M.Sc. IT (Part I) Examination, 2014

Computer Organization

Part A (Marks: 10)

1. What do you understand by universal gate?

2. Explain shift micro-operations.

3. What is register indirect addressing?

4. Explain the difference between cache memory and virtual memory.

5. What do you understand by combinational circuits?

6. What is Quine-MCKLUSKEY method?

7. Explain the difference between multiplexer and demultiplexer.

8. Define flip-flop.

9. What do you understand by synchronous counter?

10. Explain the difference between fixed point representation and floating point representation.

Part B (Marks: 10)

1. Explain arithmetic micro-operations and logic micro operations with example.

2. Convert the following:

   (a) $(B2F8)_{16} = (?)_8$

   (b) $(113.2)_8 = (?)_2$

   (c) $(A2B.1A)_{16} = (?)_{10}$

   (d) $(74.1A)_{16} = (?)_2 = (?)_8 = (?)_{10}$

3. Find the complement of the following functions:

   (a) $(AB'+C).D+AC'$

   (b) $(w\,x\,y + x'y).z + w'x'$

4. Simplify the following Boolean expression:

(a) A'BC' + A'B'C + AB'C

(b) A + (bC')' + CD + (BC)''

5. If in an edge triggered JK flip-flop, J=1, K=0 and Q=1, when the clock pulse goes HGH, what would be the next state of Q?

Part C (Marks: 60)

1. (a) Draw the logic diagram of clocked RS flip-flop and obtain its characteristics equation. Also show its excitation table.

(b) Write a short note on shift register.

OR

(a) A decoder accepts 64 different input combinations. How many inputs and outputs does it have?

(b) What do you understand by cache coherence? Explain.

2. (a) What do you understand by instruction codes? Explain input outout interupts.

(c) Explain stack organization.

OR

(a) Explain the architecture of 8085 processor.

(b) Write short note on:

   (i)   DMA

   (ii)   Associative memory

3. (a) Explain 8086 instruction set.

(c) Write short note on:

   (i)   Half adder

   (ii)   Full Substractor

OR

(a) Simplify the following Boolean expression using K-map

Y = (a + B + C + D)(A B C D)

Also draw the logic circuit of the given Boolean and find the total number of input gate leads.

(b) COnvert the following Boolean expression to standard SOP term.

(i)   A B + C D (A B' + C D)

(ii)   A B ((B C)' + B D)

M.Sc. IT (Part I) Examination, 2014

Data Structure and Algorithm

Part A (Marks: 10)

1. How many number of swaps required to swap n elements using selection sort, in the worst case.

2. Which sorting algorithm is preferred to sort 20 randomly generated numbers?

3. What is the sum of degrees of each vertex for an undirected graph G with 5 vertices and 6 edges.

4. What is the range of integer in C?

5. What will be the output of the following code:

   printf("%d", (1=1)? (3=4)? 5 : 6 : 4);

6. What will be the output of following code:

   int var = 18;

   printf("%d", var >> 2);

7. Find postfix equivalent of the infix:

   A + B * (c + D) / F + D * E

8. How many comparisons are required to sort 7 items using radix sort (assume that each item is a 4 digit decimal number).

9. Which operator works with variable but not with literals?

10. Arrange the following operators in higher order to lower order precedence:

    &&, ||, *(multiply), !, ?

Part B (Marks: 10)

1. Write a program to print factorial using recursion in C.

2. Explain various storage classes of variables in C.

3. Explain various memory allocation and releasing functions with their syntax and example.

4. What is difeerence between array of pointers and pointer to an array?

5. Write a program to print reverse of given number.

Part C (Marks: 60)

1. (a) Explain insertion sort algorithm with suitable example.

   (b) Write a program to sort an array using insertion sort in C.

   OR

   (a) Explain selection sort algorithm with suitable example.

   (b) Write a program to sort an array using selection sort in C.

2. Write algorithm for preorder, post order and in order traversing in a binary tree. Explain these with suitable diagram.

   OR

   Explain various functions of stack with their algorithm and diagrams.

3. Explain DFS algorithm with suitable example.

   OR

   Explain Kruskal algorithm with suitable example.

M.Sc. IT (Part I) Examination, 2014

Relational Database Management System

Part A (Marks: 10)

1. What are the components of data dictionary? Discuss active and passive data dictionaries.

2. Define a serializable scedule.

3. Draw an E-R diagram for a hospital system. Convert this diagram to a suitable telational scheme.

4. Define the timestamp band concievency management scheme.

5. What are the basic components of query processor? Discuss.

6. Explain fair dependency.

7. What do you mean by objects of database?

8. What is check point? How is the check point information and for recovery in databases.

9. Explain ACID properties of a transaction.

10. What is Oracle transaction?

Part B (Marks: 10)

1. Explain multivalued dependency with the help of an example. How is it related to 4NF.

2. How can a query can be optimized? Write down the algorithm for external sorting.

3. What do you mean by temporal database?

4. Explain different constraints used in database.

5. Explain stored function and stored procedures with differences.

Part C (Marks: 60)

[Any Three]

1. (a) What are the various ways in which concurrency control can be implemented in a database.

   (b) Explain the various ways in which database recovery and backup can be implemented.

   OR

   (a) What do you mean by object oriented modelling. Explain features of object oriented database with suitable example.

   (b) How do you implement a distributed database in real time environment.

2. (a) Explain the four levels of architecture in the data warehouse environment.

   (b) List out the difference in OLTP and OLAP.

   OR

   Write short note on following:

   (a) Association rule

   (b) Classification

   (c) DTD Scheme

   (d) Select and Join

3. (a) Explain a three tier architecture of data warehouse.

   (b) Illustrate the various schemes for multi dimentional databases.

   OR

   (a) What is normalization and its utility in database? Explain functional and fully functional dependency with suitable example.

   (b) Write short note on multimedia database and locking.

M.Sc. IT (Part I) Examination, 2014

Discrete Mathematical Structures

Part A (Marks: 10)

1. Define tautology and contradiction.

2. State biconditional statement with its truth table.

3. Define equivalence relation.

4. Define Lattices.

5. State Pigeonhole principle.

6. What is degree of graph?

7. Define biparalite graph.

8. Define Euler's graph.

9. Define group.

10. Define cartesian product of the set.

Part B (Marks: 10)

1. Show that the statement $(p \rightarrow q) \wedge (p \vee q)$ is a contingency.

2. In a class of 50 students, 30 are studying Hindi and 25 English language and 10 are studying both languages. How many students are studying either language?

3. Let A = {1, 2, 3, 4} & consider the partition P = {{1, 2, 3}, {4}}. Obtain the equivalence relation R on A determined by P.

4. Answer the following questions concerning the poset ({2, 4, 6, 9, 12, 18, 27, 36, 48, 60, 72}, l)

    (i)   Find $l$ub of {2, 9}, if exists.

    (ii)   Find g l b of {60, 72}, if it exists

5. If f is one-one on to map, then $\bar{f}$ is also one-one onto.
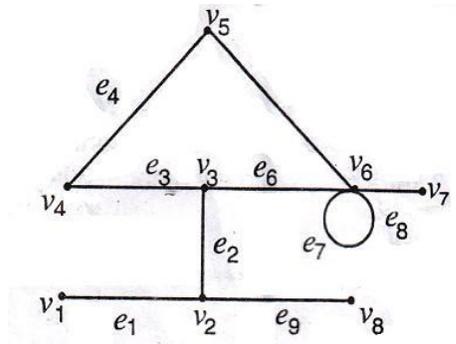
Part C (Marks: 60)

1. Show that $(p \wedge q) \rightarrow (p \vee q)$ is a tautology.
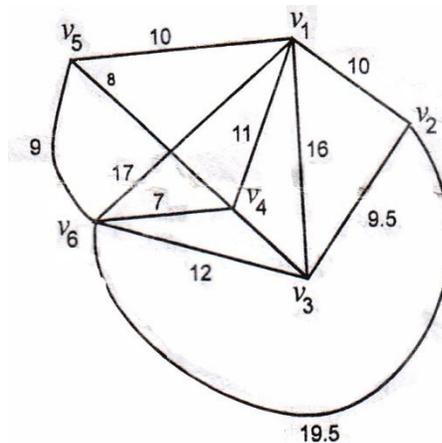
OR

For non-void sets A, B, C, D, prove:

(i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

(ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

2. Explain open walk, closed walk, path, trail, circuit by considering the following graph:

OR

(i)   Show that the complete graph k5 is non plannar graph.

(ii) Show that the complete biparatite graph $K_{3,3}$ is a non-planar graph.

3. Find the minimal spanning tree by tab application of prim's algorithm in the given graph.

OR

Let A = Z, the set of integers relation R defined in A by 'aRb' as "a is congruent to b mod 2." Prove that R is a equivalence relation.

M.Sc. IT (Part I) Examination, 2014

Programming in Visual Basic

Part A (Marks: 10)

1. Write the full form of MDI.

2. What is combo box?

3. Write the file extension name for the standard module file.

4. Write the syntax for input box.

5. What is MS Flexgrid control?

6. Which event is used to identify the pressed key?

7. What is 'Me' in Visual Basic?

8. What is control array?

9. What do you mean by the term CLR?

10. Write the connection string for connecting vb.net with MS-Access?

Part B (Marks: 10)

1. What do you mean by option explicit?

2. What is the difference between .dll extension and .exe extension file?

3. What is the use of SDI? Explain it.

4. What is difference between namespace and assembly?

5. Explain what is ASP.net validation controls with example.

Part C (Marks: 60)

1. (a) Implement program to illustrate polymorphism concept in VB.

   (b) Implement VB program to check an element present in an array or not by using required control.

OR

(a) Explain any four Visual Basic controls with example.

2. (a) Develop a VB application which develops a student mark list. Conditions:

   (i)   Read any 5 subject marks

   (ii)   For qualifying minimum marks one 40%

   (iii)   For pass average is 50%

   (iv)   For first class percentage is >=60

   (v)   For second class percentage is between 40 and 50.

   (vi)   For third class percentage is 40

   (vii)   Minimum percentage is <50 then result is fail.

OR

   (a) How can you add properties, methods and events to your own activeX control?

   (b) Explain the different types of error handling techniques in VB.

3. (a) Explain visual studio.net IDE.

   (b) Explain about database connecting.

OR

   Write short notes:

   (i)   Member shadowing

   (ii)   Data grid control

   (iii)   List view and Tree view control

   (iv)   Collection object.

M.Sc. IT (Part I) Examination, 2014

Web Technology

Part A (Marks: 10)

1. What is Internet?

2. What is a URL?

3. What is a web browser?

4. What is a firewall?

5. What is an applet?

6. How do we ensure the data message security?

7. What is a style sheet?

8. What are the usage of DHTM?

9. What is the advantage of a jpeg image?

10. What is a splash page?

Part B (Marks: 10)

1. What is the ISP and what are its functions?

2. How do we ensure the security on web.

3. What do you understand by e-commerce?

4. What is data encryption?

5. Write the steps for adding an animation to your web page.

Part C (Marks: 60)

1. Discuss in detail the functions of search engines. List and describe the various searching tools for refinement of search criteria.

OR

Write a detailed note on e-commerce framework. How is it different from traditional business stores list. The modules of a hypothetical book store online business and name the web technologies to be used in this e-commerce web site.

2. Discuss in detail the stages of an applet life cycle. What are the advantages of using applets and how do we pass parameters to applets. Illustrate using an applet example.

OR

Demonstrate the usage of frames and tables in an HTML document? Illustrate the image handling parameters of web pages.

3. What do you understand by multimedia. Discuss the tools and tags for embedding images, sound, video and animation to web pages. Illustrate the usage by writing a script.

OR

How do you evaluate a web document for effectiveness, usability and efficiency. Discuss the site design principles and application development life cycle for e-commerce site.

M.Sc. IT (Part I) Examination, 2014

Data Communication and Networks

Part A (Marks: 10)

1. What is frequency modulation?

2. What is the use of baseband signals?

3. What is the difference between Simplex and Half Duplex?

4. What are responsibilities of data link layer?

5. What is ISDN and BISDN?

6. What do you mean by ethernet?

7. Why parity bit is important in error detecting code?

8. What is the need of CRC and check sum?

9. Explain the term switching.

10. Explain the link control protocol.

Part B (Marks: 10)

1. What do you understand by multiplexing? Compare FDM with TDM.

2. Write short note (any one):

    (i)   DTE-DCE Interface

    (ii)   EIA-449

3. "FDDI is better network topology than traditional ring topology". Justify the statement.

4. What are the function of ATM layer? Explain the working of ATM adaptation layer.

5. Compare go-back-n ARQ method and selective reject method.

Part C (Marks: 60)

[Any Three]

1. (a) What are error detection and error correction code? Explain one error of detection and one error of correction codes with example.

   (b) What is normal operation of bit-shifting? Why it is used?

   OR

   Describe ASK, FSK, PSK, and QAM digital to analog encoding techniques using suitable bit sequence and diagram.

2. (a) What is OSI model? Describe its various layers in detail.

   (b) What is the difference between OSI model and TCP/IP model?

3. What are various digital data transmission techniques? Why digital transmission is better than analog transmission?

4. Explain line configuration techniques. What are various topologies of network? Why mesh topology is most reliable network topology?

   OR

   Give a comparative study of circuit switching, message switching and packet switching. Justify your answer with advantages and disadvantages of switching types.

M.Sc. IT (Part I) Examination, 2014

Data Warehouse & Mining

Part A (Marks: 10)

1. What is a data warehouse?

2. What is a fact table?

3. What do you understand by dimentions.

4. Define data integrity.

5. What is the role of partitioned indexes?

6. Define data partitioning.

7. What is a data mart?

8. What do you understand by meta data.

9. What is data mining?

10. Name any three data mining techniques.

Part B (Marks: 10)

1. Compare and contrast the DLTP vs data warehouse approach.

2. Discuss the steps in extract and load process.

3. What is the role of a data warehouse manager?

4. What is star flake scheme?

5. What is a decision tree?

Part C (Marks: 60)

1. Discuss in detail the concept and application areas of a data warehouse.

OR

Write a detailed note on data warehousing architecture with explaination of staging area processes and data marts.

2. Discuss the key activities associated with following system processes.

   (i)   Extract and load process.

   (ii)   Clean and transform process.

OR

What is the role of a data warehouse administrator? Hence discuss the making of a data warehouse and list the other roles associated to it.

3. What do you understand by data mining? Discuss the data mining approaches and methodologies.

OR

What do you understand by dimentional modeling. Identify the business dimentions associated with an online bank. Create an illustrative stare schema to demonstrate banking business facts and dimentions.