Question Bank/OOPS
PAPER CODE: CMSA CC12

OBJECTIVE TYPE QUESTIONS: -

Q 1. OOP uses <u>bottom-up</u> approach
a. Top-down   b. bottom-up

Q 2. All languages are suitable to implement the oop concept easily <u>no</u>
a. Yes   b. no

Q 3. Procedural languages follow <u>Top-down</u> approach
a. Top-down   b. bottom-up

Q 4. OOP treats <u>Data</u> as a critical element in the program development
a. Data   b. function
c. Object   d. classes

Q 5. OOP allows us to decompose a problem into a number of entities called <u>object</u>
a. Object   b. classes
     c. Data   d. function

Q 6. The combination of data and method make up on <u>object</u>
a. Function   b. Object

Q 7. Objects may communicate with each other through <u>methods</u>
b. Methods   c. Object   d. classes

Q 8. New methods & data cab be easily added <u>True</u>
a. True   b. false

Q 9. Set of objects is called as <u>Class</u>
a. Class   b. function

Q 10. The entire set of data & code of an object can be made a <u>user-defined</u> data type using the concept of class
a. User-define   b. static   c. global   d. derived

Q 11. The wrapping up of data & methods into a single unit is called as <u>Encapsulation</u>
a. Inheritance   b. polymorphism   c. Encapsulation

Q 12. <u>Methods</u> provide the interface between the object's data & the program
a. Data   b. class   c. methods

Q 13. The insulation of data from direct access by the program is called as <u>data hiding</u>
a. Encapsulation   b. data hiding   c. private

Q 14. <u>Inheritance</u> is the process by which object of one class acquires the properties of object of another class

a. Encapsulation   b. data hiding   c. inheritance

Q 15. The concept of inheritance provides the idea of <u>reusability</u>

     a. Taking more than one form   b. reusability   c. data hiding

Q 16. The derived class is known as <u>subclass</u>

     a. Superclass   b. subclass   c. parentclass

Q 17. The class from which the subclass derives the properties is called as <u>Super class</u>

     a. Superclass   b. subclass   c. baseclass

Q 18. The property or the ability to take more than one form is called as
     <u>Polymorphism</u>

     a. Encapsulation   b. Polymorphism   c. inheritance

Q 19. Polymorphism is extensively used in implementing <u>Inheritance</u>

     a. Encapsulation   b. data hiding   c. inheritance

Q 20. The process of linking of a procedure call with the code to be executed is called
     as <u>Binding</u>

     a. Binding   b. Loading   c. assembling

Q 21. The process in which the code to be link with the procedure call is not know till
     execution time it is called as <u>Dynamic binding</u>

     a. Binding   b. early binding   c. static binding   d. dynamic binding

Q 22. When the code to be linked with the call is known at compile time that
     situation is called as <u>Static binding</u>.

     a. Binding   b. late binding   c. static binding   d. dynamic
     binding

Q 23. The most striking feature of java is that it is <u>platform independent.</u>

     a. Java compiler   b. java interpreter   c. platform independent

Q 24. Java is a <u>2-stage</u> system

     a. 2-stage   b. 3-stage   c. 1-stage

Q 25. Java is developed by <u>sun Microsystems</u> in 1991 at USA

     a. Microsoft   b. sun Microsystems   c. IBM

Q 26. Java compilers converts source code into <u>Byte code</u>

     a. Unicode   b. byte code   c. psuedocode

Q 27. <u>Java interpreter</u> translates byte code into machine code

     a. Java interpreter   b. java compiler   c. assembler

Q 28. Java programs can be easily moved from one computer system to another
     <u>True.</u>

     a. False   b. True

Q 29. Java is a robust language <u>True</u>.

     a. False   b. True

   Q 30. Java supports multithreaded programs <u>True.</u>

     a. False   b. True

Q 31 The development tools are part of the system known as <u>Java development kit (JDK)</u>
  a. JDK   b. JSL   c. java compiler

Q 32. Classes and methods are part of <u>Java standard library (JSL)</u>
  a. JDK   b. JSL   c. java compiler

Q33. Javac stands for <u>java compiler</u>
  a. Java interpreter   b. java compiler   c. java virtual m/c

Q34. Java stands for <u>java interpreter</u>
  a. Java interpreter   b. java compiler   c. java virtual m/c

Q 35. <u>Javah</u> produces header files for use with native methods
  a. javac   b. java   c. javah   d. javadoc

Q 36. <u>Applet viewer</u> enables us to run java applets (without actually using a java-compatible browser
  a. javac   b. appletviewer   c. javah   d. javadoc

Q 37. <u>Javap</u> stands for java disasembler
  a. Java interpreter   b. java compiler   c. javap

Q 38. <u>Java disassembler</u>, which enables us to convert byte code, files into a program description.
  a. Java interpreter   b. java compiler   c. Java disassembler

Q 39. <u>Jdb</u> stands for java debugger
  a. javac   b. java   c. javah   d. Jdb

Q 40. <u>Java debugger</u> helps us to find error in our program.
  a. Java debugger b. java compiler   c. Java disassembler

Q 41. <u>Language support package</u> contains collection of classes and methods required for implementing basic features of java
  a. Utility package   b. I/O package   c. language support package

Q 42. <u>Utility package</u> contains classes to provide utility functions.
  a. Utility package   b. I/O package   c. language support package

Q 43. <u>I/O package</u> contains classes required for I/O manipulation.
  a. Applet package   b. I/O package   c. language support package

Q 44. Does Java have "goto" <u>NO?</u>
  A. Yes   b. no

Q 45. <u>Type casting</u> is use to convert the value of one type to another
  a. Data type   b. variable   c. typecasting

Q 46. How many numbers of java constants are present <u>four</u>
  a. 6   b. 4   c. 5

Q 47. Instance and class variables are declared <u>inside</u> a class
  a. Inside   b. outside   c. in the main

Q 48. Instance variables are created when the objects are <u>instantiated</u> and therefore
they are associated with the objects
a. Declared   b. defined   c. instantiated
Q 49. Class variables are <u>global</u> to the class
a. Local   b. static   c. global   d. derived
Q 50. Instance variables take <u>different</u> values for each object
a. Different   b. same   c. non-zero

Short type Questions:-

1. State the difference between procedural language and OOP.
2. Define OOP & state the features supported by OOP.
3. What is Encapsulation & data abstraction state its advantages.
4. Explain the concept of inheritance in OOP with an Eg.
5. Differentiate between early binding and late binding.
6. State the applications of OOP
7. State the benefits of OOP.
8. Explain how objects communicate with each other
9. Differentiate between objects and classes
10. Explain evolution of JAVA
11. Explain the features supported by java.
12. Explain why JAVA is called as platform independent.
13. Explain working of Java Virtual Machine (JVM)
14. What are methods and how are they defined
15. How many ways can an argument be passed to a subroutine and explain
    them?
16. What is meant by Inheritance and what are its advantages?
17. Explain java tokens in detail.
18. Explain the naming conventions in JAVA.
19. Explain how java differs from C, C++.
20. Write a java program that uses command line argument.
21. Why Java is not 100% pure object oriented language?
    22. Difference between "APPLET" and "APPLICATION"
    23. What are Class, Constructor and Primitive data types?
    24. What is an Object and how do you allocate memory to it?
25. What is the difference between constructor and methods state the properties
of
    constructor?
26. What is casting, explain with eg.

27. How many ways can an argument be passed to a subroutine and explain them?

28. What are different types of access modifiers? Explain the features of each of it.

29. What is the difference between an argument and a parameter?

30. Explain the variables, constants, and data types present in java

31. Why do we need the import statement and what is the task of the main method in

      a java program

32. What are the command line arguments? How are they useful?

33. What are separators? Describe the various separators used in java

34. What is a statement? How do the java statement differ from those of C & C++?

35. Describe in detail the steps involved in implementing a stand-alone program?

36. Why can't we use a keyword as a variable name?

37. Explain the need of symbolic constants in java?

38. What is a scope of a variable?

39. Which of the following are invalid constants and why?

    a.0.0001   b.5*1.5c.RS 75.50   d.+100 e.75.45E-2   f. "15.75"

40. Write a program to convert the given temperature in Fahrenheit to Celsius using

      the following conversion formula $C = \dfrac{F-32}{1.8}$

41. In what ways does a switch statement differ from an if statement?

42. What is final, finalize () and finally?

43. What is Garbage Collection and how to call it explicitly?

44. What is method overloading and method overriding?

45. What is difference between overloading and overriding?

46. Write a program to find the number & sum of all integers greater than 100 & less

      then 200 that are divisible by 7.

47. What is an empty statement? Explain its usefulness

48. Compare in terms of their function the following pairs of statements:

  a. While and do while loop.

  b. While and for.

  c. Break and continue.

49. What is a class? How does it accomplish data hiding? What are the 3 parts a simple, empty class?
50. What are objects? How are they created from a class? How do we declare a member of class static?

Descriptive type Questions:-

1. What do you mean by Encapsulation (explain with examples)?
2. What is the concept of Inheritance? Explain with a program.
3. What is JVM? Explain the process of compilation and interpretation in Java.
4. What is the difference between java and C++?
5. What are literals in java? Explain the conditional OR, AND, shift operation. What is type casting?
6. Explain the types of Inheritances with diagram. Write a program to implement multiple inheritances. **(Be prepare for case study problems)**
7. What do you mean by method overloading and overwriting? Explain both with programs. What do you mean by constructor overloading? Explain constructor overloading by a program.
8. What is parametric and non-parametric constructor? Explain both with programs.
9. What do you mean by "this","static","super","final","finally" keyword? Explain their characteristics through programs.
10. What are characteristics of abstract class? Explain it with a code. **(Be prepare for case study problems)**
11. What do you mean by package? How would construct a package? What are the characteristics of an Interface? Is it possible to extend interface from another interface? If possible write a program to explain it.
12. What is the immutability of String class? Different String operations(append ,concatenation, compare, indexOf,substring,charAt,toUppercase.toLowercase) What is String-buffer class? Explain with an example.
    14. What do you mean by exception? What are the different exception types? Explain "try-catch","multiple catch", "throw","throws" through programs.
    Explain user defined exception. Nested try catch example.
13. What do you mean by call by value and call by reference? Explain with program.
14. What do you mean thread? Create a thread by using "Thread" class. What is Runnable interface? Explain through a program. Explain different thread states with diagram. Explain thread priority through by program. Explain

multithreading using isAlive () and join (). Explain thread priority with a program.Difference between wait() and sleep().

15. Explain reading and writing files with both Byte stream and IO package. What is serialization and de-serialization? Explain with an example.

16. What is the difference between applet and application? Explain the hierarchy of applet class. Explain applet life cycle with diagram. Different methods drawstring(),setBackground(),setForeground(),showStatus(),paint(),update(),repaint(),getCodeBase(),getDocumentBase().

17. Create an applet having background color black and foreground color as white.

18. Thread synchronization and inter thread communication example. Daemon thread example. How it works?

Question Bank
Python Programming (CMSA DSE B2)

1. State and explain any six features of python.

2. State any six applications of python.

3. State any six reasons, why you must consider writing software applications in Python.

4. Explain input command in python with suitable example.

5. Explain print command in python with suitable example.

6. State which of the following python statements are valid and invalid.
   a. print("ksk", + "123")
   b. print("ksk" '+' "123")
   c. print("ksk", '+', "123")
   d. print('ABC is a "technological" University')
   e. print(2 + '3')
   f. print('2' * 3)

7. What will be the output of following print statements?
   a. print('abc' * 2)
   b. print(3+4j + 2+1j)
   c. print(3*2 // 4)

8. State which of the following python statements are valid and invalid.
   a. x = input("enter a number")
   b. x = input()
   c. x = input("")
   d. x = input(" ' ")
   e. x = input(2)
   f. x=input("2" + "3")

9. What will be the value of variables x, y & z after execution of following python program. Assume that user enters a value 5.

   temp=input("enter a
   number") x=temp*5
   y=int(temp)*5
   z=bool(temp*0)

10. What will be the output of following program? Assume that user will enter only integer value.

    temp=input("enter a
    number") x=temp*0
    y=int(temp)*0
    z=bool(temp*0) print(x)
    print(y) print(z)

11. What are the types of following variables?
    a. a = 55
    b. b = '3 + 4j'
    c. c = "1DBATU"
    d. d = 5 + 2j
    e. e = a
    f. f = b+c

12. Rewrite following code with proper indentation to get the output as

Expected output	Code without indentation

cube of 1 is: 1 square of 2 is: 4 cube of 3 is: 27 square of 4 is: 16 cube of 5 is: 125	abc = [1,2,3,4,5] for x in abc: if x%2 == 0: print("square of ", x , "is:") print(x**2) else: print("cube of ", x , "is:") print(x**3)

13. What will be the output of following print statements?
    a. print(123,"\nabc")
    b. print("****","\\n***","\\n**","\\n*")
    c. print(" ' " ' " " ' " ' ")

14. Explain any six arithmetic operators of python with suitable examples of each.

15. Explain any six assignment operators of python with suitable examples of each.

16. Explain all comparison operators of python with suitable examples of each.

17. Explain "and, or, not" operators of python with suitable examples of each.

18. Explain following operators of python with suitable examples of each. a. is,
    b. in,
    c. not in

19. Explain all bitwise operators of python with suitable examples of each.

20. Explain while loop with suitable example?

21. Explain for loop with suitable example?

22. Explain break, continue and pass statement with suitable example of each.

23. Differentiate between List, Tuple & Set with suitable examples of each.

24. Explain any three collection data types of Python with suitable examples of each.

25. Explain append() and copy() methods of list with suitable examples of each.

26. Explain count() and index() methods of list with suitable examples of each.

27. Explain insert() and remove() methods of list with suitable examples of each.

28. Explain reverse() and remove() methods of list with suitable examples of each.

29. Explain clear() and extend() methods of list with suitable examples of each.

30. Explain pop() and sort() methods of list with suitable examples of each.

31. What will be the output of following python statements?

   a. print(23 // 5)
   b. print(2 << 2)
   c. print(2 >> 0)
   d. print(2 ^ 2)
   e. print(2 != 2)
   f. print(2 < 0)

QUESTION BANK
DIGITAL IMAGE PROCESSING

Paper code: DSEA1

UNIT I

1. Fundamental steps in DIP.
2. Components of DIP.
3. Mass storage types.
4. Retina – Types of light receptors cones/rods.
5. Brightness adaptation and discrimination.
6. Weber ratio.
7. Simultaneous contrast.
8. Image sampling and quantization.
9. Neighbor of pixel, adjacency, connectivity, distance.
10. Brightness, hue, saturation, intensity, radiance and luminance.
11. Gray level of image.
12. Digital image and application of DIP.
13. Blind spot.
14. Spatial and intensity level resolution.

UNIT II

1. Gray level transformation.
2. Contrast stretching.
3. Bit plane slicing.
4. Histogram, equalization matching/specification.
5. Median
6. Min/max
7. First order derivative
8. Second order derivative.
9. Image enhancement and its types.
10. Spatial filtering
11. Frequency filtering.
12. Weighted average filter.
13. Homomorphic filter.
14. Spatial and frequency domain method.
15. Order statistic filter.

UNIT III

1. Restoration/enhancement.
2. Model.
3. Noise models.
4. Mean Filter 5. Order statistics filter.
6. Adaptive filter.
7. Notch filter.
8. Inverse 9. Mean square filter.
10. Segmentation.
11. Rotation of discontinuities.
12. Edge.
13. Region based segmentation.
14. Erosion and dilation.
15. Morphological processing.

UNIT IV

1. Wavelets.

2. Image pyramids.

3. HAAR transform.

4. Coding.

5. Image compression types.

6. Data redundancy and its types.

7. Compression model.

8. Need for compression.

9. Huffman coding and its limitations.

10. Arithmetic coding.

11. JPEG, MPEG.

12. Huffman/Arithmetic/LZW.

UNIT V

1. Channel code.

2. Texture

3. Pattern/pattern 4. Polygonal apex method.

5. Regional description 6. Boundary description.

7. Shape

8. Pattern recognition.

9. Statistical moments.

10. Advantages of statistics.

11. Pattern

12. Minimum distance classifier.

13. String description.

16 MARKS

UNIT I

1. ORIGIN IN DIP
2. **STEPS IN IMAGE PROCESSING**
3. **COMPONENTS IN IMAGE PROCESSING**
4. **ELEMETS OF VISUAL PRECEPTION**
5. **IMAGE SENSING AND ACQUISTION**
6. **IMAGE SAMPLING AND QUANTIZATION**
7. **RELATION SHIP BETWEEN PIXELS**
8. COLOUR MODELS

UNIT II

1. **GRAY LEVEL TRANSFORMATION**
2. **HISTOGRAM**
3. **SPATIAL DOMAIN FILTERING**
4. **FREQUNCY DOMAIN FILTERING**
5. **HOMOMORPHIC FILTERING**
6. FOURIER TRANSFORM AND PROPERTIES

UNIT III

1. **NOISE MODELS**
2. **MEAN FILTERS , ORDER STATICS FILTER**
3. **BAND FILTERS NOTCH FILTER,OPTIUM NOTCH**
4. **INVERSE, WEINER**
5. DETECTION OF DISCONTINUITY
6. EDGE LINKING AND BOUNDARYDETECTION
7. **REGION BASED SEGMENTATION**
8. **MORPHOLOGIACL PROCESSING & EROSION & DILATION**

UNIT IV

1. WAVELETS
2. **SUBBAND CODING**
3. MULTI RESOLUTION EXPANSION
4. **IMAGE COMPRESION MODEL**

5. **VARIABLE LENGTH CODING**
   a. **HUFFMANN CODING**
   b. **ARITHMETIC CODING**
6. **BIT PLANE CODING**
7. **LOSSY AND LOASLESS PREDICTIVE CODING**
8. **JPEG AND MPEG**

UNIT V

1. BOUNDARY REPRESENTATION
2. CHAIN CODE, SIGNATURE, POLYGONAL APPROXIMATION
3. **BOUNDARY DISCRIPTORS**
4. **REGIOANL DISCRIPTORS**
5. **TEXTURE**
6. **PATTERNA ND PATTERN CLASSES**
7. **RECOGINITION BASED ON MATCHING**

<u>Data Communications and Networking Question Bank for General</u>
PAPER CODE: CMSG SEC-A1

1. What is meant by Data Communication and explain its characteristics?
2. What are the components of Data communication?
3. Explain different Data flow directions.
4. Write about different types of connections.
5. Explain different types of topologies.
6. Explain different types of Networks.
7. Write about Protocol and Standards.
8. Explain different layers in OSI Model.
9. Explain the layers of TCP/IP model.
10. Write about Digital Signals.
11. Write about Composite Signals.
12. Different methods for Digital signal transmission.

13. Write about different transmission modes.
14. Explain Different Digital to Analog Conversion Techniques.

15. Explain Analog to Analog Conversion Techniques.
16. What is Multiplexing and Explain different types of Multiplexing
17. Write about Frequency Division Multiplexing.
18. Write about Wavelength Division Multiplexing.
19. Write about Time Division Multiplexing
20. What are the different spread spectrum techniques.
21. What is transmission medium? What are the different types of transmission medium?
22. Write about Guided medium?
23. Write about Unguided medium?
24. Write about Block Coding and explain how the errors are detected and corrected using Block coding?
25. What is Switching and What are the different types of Switching Techniques?
26. Write about Circuit Switched Network.
27. Write about Datagram Network.
28. Write about Virtual Circuit Network.
29. What is meant by linear Block Code and explain Simple Parity-Check Code?
30. What is cyclic code and explain Cyclic Redundancy Check (CRC) code?
31. Explain different types of errors in data transmission.
32. What is framing and explain different framing algorithms?
33. Write about Flow control and Error Control.
34. Write about Simplest Protocol.
35. Write about Stop and wait protocol.
36. Write about Stop and wait with ARQ protocol.
37. Write about Go-Back-N ARQ protocol.
38. Write about Selective Repeat ARQ protocol.
39. Explain about HDLC Configurations,Transfer Modes and different types of frames.
40. Explain about Control Fields of HDLC frames.
41. Define random access and list three protocols in this category
42. Write about ALOHA Protocols.
43. Write about CSMA/CD protocol
44. Define controlled access and list three protocols in this category.
45. Write about loop problem in Transparent bridges.
46. Wrtie about Bus Backbone network.
47. Explain about Process-to-Process Delivery

48. Explain about UDP.
49. Write about TCP services.
50. What are the features of TCP?
51. Write about TCP segment?
52. Write about different steps to create a TCP Connection.
53. Write about Flow Control in TCP.
54. Write about Error Control in TCP.
55. Write about Packet Format in SCTP?
56. Write about Error Control in SCTP?

Data Communications and Networking Question Bank for Honours
PAPER CODE: CMSA CC8

Group-A(MCQ Questions)

1. Computer Network is
A. Collection of hardware components and computers
B. Interconnected by communication channels
C. Sharing of resources and information
D. All of the Above
2. Protocols are?
A. Agreements on how communication components and DTE's are to communicate
B. Logical communication channels for transferring data
C. Physical communication channels sued for transferring data
D. None of above
3. Two devices are in network if
A. a process in one device is able to exchange information with a process in another device
B. a process is running on both devices
C. PIDs of the processes running of different devices are same
D. none of the mentioned
4. what is a Firewall in Computer Network?
A. The physical boundary of Network
B. An operating System of Computer Network
C. A system designed to prevent unauthorized access

D. A web browsing Software

5. The IETF standards documents are called

A. RFC

B. RCF

C. ID

D. None of the mentioned

6. Which data communication method is used to transmit the data over a serial communication link?

A. Simplex

B. Half-duplex

C. Full duplex

D. All of above

7. Each IP packet must contain

A. Only Source address

B. Only Destination address

C. Source and Destination address

D. Source or Destination address

8. What is the minimum header size of an IP packet?

A. 16 bytes

B. 10 bytes

C. 20 bytes

D. 32 bytes

9. Routing tables of a router keeps track of

A. MAC Address Assignments

B. Port Assignments to network devices

C. Distribute IP address to network devices

D. Routes to use for forwarding data to its destination

10. Which of the following is not the External Security Threats?

A. Front-door Threats

B. Back-door Threats

C. Underground Threats

D. Denial of Service (DoS)

11. What is the IP Address range of APIPA?

A. 169.254.0.1 to 169.254.0.254

B. 169.254.0.1 to 169.254.0.255

C. 169.254.0.1 to 169.254.255.254

D. 169.254.0.1 to 169.254.255.255

12. Which of the following is not the possible ways of data exchange?

A. Simplex

B. Multiplex

C. Half-duplex

D. Full-duplex

13. The management of data flow between computers or devices or between nodes in a network is called

A. Flow control

B. Data Control

C. Data Management

D. Flow Management

14. What does the port number in a TCP connection specify?

A. It specifies the communication process on the two end systems

B. It specifies the quality of the data & connection

C. It specify the size of data

D. All of the above

15. What is the purpose of the PSH flag in the TCP header?

A. Typically used to indicate end of message

B. Typically used to indicate beginning of message

C. Typically used to push the message

D. Typically used to indicate stop the message

16. Which of the following protocol is/are defined in Transport layer?

A. FTP

B. TCP

C. UDP

D. B & C

17. The meaning of Straight-through Cable is

A. Four wire pairs connect to the same pin on each end

B. The cable Which Directly connects Computer to Computer

C. Four wire pairs not twisted with each other

D. The cable which is not twisted

18. What is the size of MAC Address?

A. 16-bits

B. 32-bits

C. 48-bits

D. 64-bits

19. Repeater operates in which layer of the OSI model?

A. Physical layer

B. Data link layer

C. Network layer

D. Transport layer

20. Which of the following layer of OSI model also called end-to-end layer?

A. Presentation layer

B. Network layer

C. Session layer

D. Transport layer

21. Router operates in which layer of OSI Reference Model?

A. Layer 1 (Physical Layer)

B. Layer 3 (Network Layer)

C. Layer 4 (Transport Layer)

D. Layer 7 (Application Layer)

22. ADSL is the abbreviation of

A. Asymmetric Dual Subscriber Line

B. Asymmetric Digital System Line

C. Asymmetric Dual System Line

D. Asymmetric Digital Subscriber Line

23. How many layers does OSI Reference Model has?

A. 4

B. 5

C. 6

D. 7

24 Bridge works in which layer of the OSI model?

A. Appliation layer

B. Transport layer

C. Network layer

D. Datalink layer

25. Why IP Protocol is considered as unreliable?

A. A packet may be lost

B. Packets may arrive out of order

C. Duplicate packets may be generated

D. All of the above

26. What is the benefit of the Networking?

A. File Sharing

B. Easier access to Resources

C. Easier Backups

D. All of the Above

27. Which of the following is not the Networking Devices?

A. Gateways

B. Linux

C. Routers

D. Firewalls

28. What is the maximum header size of an IP packet?

A. 32 bytes

B. 64 bytes

C. 30 bytes

D. 60 bytes

29. Which of the following is correct in VLSM?

A. Can have subnets of different sizes

B. Subnets must be in same size

C. No required of subnet

D. All of above

30. DHCP Server provides _____ to the client.

A. Protocol

B. IP Address

C. MAC Address

D. Network Address

31. What is the address size of IPv6 ?

A. 32 bit

B. 64 bit

C. 128 bit

D. 256 bit

32. What is the size of Network bits & Host bits of Class A of IP address?

A. Network bits 7, Host bits 24

B. Network bits 8, Host bits 24

C. Network bits 7, Host bits 23

D. Network bits 8, Host bits 23

33. What is the full form of RAID ?

A. Redundant Array of Independent Disks

B. Redundant Array of Important Disks

C. Random Access of Independent Disks

D. Random Access of Important Disks

34. What do you mean by broadcasting in Networking?

A. It means addressing a packet to all machine

B. It means addressing a packet to some machine

C. It means addressing a packet to a particular machine

D. It means addressing a packet to except a particular machine

35. What is the size of Source and Destination IP address in IP header?

A. 4 bits

B. 8 bits

C. 16 bits

D. 32 bits

36. What is the typical range of Ephemeral ports?

A. 1 to 80

B. 1 to 1024

C. 80 to 8080

D. 1024 to 65535

37. A set of rules that govern all aspects of information communication is called

A. Server

B. Internet

C. Protocol

D. OSI Model

38. Controlling access to a network by analyzing the incoming and outgoing packets is called

A. IP Filtering

B. Data Filtering

C. Packet Filtering

D. Firewall Filtering

39. DHCP is the abbreviation of

A. Dynamic Host Control Protocol

B. Dynamic Host Configuration Protocol

C. Dynamic Hyper Control Protocol

D. Dynamic Hyper Configuration Protocol

40. What is the use of Bridge in Network?

A. to connect LANs

B. to separate LANs

C. to control Network Speed

D. All of the above

41. Network congestion occurs

A. in case of traffic overloading

B. when a system terminates

C. when connection between two nodes terminates

D. none of the mentioned

42. What is the meaning of Bandwidth in Network?

A. Transmission capacity of a communication channels

B. Connected Computers in the Network

C. Class of IP used in Network

D. None of Above

43 Which of the following is correct regarding Class B Address of IP address

A. Network bit – 14, Host bit – 16

B. Network bit – 16, Host bit – 14

C. Network bit – 18, Host bit – 16

D. Network bit – 12, Host bit – 14

44. ....provides a connection-oriented reliable service for sending messages

A. TCP

B. IP

C. UDP

D. All of the above

45. What does Router do in a network?

A. Forwards a packet to all outgoing links

B. Forwards a packet to the next free outgoing link

C. Determines on which outing link a packet is to be forwarded

D. Forwards a packet to all outgoing links except the originated link

46. What is the use of Ping command?

A. To test a device on the network is reachable

B. To test a hard disk fault

C. To test a bug in a Application

D. To test a Pinter Quality

47. What is the size of Host bits in Class B of IP address?

A. 04

B. 08

C. 16

D. 32

48. Which of the following is correct in CIDR?

A. Class A includes Class B network

B. There are only two networks

C. There are high & low class network

D. There is no concept of class A, B, C networks

49. The processes on each machine that communicate at a given layer are called

A. UDP process

B. Intranet process

C. Server technology

D. Peer-peer process

50. Which of the following layer is not network support layer?

A. Transport Layer

B. Network Layers

C. Data link Layer

D. Physical Layer

51. A network that requires human intervention of route signals is called a ?
A. Bus network
B. Ring netwkork
C. Star network
D. T-switched network
E. None of above

52. Which layer functions as liaison between user support layers and network support layers ?
A. network layer
B. physical layer
C. transport layer
D. session layer

53. If digital data rate of 9600 bps is encoded using 8-level phase shift keying method, the modulation rate is?
A.1200 bands
B. 3200 bands
C. 4800 bands
D. 9600 bands
E. None of above

54. Maximum data rate of a channel for a noiseless 3-KHz binary channel is?
A. 3000 bps
B. 6000 bps
C. 1500 bps
D. None of above

55. If the bit string 0111101111101111110 is subjected to bit stuffing for the flag string 01111110, the output string is ?
A. 011110111110011111010
B. 01111011111011111100
C. 01111011111011111010
D. 0111101111101111110

56. Which of the following is not a standard RS-232C signal ?
A. RTS
B. CTS

C. DSR
D. VDR

57. In Ethernet CSMS/CD the special bit sequence transmitted by the media access management for collision handling is called as ?
A. preamble
B. postamble
C. jam
D. None of above

58. HDLC is ?
A. bit oriented
B. Code transparent
C. Code dependent
D. None of above

59. Which of the following are non-polling system ?
A. TDMA
B. stop & wait
C. Xon/Xoff
D. Continuous ARQ

60. Adaptive or dynamic directory used in packet routing changes ?
A. within each user session
B. with each user session
C. at system generation times only
D. Both A and B

61. Manchester code is a ?
A. Bi- Polar code
B. non return to zero code
C. polar code
D. B and C

62. How many OSI layers are covered in the X.25 standard ?
A. three

B. two

C. seven

D. six

63. The receive equalizer reduce delay distortions using ?

A. tapped delay lines

B. gearshift

C. descrambler

D. difference engine

E. None of above

64. In communication satellite, multiple repeaters are known as ?

A. detector

B. modulator

C. stations

D. transponders

E. None of above

65. In OSI network architecture, the dialogue control and token management are responsibilities of ?

A. Session layer

B. network layer

C. transport layer

D. Data link layer

E. None of above

66. The frequency ranges from 300 KHz to 3 MHz is used for ?

A. AM radio transmission

B. TV transmission

C. FM radio transmission

D. Microwave communication, satellite and rader

E. None of above

67. Which of the following is a function of e-mail system ?

A. Composition

B. Transfer

C. Reporting

D. All of above

68. BSC is a ?
A. Character Oriented Protocol
B. Bit Oriented Protocol
C. Full duplex protocol
D. Half duplex protocol
E. A and D

69. Which of the following are non - polling system ?
A. TDMA
B. Stop & wait
C. Xon/Xoff
D. Continuous ARQ
E. A and C

70. Adaptive or dynamic directory used in packet routing changes?
A. within each user session
B. with each user session
C. at system generation time only
D. Both A and B

71. The parameter which gives the probability of the transport layer itself
    pontaneously terminating a connection due to internal problem is called?
A. protection
B. resilience
C. option negotiation
D. transfer failure

72. What is the main purpose of a data link content monitor ?
A. to detect problems in protocols
B. to determine the type of switching
C. to determine the type of transmission used in data link
D. to determine the flow of data

73. Which of the following is an example of bounded media ?
A. Wave guide
B. Coaxial Cable
C. Fiber optic cable
D. All of above

74. ICMPv6 includes ......?
A. RARP
B. ARP
C. ICMP
D. B and C

75. IPv6 has ...... bit address ?
A. 32
B. 64
C. 128
D. variable

76. What is the main difference between DDCMP and SDLC ?
A. DDCMP does not need special hardware to final the beginning of a message
B. DDCMP has a message header
C. SDLC has a IP address
D. SDLC does not use CPC

77. Which of the following is not a type of Computer Network?
A. Local Area Network (LAN)
B. Personal Area Network (PAN)
C. Remote Area Network (RAN)
D. Metropolitan Area Network (MAN)

78. Full Form of NIC?
A. New Internet Connection
B. Network Interface Card
C. Network Interface Connection
D. Net Interface Card

79. Which of the following are type of Twisted Pair Cable?
A. Coaxial Cable
B. Shielded Twisted Pair (STP)
C. Unshielded Twisted Pair (UTP)
D. Only B and C

80. _____ Supports Data Rate Upto 1000 Mbps Gigabyte Ethernet.
A. CAT 1
B. Thinnet

C. CAT 5

D. CAT 5e

81. Which Color Coding of Cable is Used to Connect Similar Devices?

A. Straight Cable

B. Cross Over Cable

C. Serial Cable

D. All of Above.

82. HUB is a _____ Device and Switch is a _____ Device.

A. Unicast, Multicast

B. Malticast, Unicast

C. Broadcast, Unicast

E. None of Above

83. Switch is a Device of _____ Layer of OSI Model.

A. Network Layer

B. Data Link Layer

C. Application Layer

D. Session Layer

84. Star Topology is Based On a Central Device that can be _____ ?

A. HUB

B. Switch

C. Only A

D. Both A and B

85. TCP/IP is also well known as _____.

A. OSI Model

B. TCP Model

C. DOD Model

D. Network Model

86. IPX/SPX is used in _____.

A. Novell's Netware Network

B. Mac - Macintosh

C. Apple

D. Microsoft

87. The collection of communication lines and routers is called
A. LAN
B. MAN
C. WAN
D. Communication Subnet

88. In the IEEE standards 802.5 standard is also called ?
A. Ethernet
B. Token Bus
C. Wireless Token Area Network
D. Token Ring

89. _____ have a single communication channel that is shared by all the users on the network. ?
A. Point-to-Point
B. Broadcast Network
C. Protocol
D. PAN

90. A Wireless Access Point Behaves in a similar manner to that of a master-slave operation ?
A. True
B. False

91. Which of the following is an advantage to using fiber optics data transmission?
A. resistance to data theft
B. fast data transmission rate
C. low noise level
D. all of above

92. Which of the following types of channels moves data relatively slowly?
A. wide band channel
B. voice band channel
C. narrow band channel
D. all of above

93. A protocol is a set of rules governing a time sequence of events that must take place ?

A. between peers
B. between an interface
C. between modems
D. across an interface

94. Which of the following transmission systems provide the highest data rate to in individual device?
A. computer bus
B. telephone lines
C. voice and mode
D. lease lines

95. Communication circuits that transmit data in both directions but not at the same time are operating in
A. a simplex mode
B. a half duplex mode
C. a full duplex mode
D. an asynchronous mode

96. Which of the following is wrong example of network layer ?
A. X.25 Level 2-ISO
B. Source Routing and Domain Naming Usenet
C. Internet Protocol(IP) - ARPANET
D. X-25 Packet Level Prrotocol (PLP) - ISO
E. None of these

97. Mobile computers and personal digital assistant (PDAs) are the examples of ?
A. Radio broadcasting
B. Wireless network
C. Geosynchronous
D. LAN

98. ATM (Asynchronous Transfer Mode) is fundamentally a....... technology?
A. Circuit switching
B. Packet switching
C. Narrow band
D. None of these

99. Which of the following is a variation of Frequency Division Multiplexing (FDM) ?
A. Time Division Multiplexing(TDM)
B. Pulse Code Multiplexing(PCM)
C. Wavelength Division Multiplexing(WDM)
D. None of these

100. One security method is encryption. But encryption does nothing to keep digital pests and hackers out. To accomplish this goal, we need ?
A. Router
B. Bridges
C. Hubs
D. Firewalls

Group-B(Short Answer Type Questions)

1. Explain OSI reference model.
2. What is the major disadvantage of NRZ encoding? How does RZ-encoding attempt to solve the problem?
(3+2)
3. What do you mean by network topology? Briefly explain.
4. Compare star and mess topology advantages and disadvantages.
5. Draw the waveform for 00011100 in Manchester encoding method. What is the difference between full-duplex and half-duplex transmission mode. How single bit error differ from burst error?
6. How does FDM combine multiple signals into one? How guided media differ from unguided media? Given a bandwidth of 5000Hz for an 8-PSK signal ,what are the baud rate and bit rate? (1.5+1.5+2)
7. What do you mean by classful addressing? What are the advantages of classless addressing over classful addressing? What do you mean by net id and host id?
8. What do you mean by the term "Subnet masking"? Explain how that can be achieved with an example.
9. What is connection oriented protocol? Briefly explain the services of this protocol.
10. Explain Selective Repeat ARQ protocol with the help of diagram.
11. Explain RSA algorithm.

12. What is IP address? Compare Classful and classless addressing.
13. What do you mean by data transparency and bit stuffing? Why is bit stuffing needed?
14. Explain distance vector routing with an example.
15. Why do we need DNS system, when we can directly use an IP address? What is the purpose of inverse domain?
16. What is congestion? What is the difference between congestion control and flow control? What is the difference between pure ALOHA and slotted ALOHA?
17. What is the difference between TCP and UDP? Describe addressing system used by SMTP.
18. Why CSMA/CD is not used in wireless LAN? What is the requirement of SFD? IS the size of ARP packet is fixed? Explain.
19. How the connection is established in three-way handshaking protocol?
20. Write down different types of messages and General message format of ICMP.
21. Distinguish between circuit switching and packet switching. Discribe the following term FQDN and PQDN .
22. Discuss about any two methods of framing.
23. Compare virtual circuits and datagrams.
24. List the features of internetworking.
25. What is modern and codec?
26. What is flooding? What are its disadvantages?
27. What are the primary services offered by a computer network?
28. Mention the advantages of fiber optics.
29. What is meant by narrow band ISDN?
30. What is the significance of flow control?
31.   List the drawbacks of simplex protocol.
32. What are satellite networks?
33. Compare TCP and IP services.
34. Write a note on e-mail.
35. Explain the function of TCP/IP protocol.
36. Explain ISDN architecture and its services.
37. Describe the sliding window protocol for data link layer.
38. Describe the congestion control algorithms.
39. Explain IEEE's logical link control protocol used for LAN.
40. Explain the traditional cryptography used for network security and privacy.
41. Describe the structure and functions of E-mail protocol.

Group-C(Long Answer Type Questions)

1. a) A channel has a data rate of 4kbps and propagation delay is 20ms. For what range of frame size does stop-and-wait give an efficiency of at least 50%?
b) Why window size of Go-back-N is 2n-1, where n is the number of bits required to indentify the sequence number of the data frame?
c) What type of error cannot be detected by CRC?
d) Prove that $2r \geq m+r+1$, where m is the number of data bits and r is the number of redundancy bits required to correct the error.
2.a) Find the NRZ-1 , Manchester encoding , and differential Manchester encoding for the binary data 100110111.
b) Suppose that a signal has 2n times the power as a noise signal that is added to it . Find SNR in decibels.
c) A message 1010111101 with a CRC arrives at a destination node , the polynomial s are $X3+X+1$. What has there been an error in transmission?
d) Compare and contrast the layers of OSI model and Internet model.
e) Distinguish between the working principles of circuit switching, message switching and packet switching.
3. a) Explain about error detection or method of error detection (Parity check, Cyclic Redundancy Check (CRC) & Check sum) with proper example.
b) The code 11110101101 was received. Using the Hamming encoding algorithm what is the original code?
c) Given a 10-bit sequence 1010011110 and a divisor of 1011. Find the CRC.
4. a) Why digital-to-digital encoding is required? Explain Manchester and diff. Manchester encoding techniques.
b) Find the maximum bit rates for FSK signal where the maximum band rate is 12000 Hz and the difference between two carriers is 2000Hz.Transmission is on full-duplex mode.
c) What sampling rate is needed for a signal with bandwidth 1000Hz?
d) Applying CRC, determine the transmitted frame for 11010111 and for the generator polynomial $X3+X2+1$.
5. a) What is composite signal? What is VLAN?
b) What is transmission impairment? How many types of transmission impairment are there? Discuss them.
c) We measure decibel in logarithmic forms. What is the actual reason behind it?
d) Suppose transmission channel become error-free. Is data link layer still needed? Explain.

e) Write down the advantages of fibre-optic cable over twisted pair and coaxial cable.

6. a) Is bit stuffing needed in the control field of HDLC data frame?

b) What is the basic difference between CSMA and CSMA/CD?

c) What do you mean by back off factor of in case of CSMA/CD protocol?

d) Briefly discuss the token management using priority in IEEE 802.5.

e) Suppose a computer sends a packet in the network to another computer somewhere in the internet. The logical destination address of the packet is corrupted. What happens to the packet? How can the source be informed about this situation?

f) What are the difference between amplifier and repeater?

7. a) Describe Stop-and-wait ARQ , Go-Bank-N ARQ ,Selective Repeat ARQ protocol with the help of diagram.

b) Selective Repeat ARQ the window size must be at most 2m/2. Explain it.

8. a) What are the advantages of IPv6 over IPv4. Explain the header format of IPv4 and IPv6.

b) What is the purpose of masking?

c) A class B network on the internet has a subnet mask 255.255.240.0 . What is the maximum number of hosts per subnet?

d) Describe Bellman-Ford algorithm for shortest path routing and apply it to find out the shortest paths from node 4 to node 6. Do the same with Dijkstra Algorithm.

9. a) What is the working operation of stop-and-wait ARQ for lost acknowledgement?

b) What is IP diagram? Write all the fields of IP diagram.

c) Write down the main functions of network layer.

d) Briefly explain the modes of communication. in network.

e) Difference between sky propagation and line-of-sight propagation.

10. a) Compare and contrast a random access protocol with a controlled access protocol.

b) What is transparent bridge? How the loop problem is removed in transparent bridge? How does a repeater extend the length of the LAN?

c) The address 43:7B:6C: DE: 10:00 has been shown as the source address in an Ethernet frame. The receiver has discarded the frame. Why?

d) What is QAM? Why is it better than PSK?

11. a) An ISP has a block of 1024 addresses. It needs to divide the addresses among 1024 customers. Does it need subnetting? Explain your answer.

b) Write the advantages of ICMP an IGMP over IPv4.

b) Calculate the HLEN in IPv4 value if the total length is 1200bytes, 1176 of which is data from the upper layer.

12. a) Find the net id and host id of the following IP addresses ,

23.67.12.1

190.12.67.9

b) Find the classes of the following IP addresses ,

11110111 11110011 10000111 11011101

01111111 11110000 01100111 01111101

c) What is the meaning of unicasting , multicasting ,broadcasting?

d) Write the difference between Distance vector routing and Link state routing.

e) What is the purpose of masking? Explain different types of addresses contained in the packet flowing in the internet.

12. a) What do you mean by message security? Explain the terms "User authentication" ,"Key Management" and "Security Protocol".

b) How does Leaky Bucket algorithm work in congestion control?

c) "TCP and UDP" which is better? Explain.

d) What is connection oriented protocol? Briefly explain the services of the protocol.

e) "Transport layer is true end-to-end layer" – explain.

f) Explain RIP updating procedure with an example.

13. a) What is silly window syndrome?

b) Describe the functions of two FTP connections.

c) Write down the differences between symmetric key cryptography and asymmetric key cryptography.

d) Explain RSA algorithm with an example.

14. Write Short notes

 a) FTP ,b) DNS ,c) Cryptography

15. Write Short notes

a) RSA algorithm b)HTTP c)SMTP ,

16. Write Short notes

 a) Circuit switching , b) ICMP , c) Email ,

17. Write Short Notes

 a)CRC , b) Routing , c) Leaky bucket algorithm

18. Explain the function of TCP/IP protocol.

19. Explain ISDN architecture and its services.

20. Describe the sliding window protocol for data link layer.

21. Describe the congestion control algorithms.

22. Explain IEEE's logical link control protocol used for LAN.

23. Explain the traditional cryptography used for network security and privacy.

24. Describe the structure and functions of E-mail protocol.
25. Explain wireless communications and their suitability to computer networks.
26. Explain the design issues of datalink layers.
27. Discuss the method of performing protocol specification and verification.
28. Describe the structure of network layer in the internet.
29. Discuss the services offered by the application layer.
30. Write short notes on the following

World wide web

High speed LANs.

Virtual LAN

31. Explain dialog management. Explain various ciphers with their merits and de merits.

  Describe the working of DES.

32. What is FTP? Explain the functions and working of FTP. Differentiate between lossless

   compression and lossy compression.

33. What is Telnet? Explain the working of telnet. What the various functions of presentation

   layer?

34. What are the various functions of application layer?

   Write notes on:

Remote file server

World wide web

Explain any two cryptography algorithm.

35. What is DQDB? Explain its working. Compare the properties of Bridges, Repeater and

   Gateways. Explain FDDI-I and FDDI-II.

36. Describe the working and features of X.25.What is Router? How filtering is done by

   router. Explain: NETSCAPE and MOSAIC.

37. Describe congestion control algorithms. Explain SONET/SDH. Explain frame relay.

   Differentiate between Routers and Gateways.

38. Explain virtual circuits and datagrams. Explain Dijkstra's algorithms. Describe
   congestion control algorithms.

39. What is traffic shaping? Explain. Explain transport layer protocols. Write notes on

   connection establishment and connection release.

40. Explain 3-way Hand-shake. Write notes on IP fragment. Explain distance vector routing and link state routing.

QUESTION BANK
DATA STRUCTURES

Short Answers Type Questions

1. Explain recursion. Write a recursive algorithm to calculate factorial of a number.
2. What is data structure? Explain various types of data structure.
3. Give the applications of stack.
4. Write an algorithm to convert Infix expression into postfix expression.
5. Describe abstract data type with example.
6. Write the applications of queue data structure.
7. Explain stack as static data structure.
8. What is link list. Explain its type with suitable diagram.
9. Write the applications of linked list.
10. Write the applications of binary tree.
11. Give algorithm to sort a list using bubble sort.
12. Differentiate between stack and queue data structures.
13. What is graph. Explain the types of graph with example.
14. Write algorithm for insertion sort. Explain with the help of example.
15. Why we need data structure?
16. Differentiate between linear and non-linear data structures.
17. Give the features of abstract data type (ADT).
18. What are the disadvantages of linked list?
19. Mention the advantages of linked list?
20. What are the advantages linked list over array?
21. Write short notes on threaded binary tree.
22. What is an algorithm? Discuss the different steps in the development of an algorithm?
23. Distinguish between primitive and non-primitive data structures.

24. Differentiate between iteration and recursion.
25. Discuss the use of stack in implementing recursive procedures?
26. Convert the following infix expression into postfix form (A+B)*(C+D)*E^F
27. Write the prefix and postfix form for: A+B*(C-D)/(E-F)
28. Write an algorithm for in-order traversal of a binary tree.
29. Explain the method of representing graphs by using matrices?
30. Explain the use of graph in data structures?

Long Answers Type Questions

1. What do you mean by Array? Describe the storage structure of array. Also explain various types of array in detail.
2. What is stack? Why it is known as LIFO? Write algorithm of PUSH and POP operation on stack.
3. What is queue? Why it is known as FIFO? Write an algorithm to insert and delete an element from a simple queue.
4. Explain circular queue? Write an algorithm to insert and delete an element from a circular queue.
5. Explain how to represent singly linked list with help of diagram and example.
6. What is minimum spanning tree. Write algorithm to find the minimum spanning tree.
7. Write and explain algorithm to insert element at the beginning of circular linked list.
8. Explain algorithm to delete element from circular linked list.
9. Write and explain algorithm to insert element at the beginning of singly linked list.
10. Explain algorithm to delete element from singly linked list.
11. Write and explain algorithm to insert element at the beginning of doubly linked list.
12. Explain algorithm to delete element from doubly linked list.
13. What is tree traversal. Explain the in-order, preorder and post-order traversal.
14. Differentiate between depth first search and breadth first search.
15. Explain how infix expressions are converted to polish notation. Illustrate your answer with suitable example?

16. Explain the implementation of circular queue using array. How an "empty queue" is distinguished from a "full queue"? Write necessary functions to perform all valid operations on circular queue.
17. Write down the steps to invert a singly-linked list to circular linked list?
18. Explain quick sort algorithm with the help of an example.
19. Explain heap sort. Construct heap sort for the initial key set 42, 23, 74,11, 65,58,94,36,99,87.
20. Discuss the advantages and disadvantages of linked list over array?
21. Write an algorithm for binary search and discuss its speed compared with linear search.
22. Discuss the improvement in performance of binary trees brought by using threads.
23. Discuss the difference between a general tree and a binary tree. What is a complete binary tree? Give an algorithm for deleting a value X from a given binary tree.
24. Write an algorithm for the depth first search of a graph? State its advantages and disadvantages?
25. Explain the Prim's algorithm to find minimal spanning tree for a graph.
26. Explain the Kruskal's algorithm to find minimal spanning tree for a graph.

QUESTION BANK   DBMS
Paper code: CMSA CC11

UNIT–I: Introduction to Database Systems

1. Define Database and DBMS. Explain the importance of database design   12M

2. What are the problems in file system data management? Explain in detail with relevant
   example.   12M

3. A. Define Data Model. Explain the importance of data models.   7M

   B. Write briefly about business rules while data modeling.   5M

4. A. What are the different types of data model? Explain each briefly .   6M

   B. Briefly explain basic building blocks of data modeling.   6M

5. Explain the Three Schema Architecture of a database with neat diagram   12M

6. What are the various components of a DBMS? Explain with neat diagram   12M

7. Define E/R Model. Explain the following: 3M

   a. Entities and Relationships   4M

   b. Attributes and different types of attributes in   5M

   details 8. Write about the following:

   a. Query Processor   4M

   b. Data Manipulation Language Processor   4M

   c. Data Dictionary   4M

9. Write about the following:

   a. Simple Attribute   3M

   b. Derived Attribute   3M

   c. Multi-Valued Attribute   3M

   d. Composite Attribute   3M

10. Write about various notations of E/R diagram   12M

UNIT–II: Relational Data Model

1. A. Explain Relational Data model and its concepts   5M

   B. Briefly explain different types of keys in Relational data model   7M

2. Describe about various keys in relational model. Explain in detail.   12M

3. What are the different types of Relation Algebra Operators? Explain in detail   12M

4. Explain the following:

   a. Tuple Relational Calculus
      6M

   b. Domain Relational Calculus
      6M

5. Draw an ER diagram for the relations Employee and Department with relevant relationships.

            12M

6. Explain the following terms:

    a. Required and optional attribute   3M

     b. Identifiers   3M

     c. Composite identifier   3M

    d. Simple and Composite attribute   3M

7. Explain the following briefly:

     a. Entity integrity   6M

     b. Referential Integrity   6M

8. Explain the differences between the following:

     a. Super key   3M

    b. Candidate key   3M

    c. Primary key   3M

    d. Secondary key   3M

9. Explain about integrity rules in detail.   12M

10. Discuss about Codd's relational database rules in   12M
brief.

UNIT–III: Structured Query Language (SQL)

1. Explain various Data Definition Commands in details with syntax &   12M
examples

2. Briefly explain about Data Manipulation Commands with syntax and   12M
examples.

3. Explain Aggregate functions, GROUP BY, HAVING Clause with example.   12M

4. What you meant by Nested, Correlated & Uncorrelated queries?   6M
  Explain with suitable examples?   6M

5. Explain SELECT query using Relational and Logical with syntax and examples.
12M 6. Classify SQL Functions. Explain numeric functions with explanations.   12M

7. Explain advanced SELECT Queries with examples.
    12M

8. Write queries using Relational Set operators and SQL Join operators.
    12M

9. Write queries using Sub queries and correlated queries.
    12M

10. Discuss about different advanced Data Definition Commands.
    12M

UNIT–IV: Dependencies and Normal forms

1. What are the problems caused by Redundancy? Explain about Normalization and need for normalization.
                     12M

2. A. Define Functional Dependencies.
    3M

  B. Discuss about different functional dependencies   9M

3. Define Normalization.
    3M

  Explain about 1NF, 2NF with relevant examples.   9M

4. Explain about 3NF and BCNF with relevant table structure.
        12M

5. Discuss about higher level normal forms with suitable table.
        12M

6. Explain the following terms:
        a. Fully functional Dependencies
            6M
        b. Transitive Dependencies
            6M

7. Discuss about schema refinement in database design.
        12M

8. Explain the following: Multi-valued dependencies and fourth normal forms.
        12M

9. Explain the steps to improving the design.
        12M

10. Discuss about renormalization in detail.
        12M

UNIT–V: Data Storage and Indexes

1. What is meant by File Organization? Briefly discuss different types of file organization 12M
2. Write about Index file organization. Explain various index structures   12M
3. Discuss about Hashing in detail. Write merits and demerits   12M
4. Discuss about B-Tree. Write applications, merits and demerits of B+TREE.   12M

5. What is transaction? Explain the ACID Properties with neat diagram.   12M
6. Define Concurrency control. Explain different concurrency control.   12M
7. Explain various concurrent control mechanisms in detail.   12M
8. Explain lock-based concurrency control mechanisms with diagram in detail.   12M
9. Explain about concurrency control based on time-stamp ordering.   12M
10. Explain log-Based Recovery in detail.   12M

Question Bank

Operating System

PAPER CODE: CMSA CC7

UNIT 1: INTORDUCTION TO OS

8M Questions

1. Define operating system and list the basic services provided by operating system.

2. Differentiate among the following types of OS by defining their essential properties.

   a) Time sharing system

   b) Parallel system

   c) Distributed system

   d) Real time system

3. Explain the essential properties of

a) Batch System

b) Time sharing

c) Real time

d) Parallel

e) Distributed

f) Handheld

g) Embedded

h) Smart Card O.S

4. Differentiate among the following types of OS by defining their essential properties:

a) Time Sharing System

b) Parallel System

c) Simple batch System

d) Real time System

5. Explain batch system and Multiprogrammed System in detail.

6. Explain the terms :

a) Real time System

b) Distributed System

7. Explain the terms :

a) Parallel System

b) Batch System

8. Explain O.S as extended machine in detail.

9. Explain OS as resources manager

10. Explain essential features of following structure of O.S

a) Monolithic System

b) Layered Systems

c) Micro Kernels

d) Client Server Model

e) Virtual Machines

f) Exokernels

2M/Short Answer Questions

1) What is the key difference between a trap and an interrupt?

2) What are the types of System calls?

3) List any four process management system call.

4) Define user mode and kernel mode. Why two modes are required?

5) What is the O.S features required for multiprogramming

6) What are the advantage and disadvantage of multiprocessor system?

7) Describe the difference between symmetric and asymmetric multiprocessing? 8) Distinguish between the client-server and peer-to-peer models of distributed system 9) What difference is between loosely coupled and tightly coupled system.

10) What are advantages of distributed System?

11) What are the requirements of hard real time and soft real time system?

12) What are the drawbacks of monolithic system?

13) What are the advantages of layered structure over monolithic structure?

14) Give examples of microkernel

15) What are differences between macro kernel and micro kernel?

16) Justify whether following statements are true or false

      a) The user application interacts directly with O.S.

      b) Shell is part of operating System

UNIT 2: PROCESS MANAGEMENT

8M Question

1) Define process and Explain process states in details with diagram

2) Explain process states and process control block in details

3) Explain the process state transition diagram used in multiprogramming environment.

   Describe the fields in a process control block (PCB).What is switching overhead?

4) What is thread? Explain classical thread model

   OR Explain threads in detail

5) Explain and differentiate between user level and kernel level thread.

6) List the main difference and similarities between threads and process.

7) What are various criteria for a good process scheduling algorithm? Explain any two preemptive scheduling algorithms in brief.

8) Explain the following process scheduling algorithm

   a) Priority scheduling

   b) Shortest job first scheduling

9) Explain the effect of increasing the time quantum to an arbitrary large Number and decreasing the time quantum to an arbitrary small number for round robin scheduling algorithm with suitable example?

10) Consider following processes with length of CPU burst time in milliseconds

Process	Burst time
P1	5
P2	10
P3	2
P4	1

   All process arrived in order p1, p2, p3, p4 all time zero

   a) Draw Gantt charts illustrating execution of these processes for SJF and round robin

   (quantum=1)

   b) Calculate waiting time for each process for each scheduling algorithm

   c) Calculate average waiting time for each scheduling algorithm

37. Consider following processes with length of CPU brust time in millisecond

Process	Brust time	Priority
P1	10	3

P2	1	1
P3	2	3
P4	1	4
P5	5	2

All processes arrived in order p1, p2, p3, p4, p5 all at time zero.
1) Draw Gant charts illustrating execution of these processes for SJF, non preemptive priority
(smaller priority number implies a higher priority) & round robin(quantum=1)
2) Calculate turnaround time for each process for scheduling algorithm in part (1) 3) Calculate waiting time for each scheduling algorithm in part (1)

38. Explain the following term related to IPC: a) Race condition b) critical region
39. What are critical sections? Why mutual exclusion required? Explain any 2 methods of achieving mutual exclusion in detail.
40. Explain the terms related to IPC –a) Race condition b) critical section c)Mutual exclusion d)Semaphores
41. Explain in detail the following solutions for achieving mutual exclusion a)look variable b)TSL instruction
42. Explain Peterson's solution for achieving mutual exclusion
43. Discuss in detail following solution for achieving mutual exclusion a) Disabling interrupts b)
Strict alteration
44. Explain semaphore in detail
45. What is semaphore? Discuss product-consumer problem with semaphore.
46. Write short note on: a) Dining philosopher problem b) System calls c) Monitors
d) Peterson's solution for achieving mutual exclusion e) Semaphores
f) Readers & writers problem.
47. Explain the terms: a) time sharing b) mutual exclusion
48. What is monitor? Explain solution for producer-consumer problem using monitor. Explain monitors in detail.
49. Write short on: a) message passing b) shell
50. How message passing is used in IPC.
51. What is message passing? Discuss procedure consumer problem with message passing.
52. Explain use of message passing & semaphore for inter process communication?

53. Explain dinning philosopher problem & its solution.
54. What is dinning philosopher problem? Explain its solution with monitor.

55. What is dinning philosopher problem? Explain its solution with semaphore.
56. Explain readers & writers problem? Give its solution with semaphore.
57. Write short notes on: a) Process states b) Critical section c) Race condition
d) Starvation e) PCB f) Two level scheduling g) Round robin scheduling

UNIT 03: FILE MANAGEMENT

8 MARKS
58. What are the objectives and minimal set of requirement for the file management system?
59. What criteria are important in choosing a file organization?
60. Explain briefly file system architecture & file management function.
61. List& briefly explain 5 file organization.
62. Compare file organization methods
63. Which are the typical information elements of a file directory?
64. Which are the typical operations performed on directory?
65. What are the typical access rights that may be granted or denied to a particular user for a particular file?
66. What are methods of free space management of Disk?
67. Explain linked list allocation using index in details.
68. Explain file system consistency in detail.
69. Explain file system reliability & performance in detail.
70. What is directory? Explain directory operation in details.
71. Explain linked list allocation of file in detail.
72. Explain file system performance in detail.
73. Explain the following techniques to improve file system performance.
     a) block read ahead and
     b) Reducing disk arm motion
74. Explain file system implementation using linked list with index and i-node in detail? 75. Explain the following file allocation methods
     a) Contiguous allocation   b) i-node

76. What are points to be consider in file system design? Explain linked list allocation & index allocation in detail.
77. Differentiate between windows and unix file system.

2 MARKS/SHORT ANSWER QUSTIONS

78. What is the difference between field and record?
79. What is the difference between file and database?
80. What is file management system?
81. What is relation between pathname & a working directory?

UNIT 4: MEMORY MANAGEMENT

82. What are the memory management requirements?
83. Explain multiprogramming with fixed partition.
84. Explain multiprogramming with dynamic partition.
85. Write short note on: Relocation problem for multiprogramming with fixed partitions.
86. Explain static partitioned allocation with partition sizes 300,150, 100, 200, 20. Assuming first fit method indicate the memory status after memory request for sizes 80, 180, 280, 380, 30.
87. Discuss in details memory management with buddy system.
88. A 1MB block of memory is allocated using the buddy system.
    i. Show the results of the following sequence in a figure: Request 70; Request 35; Request 80; Return A; Request 60; Return B; Return D; Return C.
    ii. Show the binary tree representation following Return B.
89. Explain memory management with bit maps in detail.
90. Explain memory management with linked list in details.
91. What are the differences of internal and external memory Fragmentation?
92. Explain following allocation algorithm.
    a. First fit
    b. Best fit
    c. Worst fit
    d. Next fit
93. Explain the difference between logical and physical addresses?
94. What is paging? Discuss basic paging technique in details.

OR

Explain paging in detail.

95. Explain hierarchical page table and inverted page table.

96. Explain Segmentation in detail.

OR

What is segmentation? Explain the basic segmentation method.

97. What is demand paging? Explain it with address translation mechanism used. What are its specific advantages? How a page table is implemented?

98. What is virtual memory? How it is implemented.

99. Write short on:

     a. multiprogramming with fixed & variable partition.

     b. Relocation problem for multiprogramming with fixed partition.

     c. Use of multiprogramming in memory management.   d. TLB.

     e. Paging.

     f. Design issues of paging system.

     g. Relocation and protection.

     h. policy driven scheduling.

100. Write short note on:

     a. Segmentation

     b. Page table

     c. Compaction

     d. Working set model

     e. fragmentation 101. Write short note on:

          a) Not-recently used page replacement algorithm.

          b) Optimal page replacement algorithm.

          c) Swapping.

          d) Relocation and protection.

102. Explain following page replacement algorithm in detail.

     i. LRU   ii. FIFO

103. Explain the following page replacement algorithm.   a) Optimal page replacement

     b) Least recently used page replacement.

104. Explain difference between internal external fragmentations in detail.

105. Consider the following page reference string.

1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2How many page faults would occur for the following replacement algorithm, assuming four and six frames respectively? a. page replacement. b. FIFO page replacement.

106. Describe the term page fault frequency. What is thrashing? How is it controlled by OS? 107. Free memory holes of sizes 15K, 10K, 5K, 25K, 30K, 40K are available. The processes of size 12K, 2K,

25K, 20K is to be allocated. How processes are placed in first fit, best fit, worst fit.

Calculate internal as well as external fragmentation.

108.   On a simple paging system with 2^{24} bytes of physical memory, 256 pages of logical address Space, and a, page size of 2^{10} bytes, how many bits are in logical address?

109.   A certain computer provides its user with a virtual memory space of 2^{32} bytes. The computer has 2^{35} bytes of physical memory. The virtual memory is implemented by paging the page size is 4096 bytes. A user process generates the virtual address 11123456. Explain how the system establishes the corresponding physical location.

110.   Calculate page faults for (LRU, FIFO, OPT) for following sequences where page frame is three.

0,1,2,1,4,2,3,7,2,1,3,5,1,2,5.

UNIT 5: DEVICE MANAGEMENT

111. Discuss briefly the following issues related to device independent i/o software.
    a. Uniform interfacing for device drivers.
        b. Buffering.
112. Discuss in details devices drivers.
113. Write short notes on:
    a. Devices independent I/O software
    b. Goals of I/O software
    c. Interrupt handler
    d. I/O Devices.
    e. Device drivers

f. Device controllers

g. Disk space management

h. Disk arm scheduling algorithm 114. Discuss the following: a) Magnetic disk

b) CDs

c) RAID

d) DVDs

e) Formatting Disk

115. Discuss the following related to disk space management

    a)   Block size

    b)   Keeping track of free blocks.

116. Suppose a disk drive has 400 cylinders , numbered 0 to 399.The driver is currently serving a request at cylinder 143 and previous request was at cylinder 125 .The queue of pending request in FIFO order is: 86,147,312,91,177,48,309,222,175,130.

   Starting from the current head position what is the total distance in cylinders that the disk to satisfy all the pending request for each of the following disk scheduling algorithms?   1] SSTS   2] SCAN   3] C-SCAN

UNIT 6: DEADLOCK AND CASE STUDY

117. What are the conditions for deadlock? Explain deadlock detection and recovery in detail.

A/M 2011 8M.

118. Explain deadlock prevention in detail. **N/D 2011   8M M/A 2009.**

119. Write short notes on:

    a. Deadlock modeling **(DEC 2008 O/N2010) 6M(N/D2008).**

    b. Bankers algorithm**. A/M 2011 6M.**

120. Explain deadlock avoidance using banker's algorithm in details. **O/N2010 8M M/J 2009 8M.**

121. What is deadlock? Explain deadlock detection with multiple resources of each type. **M/A 2010 8M.**

122. Explain bankers algorithm for multiple resources to avoid deadlock. **M/A 2010 8M.**

123. Explain various methods for recovery from deadlock.**DEC 2010 8M.**

124. Discuss deadlock detection with one resource of each type.**DEC 2009 8M.**

125. Write short notes on-

        a) Bankers algorithm for single resources.

        b) Ostrich algorithm. **M/J 2010 6M M/A 2010.**

126. Explain deadlock avoidance with suitable example using banker's algorithm. **M/J 2012 8M.**

127. Consider the following snapshot-

Allocated   Max   Available

	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using banker's
algorithm: a) What are contents of matrix end?

b) Is the system in safe state?

c) If request for process p1 arrives for (0,4,2,0) .Can the request be granted immediately? **N/D 2008 8M.**

128. What are deadlock? Explain its model with example. Explain any three methods of dealing with deadlock. **N/D 2008 8M.**

129. A system has three types of resources R1 R2 R3 and their number of units are 3, 2, 2 respectively. Four processes P1 P2 P3 p4 are currently competing for these resources in following number.

    1. P1 is holding one unit of R1 and is requesting for one unit of R2.

    2. P2 is holding two units of R2 and is requesting for one unit each of R1 and R3.

    3. P3 is holding one unit of R1 and is requesting for one unit of R2.

    4. P4 is holding two units of R3 and requesting for one unit of R1.

Determine which if any of the processes are deadlock in this state**. M/J 2012 8M.**

130. Explain swap space management methods of disk in detail. **N/D 2008 8M.**

131. Consider system with total of 150 minutes of memory allocated to three processes as shown. Apply banker's algorithm to determine whether it would be safe to grant each of following request. If yes-Indicate sequence of termination that could be possible. If no- Show reduction of resulting allocation table.

       1.   A 4th process is arrived with maximum need of 60 and initial need of 25 units.

       2.   A 4th process is arrived with maximum need of 60 and initial need of 35 units.

Process	Max	Hold
P1	70	45
P2	60	10
P3	60	15

132. Explain history of windows operating system. 133. Write short notes on-

      a) Features of windows- 7.

      b) WINDOWS -7 architecture

      c) WINDOWS -7 Registry 134. Explain architectural features of WINDOWS-7.

135. Explain system structure of WINDOWS- 7.
136. Explain process and thread management WINDOWS- 7 in detail.
137. Explain in brief concurrency control supported by WINDOWS -7.
138. Briefly explain security features of WINDOWS7.
139. Explain memory management and I/O management.

QUESTION BANK

DIGITAL ELECTRONICS
PAPER CODE-CMSA CC1

1.   Apply De-Morgan's theorem to simplify A+BC.

2.   Define the term prime implicants and Essential prime implicants.

3.   Draw the XOR logic using only NAND gates.

4.   Implement the following Boolean function with NOR – NOR logic

F   = $\Pi(0,2, 4,5,6)$

5.   Express the switching function f (ABC) = B in terms of minterm.

6.   Define minterm & Maxterm. Give examples.

7.   Simplify the given Boolean Expression F= x'+xy+xz'+xy'z'.

8.   Prove that the logical sum of all minterms of a Boolean function of 2 variables is
1.

9.   Show that a positive logic NAND gate is a negative logic NOR gate.

10.   If A & B are Boolean variables and if A=1 & A+B=0, Find B?

11.   Realize F = A'B+AB' using minimum universal gates.

12.   Write the Boolean expression for the output of the system shown in figure.

13.   Write down fan-in & fan-out of a standard TTL IC.

14.   Prove that AB+A′C+BC = AB + A′C

15.   Implement the following Boolean function with NAND – NAND logic

F $= \sum(0,1, 3, 5)$

16.   What are don't care terms?

17.   What are universal gates implement AND gate using any one universal gate?

18.   What are the advantages of Schottky TTL family?

19.   Define the term (i). Propagation delay (ii). Power dissipation

20.   Draw an active high tri-state Gate & write its truth table.

PART – B

1.   a). i). Simplify the following function using K – map,
f=ABCD+AB′C′D′+AB′C+AB & realize the SOP using only NAND gates and POS
using only NOR gates   (12)   ii). Simplify the logic circuit shown in figure   (4)

2.   a). i). Minimize the term using Quine McCluskey method & verify the result
using K-
        map method $\pi M(0,1,4,11,13,15)+ \pi d(5,7,8)$.   (10)

ii). Explain the operation of 3 input TTL NAND gate with required diagram & truth

table. (6)

3. a). i). Using K-map method, Simplify the following Boolean function and obtain
(a) minimal SOP and
(b) minimal POS expression & realize using only NAND and NOR gates
$F=\sum m(0,2,3,6,7) + d(8,10,11,15)$ (10)
ii). Draw the circuits of 2 input NAND & 2 input NOR gate using CMOS (6)

4. a). i). Using Quine McCluskey method Simplify the Boolean expression
$F(v,w,x,y,z) = \sum (4,5,9,11,12,14,15,27,30) + \sum \emptyset(1,17,25,26,31)$ (10) ii). Explain
the working of a basic totem-pole TTL 2 input NAND gate. (6)

5. a).i).Find a minimal SOP representation for $f(A,B,C,D,E) =$
$\sum m(1,4,6,10,20,22,24,26) + d(0,11,16,27)$ using K-map method. Draw the circuit of the
minimal expression using
only NAND. (12)
ii). Obtain 3 level NOR – NOR implementation of f = [ab + cd] ef (4)

6. Minimize the term using Quine McCluskey method & verify the result using K-
map
method $\Pi M(1,4,5,9,12,13,14) \cdot \Pi d(8,10,11,15)$. (16)

7. Find a minimal SOP representation for $f(A,B,C,D,E)=\sum m(1,4,6,10,20,22,24,26)+$
$d(0,11,16,27)$ using K-map method. Draw the circuit of the minimal expression using
only NAND. (16)

8. (i)Given $Y (A, B, C, D) = \prod M (0, 1, 3, 5, 6, 7, 10, 14, 15)$, draw the K-map and
obtain the simplified expression. Realize the minimum expression using basic gates. (8)
(ii) Prove by perfect induction (8)

(i). A+AB = A

(ii) A(A+B) = A

(iii) A+A′B = A+B and

(iv) A(A′+B) =AB

9.   (i). Compare & contrast the features of TTL & CMOS logic families. (8)
        (ii). List out the basic rules (laws) that are used in Boolean algebra expressions with
        example.   (8)
10.   Simplify using K-map to obtain minimum POS expression (A′+B′+C+D) (A+B′+C+D)
        (A+B+C+D′) (A+B+C′+D′) (A′+B+C+D′) (A+B+C′+D).   (16)
11.   (i). Implement the expression Y (A, B, C) = $\prod$M (0, 2, 4, 5, 6,) using only NOR-NOR
        logic. (8)
 (ii). Draw the schematic and explain the operation of a CMOS inverter. Also explain its characteristics.   (8)
12.   (i). Express the Boolean function F=XY+X′Z in product of maxterm.   (4)
        (ii). Simplify the 5 variable switching function using Karnaugh map
        f(EDCBA)=$\sum$m(3,5,6,8,9,12,13,14,19,22,24,25,30).   (12)

UNIT –II COMBINATIONAL CIRCUIT DESIGN PART – A

1.   What is combinational circuit? Give examples.

2.   Draw the block diagram of n-bit parallel adder

3.   Write an expression for borrow and difference in a full Subtractor circuit.

4.   Differentiate a decoder from a Demultiplexer.

5.   Design Half – adder using only NAND gates.

6.   What is code converter? List their types.

7.   Draw a logic diagram of 1 to 4 data distributor

8.   Express Gray code 10111into binary numbers.

9.   Implement full adder using multiplexer.

10.   Draw the block diagram of a 2's complement 4 – bit adder/ Subtractor.

11.   Write the function table and logic diagram of a 4:1 data selector.

12.   Implement the following function using suitable multiplexer F= Σm(0,2,5,7)

13.   Relate carry generate, carry propagate, sum and carry-out of a carry look ahead adder.

14.   Design a single bit magnitude comparator to compare two words A and B.

15.   What is priority encoder?

16.   Design a three bit even parity generator.

17.   Draw the logic diagram of a serial adder.

18.   Design a half subtractor combinational circuit to produce the outputs Difference and Borrow.

19.   Draw the logic diagram of a 2 bit multiplier.

20.   Suggest a solution to overcome the limitation on the speed of an adder.

        PART – B
1.   (i). Implement the following function using suitable multiplexer F (A, B, C, D) = Σ(1, 3,
        4, 11, 12, 13, 14 , 15)   (8)
        (ii). Draw the logic diagram of a 2-bit by 2-bit binary multiplier and explain its operation.

(8)

2. Draw the block schematic of Magnitude comparator and explain its operation (16)

3. Draw & explain the block diagram of a 4-bit parallel adder / Subtractor (16)

4. Design & implement the conversion circuits for BCD to Excess – 3 code. (16)

5. (i) Design a BCD to Gray code converter. Uses don't care. (10)
   (ii) Implement full subtractor using Demultiplexer. (6)

6. Design an Excess – 3 to BCD code converter. Uses don't care (16)

7. (i). Implement full adder using decoder. (6)
   (ii).Realize F(w, x, y, z)= Σ (1,4,6,7,8,9,10,11,15) using 8 to 1 Mux (10)

8. Explain the operation of carry look ahead adder with neat diagram (16)

9. (i). Draw and explain the BCD adder circuit. (10)
   (ii). Design a seven segment decoder circuit to display the numbers from 0 to 3.

   (6)

10. (i).Design & explain the working of Gray to BCD converter. (10)
    (ii).Explain even parity checker and generator. (6)

11. (i).Draw the logic diagram of BCD to Decimal decoder and explain its operations.
    (10)
    (ii).Design & explain the following circuits, (i) Comparator (ii) 4 to 1 Mux. (6)

12. Draw & explain the block diagram of a 4-bit serial adder to add contents of two registers.
(16)

UNIT –III SYNCHRONOUS SEQUENTIAL CIRCUITS PART – A

1. Compare Asynchronous and Synchronous sequential logic.

2. Draw the state diagram and characteristics equation of a D FF.

3. What is latch? What is the difference between latch and flip flop?

4. Realize T Flip Flop using SR Flip Flop

5.   How does the JK FF differ from an SR FF in its basic equation?

6.   Define Synchronous counter.

7.   Define Setup and Hold time.

8.   What is the condition on JK FF to work as D FF?

9.   What is race around condition? How do you eliminate it?

10.   Mention any two differences between the edge triggering and level triggering.

11.   Draw the state diagram of MOD -10 counters.

12.   What is sequential circuit? Give some example.

13.   Draw a NAND based logic diagram of Master Slave JK FF.

14.   Convert Transparent flip flop into a JK flip flop.

15.   Differentiate Asynchronous and Modulus counter

16.   Define the terms State table and State Assignment.

17.   What is meant by programmable counter? Mention its applications.

18.   Draw the state table and excitation table of T flip flop.

19.   How many Flip Flops are required to build a binary counter that counts from 0 to 1023.

20.   Design a 3 bit ring counter and find the mod of a designed counter.

PART – B

1.   i). Design and explain the working of an 4-bit Parallel counter (8) ii). Design and working of a BCD ripple counter with timing diagram. (8)

       010,100, 110, (repeat) 000, …using D flip flop.   (10)

       ii).Analyze the logic diagram and draw the state diagram for the given logic. (6)

2.   i).Design a 3 bit synchronous counter which counts in the sequence 000, 001, 011,

3. i).Design and explain the working of an 4-bit Up/Down ripple counter   (8)

       ii). Design and working of a synchronous MOD- 5 counter.   (8)

4. i).Design a synchronous counter with states 0, 1, 2, 3, 0, 1, ... using JK flip flop. (8)

       ii).Construct a JK FF using a D FF, a 2:1 Multiplexer and an inverter.   (8)

5. i).Design and explain the working of an 4-bit Up/Down Parallel counter.   (8)

       ii).Design and working of a synchronous MOD- 6 counter using JK FF.   (8)

6.   i).Design a synchronous 3-bit counter which counts in the sequence 1, 3, 2, 6, 7, 5, 4,

       (repeat) 1,3..... using T FF   (10)

       ii).Realize JK Flip Flop using SR Flip Flop   (6)

7.   Design a sequence detector which detects the sequence 01110 using D flip flop (16)

8.   (i).Explain the operation of universal shift register with neat block diagram. (8)

       (ii). Explain the working Master/Slave JK FF   (8)

9.   i). Draw the logic diagram for a 5- bit serial load shift register using D FF & explain. (10)

       ii). Write notes on state minimization.   (6)

10.   Draw a 4-bit SISO SIPO, PIPO and PISO shift register and draw its waveforms (16)

11.   i). Draw an asynchronous decade counter & explain its operation with neat waveforms.(8) ii). Design a 3-bit binary counter using T FF that has a repeated sequence of 6 states.

000-001-010-011-100-101-110. Give the state table, state diagram & logic diagram. (8)

12.   i). Design and explain the working of a MOD-11 counter. (8) ii). Design a counter to count the sequence 0, 1, 2, 4, 5, 6,...using SR FF's (8)

UNIT –IV

ASYNCHRONOUS SEQUENTIAL CIRCUITS PART – A

1.   Differentiate synchronous and asynchronous sequential circuits?

2.   What are the two types of Asynchronous sequential circuits?

3.   Differentiate Moore machine and Mealy machine.

4.   Define flow table and primitive flow table.

5.   Write a Verilog HDL model of a full subtractor circuit.

6.   Define state table and state assignment.

7.   Draw the basic building blocks of an Algorithmic State Machine chart?

8.   Differentiate stable and unstable state.

9.   Write a Verilog behavioral model of a Transparent flip flop with reset input.

10.   Draw block diagram for Moore and Mealy model.

11.   Define the terms race and critical race.

12.   What is a state diagram? Give an example

13.   Write a Verilog code for 4-to-2 Encoder using gate level model.

14.   What are Hazards? How it can be avoided?

15.   Compare the ASM chart with a conventional flow chart.

16.   Differentiate fundamental mode and pulse mode asynchronous sequential circuits.

17.   Design a 3 input NAND gate using Verilog.   18. What is the cause for essential Hazard?

19. Write a Verilog model of a full subtractor circuit.   20. Write analysis procedure of synchronous sequential circuits.

    PART – B

1.   Design a clocked synchronous sequential logic circuit using JK flip flops for the

       following state diagram. Use state reduction if possible.   (16)

2.   What is a Hazard? What are the types of hazards? Check whether the following

circuit contains a hazard or not $Y = x_1 x_2 + x_2' x_3$ If the hazard is present,

       demonstrate its removal   (16)

3.   Design a clocked sequential machine using JK flip flops for the state diagram shown

       in figure. Use state reduction if possible and make proper state assignment.
       (16)

4.   Derive the transition table, state table and state diagram for moor sequential circuit

shown in below figure.   (16)

5.   Sequential circuit has three flip flops A, B, and C; one input x_in ; and one output y_out. The state diagram is shown in below figure. The circuit is to be designed by
treating the unused states as don't care conditions. Analyze the circuit obtain from the design to determine the effect of the unused states. Use T flip flops in the design.
    (16)

6.   i). Reduce the number of states in the following state table, and tabulate the reduced

    state table.   (8)

Present State

    Next State
        Output

        X = 0 X =1
            X =0   X=1

    a   f   b   0   0   b   d   c   0   0
    c   f   e   0   0   d g a 1 0 e d c 0 0 f f b 1 1 g g h 0 1
    h   g   a   1   0

        ii). Analyze the synchronous sequential logic circuit and derive the transition table   and state diagram.   (8)

7.   Design a clocked synchronous sequential machine using T flip flops for the following state diagram. Use state reduction if possible .also use straight binary state assignment.
      (16)

8.   i).What is hazards? Give hazard free realization for the following Boolean function.
      F(A, B, C, D) = $\sum m(0, 2, 6, 7, 8, 10, 12)$ (10)
      ii).Differentiate Moore and Mealy machines with block diagram   (6)

9.   Derive the state table and state diagram of the sequential circuit shown in below

      figure. Explain the function that the circuit performs. (16)

 10.   Design a clocked synchronous sequential logic circuit for the following state diagram.

      Use state reduction if possible. (1) Using D flip flops (2) Using T flip flops (16)

11.   i). For the state diagram shown in below figure, design a synchronous sequential
      circuit using JK flip flops. (12)

      ii). What is ASM? Give the basic notations.   (4)

12.   i). What are static and dynamic hazards? Give static – 0 hazard free realizations for the following Boolean function. F(A, B, C, D) = $\Pi M(3, 4, 5, 7, 9, 13, 14, 15)$. (12) ii). Write the design procedure for Asynchronous sequential logic circuits. (4) UNIT –V

MEMORY DEVICES AND DIGITAL INTEGRATED CIRCUITS

PART – A

1.   How the memories are classified.

2.   What is an EPROM?

3.   Compare and contrast static RAM and dynamic RAM

4.   What is PLD? List their types.

5.   Explain write operation with an example.

6.   Distinguish between PAL and PLA.

7.   Which memory is called volatile? Why?

8.   Write the advantages of EPROM over a PROM.

9.   Compare the features of PROM, PAL and PLA

10.   What is access time and cycle time of a memory?

11.   What is PLA? How does it differ from PAL and GAL?

12.   What is memory decoding?

13.   Implement the Exclusive-OR function using PROM

14.   Write the advantages of E2PROM over an EPROM.

15.   Implement the function $F1=\sum (0, 1, 2, 5, 7)$ and $F2 = \sum (1, 2, 4, 6)$ using PROM.

16.   Draw the static and dynamic RAM cells.

17.   Implement a 2-bit multiplier using ROM.

18.   What is meant by memory expansion? Mention its limit.

19.   Compare PLD's with FPGA.

20.   Draw the equivalent logic circuit of a binary memory cell that stores one bit of information.

PART – B
1.   i). Give the classification of semiconductor memories   (8)
     ii). Implement the following function using PLA F1=$\sum$ (2, 4, 5, 10, 12, 13, 14) and
     F2 = $\sum$ (2, 9, 10, 11, 13, 14, 15).   (8)
2.   i). Realized BCD to Excess-3 code using ROM array   (8)   ii). With
logic diagram, explain the basic macrocell.   (8) 3. i). Write short note on
RAM, types of ROMs   (10)
     ii). Implement the following function using PLA F1=$\sum$ (0, 1, 2, 4) and
     F2 = $\sum$ (0, 5, 6, 7).   (6)
4.   i). Realize the following function using PAL
     F1(x, y, z) = $\sum$ (1, 2, 4, 5, 7). And
F2(x, y, z) = $\sum$ (0, 1, 3, 5, 7) (8) ii). Write a note on FPGA with neat diagram. (8)
5.   i). Explain read cycle and write cycle timing parameter with the help of timing

 diagram. (10) ii). A combinational circuit is defined as the function F1 =
AB'C'+AB'C+ABC and
     F2 = A'BC+AB'C+ABC. Implement the digital circuit with a PLA having 3
inputs, 3
     product terms and 2 outputs.   (6)
6.   i).Write short notes on PLD, types of PLDs.   (8)
     ii). Implement the following Boolean function using 3×4×2 PLA, F1(x, y, z) = $\sum$
(0, 1,
     3, 5) and F2(x, y, z) = $\sum$ (3, 5, 7)   (8)

7. Design using PAL the following Boolean functions   (16)

$W(A,B,C,D) = \sum(2, 12, 13)$

$X(A,B,C,D) = \sum(7, 8, 9, 10, 11, 12, 13, 14, 15)$

$Y(A,B,C,D) = \sum(0, 2,3, 4, 5, 6, 7, 8, 10, 11, 15)$

$Z(A,B,C,D) = \sum(1, 2, 8, 12, 13)$

8. i).Design a combinational circuit using ROM. The circuit accepts a three bit number and outputs a binary number equal to the square of the input number. (8)

ii). Describe the RAM organization.   (8)

9. i). Draw a PLA circuit to implement the function $F1 = A'B + AC'$,

$F2 = (AC + AB + BC)'$ (8)

ii). Write short notes on EPROM and EEPROM.   (8)

10.   i). Realize the following function using PLA $F (w, x, y, z) = \Pi (0, 3, 5, 7, 12, 15)$

+ d (2, 9).   (8) ii). Implement Binary to Gray code converter using PROM devices (8)

11.   Implement the following Boolean functions using 4 × 3 × 4 PAL   (16)

i. $W(A, B, C, D) = \sum (0, 2, 6, 7, 8, 9, 12, 13)$ ii. $X (A, B, C, D) = \sum (0, 2, 6, 7, 8, 9, 12, 13, 14)$.   iii. $Y(A, B, C, D) = \sum (2, 3, 8, 9, 10, 12, 13)$ iv. $Z(A, B, C, D) = \sum (1, 3, 4, 6, 9, 12, 14)$

12.   i). Explain the principle of operation of Bipolar SRAM cell.   (8)

ii). How can one make 64X8 ROM using 32X4 ROMs? Draw such a circuit & explain. (8)

INTRODUCTION TO ALGORITHM & ITS APPLICATION

Question Bank

Unit-I

Introduction

Part - A

1. What is an Algorithm?

2. Write the Euclid's algorithm for GCD calculation?

3. What is algorithm design Technique?

4. Differentiate time and Space efficiency?

5. Design an algorithm to compute the area and Circumference of a circle

6. List the important problem types

7. How will you measure input size of algorithms

8. Define best, worst and average case efficiency?

9. Define big oh(O),Big omega(Ω) and big theta(θ) notations

10. List the basic efficiency classes

11. Define recurrence relation?

12. What is non recursion relation?

13. Define nonrecursive algorithm? 14. Define order of growth? Find the order of growth of $\sum_{i=1}^{n-1}(i^2 + 1)^2$

15. Consider the following algorithm

    S=0

```
for
i=
1
to
n
d
o
S=
S+
i
re
tu
rn
i
```

What does this algorithm compute? How many times is the basic
operation executed?

16. Write an algorithm using recursive function to find the sum of n numbers.

17. What is algorithm optimality

18. List the factors which affects the running time of the algorithm.

19. What is meant by substitute methods?

20. Write the general plan for analyzing Time efficiency of recursive algorithm

PART - B

1. Discuss in detail about fundamentals of algorithmic problem solving?

2. Explain the important problem types in detail

3. Explain the necessary steps for analyzing the efficiency of recursive algorithms

4. Explain the general framework for analyzing the efficiency of algorithm.

5. Write the asymptotic notations used for best case ,average case and worst case analysis of algorithms and Write an algorithm for finding maximum element of an array perform   best , worst and average case complexity with appropriate order notations

6. Explain the method of solving recurrence equations with suitable example.

7. Explain the method of solving Non recursive equations with suitable examples

8. i)Describe the basic efficiency classes in detail.

ii) Write an algorithm for Fibonacci numbers generation and compute the following

a) How many times is the basic operation executed

b) What is the efficiency class of this algorithm

9. Solve the following recurrence relations

a) $x(n)=x(n -1) + 5$ for $n > 1$ $x(1)=0$

b) $x(n)=3x(n-1)$ for $n > 1$ $x(1)=4$

c) $x(n)=x(n-1)+n$ for $n > 0$ $x(0)=0$

d) $x(n)=x(n/2)+n$ for $n > 1$ $x(1)=1$ (solve for $n=2^k$)

e) $x(n)=x(n/3)+1$ for $n >1$ $x(1)=1$ (solve for $n=3^k$)

10. Consider the following recursion algorithm

Min1(A[0 -------n-1])

If n=1 return A[0]

Else temp = Min1(A[0.......n-2])

   If temp <= A[n-1] return temp

Else

Return A[n-1]

a) What does this algorithm compute?

b) Setup a recurrence relation for the algorithms basic operation count and solve it

UNIT-2

BRUTE FORCE AND DIVIDE-AND-CONQUER

PART - A

1. Define brute force method

2. Write an algorithm for brute force closest –pair problem

3. Define convex hull problem

4. Define exhaustive search

5. Give formula for Manhattan distance computation

6. What is median of three partitioning?

7. Write an algorithm for binary search.

8. What is worst case complexity of binary search?

9. What is Hamiltonian circuit?

10. Define Hungarian method.

11. What are the conditions for travelling salesman problem?

12. Define Knapsack problem?

13. List the general plan in divide and conquer algorithm

14. Write an algorithm for merge sort

15. Write an algorithm for quick sort

16. How the operations performed in Strassen's Matrix multiplication

17. What is the largest number of key comparisons made by binary search in searching for a key in the following array?

    3,14, 27, 31, 39, 42, 55, 70, 74, 81, 85, 93, 98
18. Apply the Quick sort to the list

    E , X , A , M ,P ,L , E

19. Compute 2011 * 1130 using divide and conquer algorithm.

20. Solve the average case recurrence for quick sort.

PART - B

1. Explain selection sort and bubble sort algorithm using brute force method and analyze with examples

2. Describe Sequential search and brute force string matching using brute force method

3. Explain the following in detail

   i) Closest pair problem

   ii) Convex hull problem

4. Describe exhaustive search in detail

5. Explain in detail quick sorting method. Provide a complete analysis of quick sort with example.

6. Explain in detail merge sort. Illustrate the algorithm with a numeric example. Provide complete analysis of the same.

7. Describe binary search in detail? And provide the complete analysis with example

8. Write short notes on the following

    i. Strassen's Matrix Multiplication

    ii. Multiplication of largest integer.

9. Apply strassen's algorithm to compute

$$\begin{vmatrix} 1 & 2 & 1 \\ 0 & 3 & 2 \\ 0\,1\,1\,1 & 0\,3\,2\,1 \end{vmatrix} \begin{vmatrix} 1\,2 \\ 4*1 \\ 5\,0\,1\,0\,4 \end{vmatrix} \begin{Vmatrix} & & \\ 0\,0\,4 & & \end{Vmatrix} \begin{vmatrix} 1 & 0 & 2 \\ 2 & 1 & 1 \\ & & \end{vmatrix}$$

10. Find the optimal solution for the assignment operator given below

	Job1	Job2	Job 3	Job 4
Person 1	4	3	8	6
Person 2	5	7	2	4
Person 3	16	9	3	1
Person 4	2	5	3	7

UNIT – 3

DYNAMIC PROGRAMMING AND GREEDY

PART - A

1. What is principle difference between dynamic programming and divide

    and   Conquer techniques?

2. Compute Fibonacci series using dynamic programming

3. Apply Warshall's Algorithm to find the transitive closure of the digraph defined by the following adjacency matrix

$$
\begin{matrix}
0 & 1 & 0 & 0 \\
0 & 0 & 1 & 0 \\
0 & 0 & 0 & 1 \\
\\
0 & 0 & 0 & 0
\end{matrix}
$$

4. What is meant by principle of optimality?

5. Define optimal binary search tree with example

6. What is the use of Warshall's algorithm and Floyd's Algorithm?

7. Define greedy technique.\

8. What is minimum spanning tree problem?

9. Define min heap and max heap

10. What are the operations performed by disjoint subset?

11. What is single source shortest path algorithm?

12. Differentiate variable length encoding and fixed length encoding

13. Write the Huffman Algorithm.

14. Define prim's Algorithm

15. What is Kruskal's Algorithm?

16. Define Dijkstra's Algorithm

17. Differentiate prim's Algorithm and Kruskal's Algorithm

18. What is Knapsack problem?

19. Define Quick find and quick union

20. How to calculate the efficiency of Dijkstra's Algorithm?

PART - B

1. Write an algorithm for binomial coefficient computation and analyze the efficiency of algorithm

2. Describe the Warshall's algorithm with example and analyze its efficiency

3. Explain Floyd's Algorithm for all pair shortest path algorithm with example and analyze its efficiency

4. Explain optimal binary search tree algorithm with example and analyze its efficiency

5. Describe Knapsack problem and Memory functions with example

6. Apply the bottom up dynamic programming algorithm to the following instance of Knapsack Problem

Item	Weight	Value
1	7	$42
2	3	$12
3	4	$40
4	5	$25

Capacity W=10

7. Explain in detail about prims algorithm with example and analyze its efficiency

8. Describe in detail about Kruskals Algorithm with example and analyze its efficiency

9. Explain Dijkstra's Algorithm in detail with example and analyze its efficiency

10. Write the Huffman's Algorithm. Construct the Huffman's tree for the following data and obtain its Huffman's Code

Character	A	B	C	D	E	-
probability	0.5	0.35	0.5	0.1	0.4	0.2

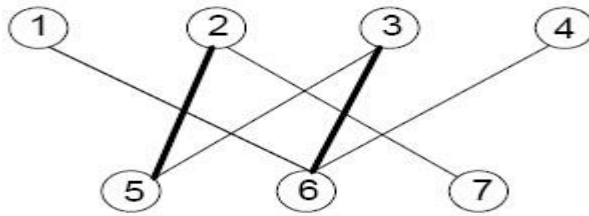**UNIT -4**

ITERATIVE IMPROVEMENT

PART - A

1. Define the iterative improvement technique.

2. List the standard form requirements of linear programming problem in simplex method.

3. Define the extreme Point theorem

4. Define basis and non basic solution

5. List the steps of simplex method

6. What is two phase simplex method?

7. Define Ellipsoid method

8. What is Bland's rule?

9. Differentiate Feasible and optimal solution

10. Solve the linear programming problem geometrically

    Maximize 3x+y
    Subject to –x+y <= 1
        2x + y < =4

        X >= 0 y > =0

11. List the properties of flow network

12. Define Max-Flow Min-Cut Theorem

13. What is Flow conservation requirement?

14. Define Augment path method/ Ford-fulkerson method

15. What is shortest augment path algorithm?

16. Define bipartite graph

17. What is maximum cardinality matching?

18. Write the stable marriage algorithm

19. Define forward and backward edges

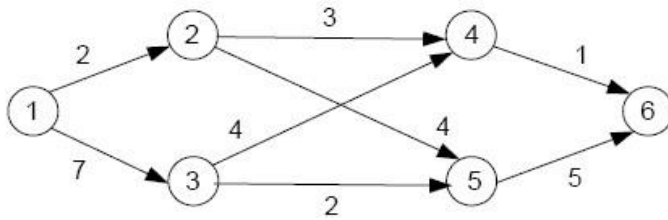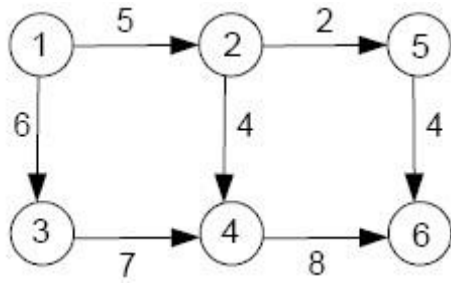20. For each matching shown below in bold, find an augmentation

PART - B

1. Descibe in detail about outline of simplex method

2. Explain geometric interpretation of Linear programming with example

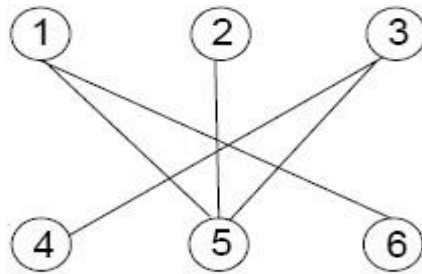3. Trace the simplex method on the following problems

    Maximize p= 2x-3y=4z

    Subject to 4x-3y+z<=3

        x+y+z <=10

        2x+y- z<=10 where x, y and z are non-negative

4. Explain the maximum flow problem algorithm and prove the max Flow min cut theorem 5. Apply the shortest augmenting path algorithm to find a maximum flow and minimum cut in the following network

6. Write the algorithm for maximum matching in Bipartite Graphs and prove
   the theorem with example

7. Apply the maximum matching algorithm to the following bipartite graphs

8. Explain the algorithm for stable marriage problem and prove the theorem
   with

   Example

9. Consider an instance of the stable marriage problem given by the ranking
   matrix

   A   B   C

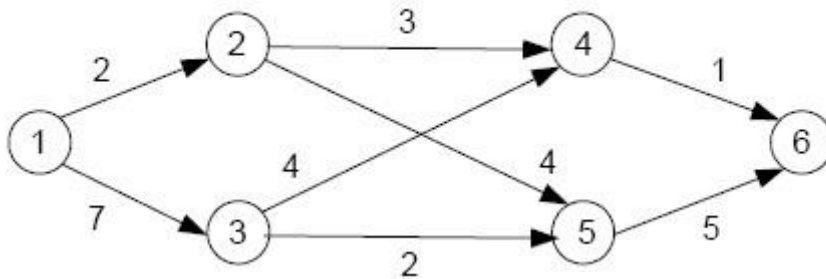α   1,3

2,2   3,

1   β

3,1

1,3   2,

2   γ

2,2

3,1   1,

3

For each of its marriage matching's, indicate whether it is stable or not

10.   Illustrate pictorially the Ford –Fulkerson method by showing the flow augmenting paths in bold for the given flow network
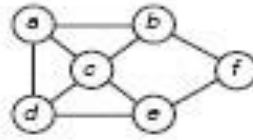

UNIT 5

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UNIT V
COPING WITH THE LIMITATIONS OF A LGORITHM

</div>

POWER

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PART - A

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1. What is information theoretic lower bound?

2. Define adversary method.

3. List the lower bounds for sorting, searching and multiplication.

4. Define decision tree with example

5. Write the formula for decision tree for searching a sorted array.

6. Define complexity theory

7. What is halting problem.

8. Define P and NP problems.

9. Give examples for NP Complete problems

10. What is CNFs satisfiablity problem?

11. What are the additional items required for branch and bound compared to backtracking technique

12. State the reason for terminating search path at the current node in branch bound algorithm

13. Define State Space tree

14. What is subset- sum problem?
15. Define N queens problem

16. Define branch and bound problem

17. Write nearest neighborhood algorithm

18. Write greedy algorithm for discrete knapsack problem

19. Define local search heuristics

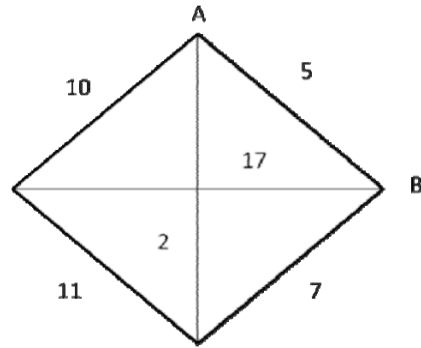20.Draw the Hamiltonian circuit for the given graph

PART - B

1. Explain lower bound Arguments in detail.

2. Draw the Decision Tree and Find the number of Key Comparison in the worst and average case for:

a. The four Element Binary search

b. the Three-element basic insertion sort.

3. i)Describe in detail about P and NP Problems ii) Write short notes on NP Complete Problem

4. Write backtracking algorithm for

a. The n-queens problem

b. Hamiltonian problem

c. The subset-Sum problem

5. Explain the Assignment problem in Branch and bound with Example.

6. Solve the following instance of Knapsack problem by Branch and bound Algorithm

Item	weight	profit	
1	5	$40	
2	7	$35	
3	2	$18	W=15
4	4	$4	

5	5	$10
6	1	$2

7. Apply the branch and bound algorithm to solve the traveling salesman problem for the following graph

8. Write short notes on the following using approximation Algorithm

   i) Nearest –neighbor algorithm with example

ii)Multifragment heuristic algorithm with example

9. i)Describe in detail about Twice around the tree algorithm with example

   ii) Explain local search heuristic with example

10. Explain the knapsack problem using approximation algorithm with example .

QUESTION BANK

MICROPROCESSOR and ITS APPLICATION
CMSA -CC10

UNIT-I

1)   a) Define microprocessor. Explain the brief history of evolution of μP.

2)   b) List the major features of 8085 microprocessor.

3)   Explain the requirement of a program counter, stack pointer and status flags in the architecture

      of 8085 microprocessor.

4)   Illustrate neat block diagram of 8085 microprocessor and explain its internal architecture.

4)   Draw the pin diagram of 8085 μP and explain the functionality of each pin.

5)   a) Draw and explain the flag register of 8085 microprocessor.

b) Describe how timing and control signals are generated in 8085 μP.

6) Illustrate the timing diagrams of the following 8085 μP instruction and explain them in detail.

a)   MOV A, M

b)   MVI B, 25H

7) List the various addressing modes of 8085 μP and explain each with suitable example.

8) Explain the following instructions of 8085 microprocessor with an example.

a)   Data transfer instructions

b)   Logical instructions

9)   Explain the following instructions of 8085 microprocessor with an example.

a)   Arithmetic instructions

b)   Machine control instructions

10)   a) Define instruction.

        b) Explain the instruction and data formats of 8085 µP.

11)   Explain the Branch, Stack & I/O instructions of 8085 µP with an example.

UNIT-II

        1) a) List the salient features of 8086 microprocessor.

        b) Draw and explain the flag register of 8086 microprocessor.

2) With the help of neat block diagram, describe the functionality of Bus interface unit and

        Execution unit of 8086 µP.

3) With the help of neat block diagram, explain the internal architecture of 8086 microprocessor.

4) Explain the functionality of pins used in the following modes of 8086 µP.

a)   Minimum mode.

b)   Maximum mode.

5)   List the registers present in 8086 µP and discuss its functionality.

6)   Draw the pin diagram of 8086 µP and explain its individual pin functionality.

7)   a) Mention the importance for memory segmentation.

b)   Explain the memory segmentation of 8086 µP.

8)   a) Write a short note on memory of 8086 microprocessor.

b)   Explain the physical memory organization in an 8086 µP.

9)   a) Mention the features of Pentium processor.

10)   b) List the major features of the 80386 processor.

11)   a) List the features of 80286 processor.

b)   Mention the differences between 8085 and 8086 microprocessors.

UNIT – III

1)   With the help of neat diagrams, Describe the differences between microprocessors and

        microcontrollers.

2)   a) List the features of 8051 microcontroller.   b) Mention the applications of microcontrollers in everyday life. [

3)   With the help of a neat block diagram, Explain the internal architecture of 8051 microcontroller in detail.

4)   a) Define register. Mention the need of registers in µP or µC.

b) Draw the flag register of 8051 µC and describe the functionality of each flag in detail

5) Mention the various registers present in 8051 µC and explain their functionality in detail

6) Draw the pin diagram of 8051 µC and describe the functionality of each pin in detail.

7) a) Mention the importance of I/O port in a µP or µC.

      b) Describe the functionality of I/O ports present in 8051 µC.

8)   a) Explain the importance of memory in a µP or µC.

b)   Describe how the memory is organised in 8051 µC in detail.

9)   a) Define addressing mode.

b)   List various addressing modes of 8051 microcontroller and explain them with an example

      each.

10)   a) Define counter. Mention the applications of counter

b)   Describe the operation of timers present in 8051 µC.

11)   a) Compare serial communication and parallel communication.

12)   b) Explain how the 8051 µC transfers the data using serial port.

UNIT – IV

1)   a) Write a short note on assembly language programming.

2)   b) Explain the moving data instructions of 8051 µC with an example.

3)   a) Write a short note on assembler.

b)   Explain various assembler directives of 8051 µC.

4)   a) Mention various logical operations performed in assembly language.

b)   Explain the logical Instructions of 8051 µC with an example.

5)   Explain the following operators of 8051 µC with an example.

6)   (i) Bit level   (ii) Byte level

7)   a) Mention the difference between Jump and Call operations.

b)   Explain Jump and Call instructions of 8051 µC with an example.

8)   a) Define interrupt. [L4][CO4][2M]

b)   Write a brief description of the interrupts present in 8051 µC.

9)   Write an assembly program of 8051 µC to multiply two 8-bit numbers and store the result in a

        memory location.

10)   a) Mention various arithmetic operations performed in assembly language.

b)   Explain the arithmetic Instructions of 8051 µC with an example.

c)   9) a) Describe the operation of return instruction in 8051 µC with suitable example.

b) Explain how the 8051 µC performs rotate and swap operations with an example.

10) a) Define ISR, Interrupt vector. [L1][CO4][4M] b) Explain how the ISR is implemented with an example. [L2][CO4][8M]

UNIT – V

1)   a) With a neat diagram, show the interfacing of a 4x4 matrix keypad with 8051 µC.

2)   b) Describe key bouncing problem and de-bouncing solutions.

3)   Describe with a schematic, the scanning of the 4x4 matrix keyboard in an 8051 based system and

identifying the key pressed.

4)   a) Write a short note on LCD Display

b)   With the help of a neat diagram show the interfacing of LCD Display with 8051 µC and

explain its operation.

5)   a) List instruction command codes for programming an LCD.

b)   List the merits, demerits and applications of an LED display over an LCD.

6)   a) List the features of 16X2 LCD display

b)   Draw and explain the pin Diagram of 16x2 LCD display.

7)   a) Write a short note on 7-Segemnt display

b)   With the help of a neat diagram, show the interfacing of 7- segment display with 8051 µC and

explain its operation.

8)   a) Write a short note on Analog to Digital Converter.

b)   With the help of a neat diagram, show the interfacing of ADC 0808 with 8051 µC and explain

its operation.

9)   a) Define Interrupt and classify the interrupts.

b)   Explain multiple interrupts present in 8051 µC.

10)   a) Draw and explain briefly SCON SFR in 8051 µC.

b)   Explain the various modes of operation w.r.t serial port in 8051 µC.

11)   Design and explain any microcontroller-based system.