QP Code:594304

(3 Hours)   [Total Marks : 80

CGVRold

N.B.: (1) Question **1** is compulsory.
(2) Attempt any **three** from remaining Questions.
(3) **Assume** suitable **data** wherever **necessary**.
(4) **Figure** in **right** indicates **marks**.

1.
(a) What are different application of computer graphics   20
(b) Explain even odd method for inside test for polygone
(c) Explain parallel and perspective projections
(d) Various application of VR

2.
(a) Explain Cohen Sutherland line clipping algorithm with example   10
(b) Derive the DDA line drawing algorithm. Take suitable example and draw   10
a line between two points.

3.
(a) Write a short note on Homogeneous co-ordinate system.   10
(b) List various types of computing architectures of VR and explain any   10
one in detail.

4.
(a) Explain Flood Fill Algorithm using 8-connected approach. What are its   10
advantages over Boundary Fill Algorithm?
(b) Derive the matrix for Rotation about an arbitrary point for 2D Rotation.   10

5.
(a) Let ABCD be the rectangular window with A(20,20), B(90,20), C(90,70),   10
and D(20,70). Find region codes for endpoints and use Cohen Sutherland
algorithm to clip the lines P1P2 with
P1 (10,30), P2 (80,90) and q1q2 with q1(10,tO),q2(70,60)
(b) Explain B spline curve   10

6.
(a) Show that transformation matrix for reflection about line y=x is equivalent   10
to reflection to X axis followed by counter clockwise rotation of 90 degree.
(b) Derive mathematical representation for Beziers curve and state their   10
property

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Q.P. Code : 594202

(3 Hours)   [Total Marks : 80

N.B.: (1) Question No. **1** is **compulsory**.
     (2) Solve any **three** questions out of remaining **five**.
     (3) Figures to **right** indicate **full** marks.
     (4) Assume suitable **data** where **necessary**.

1   **Attempt any four questions.**
  (a) Explain various states of a process with the help of a state transition diagram. (5)
  (b) What is Producer Consumer Problem? What is solution of example? (5)
  (c) Describe and design I-node structure of Unix operating system (5)
  (d) Discuss Critical Section Problem? How to solve it? (5)
  (e) What is system call? Explain any four system calls. (5)

2 (a) Use following Scheduling algorithm to calculate ATAT & AWT for the following process. (10)
     i) FCFS   ii) Pre-emptive and non-Pre-emptive SJF   iii) Pre-emptive Priority

Process	Arrival Time	Burst Time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

  (b) What is Thread? Explain User Level Threads and Kernel Level Threads. (10)

3 (a) Consider the following snapshot of a system (10)

Process	Max			Allocation			Available		
	A	B	C	A	B	C	A	B	C
P0	0	0	1	0	0	1	1	5	2
P1	1	7	5	1	0	0			
P2	2	3	5	1	3	5			
P3	0	6	5	0	6	3			

     Using Banker's algorithm answer the following questions
       i) How many resources are there of type (A, B, C)?
       ii) What are the contents of the Need matrix?
       iii) Is the system in a safe state? Why?

  (b) State the necessary conditions for deadlock. Explain deadlock prevention and avoidance (10)
     Techniques.

4 (a) Calculate page faults and Hits using FIFO, LRU and Optimal Page replacement algorithm (10)
     for the following page sequence (2,3,5,4,2,5,7,3,8,7). Assume Page frame size is 3.
  (b) What Is Kernel? Explain its types.

TURN OVER

5 (a) Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each off the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory?

    (b) Explain how logical address converted Into physical address in paging & what segmentation?

6   Write short note on
        (i) Semaphore
        (ii) Compare preemptive & Preemptive scheduling.
        (iii) Android OS
        (iv) Inter process communication

Q.P. Code : 594400

(3 Hours) [Total Marks: 80

N.B.:- (1) Question No. **1** is **Compulsory**.
    (2) Solve any **three** questions from the remaining **five** questions.
    (3) **Figures** to the **right** indicate **full** marks.
    (4) Assume **suitable** data where **necessary**.

1. (a) Define Embedded System. Explain application areas of embedded system.   5
   (b) Explain the pin configuration of 8051 microcontroller.   5
   (c) Compare AJMP, SJMP, LJMP instructions of 8051   5
   (d) Explain Real Time operating Systems and SoC in detail.   5

2. (a) Explain various Embedded microcontroller cores in detail.   10
   (b) Explain in detail ARM 7 pipelining   10

3. (a) Write an assembly language program for 8051 microcontroller to find and count the   10
   number of negative numbers from an array of signed numbers.
   (b) Explain the following SFR's of 8051:   10
   SCON, TCON, TMOD, PCON

4. (a) Explain addressing Modes of 8051 microcontroller.   10
   (b) Explain the following instructions with suitable examples w.r.t ARM processor   10
      (i) BX
      (ii) TEQ
      (iii) BIC
      (iv) BKPT
      (v) STC

5. (a) What is Semaphore? Explain the use of semaphore with respect to embedded systems.   10
   (b) Explain the architecture of 8051 microcontroller.   10

6. Write note on (any two):   20
   (a) Automated meter reading system
   (b) Digital clock as an Embedded system
   (c) 8051 Register Bank
   (d) Serial Port Communication in 8051

Q.P. Code : 594502

(3 hours)   **Marks : 80**

Note : 1) Question no. **1** is **compulsory.**
       2) Solve any **Three** questions out of remaining **Five** questions.

1. a) Explain different types of transparencies in distributed databases.   5
   b) What is a view? Discuss the difference between a view and a base relation.   5
   c) Explain Factless Fact Table.   5
   d) Illustrate the concepts of embedded SQL.   5

2. a) List and explain the operations on Files.   10
   b) Create an ER model for a Railway system with following constraints: 10
     i) Stations
     ii) Tracks, connecting stations. You can assume for simplicity that only one track exists between any two stations. All the tracks put together form a graph.
     iii) Trains, with an ID and a name
     iv) Train schedules recording what time a train passes through each station on its route. You can assume for simplicity that each train reaches its destination on the same day, and that every train runs every day. Also for simplicity, assume that for each train, for each station on its route, you store (a) time in, (b) time out (same as time in if it does not stop), and (c) a sequence number so the stations in the route of a train can be ordered by sequence number.
     v) Passenger booking consisting of train, date, from-station, to-station, coach, seat and passenger name; for simplicity, don't bother to model passengers as entities.

3. a) Explain the Object Database Concepts with: 10
     i) Object identity
     ii) Type constructors
     iii) Type hierarchies and inheritance and
     iv) Extents
   b) Why is the entity-relationship modeling technique not suitable for the data warehouse? How is dimensional modeling different? What are hierarchies and categories as applicable to a dimension table?   10

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4. a) Design a schema in SQL for a Library System. Show one example each for Primary key and Foreign Key constraint. Create one suitable ECA example to enforce the Library constraint.   10

   b) Consider a data warehouse for a hospital, where there are three dimensions: 10
      i) Doctor, ii) Patient and iii) Time and
         two measures i) Count and ii) Charge.
      Using the above example describe the following OLAP operations
         i) Rollup, ii) Drilldown iii) Slice iv) Dice and v) Pivot

5. a) Give three reasons why you think ETL functions are most challenging a data warehouse environment.   10

   b) Analyze the log after crash shown in Table-1 and briefly answer the following questions: 10
      i) What are the roles of the Analysis, Redo, and Undo phases in ARIES?
      ii) What is done during Analysis? (Be precise about the points at which Analysis begins and ends and describe the contents of any tables constructed in this phase.)
      iii) What is done during Redo? (Be precise about the points at which Redo begins and ends.)
      iv) What is done during Undo? (Be precise about the points at which Undo begins and ends.)

Table 1: Log after a crash.

0	BEGIN CHECKPOINT
5	END CHECKPOINT (EMPTY XACT TABLE AND DPT)
10	T1: UPDATE P1 (OLD: YYY NEW: ZZZ)
15	T1: UPDATE P2 (OLD: WWW NEW: XXX)
20	T1: COMMIT

6. a) With suitable relational schema give at least two examples of Simple and Nested Queries.   5

   b) Explain in short the concerrency control in distributed databases.   5

   c) Explain Role-Based Access Control for Multilevel Security.   5

   d) Describe the following OQL concepts (any two):   5
      i) Database entry points,
      ii) Path expressions,
      iii) Iterator variables,
      iv) Named queries (views),
      v) Aggregate functions, grouping, and quantifiers.

Q.P. Code : 594602

(3 Hours)   [Total Marks : 80

N.B. : (1) Question number 1 is compulsory.
        (2) Attempt any Three questions from remaining.
        (3) Assume suitable data, if necessary.
        (4) Draw suitable diagram wherever necessary.

1.   Attempt any four sub questions :-
   a.   Explain backup commands in Linux   5
   b.   Describe role of init signal   5
   c.   Explain permissions on directory and files   5
   d.   Describe 'AndroidManifest.xml' file components   5

2. a. What is daemon process. Name any five daemon processes. Explain working   10
        of any two in details.
    b. What is an Activity? How is it created? Draw and explain activity life cycle. 10

3. a. What is process? Mention briefly the role of fork-exec mechanism in fork   10
        creation.
    b. Explain with example usage of given commands- grep, tr, cat, sort, export.   10

4. a. Explain networking commands- nslookup, traceroute, host, ping, ifconfig.   10
    b. What is data persistency in Android   10

5. a. Discuss significance of given files- /etc/passwd, /etc/shadow, /etc/group,
        /etc/gshadow   10
    b. Draw hierarchical structure of Linux File system and explain any five   10
        directories.

6. a. Explain various open source software licences.   10
    b. What is shell programming ? Write a shell script that will sequentially clear 10
        screen, print only name of current directory, display name of all currently
        logged in users.