

# University of Mumbai
## Examination Summer 2022

Time: 2hour 30 minutes Max. Marks: 80

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| Q1. | **Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** |
|---|---|
| 1. | Which of the following is true in DBMS |
| Option A: | Mechanism to copy data |
| Option B: | Mechanism to copy and managed data. |
| Option C: | Mechanism to store and manage data |
| Option D: | Mechanism to paste data. |
| | |
| 2. | Weak Entity set |
| Option A: | Do not have sufficient attributes |
| Option B: | Do not have any rrelation. |
| Option C: | Do not have sufficient attributes to form primary key |
| Option D: | Do not have attributes at all |
| | |
| 3. | In E-R notations relationship reprinted as |
| Option A: | eclipse |
| Option B: | diamond |
| Option C: | triangle |
| Option D: | circle |
| | |
| 4. | Which of the following is correct syntax to display all employee from employee table using SQL |
| Option A: | Select & from employee |
| Option B: | Select * from employee |
| Option C: | Select * from department |
| Option D: | Select nothing |
| | |
| 5. | Which SQL command use to sort the data in ascending or descending order |
| Option A: | Group by |
| Option B: | Order by |
| Option C: | having |
| Option D: | Not having |
| | |
| 6. | Which of the following provides the ability to query information from the database and insert tuples into, delete tuples from, and modify tuples in the database? |
| Option A: | DDL |
| Option B: | DCL |
| Option C: | DML |
| Option D: | Entity |
| | |
| 7. | The Projection operation in relational algebra is written as |
| Option A: | Σ |
| Option B: | P |
| Option C: | Π |
| Option D: | Σ |
| | |
| 8. | Deletion of an student from table also deletes that student from another table. This kind of delete is called |
| Option A: | cascaded |

| | |
|---|---|
| Option B: | virtual |
| Option C: | related |
| Option D: | Simple |
| | |
| 9. | Which one of the following is not a part of ACID Properties of database transactions |
| Option A: | Atomicity |
| Option B: | Consistency |
| Option C: | Isolation |
| Option D: | Deadlock |
| | |
| 10. | A Transaction complete its execution is said to be |
| Option A: | Saved |
| Option B: | Loaded |
| Option C: | rolled |
| Option D: | committed |
| | |

| **Q2** | **Solve any Two Questions out of Three 10 marks each** |
|---|---|
| A | Explain the DDL and DML with suitable Examples |
| B | Explain all E-R Notations with examples. |
| C | Explain relational algebra operations in details. |

| **Q3** | **Solve any Two Questions out of Three 10 marks each** |
|---|---|
| A | Draw E-R diagram for Hospital Management System |
| B | Explain deadlock with respect to database transactions. Also discuss deadlock handling. |
| C | Explain database architecture in detail. |

| **Q4** | |
|---|---|
| A | **Solve any Two 5 marks each** |
| i. | Compare traditional file system with database management system. |
| ii. | Explain Log based recovery in transaction management |
| iii. | Explain the role of primary key and foreign key in DBMS. |
| B | **Solve any One 10 marks each** |
| i. | Explain any five SQL aggregate functions with examples |
| ii. | Explain ACID Properties in Details. |

**Annexure A**

# University of Mumbai

## Examination Second Half 2022 under cluster _7_ (Lead College: BVCOE)

**Examinations Commencing from Nov 2021 to May 2022**

Program: **IT**

Curriculum Scheme: Rev2019 C Scheme

Examination: SE Semester III

Course Code: ITC304 and Course Name: Principle of Communication

Time: 2-hour 30 minutes Max. Marks: 80

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| Q1. | **Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** |
|---|---|
| 1. | What is the necessary and sufficient condition for a sum of a periodic continuous time signal to be periodic? |
| Option A: | Ratio of period of the first signal to period of other signals should be constant |
| Option B: | Ratio of period of the first signal to period of other signals should be finite |
| Option C: | Ratio of period of the first signal to period of other signals should be real |
| Option D: | Ratio of period of first signal to period of other signal should be rational |
| | |
| 2. | Find the Fourier transform of the unit step function. |
| Option A: | $\pi\delta(\omega) + 1/\omega$ |
| Option B: | $\pi\delta(\omega) + 1/j\omega$ |
| Option C: | $\pi\delta(\omega) - 1/j\omega$ |
| Option D: | $\delta(\omega) + 1/j\omega$ |
| | |
| 3. | In an AM wave, the majority of the power is in ……. |
| Option A: | Carrier |
| Option B: | Lower sideband |
| Option C: | upper sideband |
| Option D: | Single sideband |
| | |
| 4. | Discrete time signal is derived from continuous time signal by _____ process. |
| Option A: | Addition |
| Option B: | Multiplying |
| Option C: | Sampling |
| Option D: | Addition and multiplication |
| | |
| 5. | Modulation index in frequency modulation can be determined by using _____. |
| Option A: | Ac/fm |
| Option B: | $\delta f$ / fm |
| Option C: | Am/fm |
| Option D: | Am/Ac |
| | |
| 6. | The process of converting the analog sample into discrete form is called |
| Option A: | Multiplexing |
| Option B: | Modulation |
| Option C: | Quantization |
| Option D: | Sampling |
| | |
| 7. | The sequence of operations in which PCM is done which is _____ |
| Option A: | Sampling, quantizing, encoding |
| Option B: | Quantizing, encoding, sampling |
| Option C: | Quantizing, sampling, encoding |
| Option D: | Encoding, Sampling, Quantizing |
| | |
| 8. | The noise due to random behavior of charge carriers is |
| Option A: | Partition noise |

| | |
|---|---|
| Option B: | Industrial noise |
| Option C: | Flicker noise |
| Option D: | Shot noise |
| | |
| 9. | In_____ the amplitude of the carrier signal is varied based on the information in a digital signal. |
| Option A: | ASK |
| Option B: | PSK |
| Option C: | FSK |
| Option D: | QAM |
| | |
| 10. | Electromagnetic waves are represented in which of the following format? |
| Option A: | Longitudinal waves |
| Option B: | Transverse waves |
| Option C: | Sinusoidal waves |
| Option D: | Surface waves |

| | |
|---|---|
| Q2<br>(20 Marks Each) | Solve any Two Questions out of Three 10 marks each |
| A | Draw and Explain Electromagnetic Spectrum and list different applications. |
| B | Explain in detail generation of DSB using Balanced modulator. |
| C | Compare PAM, PWM and PPM generation and Degeneration. |

| | |
|---|---|
| Q3<br>(20 Marks Each) | Solve any Two Questions out of Three 10 marks each |
| A | Define Noise parameters: Signal to noise ratio, Noise factor, Noise figure, Friss formula and Equivalent noise temperature. |
| B | Explain different characteristics of super heterodyne receiver. |
| C | Explain Sampling theorem for low pass and band pass signals. |

| | |
|---|---|
| Q4.<br>(20 Marks Each) | Solve any Two Questions out of Three 10 marks each |
| A | Explain Pre-emphasis and de-emphasis in FM. |
| B | Explain Time Division Multiplexing and Frequency Division Multiplexing along with its applications. |
| C | Compare ground wave, sky wave and space wave tropospheric scatter propagation. |