Total No. of Questions : 10] [Total No. of Printed Pages : 4

Roll No. .....

MCA–405(B)(N)

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

(New Course)

JAVA PROGRAMMING AND TECHNOLOGIES

(Elective–I)

[MCA–405(B)(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt all questions. All questions carry equal marks.

Unit–I

1. (a) What is a method ?
   (b) What is an encapsulation ?
   (c) What is the difference between a 'byte' and a 'byte' ?
   (d) What do you understand by portability of code ? Are Java programs portable ? Justify your answer. 20

Or

2. (a) Differentiate between the following : 10
      (i) Method overloading and method overriding
      (ii) Static and instance members of a class
   (b) What do you understand by polymorphism ? Briefly explain Dynamic Method Dispatch with the help of an example. 10

P. T. O.

Unit–II

3. (a) Write a program to create a thread "A", which creates two child threads "B" and "C". "A" must terminate after both "B" and "C" have terminated.

"B" and "C" must print their own names 100 times and then terminate. 10

(b) Explain Thread life cycle. 10

Or

4. (a) What do you understand by multithreading ? What facilities are provided by Java to handle concurrent access of a common data structure by two or more threads ? 12

(b) How are the following code segments handled by Java ? 8

(i) int $x = 0, y = 1$; int $z = y / x$;

(ii) try { ...}

catch (Exception e) {System.out.println ("Exception Caught");}

catch (Arithmetic Exception e)

{ System.out.println("Arithmetic Exception Caught"); }

Unit–III

5. (a) Discuss about the Event Delegation model in java. Discuss the role of Listener in Event Delegation model. 10

(b) AWT, what do the following terms mean and how are they related to each other ? 10

(i) Component

(ii) Container

(iii) Panel

(iv) Window

Or

6. (a) Design an applet "Clicker" that displays a button and a text field on the screen. The text field must display the number of times the button is pressed. 10

   (b) What do you understand by AWT Controls ? What are the various controls supported by AWT ? 10

Unit – IV

7. (a) What are the similarity and differences between JDBC and ODBC ? What is JDBC-ODBC bridge driver ? 10

   (b) Make comparison between NestedSQLException and RuntimeSQLException. 10

Or

8. (a) Explain the following : 10

   (i) File input stream

   (ii) Character stream

   (b) Explain the following API of Java. sql package : 10

   (i) DriverManager class

   (ii) SQLPermission class

   (iii) Driver interface

   (iv) Connection interface

Unit – V

9. (a) When a client Java application communicates to a Java server using RMI, a stub is created. Explain which part of the application creates the stub, where the stub resides and how it is used. 10

   (b) Briefly explain what functions do the socket APIs socket ( ) and send ( ) perform. 10

P. T. O.

Or

10. (a) Describe the purpose/functionality of the socket(s) used as the server in reliable, connection-oriented socket-based communication with a client. (You need not discuss client side functionality). 10

(b) Write notes on the following : 10

(i) Proxy Server

(ii) Collection interface

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

Roll No. .....

MCA–405(O)

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

(Old Course)

COMPUTER NETWORKS AND COMMUNICATION

[MCA–405(O)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) Compare and contrast between the OSI and TCP/IP model. 10

   (b) Explain multiplanning and various types of multiplanning. Also compare various types of multiplanning. 10

2. (a) For pattern = 110011 and message = 11100011, find CRC. 8

   (b) If the bit string 011110 1111101111110 is subjected to bit stuffing, what is the output string ? 6

   (c) Explain Pulse code modulation. 6

3. (a) Discuss the strategies of initialization and disconnections of a link for ARQ protocol. 10

P. T. O.

(b) Calculate the throughput for stop and wait protocol, if the frame size is 800 bits and bit rate is 9600 bps, within distance 2000 km with speed of propagation 200000 km/s. 10

4. (a) What is multiple access problem ? 4

(b) Measurement of a slotted ALOHA channel with an infinite number of users show that 10% of the slots are idle. 10

(i) What is channel load ?

(ii) What is throughput ?

(iii) Is the channel overloaded ?

(c) Explain CSMA/CD. What is the effect of frame length on CSMA/CD ? 6

5. (a) Compare LAN standards : 10

802·3

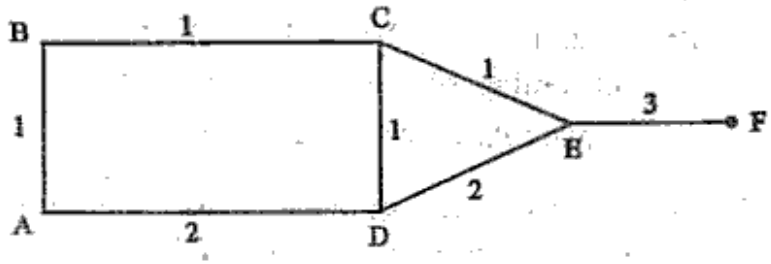
802·4

and 802·5

(b) Explain spanning tree routing in bridged LANS. What are the advantages of using spanning tree ? 10

6. (a) Compare virtual circuits and datagram. 8

(b) Explain in detail shortest path routing. Find the shortest path from router. A using Dijkstra's algorithm. 12



7. (a) Explain congestion control in TCP/IP. 10

   (b) What is Cryptography ? Explain encryption and decryption of data. 10

8. Write short notes on the following : 20

   (i) DES chaining

   (ii) Hierarchical routing

   (iii) FDDI (High Speed LAN)

   (iv) Hamming code

   (v) Distance vector routing

Total No. of Questions : 5] [Total No. of Printed Pages : 2

Roll No. .....

MCA–405–A(N)

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

(New Course)

MANAGERIAL ECONOMICS

(Elective – I)

[MCA – 405–A (N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt all the *five* questions. All questions carry equal marks.

1. What is managerial economics ? Do you think that profit maximisation model is the ideal model to explain the behaviour of a business firm ? Give reasons.

Or

Is the goal of profit maximisation in conflict with the goal of sales maximisation or growth maximisation ? Explain fully.

2. Explain the concept of opportunity cost. Does it have significance in managerial decision-making ? Explain.

Or

What do you mean by elasticity of demand ? Describe the factors determining elasticity of demand.

P. T. O.

3. What is meant by marginal and average cost of production ? Show how they are used in the determination of price.

Or

From the following data compute break even point :

	Rs.
Selling price (P. U.)	2·50
Variable cost (P. U.)	2·00
Total fixed costs	20,000

What is the new B. E. P. if fixed cost increased to Rs. 25,000 and variable cost reduced to Rs. 1·50 each unit ?

4. Distinguish between proportion and scale. Why does increasing returns to scale apply ?

Or

Explain economies and diseconomies of large scale of production.

5. Discuss the equilibrium of a firm in the short and long periods under perfect competition.

Or

What is discriminating monopoly ? When is price discrimination possible ? Is price discrimination a good policy ? Explain.

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

MCA–405(O)

M. C. A. (Fourth Semester)
EXAMINATION, Nov.-Dec., 2007
(Old Course)
COMPUTER NETWORK AND COMMUNICATION
[MCA–405(O)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) What do you understand by layered architecture ? How communication at interface takes place ? Elaborate. 10

   (b) Illustrate Sampling and Pulse Code Modulation scheme. 10

2. (a) Draw the synchronous TDM frames showing character data given the following information :

   —Four signal sources

   Source 1 message : TEG

   Source 2 message : A

   Source 3 message :

   Source 4 message : EFIL

P. T. O.

Also draw asynchronous TDM using a frame size of three characters for same. 10

(b) Differentiate between Baseband and Broadband coaxial cable along with description of coaxial cable types. 10

3. Differentiate between the following : 20

(i) Virtual circuit and Datagram

(ii) Broadcasting and Multicasting

(iii) WAN and www (Internet)

(iv) Gateways and Routers

4. (a) Computer A uses stop-and-wait ARQ protocol to send packets to Computer B. If the distance between A and B is 4000 km, how long does it take Computer A to receive acknowledgement for a packet ? Use the speed of light for propagation speed and assume the time between receiving and sending the acknowledgement is zero. 10

(b) Describe various frame formats of HDLC. 10

5. (a) Why the performance of slotted ALOHA is twice as that of pure ALOHA ? 10

(b) Compare and contrast distance vector routing with that of link state routing. 10

6. (a) Discuss the mechanism of Isarithmetic control. 10

(b) Explain FDDI protocols and their applications. 10

7. (a) Illustrate connection management in TCP/IP. 10

(b) What are key management problems in case of authentication protocols ? Elaborate. 10

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

(i) ASN

(ii) UDP

(iii) Finite state machine

(iv) Floyd Warshall algorithm

(v) ATM cells

2000

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

MCA–405

M. C. A. (Fourth Semester) EXAMINATION, Dec., 2006

COMPUTER NETWORK AND COMMUNICATION

(MCA–405)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions out of eight.

1. (a) Why the layered architecture is followed for ISO-OSI model ? Explain the OSI model of communication. 10

   (b) Explain the principles of PCM. Consider A and B signal with spectral components in the range of 300 to 3000 Hz. Assume that a sampling rate of 7000 samples per second will be used to generate a PCM signal. For SNR = 30 dB, what is the number of uniform quantization levels needed ? 10

2. (a) Explain the working of 3-bit sliding window protocol. What will be the size of window ? 10

   (b) How the ATM is different from other modes of communications ? What is the procedure for establishing the call for data transfer ? Why is the efficiency of ATM transmission good than other transmission protocols ? 10

P. T. O.

3. (a) Explain ALOHA and slotted ALOHA. Why the efficiency of slotted ALOHA is more than non-slotted ALOHA ? Suppose an ALOHA system uses a 9600-bps channel for sending 120-bit-long packets. What is the maximum possible throughput ? 10

(b) Explain the Markov chain model for S—ALOHA. 10

4. (a) Explain the ethernet protocol of LAN. Also give the frame format of ethernet. 10

(b) Write short note on any *one* of the following : 10

(i) FDDI

(ii) DQDB

5. (a) Write short notes on any *two* of the following : 10

(i) Comparison of virtual circuits and datagram

(ii) Routing algorithms

(iii) Dijkstra algorithm for finding shortest route

(b) Give the strategies for congestion control in a network. 10

6. (a) How are the packets routed to destination in Internet ? What are the contents of routing table ? How the router exchange information with neighbouring router ? 10

(b) Compare TCP/IP model with ISO-OSI model of communication. What is the difference between Layer 2 and Layer 3 switches ? 10

7. (a) What is the difference between IP_V4 and IP_V6 ? How many bits are reserved for IP address in IP_V6 ? How security issues are addressed in IP_V6 ? 10

(b) Which protocol is more reliable TCP *or* UDP ? Consider the generator polynomial $x^3 + x + 1$. Find the CRC of the data 11110 through either binary or algebraic division. 10

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

(i) SNMP

(ii) DES

(iii) Public key cryptography

(iv) FDM and TDM

(v) Hamming Code

(vi) IP address schemes

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

MCA–405

M. C. A. (Fourth Semester)
EXAMINATION, Dec., 2005
COMPUTER NETWORK AND COMMUNICATION
(MCA–405)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) How do the layers of the ISO-OSI reference model correlate to the layers of the TCP/IP model ? 5

   (b) If the bit rate of a signal is 1000 bps, how many bits can be sent in 5 secs, (1/5) secs and 100 ms. 5

   (c) Why is frequency modulation superior to amplitude modulation ? 5

   (d) What does "negotiation" mean when discussing network protocols ? Give an example of it. 5

2. (a) What are the three major multiplexing techniques ? Explain any *two* of them with the help of an example. 8

   (b) Given a 10-bit sequence 1010011110 and a divisor of 1011. Find the CRC and check your answer. 7

   (c) In the selective respect protocol, what does the number on a NAK and ACK frame mean ? 5

P. T. O.

3. (a) In the slotted ALOHA protocol, when should the station access the medium ? 5

(b) Differentiate between IEEE 802·3, 802·4 and 802·5. 10

(c) Why is the control field from HDLC totally dropped from frame relay ? 5

4. (a) Contrast and compare distance vector routing with link state routing. 10

(b) Write down the procedure of one-bit sliding window protocol. Also explain what will happen when two users start transmitting the message to each other simultaneously. 10

5. (a) What do you understand by congestion ? What are the different congestion prevention policies ? Explain any *one* in detail. 10

(b) Convert the IP address whose hexadecimal representation is C22F1582 to dotted decimal notation. 4

(c) Differentiate among bridges, routes and gateways. 6

6. (a) What is the difference between a process-to-process delivery and a host-to-host delivery ? 7

(b) What do you mean by three-way handshaking ? In which situation is this more useful ? 6

(c) What are the major functions of the session layer of ISO-OSI reference model ? 7

7. (a) What are the advantages and disadvantages of a hierarchical name space over a flat name space for a system of the size of the internet ? 8

(b) Differentiate between the following : 12

(i) Plain test and Cipher test

(ii) Triple DES and DES

(iii) Polyalphabetic and monoalphabetic substitution

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

(a) Abstract syntax notation-1

(b) Fibre-optic lines

(c) E-mail

(d) Deadlocks

(e) Verification of protocols using finite state machine

(f) DQDB

(g) Hamming code

(h) Circuit and Packet switching

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

MCA–405

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

COMPUTER NETWORKS AND COMMUNICATION

(MCA–405)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) Differentiate between the following :
   (i) Differential PCM and Normal PCM
   (ii) Adaptive delta modulator and a regular delta modulator
   (b) What are the different criterias for using layered protocols ?
   (c) Describe in detail the TCP–IP reference model.

2. (a) When bit stuffing is used, is it possible for the loss, insertion or modification of a single bit to cause an error not detected by the checksum ? If not, why not ? If so, how ? Does the checksum length play a role here ?
   (b) Write down a brief note on the data link layer in ATM.

P. T. O.

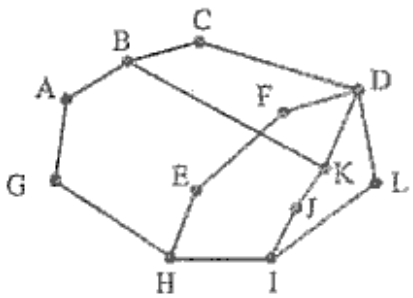
(c) Give the frame structure of the bit-oriented protocols and describe its fields in detail.

3. (a) Sketch the Manchester encoding for the bit stream : 0001110101.

(b) Consider the delay of Pure ALOHA verses Slotted ALOHA at low load. Which one is less ? Explain your answer.

(c) What do you mean by collision-free protocol ? Explain any *one* collision free protocol.

4. (a) Compute a multicast spanning tree for router C in the subnet below for a group with members at routes A, B, C, D, E, F, J and K.



(b) Is fragmentation needed in concatenated virtual circuit internets or only in datagram systems ?

5. (a) Imagine that a two-way handshake rather than a three-way handshake were used to set up connections. In other words, the third message was not required. All deadlocks now possible in the transport layer. Explain with the help of an example.

(b) Using the RSA public key cryptosystem, with $a = 05, b = 06$ etc. using $p = 10, q = 15$ and $d = 27$. Find e and encrypt "RSTUVWXYZ".

6. (a) Show the < A > tag that is needed to make the string "ACM" be a hyperlink to http://www.acm.org.

   (b) What are the factors on which one can differentiate the various types of networks ?

   (c) Write down a brief note on the internal organization of the Network layer.

7. (a) Differentiate between the following :

   (i) FDM and TDM

   (ii) Bridges and Gateways

   (iii) Hub and Rollcall Polling

   (iv) Goback *n* and Selective Repeat

   (v) IEEE 802·4 and 802·5

   (b) Explain the concept of tunneling with respect to internetworking.

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

   (a) FDDI

   (b) DQDB

   (c) Fibre-Optic links

   (d) Stability in ALOHA

   (e) Optimality principle

   (f) Abstract Syntex notation 1

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

MCA–405

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

COMPUTER NETWORKS AND COMMUNICATION

(MCA—405)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

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

1. (a) What are the reasons for using layered protocols ? Compare ISO-OSI reference model and TCP/IP model.

   (b) Differentiate between the following :

   (i) Adaptive and non-adaptive routing algorithm

   (ii) Virtual circuit and data gram model

2. (a) The message $x^{15} + x^{14} + x^3 + x + 1$ arrives using polynomial $x^5 + x^3 + 1$. Explain whether it is correct message or not. 5

   (b) How congestion effects the communication subset ? Explain any *two* strategies for controlling congestion. 6

   (c) Imagine two LAN bridges, both connecting a pair of 802·4 networks. The first bridge is faced with 1000 512-bytes frames/sec. that must be forwarded. The

P. T. O.

second is faced with 2000 1024-bytes frames/sec. Which bridge do you think will need faster CPU ? Why ?

3. (a) Differentiate between the following :

   (i) Substitution ciphers and transposition ciphers

   (ii) Time division and Statistical time division multiplexing

   (b) What do you mean by crash recovery ? Write down any *one* procedure with its merits and demerits.

4. (a) Define transmit and receive windows.

   A connection protocol for a wide area network provides a transmission window size of N messages. Derive the minimum message sequence number range for the protocol in the following cases : 6

   (i) The receiver accepts out of sequence messages and lost or corrupted messages are selectively retransmitted.

   (ii) Only-in-sequence messages are accepted and if a message is lost all subsequent message must be retransmitted.

   (b) Ten thousand airline reservation stations are competing for the use of a single slotted ALOHA channel. The average station makes 18 requests/hour. A slot is 125 μ sec. What is the approximate total channel load ? 6

   (c) Write down the procedure of a simple protocol for a Noisy channel. 8

5. (a) What is the prime purpose of the ATM and frame relay protocols ? Which ATM layer is involved with header generation and cell multiplexing ? What fields

make up an ATM cell and how money bytes are in each field ? 4, 2, 4

(b) Differentiate between the following :

(i) Start-stop and Synchronous transmission 3

(ii) IEEE 802·3, 802·4 and 802·5 7

6. (a) What is the greatest loss in fiber cables besides absorption attenuation ? What steps are taken to minimize losses ? 8

(b) Differentiate between the following :

(i) Passive star and active repeater in fiber optic

(ii) Hub polling and Roll call polling

(iii) Packet switching and circuit switching

7. (a) Give three examples of protocol parameter that might be negotiated when a connection is set up.

(b) Give a brief note on internet architecture and addressing.

(c) Describe the major components of the SNMP management model.

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

(a) PCM

(b) Marker chain model for S-ALOHA

(c) FDDI protocol

(d) Broadcasting routing algorithm

(e) E-mail

(f) Verification of protocols using finite state machine

(g) Deadlock