Total No. of Questions : 5] [Total No. of Printed Pages : 4

Roll No. .....

MCA–101

M. C. A. (First Semester) EXAMINATION, June, 2008

INFORMATION TECHNOLOGY

(MCA–101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Explain various storage devices. Differentiate between direct access and serial access memory. 10

   (b) Define the terms seek time and latency time of hard disk.

   If a hard disk has 20 surfaces, and each surface in 12 inch in diameter, and the density of recording is 6000 bits per linear inch estimate the number of bits per cylinder of disk. 10

Or

   (a) Discuss the history of computers. 6

   (b) What is system software ? Distinguish it with application software. 7

   (c) Discuss 3rd generation and fourth generation laguages. 7

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Unit – II

2. (a) Explain assembler directive statements, ORIGIN MULT and EQU. Can the operant expression in ORIGIN statement contain forward references ? If so, outline how the statement can be passed in two pass assembly scheme ? 10

(b) Explain intermediate code forms. Discuss variants of intermediate code for imperative statements and compare them. 10

Or

(a) Given the following source program : 10

```
    Start 400
A   DS 4
L1  MOVER AREG, B
    ADD AREG, C
    MOVE M AREG, D
D   EQU A + 1
L2  PRINT D
    ORIGIN A – 1
C   DC '5'
    ORIGIN L2 + 1
    STOP
B   DC '19'
    END L1
```

(i) Show the contents of symbol table at the end of pass 1.

(ii) Explain the significance of EQU and ORIGIN statements and explain how they are processed by assembler.

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(b) Discuss the design of macro preprocessor. Explain expansion time variables, formal parameters and keyword parameters. 10

Unit – III

3. (a) Discuss the aspects of compilation and tasks of memory allocation. Differentiate between dynamic and static memory allocation with examples. Also explain automatic dynamic memory allocation and program controlled dynamic memory allocation. 10

(b) Discuss compilation of expression. Compare various intermediate codes for expression. 10

Or

(a) (i) Distinguish between line editor and text editor. 5

(ii) What are the components of text editor ? Explain the role of individual component. 5

(b) What are the commonly available features of debugger ?

What is break point, check pointing and reverse execution ? How can break points be implemented with in program ? 10

Unit – IV

4. (a) Explain program relocation and how relocation is performed. Explain EXTRN and entry statements. 10

(b) Discuss the design of LINKER. Write algorithm for first pass of LINKER. 10

Or

(a) Explain the responsibilities of linker and the loader in program development. 8

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(b) Differentiate between the following : 8

(i) Static and shared libraries

(ii) Static and dynamic linking

(c) Explain different types of loaders commonly available. 4

Unit—V

5. (a) Explain indexed file organisation with example. 10

(b) How insertion and deletion are performed on indexed files ? 10

Or

(a) Explain inverted organization. What are its advantages and disadvantages ? 10

(b) Compare sequential file organization and random file organization. 10

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Total No. of Questions : 8] [Total No. of Printed Pages : 4

MCA–101(O)

M. C. A. (First Semester) EXAMINATION, Dec., 2005

(Old Scheme)

INFORMATION TECHNOLOGY

[MCA–101 (O)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. Differentiate between the following :
   (i) Data and Information
   (ii) Low level language and High level language
   (iii) Half duplex and Full duplex
   (iv) Compilers and Interpreters
   (v) Network and Internetwork

2. (a) What are the different categories of computers ? What are different criteria on which they are comparable ?
   (b) Draw block diagram of a Digital Computer. Explain the function of each component shown in the block diagram.

3. (a) What are the different categories of data processing file ?

6

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(b) Which of the OSI layers handles each of the following : 4

(i) Breaking the transmitted bit stream into frames

(ii) Determining which route through the subnet to use

(iii) Deadlocks

(iv) Acknowledgement

(c) Consider the following relational database : 6

Employee (emp-no, name, address)

Project (p-no, p-name)

Work on (emp-no, p-no)

(i) Print the names of the employees who are working on a project named "Information Technology".

(ii) Print the names of the employees who are not working in any project.

Solve the above queries using SQL.

(d) Write down the general concepts of OOPs (Object Oriented Programming). 4

4. (a) Give commands for the following operations in DOS and UNIX :

(i) Copying Group of files.

(ii) Give the list of all file names on the disk in drive A with a cam extension.

(iii) To change from the root directory to bin directory.

(iv) To know the version of the O. S.

(v) Copy 10 lines from file A to file B.

(b) Describe the (supervisor) program in controlling the operation multi-programming system. Your answer

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should include those functions which are also required in batch processing.

5. (a) "Coaxial cable has a smaller bandwidth than optical fibre." Comment. 6

(b) Describe synchronous data transmission in detail. How is this different from asynchronous data transmission ? 8

(c) What do you mean by e-mail ? How one can able to compose the mail ? What all entries are mandatory and what all entries are optional ? 6

6. (a) What do you mean by "WYSIWYG" ? Explain with the help of an example.

(b) What are the main features of graphical user Interface ?

(c) How much information can be stored on a CD and VCD ?

(d) Suggest suitable media or methods for the following applications :

(i) Keeping backup copies of master files.

(ii) Direct access storage of a very large file used once a weak.

(iii) Storing details of an employee for reference purposes within an institution.

(iv) Direct access storage on a small computer system which must be used in a slightly dusty environment.

(v) Permanent storage of a program within a small computer.

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7. (a) What are the advantages and limitations of secondary storage ?

   (b) What is the data rate for a magnetic tape drive for which the tape density is 1600 BPI and tape speed is 200 inches per second ?

   (c) What are the advantages of retaining information on microfilm ?

   (d) Differentiate between impact and non-impact printers.

8. Write short notes on any *five* of the following :

   (a) History of computers

   (b) WWW

   (c) TCP/IP

   (d) Virtual reality

   (e) Network topologies

   (f) Utility Package

   (g) Sequential file organization

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–101

M. C. A. (First Semester) EXAMINATION, June, 2005

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) What is the purpose of data entry machine ? Explain the operation of a floppy disk reader. 8

   (b) Discuss the main applications of magnetic ink character reader and optical character reader. 6

   (c) A page has 2000 characters. How many bits are needed to store it in a bit mapped form ? How many bits are needed fit is stored on EBCDIC ? 6

2. (a) Show that the memory addressing capability of CPU is equal to 2^n bytes, where n is the numbers address lines of the CPU. 10

   (b) Discuss the important features of macro, mini, main frame computers. 6

   (c) Differentiate impact and non-impact printers. 4

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3. (a) What are the different types of memory ? Discuss their merits, demerits and areas of application. 10

   (b) Define the terms seek time and latency time. If a hard disk has 10 surfaces and each surface is 12 inch in diameter and the density of recording is 60000 bits per linear inch estimate the no. of bits per cylinder of the disk. 10

4. (a) Explain the terms with examples : 10

   (i) System Software

   (ii) Application Software

   (iii) Utility Packages

   (b) What is an operating system of a computer ? Why is it required and what facilities are provided by an operating system to user ? 10

5. (a) What is network protocol ? Explain TCP/IP and ISO/OSI reference model. 12

   (b) What criteria is used in selecting a computer network topology ? Discuss star ring and multidrop topology. 8

6. (a) Explain Internet, Intranet and Extranet. How is communication between computers established in internet ? 12

   (b) Explain modular programming, structured programming and top-down and bottom-up design with examples. 8

7. (a) Draw a block diagram of computer. Explain the function of each of the blocks. 10

   (b) Explain the use of algorithm flowchart with respect to computer program. Write an algorithm to find average number of letters in a given sentence. 10

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8. Write short notes on any *four* of the following : 20

(a) Computer memory

(b) Hyper Media

(c) World Wide Web

(d) Teleconferencing

(e) e-mail

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Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–101

M. C. A. (First Semester) EXAMINATION, Dec., 2004

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Answer any *five* questions. All questions carry equal marks. Parts of the same question should be answered together and in the same sequence.

1. (a) What is the difference between data and information ? 5

   (b) How can you categorize printers ? Explain the working of any *two* types of printers. 15

2. (a) What are the different ways to organize a file ? Explain by giving examples. 10

   (b) Discuss the technology used in optical storage devices. 10

3. (a) Discuss in brief about the classification of softwares and give *two* examples of each type of software. 10

   (b) Explain the major functions performed by an operating system. 10

4. (a) List the main differences and similarities between DOS and UNIX. 10

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(b) Compare machine language, assembly language and high level languages. 10

5. (a) What is SQL ? List and write the purpose of various data sublanguages of SQL. 10

(b) What hardware facilities are required to establish network in a multistoried building ? Explain the purpose of each. 10

6. (a) Discuss in brief about various network topologies. 10

(b) What are communication protocols ? What characteristics need to be defined in a communication protocol ? List some network protocols. 10

7. (a) Write the difference between the following : 10

(i) Passive start and Active repeates

(ii) Connectionless and connection oriented communication

(b) Briefly write the functions of various OSI layers. Which of the OSI layers handles each of the following ? 10

(i) Breaking the transmitted bit stream into frames.

(ii) Detemining which route through the subnet to use ?

(iii) Providing synchronization.

8. Write short notes on the following : 5 each

(i) Tele conferencing

(ii) Concepts of OOPS

(iii) WWW

(iv) e-mail

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–101

M. C. A. (First Semester) EXAMINATION, June, 2004

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Describe briefly the basic concepts of Information Technology. 10

   (b) What are the different categories of data processing files ? Describe each of them in brief. 10

2. Differentiate between the following : 4 each

   (a) Analog and Digital transmission

   (b) Sequential file organization and Indexed file organization

   (c) Compilers and Interpreters

   (d) Half duplex and Full duplex transmission

   (e) Procedural and Non-Procedural language

3. (a) Describe any *five* operational features of visual display units. 10

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(b) What are the important characteristics of storage devices ? Also explain the working of compact disk. 10

4. (a) Differentiate between the system software and application software. Explain any *two* system software in brief. 12

(b) Give the UNIX commands to perform the following : 5

(i) Give user read, write and execute permissions, group members read and execute permissions and give others read and write permission for the file sample.

(ii) Find the name of the current directory.

(iii) Open file at line *n*.

(iv) Count the lines for the file sample.

(v) Print last *n* lines of file sample.

(c) Write brief note on SQL. 3

5. (a) What do you mean by Booting in DOS environment ? How does it works ? 8

(b) What are the advantages of Packet switching over circuit switching ? 5

(c) Describe the various network point-to-point topology. 7

6. (a) Briefly describe the role of computers in any *one* industry of your choice. 7

(b) Write down brief note on e-mail and domain names. 8

(c) Write down brief note on utilities. 5

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7. (a) What are the main features of GUI ? Explain each of them. 10

   (b) Write down the advantages and disadvantages of the following : 10

   (i) Key-to-diskette System

   (ii) Magnetic Ink Character Recognition

   (iii) Optical Mark Recognition

8. Write short notes on any *four* of the following : 5 each

   (a) Magnetic Tape

   (b) OOPS

   (c) WWW

   (d) Data Warehousing

   (e) Communication Media

   (f) Multimedia

   (g) Classification of Computers

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA – 101

M. C. A. (First Semester) EXAMINATION, Dec., 2003

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Discuss the important features of generations of computers. Give some examples of computers for each generation. 8

   (b) Give difference between the following : 9

   (i) Line printer and character printer

   (ii) Chain printer and drum printer

   (iii) Inkjet and dot matrix printer.

   (c) Differentiate between data and information. 3

2. (a) Explain booting process of DOS. 6

   (b) Discuss multiprogramming, multiuser and multi-tasking system. 6

   (c) Give commands for the following operation in DOS and UNIX : 8

   (i) Create a directory A_C 123 in T_C directory.

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(ii) Delete the directory 'temp' which is 'TC' directory.

(iii) Rename a file 'XYZ' to 'ABC'

(iv) Move a file 'ABC' from \TC\bin to \TC\ user.

3. (a) Discuss inheritance generalization and aggregation with examples. 8

(b) Discuss the merits and demerits of following : 12

(i) Machine language

(ii) Assembly language

(iii) High level language

(iv) Fourth generation language

4. (a) Explain various bounded and unbounded communication media. 10

(b) What criteria are used in selecting a computer network topology ? What are the advantages and disadvantages of star and ring network ? 10

5. Explain the following : 20

(a) Domain name

(b) Teleconferencing

(c) Commerce

(d) Data warehousing

(e) Internet

(f) World Wide Web

(g) Hypermedia

6. (a) Explain simplex, half duplex and full duplex communication mode. 6

(b) Discuss ISO/OSI reference model. 8

(c) Explain the use of bridge, repeaters and routers. 6

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7. Differentiate between the following : 20

   (i) Linker and loader

   (ii) Machine independent and machine dependent language.

   (iii) Syntax and semantics

   (iv) Source code and object code

   (v) Low level and high level language

   (vi) Procedural and non-procedural language

   (vii) Analog and digital communication

8. (a) A flopy disk rotates at the rate of 300 rpm and recording density is of 1600 bits per linear inch. What is the rate at which data will be read from track ? 10

   (b) Explan CD ROM and DVD ROM. How is data recorded on them ? 10

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Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–101

M. C. A. (First Semester) EXAMINATION, June, 2003

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Answer any *five* questions. All questions carry equal marks. Parts of the same question should be answered together and in the same sequence.

1. (a) List and compare any *five* input devices.
   (b) What is the difference between sequential and serial organization of a file ?

2. (a) What are the advantages and disadvantages of magnetic storage devices ? Draw and label any commonly used magnetic storage device.
   (b) Compare compilers, interpreters and assemblers.

3. (a) What are the differences between DOS and Windows ?
   (b) Write and explain the syntax of any *five* file handling commands of DOS as well as of UNIX.

4. (a) What are the major characteristics of OOPS ?

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(b) What are the differences between forth generation languages and traditional high level languages ? Explain.

5. (a) What are the different transaction control and access control facilities provided in SQL ?

(b) Differentiate between the following :

(i) analog and digital communication

(ii) synchronous and asynchronous transmission

6. (a) List the advantages and disadvantages of having international standards for network protocols.

(b) When is RS 232-C standard interconnection used ? Explain the characteristics of the RS-232 C interface.

7. (a) What are the different multimedia data types ?

(b) Explain the concept of data warehousing.

(c) What is the difference between web and internet ?

8. Write short notes on the following :

(i) Application of IT in industry

(ii) Virtual reality applications

(iii) Teleconferencing

(iv) Hyper media

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–101

M. C. A. (First Semester) EXAMINATION, Dec., 2002

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Let D be the time of deletion of a file, M be the time of moving a file from one memory location to other and I be the time taken for inserting a file into memory. Suppose that we have 8 files numbered from File 1 to File 8. Compute the time taken to perform the following operation :
Delete File number 6. Then move File 7 in memory location of File 6. Then move File 8 in place of File 7. Now Insert File 9. Assume the files to be of same size. Also draw the diagram after the completion of this operation. 10

   (b) Name the various types of input and output devices and explain the working of each of them. 10

2. (a) Write UNIX commands for the following : 10

   (i) Make a directory named TEST

   (ii) Remove a directory named TEST

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(iii) Copy the file X . TXT to Y . TXT

(iv) Delete the file X . TXT

(v) Print the calendar for the year 2001

(b) Explain the functions of compilers and interpreters. Compare them giving advantages and disadvantages of each. 10

3. (a) Suppose that we have the relation called as SINFO having the following structure : 10

Student No.	Student Name	Branch	Semester	Percent

(i) Write an SQL querry to find the names of all the students who are studying in 1st Semester MCA.

(ii) Find the names of all the students who are in 3rd Semester and have secured more than 75%.

(b) Compare high level language and fourth generation languages giving advantages and disadvantages of each. 10

4. (a) If the frequency is 3 MHz calculate the wavelength. 5

(b) If the transmitted power is 10 times the received power then calculate the attenuation in decibels in fibre optics cable. 5

(c) Explain simplex, half duplex and full duplex with examples. 10

5. (a) Suppose that you want to send an E-mail to rakesh @ yahoo.com wishing him "Happy Birthday". Give the

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steps which you will have to take to accomplish this task. Assume that you are already connected to Internet. 10

(b) Explain the working of a multimedia system with example. 10

6. (a) Explain the difference between "Save" and "Save As" suboptions of "File" menu in Windows. Also explain the function of "Print" suboption of "File" menu in Windows. 10

(b) Explain history of development of computers. 10

7. (a) Consider 2^{n-1} IMPs connected by the following topologies :

(i) Star (Central node is an IMP)

(ii) Complete Interconnection

For each of these give the number of hops needed for an IMP-IMP packet. Justify your answer. 10

(b) Explain the terms base class and derived class with examples. 10

8. Write short notes on the following : 10, 10

(i) Teleconferencing

(ii) Function of various layers of ISO/OSI reference model

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA – 101

M. C. A. (First Semester) EXAMINATION, June, 2002

INFORMATION TECHNOLOGY

(MCA – 101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions.

1. (a) Compute the memory of a floppy having 2 sides. Each side has 40 tracks. Each track has 9 sectors. Each sector can stores 512 bytes of information. 10

   (b) Explain the terms data and information with examples. 10

2. (a) Write DOS commands for the following : 10

   (i) To change the name of the file from A.TXT to B.TXT

   (ii) To find the names of all the files and directories in a given directory.

   (iii) To move from C:\TEST> to C:\>

   (iv) Remove the file A.TXT

   (v) To go from C:\> to C:\TEST>

   (b) Explain the functions of system software and operating system with examples. 10

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3. (a) Suppose that we have a table called as BANK having the following structure : 10

Account No	Name of Person	Balance

(i) Write an SQL query to find the average bank balance of all persons who have their account in their banks.

(ii) Find the names of persons who have their bank balance greater than Rs. 50,000.

(b) Explain the terms encapsulation and inheritance with examples. 10

4. (a) A system has an n-layer protocol hierarchy. Applications generate message of length M bytes. At each of the layer an h-byte header is added. What fraction of the network bandwidth is filled with headers. Also assume that no header bits are added at the lowest layer. 10

(b) Explain circuit switching and packet switching with examples. Compare them giving advantages and disadvantages of each. 10

5. (a) Give the full forms of Cc and Bcc while using E mail facility. Also give the functions of To, Cc and Bcc while using E mail. 10

(b) Give the applications of IT in education and training with examples. 10

6. (a) Explain the functions of "Cut", "Copy" and "Paste" suboptions of "Edit" menu in Windows. 10

(b) Explain organisation of computers. 10

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7. (a) Suppose that we want to transmit the message "We are trying to solve this problem". Explain how this message will be broken up into fragments after passing through the network with a packet size of 8 bytes. 10

   (b) Compare machine and assembly languages giving advantages and disadvantages of each. 10

8. Write short notes on the following : 20

   (a) Data Warehousing

   (b) Functions of various layers of TCP/IP model

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Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA—101

M. C. A. (First Semester) EXAMINATION, Dec., 2001

INFORMATION TECHNOLOGY

(MCA—101)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions out of eight. All questions carry equal marks.

1. (a) Classify the different generations of computer on the basis of technology used, processing power and storage capacity of computer system. 8

   (b) Explain the organization of a file system. What are the operations that can be performed on file system and explain access permission of a file. 6

   (c) Consider the case of a file system which comprises of 60 track per surface (single surface only), 48 sector per track and 512 byte per sector. Find the track number, sector number and byte offset to access the address 10,000 in this file system. 6

2. (a) What are different categories of software ? How these

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(b) Write the DOS and UNIX commands for performing the following task : 6

(i) Detail listing of file in directory

(ii) Searching particular file in directory and subdirectory

(iii) Printing particular file from command prompt

(c) What is multiprogramming, multi-processing and multi-tasking ? 6

3. (a) Compare the concepts of structured programming and object-oriented programming. List the advantages and disadvantages of both the approach. 8

(b) What is SQL ? Explain the clauses of SQL along with basic syntax/format of writing SQL. 6

(c) Compare high level langauge with assembly language on following points : 6

(i) Storage requirements

(ii) Processing time

(iii) Case of writing code

(iv) Conversion to machine language

(v) Number system supported by them

(vi) Portibility to new system (different architecture)

4. (a) Describe circuit switching, message switching and packet switching. Give their advantages and disadvantages. 8

(b) Explain different topologies of computer network. 6

(c) Describe the different communication medium for data transfer in Computer Network. 6

5. (a) Explain OSI-reference model of computer network. Compare it with TCP/IP protocol model. 8

(b) Explain the different modes of communication. 6

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(c) Consider the case of transmitting 8192 bytes of information with packet size of the following : 6

(i) 1024 byte

(ii) 512 byte

(iii) 128 byte

inclusive of header information of 16-byte. Determine the number of packets formed in transmitting this information.

6. (a) Explain the different classes of IP address and domain name. 8

(b) Explain the applications of multimedia. 8

(c) Describe world-wide web and file transfer protocol. 6

7. (a) Explain the concept of security in data communication. How the security of e-commerce is ensured in Internet ? 8

(b) Describe the client-server mode of communication. 6

(c) Determine the time taken to transmit 10 MB (megabyte) of file over Internet using modem at the rate of 9600 bits per second. 6

8. Write short notes on any *four* of the following : 20

(i) Hyper-text

(ii) Data Warehousing

(iii) LAN, MAN and WAN

(iv) Wireless communication

(v) System programming

(vi) Fourth generation language

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