MCA-III Choice Base

Paper / Subject Code: 56301 / Database Management Systems | May - 2019

Q.P. Code: 38914

(3 Hours) [Total Marks: 80]

N.B.: 1) Question No.1 is **compulsory.**
2) Attempt any **three** from the remaining **five** questions.

Write a short note on following (any Four)

1. (a) Role of DBA (5)
   (b) Weak entity set with example (5)
   (c) Primary and secondary index (5)
   (d) Transaction state diagram (5)
   (e) Differentiate OODBMS and ORDBMS (5)
   (f) Objects, Oids and reference types (5)

2. (a) A Sai car rental service is a car rental showroom. They offer different types of car on rent as small car, SUV, MUV. Each car has max. seating available and tariff per km. A system is required to show availability of the no of cars of each type of serving the inquiry. A system should have provision for booking the car. Before booking customer need to provide personal information and driving license details. Booking typically stored as booking date, date of rent, duration and vehicle type. A new transaction record is created for each booking. (10)

   Draw an ER diagram for the case and also write the schema definition.

   (b) Explain Architecture of DBMS along with advantages. (10)

3. (a) Explain 1NF, 2NF, 3NF with the help of example. Normalize the below table till 3NF. (10)

Emp_id	Emp_name	Month	Sales	Bank_id	Bank_name
E01	David	Jan	1000	B01	SBI
E01	James	Feb	1200	B01	SBI
E02	Sam	Jan	2200	B02	UTI
E03	Lisa	Jan	1700	B02	UTI

   (b) Discuss the architecture of distributed database system in detail. (10)

4. (a) Define Minimal Cover. Consider the relation R(A,B,C,D,E) and set of functional dependencies are, F{ A->D,BC->AD,C->B,E->A,E->D}.Find minimal cover. (10)
   (b) Explain tree based indexing and hash based indexing. (10)

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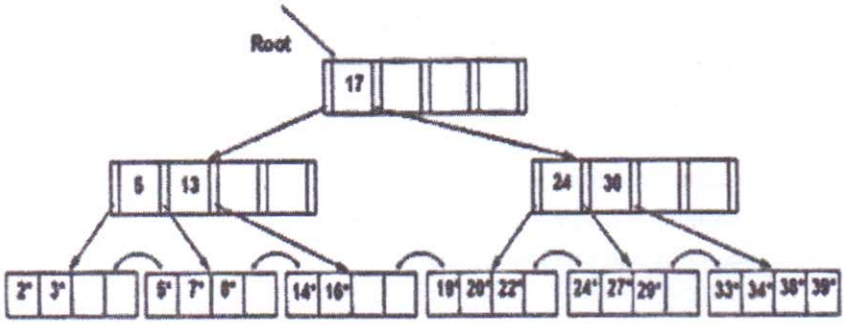
5 (a) What is B+ tree? Consider the following B+ tree; perform following operations on B+ tree assuming maximum capacity of node as four. (10)

A. Delete 19

B. Delete 20



(b) Write a note on 2 phase locking protocol in detail. Explain how it is used to handle concurrency in database. (10)

6 (a) Explain ACID properties of transaction along with example. (10)

(b) Explain horizontal and vertical fragmentation with example. Also specify replication types. (10)

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Sem-III / Paper / Subject Code: 56302 / Java Programming / May-2019

ice Based.

Q. P. Code: 24277

(3 Hours) [Total marks : 80]

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **three** from remaining **five** questions.

1. Attempt Any Four 20

a) Java is Platform independent and Architecture Neutral- Explain
b) Spring Framework Architecture
c) Compare Servlet Life Cycle with JSP Life cycle
d) Explain Annotations with suitable examples
e) Explain difference between Abstract classes and Interfaces

2. (a) What is Multithreading in java? Write a program to demonstrate use of synchronized keyword. 10
(b) Explain Lambda Expression with an example? What are the different objectives of Lambda Expressions? 10

3. (a) What is the use of Generics in java? Write a generic class to represent Stack which implements different data types like Integer and String. 10
(b) Explain steps to Connect a java Program to a database using JDBC. Add a note on types of result sets. 10

4. (a) Explain how java program is made persistent? Write a GUI program using swing to enter a file name in one textbox and view the contents of the file it in another text. 10
(b) What are Packages? Explain accessibility modifiers in Java with an example. 10

5. (a) Define an Exception? Explain Checked and unchecked Exception. Discuss how user defined exceptions can be implemented in Java. 10
(b) Differentiate the following(any 2) 10
1) ServletConfig and ServletContext
2) LinkedList and ArrayList
3) Static and final

6. (a) What is an Event Listener and Adapter classes? Explain the concept of the Anonymous inner class with an example. 10
(b) What are Actions in JSP? Explain use of "jsp:usebean" action with a suitable program.add a note on MVC. 10

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MCA/SEM III (Choice Base)

May 2019

Paper / Subject Code: 56303 / Information security

Q.P. Code: 40272

(3 Hours) **Total Marks: 80**

Note:

a) **Question No.1 is compulsory.**
b) Attempt any three from the remaining five questions.
c) Answer to sub questions should be answered together.
d) Illustrate answers with diagrams wherever necessary.
e) Use of Calculator is allowed.

Q1	A	Explain Diffie-hellman key exchange algorithm with example also discuss possible attack	10
	B	What is mutual Authentication? Discuss the problem associated with Mutual Authentication	10
Q2	A	Analyze the various principles of Security	10
	B	Discus the security services provided in the IEEE 802.11i	10
Q3	A	Discuss Kerberos as a third party authentication System	10
	B	What are firewalls? Explain the various configurations of the firewalls	10
Q4	A	Discuss the various methods of securing the databases	10
	B	Explain the various methods of providing security to the web services	10
Q5	A	Explain SHA-1 to calculate MD and compare it with MD5	10
	B	Write short notes on any two of the following i. HMAC ii. Key Distribution Center iii. DDOS	10
Q6	A	Discuss the various mode(Block cipher Modes) in which the algorithm can operate.	10
	B	What is Asymmetric key Encryption technique? Explain RSA With Suitable Example	10

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Sem-III

ice Based

Paper / Subject Code: 56304 / Operation Research / May-2019

Duration: 3 Hrs **Total Marks: 80**

Please check whether you have got the right question paper

N.B: (1) Question 1 is **compulsory.**
(2) Attempt any **Three questions** out of remaining **Five questions.**
(3) Assume any **necessary data**, if required, but **justify the same.**
(4) **Figures** to the **right** indicate **full marks** for that question.
(5) Use of Scientific **calculator** is **allowed.**

Q.1 a) Solve the following LPP using Graphical Method [10]

Maximize $Z = 20x1 + 35x2$

Subject to $3x1 + 3x2 \leq 36$

$5x1 + 2x2 \leq 50$

$2x1 + 6x2 \leq 60$

$x1, x2 \geq 0$

b) A small project is composed of 7 activities whose time estimates are listed below. Activities are being identified by their beginning (i) and ending (j) node numbers. [10]

Activities		Times in week		
i	j	Optimistic time	Most likely time	Pessimistic time
1	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

1. Draw the network
2. Calculate the expected variances for each
3. Find the expected project completed time
4. Calculate the probability that the project will be completed at least 3 weeks than expected
5. If the project due date is 18 weeks, what is the probability of not meeting the due date?

Q.2 a) Solve the following LPP using Simplex Method. [10]

Maximize $Z = 2x1 + 5x2$

Subject to $x1 + 4x2 \leq 24$

$3x1 + x2 \leq 21$

$x1 + x2 \leq 9$

$x1, x2 \geq 0$

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b) The Captain of a cricket team has to allot the five middle batting positions to five Batsmen. The average runs scored by each batsman at these positions are as follows: [10]

Batsman	Batting Position				
	I	II	III	IV	V
P	40	40	35	25	50
Q	42	30	16	25	27
R	50	48	40	60	50
S	20	19	20	18	25
T	58	60	59	55	53

Find the assignment of batsman to positions which will give the maximum number of runs.

Q.3 a) Solve the following using Big-M Method [10]

Minimize $Z = 2X_1 + 4X_2$

Subject to $2X_1 + X_2 \leq 18$

$3X_1 + 2X_2 \geq 30$

$X_1 + 2X_2 = 26$

and $x_1, X_2 \geq 0$

b) Find the initial basic feasible solution for the following transportation problem by Vogel's approximation method. [10]

	M1	M2	M3	Capacity
W1	26	23	10	61
W2	14	13	21	49
W3	16	17	29	90
Requirement	52	68	80	

Q.4 a) Two firms are competing for business under conditions so that one firm's gain is another firm's loss. Firm A's pay-off matrix is given below. Suggest optimum strategies for the two firms and find value of game [10]

		Firm B		
		No Advertising	Medium Advertising	Heavy Advertising
Firm A	No Advertising	10	5	-2
	Medium Advertising	13	12	15
	Heavy Advertising	16	14	10

b) Solve the following problem using Dual Simplex Method [10]

Minimize $Z = 2x1 + 2x2 + 4x3$

Subject to $2x1 + 3x2 + 4x3 \geq 2$

$3x1 + x2 + 7x3 \leq 3$

$x1 + 4x2 + 6x3 \leq 5$

$x1, x2, x3 \geq 0$

Q.5 a) A truck owner finds from his past records that the maintenance cost per year of a truck whose purchase price is Rs. 8000 are given below: [10]

Year:	1	2	3	4	5	6	7	8
Maintenance cost in Rs.:	1000	1300	1700	2200	2900	3800	4800	6000
Resale value in Rs.:	4000	2000	1200	600	500	400	400	400

Determine which time is profitable to replace the truck?

b) Processing time of six jobs (in hrs) on three machines M1, M2, M3 are given below: [10]

Jobs	1	2	3	4	5	6
M/C M1	3	12	5	2	9	11
M/C M2	8	6	4	6	3	1
M/C M3	13	14	9	12	8	13

Determine the sequence which will minimize the total elapse time. Also find idle time for each machine.

Q.6 a) Solve using Gomory's cutting plane method [10]

Maximize $Z=7X1 + 9X2$

Subject to $-X1 + 3X2 \leq 6$

$7X1 + X2 \leq 35$

$x1, X2 \geq 0$ and interger

b) A small assembly plant assembles PCS through 9 interlinked activities. The time duration for which is given below. I) Draw a Network ii) Calculate total float, free float and independent float. [10]

Activity	1-2	1-3	1-4	2-5	3-6	3-7	4-6	5-8	6-9	7-8	8-9
Duration	2	2	1	4	8	5	3	1	5	4	3

-Alsem-III | Paper / Subject Code: 56305 / Software Testing and Quality Assurance | May-19
choice based.

(3 Hours) Total Marks: 80

N.B. : 1) Question No.1 is **compulsory.**
2) Attempt any **three** from the remaining five questions.
3) Answer to sub-questions should be grouped together.

1. (a) Explain the difference between black box and white box testing? (05)

(b) Differentiate between functional testing and non-functional testing (05)

(c) Compare and contrast V model and VV model (05)

(d) What is testing? How is debugging different from testing? (05)

2. (a) How are reviews useful tool for static analysis. Explain role and responsibilities of people involved in reviews (10)

(b) What is incident reporting? Explain incident status model (10)

3. (a) Explain data flow anomalies used to reveal defects. Identify the data anomalies in following code (10)

```
double Sqrt(double X)
{ double returnValue;
 if (X > 0.0)
  { double W;
 while (ABS(W*W-X) > 0.01)
 {
W = W - ((W*W-X) / (2.0 * W));
 }
returnValue = W;
 } else
 {
 returnValue = 0.0;
 }
return (returnValue);
 }
```

(b) Explain the SQA plan in detail? (10)

4. (a) Draw CFG and calculate statement coverage, branch coverage and path coverage for the given code (10)

```
main()
{ int P,Q;
Cin>>P;
Cin>> Q;
IF P+Q > 100
cou<< "Large";
If P > 50
Cout<< "P Large";
}
```

(b) Explain the Principles of testing? (10)

5. (a) Draw and Explain the Architecture for test Automation? (10)

   (b) What are the different test tool selection criteria? Give steps required to select a tool. (10)

6. **Write short notes on (any four)** (20)
   - (a) Steps in Measurement
   - (b) Software Maintenance Activities
   - (c) Five Views of Software Quality
   - (d) Testing Object Oriented System
   - (e) ISO 9126 characteristics
