16CS/IS42

Fourth Semester B.E. Semester End Examination, May/June 2018-19

OPERATING SYSTEM

Hours

Max. Marks: 100

Instructions: 1. *Unit -I and Unit-III are compulsory*
2. *Answer any one full question from each of the remaining units*

UNIT – I (Compulsory)

	L	CO	PO	M
Define an Operating system? List and explain the different services provided by an operating system	(2)	(1)	(1)	(10)
Construct a sequence of system calls to transfer contents from one file to another. Explain layered approach with a neat diagram	(2)	(1)	(2)	(10)

UNIT – II

	L	CO	PO	M
With a neat process state transition diagram, explain the different states of a process.	(3)	(1)	(1)	(07)

Consider the following set of processes with Arrival Time and CPU Burst Time in milliseconds.

Process	Arrival Time	Burst Time
P1	0	10
P2	1	5
P3	2	7
P4	3	6

Apply SJF and Round Robin algorithms. Consider time quantum for Round Robin algorithm is 4 milliseconds. Draw Gantt Chart. Compute and compare the Average Waiting Time and Average Turn Around Time. (4) (2) (4) (10)

Explain three requirements for critical section problem. (2) (2) (1) (03)

OR

Explain any four Scheduling Criteria for CPU Scheduling Algorithms. (2) (2) (1) (04)

What is PCB? Explain its components. (2) (2) (1) (08)

Illustrate the Readers-Writers problem and provide a solution using semaphores. (2) (2) (1) (08)

UNIT – III (Compulsory)

	L	CO	PO	M
Define deadlock. What are the necessary conditions for deadlock to occur? Indicate how many of these should occur for deadlock to happen?	(2)	(3)	(1)	(10)

Solve the following snapshot using Banker's algorithm.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	0	2	0	0	4	1	0	2
P_1	1	0	0	2	0	1			
P_2	1	3	5	1	3	7			
P_3	6	3	2	8	4	2			
P_4	1	4	3	1	5	7			

i) Is the system in safe state?
ii) If a request from process P_2 arrives for (0,0,2), can the request be granted immediately? (3) (3) (2) (10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

UNIT - IV

			L	CO	PO
5	a.	What is Demand Paging? Explain the steps involved in handling page fault with diagram	(2)	(3)	(1)
	b.	Given memory partitions of 100k, 500k, 200k and 600k (in order). Which algorithm from worst fit and first fit places processes with requirements 212k, 417k, 112k and 426 k in manner?	(3)	(3)	(2)

OR

6	a.	Discuss Paging with neat diagrams.	(2)	(3)	(1)
	b.	Apply FIFO and LRU Page Replacement algorithms for page frames size 3 and find the for the following string: 5, 4, 3, 2 , 1 , 4 , 3 , 5 , 4 , 3 , 2 , 1 , 5	(3)	(3)	(2)

UNIT -V

			L	CO	PO
7	a.	What is a file? List and explain the various file attributes and file operations.	(2)	(3)	(1)
	b.	Discuss Remote File Systems in detail.	(2)	(3)	(1)

OR

8	a.	Discuss the different access methods in detail.	(2)	(3)	(1)
	b.	Explain the following directory structures with an example. i) single- level directory ii) two-level directory ii) three-structured directories	(2)	(3)	(1)

USN : _____ Course Code : 18CS662

Sixth Semester B.E. Semester End Examination, JULY SEPTEMBER 2022

DATABASE MANAGEMENT SYSTEM

Time: 3 hrs. Max. Marks :100

Instructions: 1. Answer any FIVE Full Questions selecting at least ONE Question from Each Unit.

	L	CO	PO	M

MODULE 1

1a. Explain the various characteristics of DBMS in detail. [2] [1] [1] [10]

1b. Explain the three-schema architecture with a neat diagram. [2] [1] [1] [10]

OR

2a. With a neat diagram, explain the various components of DBMS. [2] [1] [1] [8]

2b. Define Database and DBMS. Differentiate between File system and DBMS [2] [1] [1] [8]

2c. Explain the various reason, when not to use DBMS. [2] [1] [1] [4]

MODULE 2

3a. Suppose that you are a database designer and you have been approached to design a database for Karnataka Bank. Analyze the given scenario and model the same conceptually using an E-R diagram. Make appropriate assumptions and state the same.
1) Identify the various entities and their attributes(minimum - 4),
2) Specify the key attributes of each entity type,
3) Identify the various relationships between the entities,
4) The structural constraints on each relationship type. [4] [2] [2] [12]

3b. What is cardinality ratio? Explain the various types of cardinality ratios with an example for each. [2] [2] [1] [8]

OR

4a. Suppose that you are a database designer and you have been approached to design a database for MOVIE. Analyze the given scenario and model the same conceptually using an E-R diagram. Make appropriate assumptions and state the same.
1) Identify the various entities and their attributes(minimum - 4),
2) Specify the key attributes of each entity type,
3) Identify the various relationships between the entities,
4) The structural constraints on each relationship type. [4] [2] [2] [12]

4b. List and explain the various rules for Constructing an ER Model. [2] [2] [1] [8]

MODULE 3

5a. Consider the following tables:

CID	Course	Dept
CS01	DATABASE	CS
ME01	MECHANICS	ME
EE01	ELECTRONICS	EE

COURSES

Dept	Head
CS	ALEX
ME	MAYA
EE	MINI

Make use of the concepts of JOIN operation and per

1.Natural Join on Courses and HOD
2.Left outer join on Courses and HOD
3.Right outer join on Courses and HOD
4.Full outer join on Courses and HOD
5.Cartesian product of Courses and HOD

[3] [1]

5b. Consider the college database.

1.Student (USN, NAME, BRANCH, PERCENTAGE)
2.Faculty (FID, FNAME, DEPT, DESIGNATION, SALARY)
3.Course (CID, CNAME, FID)
4.Enroll (CID, USN, GRADE)

Write relational algebra expressions for the following:

1.Retrieve the name and percentage of all students for the course 18CS662.
2.List the Departments having an average salary of the faculties above Rs. 30,000.
3.List name of the course having students grade 'A' maximum
4.List the student name and faculty name who have opted for same course.
5.List the course names handled by all the faculty members who are Professor.

[3] [1]

OR

6a. List and explain the characteristics of relations.

[2] [1]

6b. With an example explain the various relational constraints.

[2] [1]

6c. List and explain the various Unary relational operations in Relational Algebra.

[2] [1]

MODULE 4

7a. Is the following relation in 1 NF? If not, apply the various ways for converting the into 1 NF.

USN	NAME	GENDER	CITY	HOBBIES

[3] [3]

7b. Give a relation that is not in 2NF, explain the concept of bringing a given relati Second Normal Form.

[2] [3]

OR

8a. Consider the Scheme à {City, Street, House Number, House Color, City Population}

1.key à {City, Street, House Number}
2.{City, Street, House Number} à {House Color}
3.{City} à {City Population}

Analyze the schema and convert the same in Second Normal Form

8b. Consider the Scheme à {Studio, Studio City, City Temp}

1.Primary Key à {Studio}
2. {Studio} à {Studio City}
3.{Studio City} à {City Temp}
4.{Studio} à {City Temp}

Analyze the schema and convert the same in Third Normal Form

[4] [3]

MODULE 5

9a. What is DDL & DML? Explain the various commands in DDL and DML with the sy

Feb-2022-Last Sem

[2] [4] [1] [10]

onsider the Relation (table) named Student.

USN	NAME	AGE	SEM	BRANCH
2GI19CS001	Amit	21	4	CS
2GI17EC005	Samit	22	6	EC
2GI17ME100	Sujit	20	4	ME
2GI17CS085	Mayank	23	6	CS

ite the SQL queries for the following:

1.Find student name, age who belong to CS department.

2.Find student USN and name whose age is between 18 and 21

3.Find student name who is in 4 sem and branch is ME.

4.Find student names whose age is more than 21 or who belongs to CS branch.

5.Find student names whose branch is CS or age is less than 21.

[3] [4] [2] [10]

OR

0a. List and explain the various keywords in SQL with an example for each.

[2] [4] [1] [10]

10b. Consider the following tables for insurance database.

1.person(driver_id,name,address)

2.car(regno,model,year);

3.accident(report_number,accd_date,location);

4.owns(driver_id,regno);

5.participated(driver_id,regno,report_number, damage_amount);

Draw the schema diagram for the same and write the SQL queries for the following statements:

1.Find the driver name and the model of the car which is own by them.

2.Find the model name and its year for the accidents that took place in Belagavi.

3.Find the number of accidents in which cars belonging to a specific model were involved.

[3] [4] [2] [10]