B

2861

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

MIT-101

First Paper

(Computer Organization)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

Part-C {Marks : 60}

Attempt all three questions (400 words each). Each question carries equal marks.

PTO

Part-A

1. Convert the following :

(i) $(101011)_2 = (?)_8$

(ii) $(73)_8 = (?)_{16}$

2. Name any one universal gate. Draw its truth table also.

3. Define flip-flop.

4. Develop a K-map for :

$$\bar{x}y + xy + x\bar{y}$$

5. Where does a cache memory reside ?

6. What is DMA controller ?

7. What is truth table ? If A, B and C are binary digits, then give the truth table of the following :

$$AB + \overline{AB}$$

8. Solve :

$$(10100)_2 + (1011)_2$$

9. Draw a circuit diagram for :

$$x\bar{y}z + \bar{x}\bar{y}z + xyz$$

10. What is an interrupt ? How many types of interrupts are there ?

Part-B

11. Write short notes on any two of the following :

(i) Cache coherence

(ii) Floating - point representation

(iii) Multiplication algorithm

12. Distinguish between markable and non-markable interrupt.

13. Explain the working of a serial shift register. What is its use in a CPU ?

14. Write the Boolean expression and truth table for OR, NAND, XNOR gates. Draw the logic diagrams.

15. Describe Booth's Algorithm.

Part-C

16. Discuss the architecture and pin configuration of 8086 microprocessor.

17. Explain any three of the following :

    (i) Encoder

    (ii) Decoder

    (iii) Multiplexer

    (iv) Full-Adder

18. Draw the K-map for the following functions :

    (i) $f(a,b,c,d) = \sum(3,4,5,6,10,14,15)$

    (ii) $f(x,y,a,t) = \pi(2,4,5,7,9,13,14,15)$

Or

What are the main features of DMA ? Why are the read and write control lines in DMA controller bidirectional ?

B

2862

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

(MIT-102)

Second Paper

(Data Structure and Algorithm)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C {Marks : 60}

Answer all three questions (400 words each). Each question carries equal marks.

Part-A

1. Explain the use of coma operator in C.

2. What is a pointer ? What are its advantages and disadvantages ?

3. What are self referential structures ?

4. How does static allocation differ from dynamic allocation of memory ?

5. Compare time complexity of selection sort with bubble sort.

6. Explain how circular queue is a better structure compared to linear queue.

7. Convert the following infix expression to its equivalent postfix expression :

$$A / B - C + D * E - A * C$$

8. Explain the basic operations that can be performed on a stack.

9. What do you mean by a complete binary tree ?

10. What do you mean by a connected graph ?

Part-B

11. Describe various storage classes available in C.

12. Discuss the Enqueue and Dequeue operations of a circular queue.

13. Write an algorithm to count total number of leaf nodes in a binary search tree.

14. What do you mean by operator associativity ?

15. Differentiate between structure and Union.

Part-C

16. (a) What is binary search tree ? What is the advantage

of BST over a binary tree ? Construct a binary search tree for the following data :

21, 6, 9, 4, 17, 24, 12, 10, 35, 31, 30, 13 10

(b) Write a C function to count the number of nodes in a linked list. 10

Or

(a) Differentiate between Depth First Search and Breadth First Search techniques. 10

(b) Write an algorithm for quick sort technique. 10

17. (a) Compare and contrast Adjacency matrix and Adjacency list. 10

(b) Explain Kruskal algorithm for determining a minimum cost spanning tree of a graph. 10

Or

(a) Explain various types of Tree Traversal techniques. 10

(b) Write an algorithm to delete a particular node from doubly linked list. 10

18. (a) Explain the difference between a pointer to an array and an array of pointers, by taking a suitable example. 10

(b) Using pointers write a function that receives a character string and a character as an argument and delete all occurrences of this character in the string. The function should return the corrected string. 10

Or

(a) Explain various types of looping statements used in C by taking suitable example. 10

(b) Write a recursive function to calculate the GCD of 2 numbers. 10

B

2863

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

Third Paper

MIT-103

(Relational Database Management System)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C

{Marks : 60}

Answer all three questions (400 words each). Each question carries equal marks.

Part-A

1. What is attribute ?

2. What are constraints ?

3. What do you mean by trim function ?

4. What do you mean by recovery ?

5. Write a query to delete a row ?

6. What is the database integrity ?

7. Write a command to delete a table ?

8. What is DBMS ?

9. What is domain and tupple ?

10. What is aggregation ?

Part-B

1. What do you mean by database ? Define the various types of attributes with suitable representation.

2. What is recovery technique ? Define any of the technique ?

3. What do you mean by DML ? Define any three DML commands.

4. What do you mean by generalization ? Define the specific rules for it.

5. What is the two phase locking ? Define the serialization.

Part-C

1. What to you mean by file organization ? Define the complete architecture of DMBS.

Or

2. What do you mean by the layer of DBMS ? Define the various view techniques with example.

3. What do you mean by database constraints ? Define an example to create the constraints.

Or

4. What do you mean by database joining ? Define the differences between internal and external sorting techniques with an example for each.

5. What do you mean by function ? Design a stored procedure and explain all the necessary steps to call the stored procedure in our database transaction.

Or

6. What do you mean by database triggers ? Define the differences and similarities between triggers and declarative integrity constraint with suitable example for each.

B

2864

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

(MIT-104) Paper

Fourth Paper

(Discrete Mathematical Structures)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C {Marks : 60}

Answer any three questions (400 words each). Each question carries equal marks.

Part-A

1. Define Binary Tree. 1

2. Define Lattice. 1

3. Define bipartite graph. 1

4. Define Circular Permutation. 1

5. Define Pigeonhole Principle. 1

6. Define Subgraphs. 1

7. Define Universal Set. 1

8. Define Tautology. 1

9. Define Logical equivalence. 1

10. Define path length of a Binary Tree. 1

Part-B

11. If A, B and C are three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then show that $B = C$. 2

12. Show that the proposition $P \vee \sim (P \wedge Q)$ is a tautology. 2

13. In how many ways 12 scientists around a round table if 3 specified scientists among them do not sit together ? 2

14. In the Boolean algebra $<B, +, \bullet, ', 0, 1>$, for all element $a \in B$:

$$(a^1)^1 = a$$ 2

15. If T is a binary tree with n vertices and of height h, then :

$$h + 1 \leq n \leq 2^{(h+1)} - 1$$ 2

Part-C

16. (a) If a, b and c are any three arbitrary elements of a Boolean algebra B, then :

(i) $a + b = a + c$ and $ab = ac \Rightarrow b = c$

(ii) $(a + b)\ (b + c)\ (c + a) = ab + bc + ca$ 5+5

(b) The airline distance (in hundred of kilometers) between six cities A, B, C, D, E, and F are given in the following tables :

	A	B	C	D	E	F
A	–	56	35	2	51	60
B	56	–	21	57	78	70
C	35	21	–	36	68	68
D	2	57	36	–	51	61
E	51	78	68	51	–	13
F	60	70	68	61	13	–

Find the minimal spanning tree in the graph G, where the table determines the weighted graph G with vertices A, B, C, D, E, and F. 10

Or

17. (a) For the sets A, B and C, prove that :

(i) $A - (B-C) = (A-B) \cup (A \cap C)$

(ii) $A - (B \cup C) = (A-B) \cap (A-C)$ 5+5

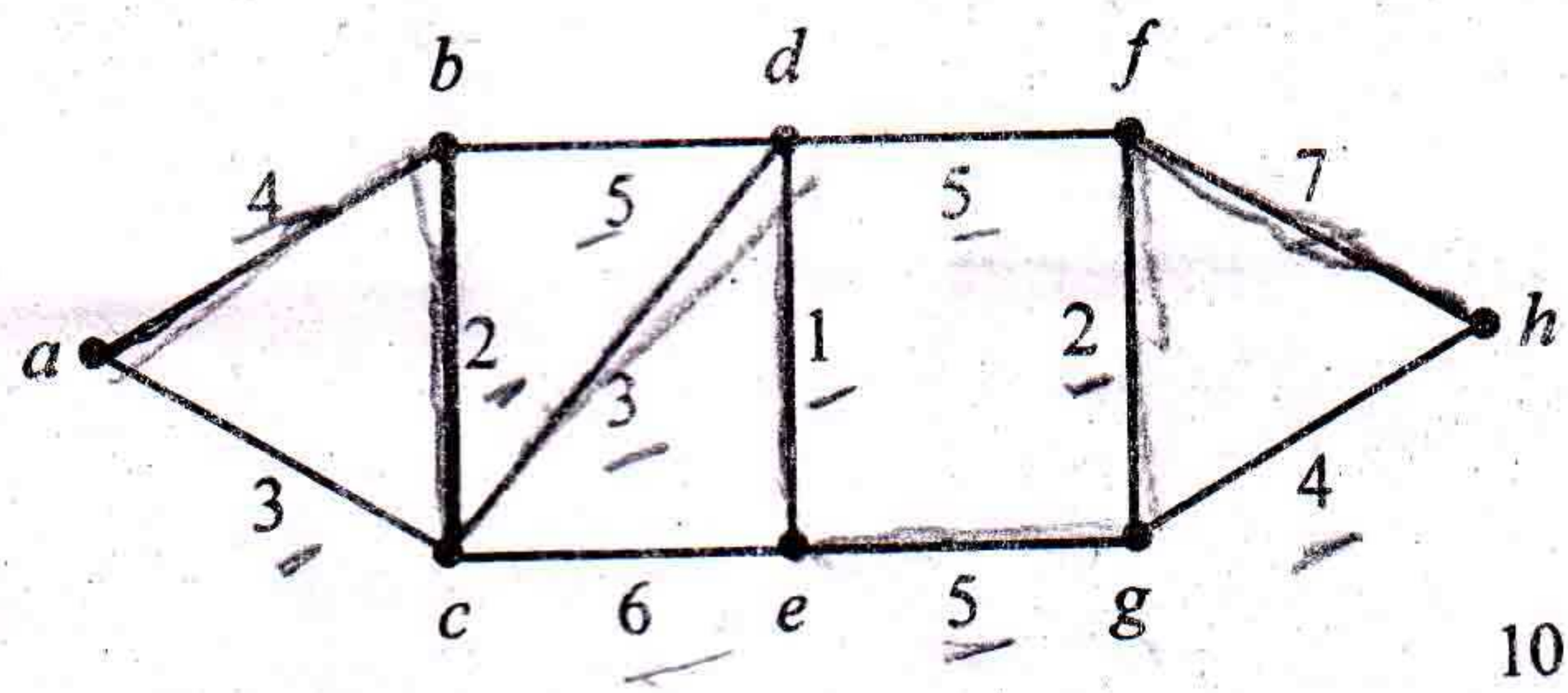
(b) Test the validity of the following argument :

If I practice Drawing, then I will not fail in fine art.
If I do not play cricket, then I will practice Drawing.
But I failed in fine art. Therefore I must have played cricket. 10

18. (a) If h (an integer) is the height of a balanced complete binary tree on n vertices, then prove that :

$$h = log_2\left(\frac{n+1}{2}\right)$$ 10

(b) Find the shortest path and its length between the vertices a and h in the following weighted graph :



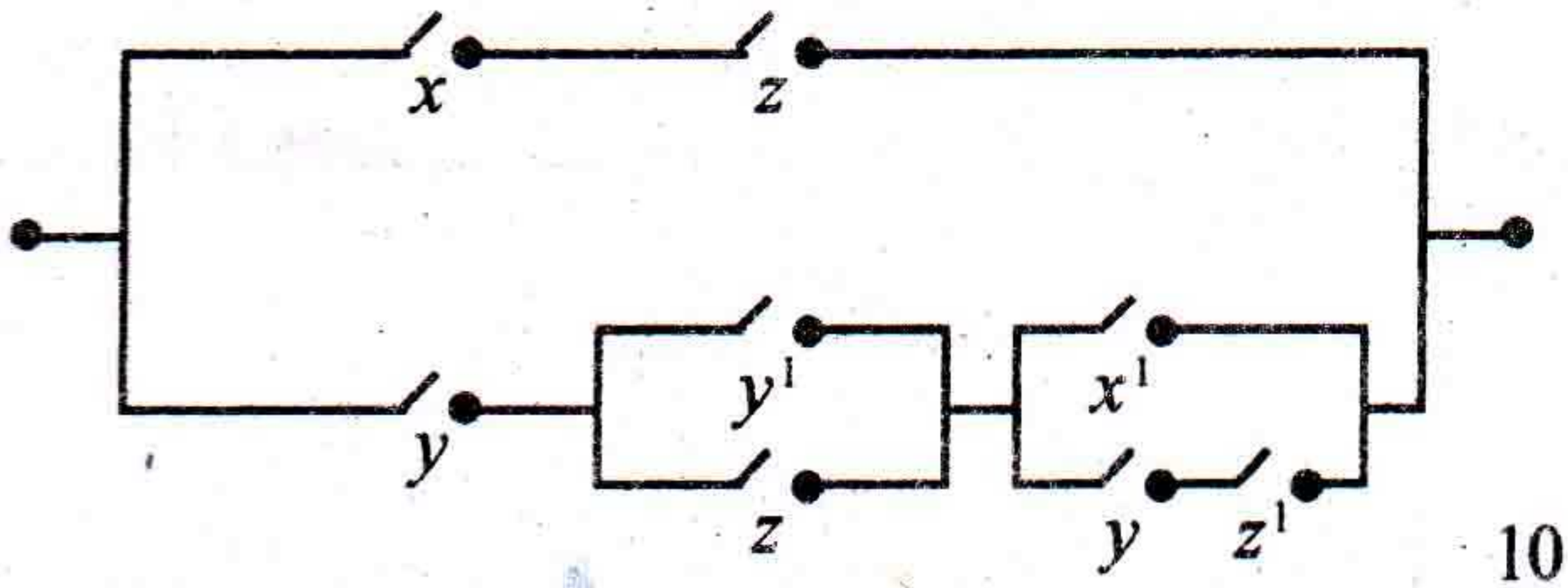
10

Or

19. (a) (i) Data stored on a computer disc are usually represented by a string of bytes. How many bytes are required to encode 125 bits of data ?

(ii) 45 candidates appear in a competitive examination. Prove that there are at least two candidates whose roll numbers differ by a multiple of 44. 5+5

(b) Find Boolean function for the following switching circuit. Simplify it to prepare a simplified circuit :



10

20. (a) Let $A = \{1, 2, 3, 6, 8, 12, 24, 30\}$ be a set and the relation '$\leq$' be defined as $a \leq b$ if and only if a divides b; a, $b \in A$, then draw a Hasse diagram of the poset $(A, \leq)$. 10

(b) 8 boys and 5 girls constitute a group. In how many ways 7 of them can be selected if the selections always have at least 3 boys and 2 girls ? 10

Or

21. (a) Show that set Q of rational numbers with binary operation * defined by :

$x * y = x + y - xy$, for $x, y \in Q$ is a commutative semigroup. Show also that it is a monoid. 8+2

(b) Let f be a homomorphism of G into G', then f is a monomorphism if and only if the Ker $f=\{e\}$ 10

B

2865

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

MIT-105

Fifth Paper

(Programming in Visual Basic)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C {Marks : 60}

Answer any three questions (400 words each). Each question carries equal marks.

Part-A

1. How many events in VB6 form.

2. Dim x, y as integer. What is x and y data type ?

3. What is option base ?

4. What is the DLL required for running the Visual Basic ?

5. Does Visual Basic support oops concepts ?

6. List out controls which does not have events ?

7. What is the result of NULL Any value = 0 (Zero) ?

8. What is static cursor ?

9. What is the default of data control ?

10. What is control array ?

Part-B

1. The clear property is available to which control ?

2. Write the difference between OCX, DLL and EXE ?

3. What is the difference between Get, Set and Let ?

4. What are types of binding ?

5. Explain about the basic features of Visual Basic ?

Part-C

1. (a) Explain the structure of Menu Editor. How will you insert the program code in menu editor ? Explain with suitable example. 10

(b) Explain the following properties :

(i) Value property of option button

(ii) Path property of Dir list box.

(iii) List property of Combo Box

(iv) Max Length property of Text Box 10

2. Perform the following in Visual Basic :

(a) Write a code to accept 10 number from user and store them in integer array and find the 2nd largest no. from it,

(b) Take a Text Box, Command Button and four Check Box having caption as (Bold, Italics, Strike, Underlines). Display the text of Text Box in selected format when command Button is clicked.

(c) Write a function which will accept a number and return factorial of the given number.

(d) Take a Command Button Captioned or Order, a List Box which will display Restaurant Menus. Display the selected items in Message Box when Order Button is clicked. 5 x 4

3. (a) What is .NET ? Explain .NET framework. 10

(b) Explain ADO.NET object model. 10

4. (a) Write short note on Visual data manager. 10

(b) Differentiate between the following :

(i) Combo Box and List Box

(ii) Picture Box and Image Box

(iii) Check Box and Option Button

(iv) Function Procedure and Sub Procedure

(v) Drive list Box and Dir List Box 10

B

2866

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

Paper : MIT-106

Sixth Paper

(Web Technology)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C

{Marks : 60}

Answer any three questions (400 words each). Each question carries equal marks.

Part-A

1. (a) What is a web server ?

(b) What is the use of IP address ?

(c) What is DNS and how it is useful ?

(d) What operations may be performed on an image ?

(e) What is an array ?

(f) Define a tag with example.

(g) What types of errors can be encountered in a program ?

(h) What is a deadlock ?

(i) What is the concept of broadband ?

(j) What is the meaning of linking ?

10 x 1

Part-B

2. Discuss the life cycle of an applet.

3. What is the concept of branching statements ?

4. Discuss different elements of a table in HTML.

5. What are frames in HTML ?

6. How parameters are passed to applets ? 5 x 2

Part-C

7. What are various features of Java Script language ? How server side programming is useful ? 20

Or

What are different types of transmission protocols ? Write a note on threading and multi threading. 20

8. How two web pages can be linked ? Write an HTML code for showing the use of multimedia application. 20

Or

What is a firewall and how network security is maintained ?
What is virus ? 20

9. What are events and primitive data types of Java Script ?
Write a note on CSS. 20

Or

How DHTML is advanced than HTML ? What are electronic commerce applications ? 20

B

2867

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

MIT-107

Seventh Paper

(Data Communication and Networks)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C

{Marks : 60}

Answer any three questions (400 words each). Each question carries equal marks.

Part-A

1. What is networking ?

2. Define Data Communication.

3. What do you mean by switching ?

4. What is FDM ?

5. What is asynchronous transfer mode ?

6. Define F.T.P. .

7. Define the transmission medium used by ATM.

8. Define the topology used by FDDI networks.

9. Which type of transmission medium is best suited in an environment with many high voltage devices ?

10. Which error detection method consists of just one redundant bit per data unit ?

Part-B

1. What are the different modes of transmission ? Explain with example.

2. Define Fourier analysis concept.

3. What are different measures of error detection ? Explain.

4. Explain analog to digital conversion.

5. Explain cyclic redundancy check. What are other methods of error correction ?

Part-C

1. (a) What are the characteristics of data communications ?

   (b) Explain different types of network topologies.

2. What do you mean by transmission of digital data ? Explain different transmission media.

3. (a) What do you mean by Multiplexing ? Compare FDM with TDM.

(b) What are the advantages of synchronous mode of data transmission ?

4. Explain the following :

(i) Routing

(ii) Packet switching

(iii) Virtual circuit approach

(iv) HDLC

5. (a) What do you mean by protocol architecture ? Explain.

(b) Write notes on the following :

(i) Link control protocol

(ii) Network control protocol

B

2868

M.Sc. (Previous) EXAMINATION, 2011

INFORMATION TECHNOLOGY

MIT-108

Eighth Paper

(Data Warehousing and Mining)

Time allowed : Three hours

Maximum marks : 80

Part-A {Marks : 10}

Answer all ten questions (20 words each). Each question carries equal marks.

Part-B {Marks : 10}

Answer all five questions (50 words each). Each question carries equal marks.

PTO

Part-C {Marks : 60}

Answer all three questions (400 words each). Each question carries equal marks.

Part-A

1. What do you understand by database ?

2. What is a DBMS ?

3. What is a data warehouse ?

4. Define decision support systems.

5. What is a Bitmapped Index ?

6. Define association discovery in datamining.

7. What is clustering ?

8. Define role based security.

9. What is OLAP ?

10. Define data warehouse Indexing and Tuning.

Part-B

11. Discuss the importance of data warehouse for a company.

12. What is the difference between data warehouse and data mart.

13. Discuss the capacity planning for a data warehouse in terms of Estimated data load.

14. Write a short note on clean and transform process.

15. What is data mining. Discuss its importance for a business corporation.

Part-C

16. Discuss the planning stages and designing approaches for a data warehouse.

Or

Write a detailed note on EIS (Executive Information System). How does decision support systems help an organisation in gaining a competitive advantage.

17. Discuss the role, abilities and responsibilities of following members of data warehouse team :

(i) Datawarehouse project manager

(ii) Data warehouse architect

(iii) Data Transformation / Grooming Specialist

Or

Write short notes on any two :

(i) Data flow process

(ii) Extract and load process

(iii) Backup and Archive process

(iv) Query Management Process

18. What is data mining. Discuss how inspection helps in "discovering new relations in data". Elaborate the statement "Discovery goes with no predetermined idea."

Or

Describe data mining techniques with special reference to Neural Networks, Association Discovery, Pattern Recognition, classification and clustering.