

Institute of Management and Career Courses (IMCC), Pune
Maharashtra Education society's
TERM END ASSESSMENT (A.Y.2022-23)
MCA I Year (Sem I)

Time: 2 hrs 30 min.

IT 14: Operating Systems

Note:-

Date: 27/02/2023

Marks: 50

1. All questions are compulsory.
2. Figures to right indicate full marks.

Q.1

Solve following MCQ. (20*0.5M) (10 M)

1. The size of a page is typically _____
 a. Varied b. power of 2 c. power of 4 d. power of 8

2. Virtual memory is normally implemented by _____
 a. demand paging b. buses c. virtualization d. Overheads

3. The primary purpose of Operating System is
a. To make the most efficient use of the computer hardware
b. To allow people to use the computer
c. To keep systems programmers employed
 d. To make computers easier to use

4. What is Scheduling?

- a. allowing a job to use the processor in allotted time slice
b. making proper use of processor
c. coordination of process
d. providing multitasking environment

5. Copying a process from memory to disk to allow space for other processes is called _____

- a. Deadlock b. Swapping c. Demand Paging d. Page Fault

6. Creating a separate process using a system call means

- a. Fork a process b. init a process c. exe process d. sys process

7. A _____ is a single computing component with two or more independent actual central processing units called "cores"
a. Multiprocessor b. Multicore processor c. Single processor
d. Simulation

8. In distributed system, each processor has its own _____
a. local memory b. CPU c. Both local memory CPU d. Interrupt call

9. Android Operating system is based on:
a. Mac b. Linux c. Windows d. Solaris
10. Which of the following is correct in real time?
a. non-preemptive kernels
b. preemptive kernels
c. neither preemptive nor non-preemptive kernels
d. preemptive kernels or non-preemptive kernels
11. The priority of a real time task:
a. must degrade over time b. must not degrade over time
c. may degrade over time d. Degradation doesn't occur at any cost
12. Which of the following is not an example of a small-scale embedded system?
a. Electronic Barbie doll b. Simple calculator c. Cell phone
d. Computer aided machines
13. Which of the following is a Disadvantages of Embedded Systems?
a. Low development effort b. Harder Trouble Shooting
c. Not applicable to scientific computer d. Easily replaceable
14. To rename or change the existing file _____ command is used
a. mv b. cp c. rv d. pv
15. What will be the output of date command in LINUX
a. Current Date and Time
b. Current Date
c. Only Time
d. Date in yy/mm/dd format with next day date
16. To install the new font in window XP
a. Start -> setting -> control panel -> font
b. Start -> setting -> control panel -> font -> install new font
c. Start -> control panel -> font -> install new font
d. Start -> setting -> font
17. The _____ is a security app by Microsoft which is a built-in one into Windows OS that is designed to filter network data from your Windows system & block harmful communications or the programs which are initiating them.
a. Windows Security Essentials b. Windows App Blocker
c. Windows Firewall d. Windows 10
18. Users communicate with the kernel through a program known as the _____
a. Shell b. Kernel c. Unix d. Pearl

19. Which command reads user input from the terminal and assign this value to a variable name?

- a. get b. declare

set

read

20. Which special character is used in CASE looping for separating one case statement from another case statement in Shell scripting?

a;;

;

c. &

d;!

Q.2 What is Paging? Explain demand paging concept

(10 M)

OR

Explain process concept with the process state diagram. Also explain the process control block (PCB) in detail

Q.3 What is Inter Process Communication (IPC)? Explain Shared Memory and Message Passing method.

(10 M)

OR

What is distributed OS? Explain its features, advantages & disadvantages.

Q.4 What is Windows OS? Explain Service Management method of Windows

(10 M)

OR

What is Linux OS? Explain any 5 Linux commands

Q.5 Write a shell script program for finding prime number

(05 M)

Write a shell script program for string comparison

(05 M)

OR

Write a shell script program for finding amstrong number using function

(10M)

Maharashtra Education society's
Institute of Management and Career Courses (IMCC), Pune

TERM END ASSESSMENT (A.Y.2022-23)

MCA I Year (Sem I)
IT11: Java Programming

Time: 2hrs 30 min.

Date: 23/02/2023

Marks: 50

Note:-

1. All questions are compulsory.
2. Figures to right indicate full marks,

Q.1 20 MCQ Questions (0.5M * 20) (10 M)

1. Which keyword is used for accessing the features of a package?
a) package
 b) import
c) extends
d) export
2. Which of the following is true about the anonymous inner class?
a) It has only methods
b) Objects can't be created
c) It has a fixed class name
 d) It has no class name
3. Which of the following is the correct way of importing an entire package 'pkg'?
a) import pkg.
b) Import pkg.
 c) import pkg.*
d) Import pkg.*
4. What is the process of defining a method in terms of itself, that is a method that calls itself?
a) Polymorphism
b) Abstraction
c) Encapsulation
 d) Recursion
5. Which of this method of class String is used to obtain a length of String object?
a) get()
b) Sizeof()
c) Lengthof()
 d) length()
6. Which of the following is a super class of all exception type classes?
a) Catchable
b) RuntimeExceptions
c) String

- d) Throwable
7. Thread priority in Java is?
- a) Integer
 - b) Float
 - c) double
 - d) long
8. What will happen if two threads of the same priority are called to be processed simultaneously?
- a) Anyone will be executed first lexicographically
 - b) Both of them will be executed simultaneously
 - c) None of them will be executed
 - d) It is dependent on the operating system
9. Which of the following is not a layout class in Java?
- a) Box Layout
 - b) Grid Layout
 - c) Flow Layout
 - d) Unbox Layout
10. What is true about Serialization?
- a) It happens to objects
 - b) It is beyond the scope of Java
 - c) It is done through Serializable interface
 - d) Both a and c
11. Which is NOT true about Collection Framework?
- a) It resides in java.util package
 - b) It is a collection of classes, interfaces, algorithms and methods
 - c) It contains Map
 - d) Only a and b
12. Which of the following package has classes, interfaces for delivering UI in java?
- a) java.awt.*;
 - b) java.io.*;
 - c) java.sql.*;
 - d) java.lang.*;
13. What is NOT true about event handling in Java?
- a) Event delegation model is responsible for handling events
 - b) Event is generated on a source
 - c) Event is an exception which is thrown by the GUI
 - d) Event is consumed by a listener
14. Which of the following is NOT an Interface of Collection Framework?
- a) Vector
 - b) Set
 - c) List
 - d) Queue

15. Which of the following is NOT a class of Collection Framework?
a) HashNet
b) ArrayList
c) Set
 d) Stack
16. How many types of drivers are available under JDBC?
a) 3
 b) 4
c) 5
d) 7
17. Which of these is the correct sequence of method invocation in a servlet?
a) main(), init(), do(), end()
b) main(), init(), service()
 c) init(), service(), destroy()
d) init(), service(), doGet(), doPost()
18. Which of these is incorrect statement?
a) JDBC operations can throw SQLException
b) Scanner object can throw IOException
c) File class can throw FileNotFoundException
d) Division by zero can throw NullPointerException
19. What is true about JSP?
a) It stands of Java Server Pages
b) It is used to deliver dynamic web pages
c) It has its own life cycle
 d) All of the above
20. What is NOT true about the web.xml?
 a) It is optional in a web app
b) It is also called as deployment descriptor
c) It is used to list all servlets and jsp's in the given project
d) It is referred by the webserver

Q.2 Explain Checked and Un-Checked Exception with suitable example for each. (10 M)
OR

- a) Discuss Thread Life Cycle. (4 M)
b) Write a program in Java to demonstrate Mutable and Immutable Strings. (6 M)

Q.3 a) Write a Java program to write a sentence given by the user to a file (6 M)
b) Explain Scanner class with suitable example (4 M)

OR

- a) Write a Java program to count occurrence of given word in the file (6 M)
b) Explain HashMap with suitable example. (4 M)

Q.4 Using event handling capture the x and y coordinates of mouse cursor when dragged on the screen and display the same. (10 M)

OR

- a) Explain what is event delegation model? Explain life cycle of a servlet.
- b) Explain any two layouts.

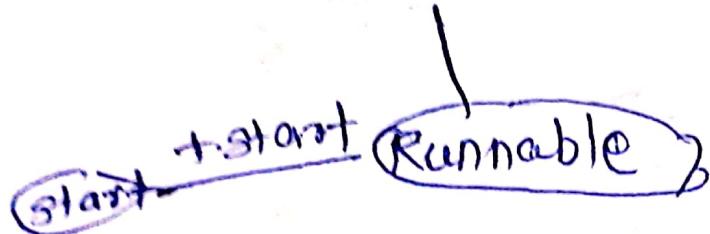
(6M)
(4M)

Q.5 Using JDBC Servlet write a web app to fetch marks of a given student. (10 M)

OR

- a) Explain life cycle of servlet
- b) What are different types of statements?

(6M)
(4M)



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TERM END ASSESSMENT (A.Y.2022-23)

MCA I Year (Sem I)

IT34: Object Oriented Software Engineering

Time: 2hrs 30 min.

Date: 25/02/2023

Marks: 50

Note: -

1. All questions are compulsory.
 2. Figures to the right indicate full marks.
 3. State your assumptions clearly.
-

Q.1 20 MCQ Questions (0.5M * 20) (20)

i) What is a core objective of a Software Process Model?

1. To define software
2. To give a specific roadmap for software engineering work
3. To prepare modules
4. None of the mentioned above

ii) The waterfall model suggests a systematic ____.

1. Iterative approach
2. Spiral approach
3. Sequential approach
4. None of the mentioned above

iii) The functionality of software models its users to quickly and then refines and expands on that functionality in later software releases.

1. Incremental Process Model
2. Waterfall Model
3. Spiral Model
4. All of the mentioned above

iv) A spiral model is an evolutionary ____ that combines the iterative aspect of prototyping with the iterative nature of development.

1. Software process model
2. Mechanical designing process
3. Identify supplementary activities
4. All of the mentioned above

v) Planning activity of a project development describes about the ____.

1. Size and resource estimates
2. Planning and designing
3. System requirement and design
4. None of the mentioned above

vi) Which of the following represents the life-cycle of software development?

1. Analysis -> Design -> Code -> Testing -> Operation and Maintenance
2. Analysis -> Design -> Operation and Maintenance -> Testing
3. Design -> Analysis -> Coding -> Testing -> Operation and Maintenance
4. Design -> Analysis -> Coding -> Operation and Maintenance -> Testing

vii) Choose the correct option from the given below?

1. Prototyping Model facilitates reusability of components
2. RAD Model facilitates reusability of components
3. Both RAD & Prototyping Model facilitates reusability of components
4. None

viii) Which one of the following is not a software process quality?

1. Productivity
2. Portability
3. Timeliness
4. Visibility

ix) Which two models don't allow defining requirements early in the cycle?

1. Waterfall & RAD
2. Prototyping & Spiral
3. Prototyping & RAD
4. Waterfall & Spiral
- 5.

x) If you were a lead developer of a software company and you were asked to submit a project/product within a stipulated time-frame with no cost barriers, which model would you select ?

1. Waterfall
2. Spiral
3. RAD
4. Incremental

xvi) A software might allow a user to interact -

1. Via Keyboard
2. Via Mouse movement
3. Via Voice recognition
4. All of these

xvii) Extreme Programming (XP) is an approach of,

- 1. Agile software development
- 2. Iterative process of software development
- 3. Prototype of software development
- 4. None of the mentioned above

xviii) Agile Software Development is based on

- 1. Linear Development
- 2. Iterative Development
- 3. Incremental Development
- 4. Both Iterative & Incremental Development

xix) How many phases are there in Scrum ?

- 1. Two
- 2. Three
- 3. Four
- 4. Scrum is an agile method which means it does not have phases

xx) The Agile model has been primarily designed to develop a project to adapt to ___ quickly.

- 1. Development quickly
- 2. Implement quickly
- 3. Change requests
- 4. None of the mentioned above

Q.2 Prepare SRS in IEEE format for the placement agency website that provides a facility for candidates to register for their academic details, personal details and skill set. Site also gives provision to update their profiles. Organizations can also register with their requirements. Search facility is provided to search for jobs and suitable candidates. (08)

OR

A Library Management System (LMS) needs to be developed to manage libraries efficiently. the system should keep track of the following -

- Issue/Return of books
- Purchasing and recording of the book in the accession register.
- collection of fine on late return of books.

Prepare SRS in IEEE format for the LMS

Q.3 The examination controller need to manage different activities (paper setting schedule for a term in which he will specify date, venue for paper setter). Teachers need to submit their details along with subject expertise. Based on subject expertise, exam controller will generate appointment orders for paper setting. Each paper setting panel will consist of a chairman and members (min-3& max - 7). Each panel need to set 3 papers for a subject and submit it

to the exam section. A paper setter can be there in many panels. Chairman needs to set the paper online and upload it on the paper setting portal of the university through authentic login.

Draw Use case and Class Diagram for the above case (20)

OR

(10)

1. Draw state transition diagram for Biometric (Finger print) system having following functionalities:
- 1) Storing fingerprints
 - 2) Generating ID
 - 3) Recording In-time/Out time by matching the finger prints
 - 4) Showing Valid/ Invalid Messages
 - 5) Calculating working hours.

2. Soft Tools Pvt. Ltd. has issued an advertisement calling applications for various posts. After receiving applications scrutiny will be made and interview letters will be sent. Deserving candidates will be selected through interviews and will be appointed as regular employees. (10)

Draw Activity diagram for the above case.

- Q.4 A system needs to be designed for a departmental store dealing in consumer items. Members enjoy credit facility and can purchase items as and when he or she needs them. Store has several counters and one can almost get all kinds of consumer items after visiting these counters. He becomes a member by paying the initial membership amount and get the credit cards. He has to pay his outstanding on quarterly basis. System generates alerts to these members. Defaulters are not allowed to purchase items until the default amount is cleared. Consider the different aspects of the above problem and model them appropriately.

Draw Bill and Membership Form and also state input validations.

OR

Front office of Orchid hotel is responsible for room reservations, room allocations, and final settlement of bills. Any company or person can reserve rooms for their future stay. They have to indicate the period of which they need the room and the number of rooms required. Sometimes reservations could be canceled or the dates or numbers of rooms changed.

Design a GUI for room booking and also state input validations.

- Q.5 How is Agile Methodology different from the Traditional Waterfall process? (08)

OR

- i) What are the pros of Agile Methodology? (04)
- ii) Differentiate in between Extreme Programming and scrum? (04)

Management and Career Courses (IMCC), Pune
TERM END ASSESSMENT (A.Y.2022-23)
MCA I Year (Sem I)
FT12: Data Structure and Algorithms

Time: 2hrs 30 min.

Date: 24/02/2023

Marks: 50

Note:-

1. All questions are compulsory.
2. Figures to right indicate full marks.

Q. 1 20 MCQ Questions (0.5M * 20)

(10 M)

1. In a circular linked list
- A. Components are all linked together in some sequential manner
 - B. There is no beginning and no end
 - C. Components are arranged hierarchically
 - D. Forward and backward traversal within the list is permitted

2. Which data structure is be used to check if an expression has balanced parenthesis?

- A. Queue
- B. Tree
- C. List
- D. Stack

3. The data structure required for Breadth First Traversal on a graph is _____

- A. queue
- B. stack
- C. array
- D. tree

4. _____ is a tree in which out degree of each node is less than or equal to two

- A. Unary tree
- B. Binary tree
- C. Trinary tree
- D. Binary tree and Trinary tree

5. If a node having two children is deleted from a binary tree, it is replaced by its

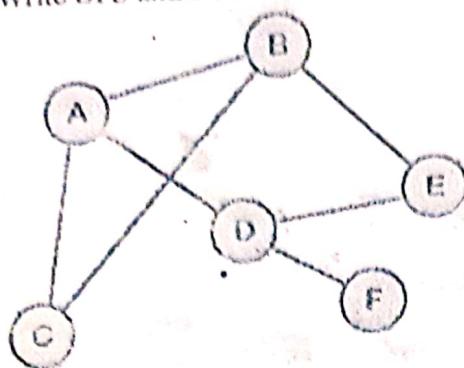
- A. Inorder predecessor
- B. Inorder successor
- C. Preorder predecessor
- D. None

- A Defining its structure
- B Allocating memory to it
- C Initialization
- D All of the mentioned

7. What is one of the common examples of a stack?
- A A pile of books
 - B Bus stop
 - C A sack of toys
 - D A carton of egg
8. In linked list implementation of a queue, where does a new element be inserted?
- A At the start of link list
 - B At the end of the link list
 - C At the center position in the link list
 - D None
9. A situation where the user tries to delete a node from an empty linked list is termed as _____
- A Underflow
 - B Overflow
 - C Pointers
 - D None
10. In doubly linked lists, traversal can be performed?
- A Only in forward direction
 - B Only in reverse direction
 - C In both directions
 - D None
11. Which of the following is not an inherent application of stack?
- A Reversing a string
 - B Evaluation of postfix expression
 - C Implementation of recursion
 - D Job Scheduling
12. A queue in which insertion and deletion operations can be performed from both the ends is _____
- A Queue
 - B Deque
 - C Priority queue
 - D Circular queue
13. How many null pointers exist in doubly circular linked list
- A 1
 - B 2
 - C 3
 - D 0

14. Graph traversal is different from a tree traversal, because
 A. trees are not connected
 B. graphs may have loops
 C. trees have root
D. None of the mentioned
15. Graphs are represented using _____
 A. Adjacency tree
 B. Adjacency linked list
 C. Adjacency graph
D. Adjacency queue
16. In Depth First Search, how many times a node is visited?
 A. Once
B. Twice
C. Thrice
D. None of the mentioned
17. A _____ algorithm finds a solution by trying all possible answers and picking the best one
 A. greedy
 B. backtracking
 C. brute force
D. dynamic
18. The output of Kruskal and Prims algorithm is _____
A. Maximum spanning tree
B. Spanning tree
 C. Minimum spanning tree
D. None
19. Fast Powering algorithm is used in
A. Security
B. Number Theory
C. Generating sequence
 D. Cryptography
20. Which of the following methods can be used to solve n-queen's problem?
 A. greedy algorithm
B. divide and conquer
C. iterative improvement
 D. backtracking

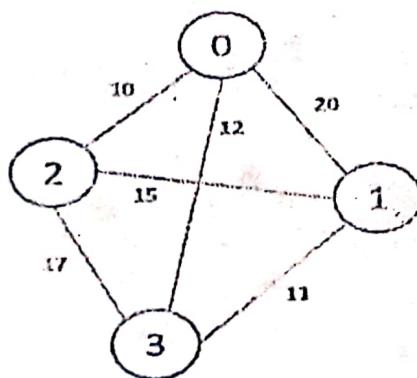
- Q.2** a) Construct AVL Tree- char, break, switch, if, int, struct, malloc, void, return, goto (6 M)
 b) Write BFS and DFS of following graph (6 M)



OR

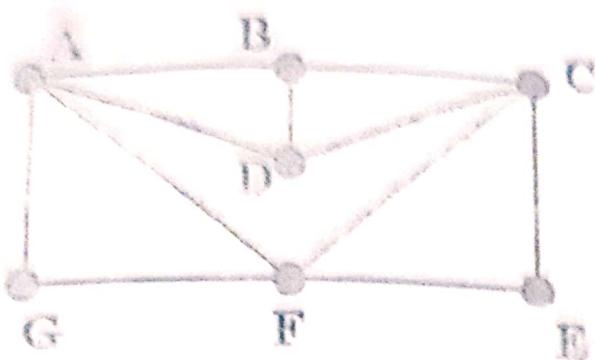
- a) Construct Binary Search Tree and write inorder, preorder and postorder traversals for following elements- 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18 (6 M)
 b) Write difference between DFS and BFS algorithm (2 M)
 c) Define Hash function with example. (2 M)

- Q.3** a) Apply Rain Terrace algorithm to the following problem. (5 M)
 Input:- Height= [3, 0, 2, 0, 4]. Draw the figure and find solution.
 b) Solve following Travelling Salesman Problem using brute force approach. (5 M)



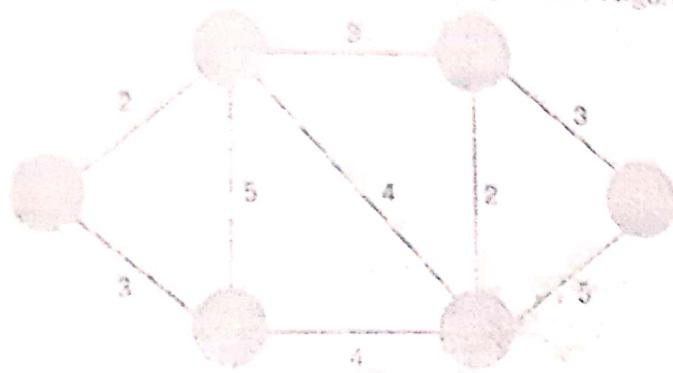
OR

- a) Explain power set with suitable example (4 M)
 b) What is Hamiltonian Cycle? Find the Hamiltonian Cycle for following graph. (6 M)



Q.4 a) Find Minimum Spanning Tree using Prim's Algorithm.

(6 M)



c) What is Jump Game problem? Explain with example.

(4 M)

OR

(6 M)

(4 M)

i) Sort the following data using quick sort algorithm [28, 17, 53, 13, 9, 82, 8]

ii) Explain Rules for Tower of Hanoi with an suitable example.

Q.5 Solve following 0/1 Knapsack Problem

(7 M)

$N=4, W=\{2, 3, 4, 5\}, p=\{3, 4, 5, 6\}, M=5$

(3 M)

Explain unique path problem with suitable example.

(6 M)

OR

Find Longest Common Subsequence for the sequences "AGGTAB" and "GXTXAYB"

(4 M)

Explain knapsack partitioning problem with suitable example.



TERM END ASSESSMENT (A.Y.2022-23)
MCA I Year (Sem I)
IT15: Network Technologies

Time: 2hrs 30 min.
50

Date: 28/02/2023

Marks:

Note: -

1. All questions are compulsory.
2. Figures to right indicate full marks.

- Q.1** 1. _____ are used for short-range communications such as those between a PC and a peripheral device. (10 M)
a) Radio waves b) Microwaves
c) Infrared waves d) Not in the list
2. A _____ topology is a combination of several different topologies
a) Tree b) Hybrid
c) Duplex d) Tertiary
3. Microwaves are _____
a) omnidirectional b) unidirectional
c) bidirectional d) Not in the list
4. An IP packet is called a _____.
a) user datagram b) segment
c) datagram d) none of the mentioned
5. E-mail is a service handled by the _____ layer.
a) session b) presentation
c) application d) data link
6. In a peer-to-peer process, layer 4 on machine A communicates with layer _____ on machine B.
a) 1 b) 2
c) 3 d) 4
7. _____ increases the likelihood of detecting burst errors.
a) Simple parity check b) Two-dimensional parity check
c) CRC d) Check-sum
8. ARQ stands for _____.
a) Automatic repeat quantization
b) Automatic repeat request
c) Automatic retransmission request
d) Acknowledge repeat request
9. If the data unit is 101000, the divisor 1001, what checksum to be appended?
a) 111111000 b) 10000
c) 011 d) 111111011



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Pune

10. _____ is default subnet mask for Class C address

- a) 255.0.255.255
- b) 255.255.255.0
- c) 0.255.255.255
- d) None of the Mentioned

11. A RIP table entry consists of

- a) destination network address
- b) the hop count to that destination

- c) IP address of the next router
- d) All of the mentioned

12. If subnet id is 255.255.255.0 for class B address, then how many bits are reserved for subnetwork?

- a) 2 bits
- b) 8 bits
- c) 6 bits
- d) 0 bit

13. In link state routing, each router receives information directly from

- a) Every router on the network
- b) Every router less than two units away

- c) A table stored on the network hosts
- d) Its nearest neighbors only

14. Electronic mail uses which Application layer protocol?

- a) SMTP
- b) HTTP
- c) FTP
- d) SIP

15. FTP is built on _____ architecture.

- a) Client-server
- b) P2P
- c) Data centric
- d) Service oriented

16. Caesar cipher is an example of

- a) Asymmetric key cryptography
- b) Symmetric key cryptography
- c) Both Asymmetric and Symmetric key cryptography
- d) None of the mentioned

17. RSA algorithm is an example of

- a) Public key encryption
- b) Symmetric key cryptography
- c) Both Asymmetric and Symmetric key cryptography
- d) None of the mentioned

18. Which of the following is not Passive attacks?

- a) Modification of message
- b) Obtaining information

- c) Release of message content
- d) Eavesdropping

19. In statement "int count=send(sockid,msg,msgLen,flags);", count is

- a) bits transmitted
- b) bytes transmitted
- c) data transmitted
- d) None of the mentioned

20. Server announces willingness to accept the connection using _____ command

- a) accept()
- b) read()
- c) write()
- d) listen()

Q.2 A) The received Hamming code word is 101101010. Using odd parity locate and correct the bit in error. (10 M)

B) Find the transmitted frame, if a series of 8-bit message blocks – 1110011'0 is to be transmitted across a data link using CRC for error detection. The generator polynomial 11001 is to be used.

OR

A) Generate CRC code for the data word 1010001011 using the divisor 11101.

B) Detect and correct the single error in the received Hamming code word 1011001011 using even parity.

Q.3 A) Explain IP address format for Class A, Class B, Class C, Class D Determine the network address for following IP Addresses: (10 M)
1) 83.41.57.10
2) 194.38.14.13
3) 143.62.11.18

B) Explain IPv6 Packet Format in detail.

OR

A) Find the maximum number of hosts available on a class-B address with a subnet mask of 255.255.255.192.

B) Find the subnet ID for the IP address 202.127.19.94 with a subnet mask of 255.255.255.248.

A) Explain SMTP protocol in detail (10 M)
B) Explain OSPF routing protocol in detail.

OR

A) Explain DHCP scope resolution protocol in detail

B) Compare POP3 and IMAP email protocols

Q.5 A) Explain socket programming in detail (10 M)
B) What are attacks? Write types of attacks in detail.

OR

A) Write the client and server program for implementing the broadcasting in the local network.

B) Explain OSI model in brief.