



QP CODE: 21103330



Reg No : .....

Name : .....

**B.Sc/BCA DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,  
DECEMBER 2021**

**Second Semester**

**Complementary Course - MM2CMT03 - MATHEMATICS - DISCRETE MATHEMATICS**

**(II)**

(Common for B.Sc Computer Science Model III, B.Sc Cyber Forensic Model III, Bachelor of  
Computer Applications)

2017 ADMISSION ONWARDS

4FD925EA

Time: 3 Hours

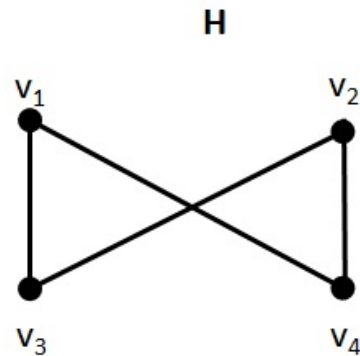
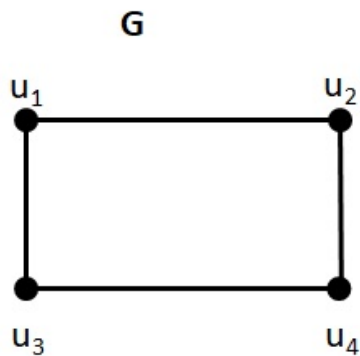
Max. Marks : 80

**Part A**

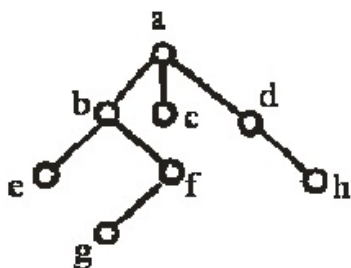
*Answer any ten questions.*

*Each question carries 2 marks.*

1. Show that the following graphs G and H are isomorphic



2. Define weakly connected graph.
3. Define Hamilton circuit.
4. Draw the subtrees with vertex 'b' as the root.





5. Find a Binary search tree for ' coconut , papaya , jackfruit , grapes ,orange
6. What is a ' Postorder ' traversal of a rooted tree ?
7. What is the value of Prefix expression  $^ - * 3 3 * 4 2 5$
8. Write the Distributive laws .
9. Check whether the following matrix is symmetric or not.  

$$\begin{pmatrix} 1 & 5 & 4 \\ 5 & 3 & 2 \\ 4 & 2 & 7 \end{pmatrix}$$
10. Define rank of a matrix.
11. Write the conjugate of the matrix  $\begin{pmatrix} 3i & 2 \\ 2 + 5i & 1 - i \end{pmatrix}$
12. Find the characteristic equation of the matrix  $\begin{pmatrix} 3 & 2 \\ 9 & 6 \end{pmatrix}$

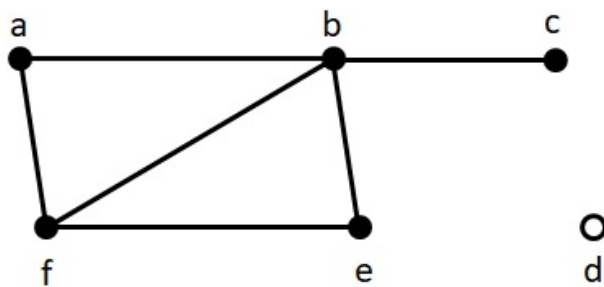
(10×2=20)

### Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Find the number of vertices, number of edges and the degree of each vertex in the given graph and identify all isolated and pendant vertices.



14. Draw an undirected graph represented by the adjacency matrix

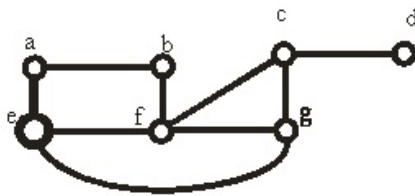
$$(a) \begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix} \quad (b) \begin{bmatrix} 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

15. Suppose that someone starts a chain letter .Each person who receives the letter is asked to send it on to four other people . Some people do this , but others do not send any letters .How many people have seen the letter including the first person , if no one receives more than one letter and if the chain letter ends after there have been 100 people who read it but did not send it out ? how many people sent out the letter ?

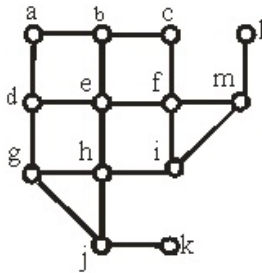




16. Define spanning tree of a connected graph. Find the spanning tree of the following graph by explaining the procedure.



17. Find DFS spanning tree for the following graph starting from the vertex 'a'.



18. Use a table to express the following boolean functions
- 1)  $F(x, y, z) = \bar{x}y + \bar{y}z$
  - 2)  $F(x, y, z) = (x + y)\bar{z}$
19. Find the sum of products expansion for the function  $F(x, y, z) = (x + y)\bar{z}$
20. Explain row canonical form and normal form of a matrix.
21. Check whether the following system is consistent or not.
- $$\begin{aligned} x + 2y + 3z &= 2 \\ 2x - 3y + 5z &= 1 \\ -x + y + 5z &= 7 \end{aligned}$$

(6×5=30)

### Part C

Answer any **two** questions.

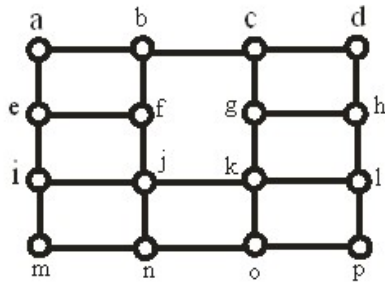
Each question carries **15** marks.

22. Draw graph models, stating the type of graph used, to represent airline routes where every day there are four flights from Boston to Newark, two flights from Newark to Boston, three flights from Newark to Miami, two flights from Miami to Newark, one flight from Newark to Detroit, two flights from Detroit to Newark, three flights from Newark to Washington, two flights from Washington to Newark, and one flight from Washington to Miami, with (a) an edge between vertices representing cities that have a flight between them.. (b) an edge between vertices representing cities for each flight that operates between them.. (c) an edge between vertices representing cities for each flights that operates between them plus a loop for a special sightseeing trip that takes off and lands in Miami.





23. (a) Explain BFS spanning tree of a connected graph.  
(b) Find BFS spanning tree of the following graph starting from the vertex 'a' by explaining steps.



24. Construct circuits that produce the following outputs 1)  $(x + y)\bar{z}$  2)  $(x + y + z)(\bar{x}\bar{y}\bar{z})$

25. Find rank by row canonical form  $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 5 & 4 \\ 6 & 9 & 1 & 0 \\ 8 & 5 & 0 & 2 \end{pmatrix}$

(2×15=30)





21103127

QP CODE: 21103127

Reg No : .....

Name : .....

**B.Sc / BCA DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,  
DECEMBER 2021  
Second Semester**

**Core Course - CS2CRT04 - DATA BASE MANAGEMENT SYSTEMS**

(Common for B.Sc Computer Applications Model III Triple Main, Bachelor of Computer Applications)

2017 ADMISSION ONWARDS

47B7FDD4

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Who is a Data base Designer?
2. What do you mean by procedural DML language? Give an example.
3. What is the use of buffer manager?
4. What is a derived attribute? Give example.
5. Define Domains and Tuples.
6. What is the basic SQL DDL commands?
7. Write the syntax of select command with an example.
8. How can we order rows in SQL?
9. What is modification anomaly?
10. Define BCNF.
11. What is permanency?
12. What are the different types of privileges?

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. Explain different data models.
14. Discuss different levels of abstraction in database system
15. Discuss the concept of entity relationship model. How it helps in designing relational databases?
16. Explain cardinality and participation in detail.
17. Explain UNION and INTERSECT commands with syntax and example.
18. Explain UNIQUE and EXIST.
19. Explain Secondary Indexing.
20. Explain the following a) 1 NF b) 2 NF c) 3 NF
21. Explain the types of failures?

(6×5=30)

### Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Why data base system is superior than file-based System.
23. Compare relation, relationship type, relationship set and structural constraints.
24. (a) Explain the use of GROUP BY and HAVING clause with syntax and examples  
(b) How will you create and manage views?
25. Explain types of single-level ordered indexes.

(2×15=30)





QP CODE: 21103330



21103330

Reg No : .....

Name : .....

**B.Sc/BCA DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,  
DECEMBER 2021**

**Second Semester**

**Complementary Course - MM2CMT03 - MATHEMATICS - DISCRETE MATHEMATICS**

**(II)**

(Common for B.Sc Computer Science Model III, B.Sc Cyber Forensic Model III, Bachelor of Computer Applications)

2017 ADMISSION ONWARDS

4FD925EA

Time: 3 Hours

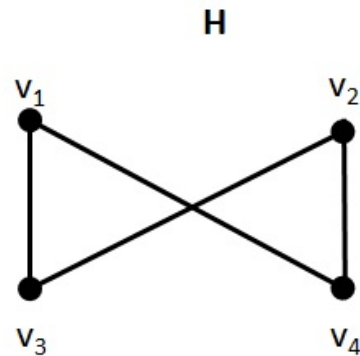
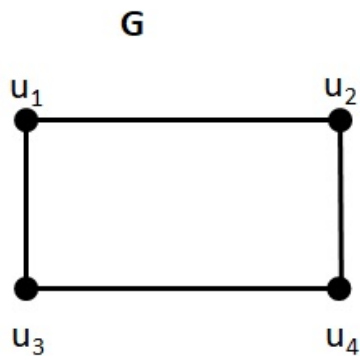
Max. Marks : 80

**Part A**

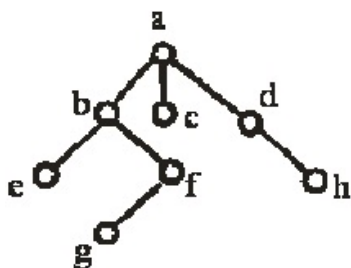
Answer any **ten** questions.

Each question carries 2 marks.

1. Show that the following graphs G and H are isomorphic



2. Define weakly connected graph.
3. Define Hamilton circuit.
4. Draw the subtrees with vertex 'b' as the root.





5. Find a Binary search tree for ' coconut , papaya , jackfruit , grapes ,orange
6. What is a ' Postorder ' traversal of a rooted tree ?
7. What is the value of Prefix expression  $^{\wedge} - * 3 3 * 4 2 5$
8. Write the Distributive laws .
9. Check whether the following matrix is symmetric or not.  

$$\begin{pmatrix} 1 & 5 & 4 \\ 5 & 3 & 2 \\ 4 & 2 & 7 \end{pmatrix}$$
10. Define rank of a matrix.
11. Write the conjugate of the matrix  $\begin{pmatrix} 3i & 2 \\ 2 + 5i & 1 - i \end{pmatrix}$
12. Find the characteristic equation of the matrix  $\begin{pmatrix} 3 & 2 \\ 9 & 6 \end{pmatrix}$

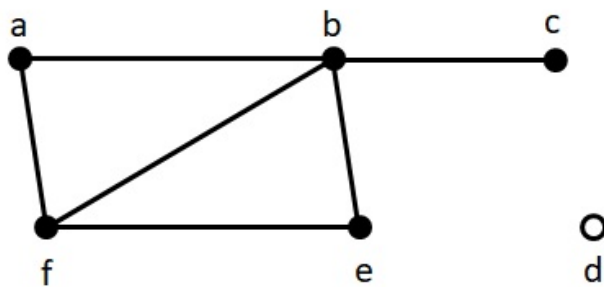
(10×2=20)

### Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Find the number of vertices, number of edges and the degree of each vertex in the given graph and identify all isolated and pendant vertices.



14. Draw an undirected graph represented by the adjacency matrix

$$(a) \begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix} \quad (b) \begin{bmatrix} 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

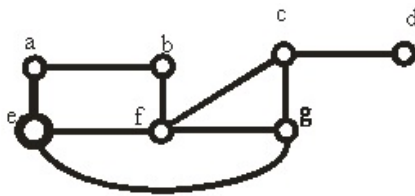
15. Suppose that someone starts a chain letter .Each person who receives the letter is asked to send it on to four other people . Some people do this , but others do not send any letters .How many people have seen the letter including the first person , if no one receives more than one letter and if the chain letter ends after there have been 100 people who read it but did not send it out ? how many people sent out the letter ?



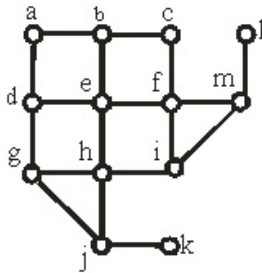




16. Define spanning tree of a connected graph. Find the spanning tree of the following graph by explaining the procedure.



17. Find DFS spanning tree for the following graph starting from the vertex 'a'.



18. Use a table to express the following boolean functions
- 1)  $F(x, y, z) = \bar{x}y + \bar{y}z$
  - 2)  $F(x, y, z) = (x + y)\bar{z}$
19. Find the sum of products expansion for the function  $F(x, y, z) = (x + y)\bar{z}$
20. Explain row canonical form and normal form of a matrix.
21. Check whether the following system is consistent or not.
- $$x + 2y + 3z = 2$$
- $$2x - 3y + 5z = 1$$
- $$-x + y + 5z = 7$$

(6×5=30)

### Part C

Answer any **two** questions.

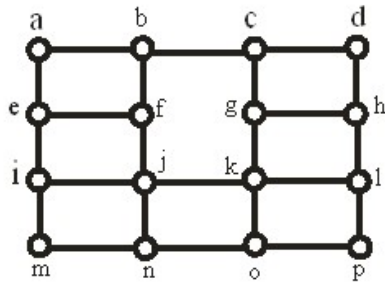
Each question carries **15** marks.

22. Draw graph models, stating the type of graph used, to represent airline routes where every day there are four flights from Boston to Newark, two flights from Newark to Boston, three flights from Newark to Miami, two flights from Miami to Newark, one flight from Newark to Detroit, two flights from Detroit to Newark, three flights from Newark to Washington, two flights from Washington to Newark, and one flight from Washington to Miami, with (a) an edge between vertices representing cities that have a flight between them.. (b) an edge between vertices representing cities for each flight that operates between them.. (c) an edge between vertices representing cities for each flights that operates between them plus a loop for a special sightseeing trip that takes off and lands in Miami.





23. (a) Explain BFS spanning tree of a connected graph.  
(b) Find BFS spanning tree of the following graph starting from the vertex 'a' by explaining steps.



24. Construct circuits that produce the following outputs 1)  $(x + y)\bar{z}$  2)  $(x + y + z)(\bar{x}\bar{y}\bar{z})$

25. Find rank by row canonical form  $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 5 & 4 \\ 6 & 9 & 1 & 0 \\ 8 & 5 & 0 & 2 \end{pmatrix}$

(2×15=30)





QP CODE: 21103328



21103328

Reg No : .....

Name : .....

**B.Sc/BCA DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,  
DECEMBER 2021**

**Second Semester**

**Core Course - CS2CRT05 - COMPUTER ORGANIZATION AND ARCHITECTURE**

(Common for B.Sc Computer Science Model III, B.Sc Information Technology Model III, Bachelor of  
Computer Applications)

2017 ADMISSION ONWARDS

17ADCA4A

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Define computer system organization.
2. Briefly state immediate operand.
3. What is a data register?
4. What is one address instruction?
5. What is control word?
6. Write the use of mode field in an instruction.
7. Write the purpose of using software interrupts in a program.
8. Compare volatile and non volatile memory.
9. Compare synchronous DRAM and asynchronous DRAM
10. What is EEPROM?
11. What is MIMD?
12. What do you mean by speedup ratio?

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. Describe instruction cycle.
14. Describe two types of control organizations for a digital computer.
15. Explain about single bus structure with neat diagram.
16. Explain difference between push and pop operations of stack.
17. Explain hard disk operation.
18. Explain the methods used to write into cache.
19. What is LRU? How is it implemented?
20. Describe multiprocessor systems..
21. Explain attached array processor. Show the interconnection with the help of a diagram.  
(6×5=30)

**Part C**

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain different types of instructions.
23. Explain the concept of main memory. What are the different types?
24. Explain different parallel processing mechanisms in a uniprocessor system.
25. Describe (a) Instruction Pipeline (b) Arithmetic Pipeline  
(2×15=30)





QP CODE: 21103329



21103329

Reg No : .....

Name : .....

**B.Sc/BCA DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS,  
DECEMBER 2021**

**Second Semester**

**Core Course - CS2CRT06 - OBJECT ORIENTED PROGRAMMING USING C++**

(Common for B.Sc Computer Applications Model III Triple Main, B.Sc Computer Science Model III,  
B.Sc Information Technology Model III, Bachelor of Computer Applications)

2017 ADMISSION ONWARDS

2CCA821B

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What are enumerated data types?
2. What are jump statements?
3. Explain two uses of scope resolution operator.
4. Define private member functions.
5. What are static data members and static member function?
6. What is a parameterized constructor?
7. What are constructor and destructor? What are the uses of constructor and destructor?
8. Define Inheritance. List the different types of inheritance.
9. What is nesting of classes?
10. What is a virtual function?
11. Explain the file stream operations.
12. List the file mode operators.

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. What are characteristics of OOPS?
14. What is inline function? Explain with an example.
15. Write a program to perform addition of time in hours and minutes format using objects as function arguments.
16. Explain Constructor Overloading.
17. Write a program to overload ++ operator (both prefix and postfix).
18. Discuss the effect of inheritance on the visibility of class members.
19. Describe virtual base class with an example.
20. What is the purpose of using 'this' pointer?
21. What are the different input and output functions used in files?

(6×5=30)

### Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain the following: (a) Function Prototyping (b) Return by Reference
23. Explain friend functions. Write a program to swap the private data of two classes using friend functions.
24. What is difference in overloading binary operators using friend functions and member functions? Explain.
25. Differentiate between multiple inheritance and multilevel inheritance.

(2×15=30)

