4TH SEM. / CSE/IT / 2022(S)

Th-1 Operating System

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
   a. Define Process Synchronization.
   b. What is Demand Paging?
   c. What is the significance of using semaphore?
   d. What is Page Fault?
   e. Write the difference between program & process.
   f. What is Fragmentation?
   g. What are the objectives of operating system?
   h. What is Belady's anomaly?
   i. What do you mean by job scheduling?
   j. What is context switching?

2. Answer **Any Six** Questions 6 x 5
   a. What is Deadlock? Explain the necessary conditions for deadlock?
   b. What is Round Robin Scheduling algorithm? Explain with example.
   c. Explain different File allocation methods briefly.
   d. Compare the FCFS and SJF scheduling algorithm with respect to following.
      1.Turn Around Time
      2.Waiting Time
      Explain with suitable example.
   e. Explain Banker's algorithm for deadlock prevention.
   f. Define the following.
      1.Swapping
      2.Virtual Memory
   g Write short note on paging.

3 What are the functions of a Compiler? Explain briefly the seven phases of compiler. 10

4 What are the different page replacement algorithms available in operating system? Explain with example. 10

5 Explain different memory allocation techniques. 10

6 Explain different types of Scheduler with suitable diagram. 10

7 i) Explain SPOOLING with diagram. 10
   ii) Explain demand paging.

4TH SEM./APP.ELEC & INSTRU ENGG/ CSE/ECE/ETE/ IT/ MECHATRONICS/2022(S)

Th2 DATA COMMUNICATION AND COMPUTER NETWORK

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. What do you mean by subnet mask?
   b. Differentiate between physical address and logical address of a node in a network.
   c. Compare between star and ring topology.
   d. What is the role of protocol in networking?
   e. Write the functional difference between STP and UTP cable.
   f. What do you mean by line and block coding?
   g. Explain Nyquist theorm for channel capacity.
   h. Write the need of multiplexing in a communication channel.
   i. Distinguish between bit rate and baud rate.
   j. Give two examples of half duplex and full duplex mode of communications.

2. Answer **Any Six** Questions 6 x 5

   a. Illustrate different services provided by application layer in OSI model.
   b. Describe the TCP/IP layering model.
   c. List the difference between FDMA, TDMA and CDMA channelization techniques.
   d. What are the transmission impairments in communication medium?
   e. Classify synchronous and asynchronous mode of communication?
   f. List the functions of switch, bridge and gateway.
   g Explain the working principle of CSMA/CD.

3 Discuss different types of physical topologies in the network with diagram. 10

4	Describe different protocols work in each layer of OSI model	10
5	Explain different transmission medium used in data communication.	10
6	Illustrate NRZ and RZ coding techniques with examples.	10
7	Write Short notes on (ANY TWO) a) Bluetooth b)WLAN c) Parity bit d) Frame Relay	2X5

4th Sem./ AE&I/ CSE/ ECE/ETC /IT / 2022(S)

Th3 MICROPROCESSOR AND MICROCONTROLLER

Full Marks: 80 Time- 3 Hrs

Answer any **five** Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

   a. Differentiate between microprocessor and microcontroller.

   b. Determine the total memory accessed by 8085 microprocessor.

   c. Name different machine cycles of 8085 microprocessor and mention the number of T – states present in each machine cycle.

   d. Define Stack Pointer (SP) and Program Counter (PC) of 8085 μP?

   e. Give 2 examples each of 2 – byte and 3 – byte instructions for 8085 μP.

   f. Name the non-maskable and non – vectored hardware interrupts of 8085 μP.

   g. Consider the following 8085 program.
   MVI A, 25H
   RRC
   RRC
   Find the content of accumulator, A after execution of this program.

   h. What do **@** and **#** signs indicate in 8051 μC and where are they used?

   i. Draw the internal RAM structure of 8051 μC.

   j. Show different bit positions of flag register in 8086 μP.

2. Answer **Any Six** Questions. 6 x 5

   a. Explain different addressing modes of 8085 μP with examples.

   b. Give 2 examples each for the following groups of instruction of 8085 μP and explain their meaning.
   i) Data Transfer ii) Arithmatic iii) Logic iv) Branching v) Machine Control

   c. Draw the timing diagram for the instruction **MVI A, 67H**.

   d. Explain the different bit positions of flag register in 8085 μP. Given **[A]=58 H**, what will be content of flag register after execution of the following instruction?
   ADI A, BCH

   e. Explain the bit positions of control word of 8255 PPI for I/O and BSR Mode.

   f. Differentiate between memory mapped I/O and I/O mapped I/O

   g Write an 8051 – assembly level language program to find the multiplication of 8-bit data present in two consecutive memory locations and store the result in next memory location.

3	Draw the pin diagram of 8085 μP and explain each pin briefly.	10
4	Explain the architecture of 8255 PPI with the help of its block diagram.	10
5	Write an 8085 – assembly language program to find the largest number in a given array of 10 numbers.	10
6	Draw the internal architecture of 8086 μP and explain the function of each block briefly.	10
7	Write short notes (**Any TWO**). I. Timer Mode (T_{MOD}) and Timer Control (T_{CON}) registers of 8051 μC. II. Direct Memory Access (DMA). III. Software and Hardware Interrupts of 8085 μP.	10

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TH-4 Database Management System

Full Marks: 80 Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10

a. What do you mean by data redundancy?
b. Define the terms instance and schema.
c. What is composite key?
d. Define database management system.
e. Explain the role of DBA.
f. Define serializability.
g. Define a partial dependency.
h. Why views are created in database?
i. What is data dictionary?
j. Define query language.

2. Answer **Any Six** Questions 6 x 5

a. What is Normalization? Why it is required? Explain the Boyco-codd normal form with example.
b. Explain the 3-tier schema architecture of DBMS.
c. What do you mean by relational algebra? Explain the following relational algebra operations with example.
i)Projection ii) selection iii)full outer join
d. Explain the concept of mapping constraints with suitable example.
e. Explain briefly all the Data Definition Language commands with suitable example.
f. What is E-R diagram? Explain with suitable example.
g Define the following terms
i)Tuple ii)Attribute iii)Primary Key
iv)Foreign Key v)Domain

3 What is transaction processing? Explain the different states of transaction. Discus ACID properties. 10

4	What is encryption? Describe the different encryption technique.	10
5	Write the SQL commands with example of following i) Create Table ii) Viewing data of tables iii) Updating the contents of table iv) Modify the structure of a table v) Insert data into table	10
6	What is data concurrency? Explain the working of concurrency control mechanism.	10
7	What is database system. Explain briefly the different components of Database System.	10