MCA / Paper / Subject Code: 56301 / Database Management Systems / NOV-2018

Sem-III - choice based

(3 Hours) [Total Marks: 80]

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

1. Write a short note on following (any Four)

(a) Data Independence (5)
(b) Generalization and specialization (5)
(c) Differentiate Extensible and linear hashing (5)
(d) Role of DBA (5)
(e) Objects, Oids and reference types (5)
(f) Differentiate OODBMS and ORDBMS (5)

2. (a) Design an Entity Relationship (ER) model for a college database with following requirements (10)

(i) A college contains many departments
(ii) Each department can offer any number of courses
(iii) Many instructors can work in a department
(iv) An instructor can work only in one department
(v) For each department there is a Head
(vi) An instructor can be head of only one department
(vii) Each instructor can take any number of courses
(viii) A course can be taken by only one instructor
(ix) A student can enroll for any number of courses
(x) Each course can have any number of students

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

(b) Explain Architecture of DBMS with the help of diagram (10)

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

(b)
EMP_PROJ

Ssn	Ename	Pnumber	Hours
123456789	Smith, John B.	1	32.5
		2	7.5
666884444	Narayan, Ramesh K.	3	40.0
453453453	English, Joyce A.	1	20.0
		2	20.0
333445555	Wong, Franklin T.	2	10.0
		3	10.0
		10	10.0
		20	10.0
999887777	Zelaya, Alicia J.	30	30.0
		10	10.0

(b) What are the various data distribution techniques in Distributed database (10)

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4. (a) Find the candidate key and closure for given set of functional dependencies. (10)
Consider the relation R(A,B,C,D,E) with dependencies:
R = ABCDE, F = {A -> BE, C -> BE, B -> D}
(b) Explain B+ tree with the help of an example. (10)

5 (a) How ISAM is different from B+ tree (10)
(b) How conflict serializability is different from view serializabilty? Explain with the help of an example? (10)

6 (a) Explain difference between query and transaction? Explain various transaction states with the help of diagram? (10)
(b) Explain parallel data base architecture with the help of a diagram. (10)

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MCA / Paper / Subject Code: 56302 / Java Programming

Sem-III - CHOICE BASED / NOV. 2018

Q. P. Code: 24278

(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) Explain difference between Swing and AWT
b) What is Bytecode? Explain how java achieves platform independence using ByteCodes.
c) Explain difference between Abstract classes and Interfaces
d) Write a note on Dependency Injection in Spring Framework.
e) JSP implicit objects

2. (a) What is Session Tracking in Servlets? Explain use of Cookies and HttpSession API. 10
(b) What are Lambda Expressions? Explain syntax and use of Lambda expressions with a suitable program. 10

3. (a) What are Directives in JSP? Explain Page, Taglib and include directive with a simple coding snippet. 10
(b) What is Exception Handling? Explain use of try,catch, throw and throws keyword with a suitable program using java. 10

4. (a) What are Byte Streams and Character Streams? Write a simple program to read and write data to a file using character streams. 10
(b) What is JDBC? Explain steps to Connect java program to Oracle database using type 4 drivers. 10

5. (a) What is InterThread Communication? Explain how you will use it to solve Producer consumer problem using a suitable program. 10
(b) Explain in brief 10
a) GenericServlet and HttpServlet
b) Custom Tags and JSTL

6. (a) Add a note on 10
a) Wrapper Classes
b) Generic Classes using Java
(b) What is Event Delegation model? Explain any two event listeners in detail. 10

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MCA- | **Paper / Subject Code: 56303 / Information security** | NOV-2018

Sem III - choice based.

[3 hours] [Marks: 80]

a) Question No. 1 is compulsory
b) Attempt **any three** from the remaining six questions
c) Assumptions should be made whenever required and should be clearly stated
d) Answers to sub questions should be answered together
e) Illustrate answers with diagrams wherever necessary
f) Use of Calculators is permitted

Q1	A	What is information security? Discuss the various principles of network security	10
	B	Discuss one round structure of the DES	10
Q2	A	Explain the methods of implementing security on databases	10
	B	What are the pros and cons of symmetric and asymmetric key encryption? Explain a method that adapts the advantages of both the techniques	10
Q3	A	Define message digest . Explain SHA for getting the message digest and compare it with MD5	10
	B	What are web services? Explain and discuss the hierarchy of providing security to the web services	10
Q4	A	Explain Kerberos as a third party authentication service.	10
	B	What are the objectives of SET? Explain how are the objectives achieved	10
Q5	A	Explain the WEP and WEP 2 used in the IEEE 802.11i standard .	10
	B	Explain the various implementations of Firewalls	10
Q6	A	Write short notes on **any four** of the following a) KDC b) Modes of Encryption c) TLS d) DDoS e) Reflection attack	20

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MCA / Paper / Subject Code: 56304 / Operation Research

Sem-III- CHOICE BASED / NOV.2018

Q. P. Code: 38581

[Time: 3:00 Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B: 1. Question No.1 is compulsory.

2. Attempt any 3 questions from question 2 to 6.

3. Figure to the right indicates marks.

4. Use of scientific calculator is allowed.

5. mixing of sub-questions not allowed

Q.1) a) Five jobs are to be processed at three machines A, B and C in the order ABC. The time taken by each job on the three machines is given below. Each machine can process one job at a time. Determine the optimum sequence for the jobs and total elapse time. Also find the idle time for each machine. **[10]**

Task	Jobs				
	1	2	3	4	5
A	7	12	11	9	8
B	8	9	5	6	7
C	11	13	9	10	14

b) A house wife makes sauce and chutney which she sells to the local store each week. She obtains a profit of Rs 4 and Rs 5 for a kg of chutney and sauce respectively. One kg of chutney requires 3 Kg of tomatoes and 4 cups of vinegar and one kg of sauce requires 5 kg of tomatoes and 2 cups of vinegar. She can buy 24 kg tomatoes and 3 bottles of vinegar at discounted price each week. The 3 bottles provide 16 cups of vinegar. In order to make it worthwhile the store insists on buying at least 3 kg of goods each week. What combination should be made in order to maximize profit. Form a Mathematical model and use graphical method to get solution **[10]**

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

Maximize $Z = 12X1 + 3X2 + X3$

Subject to

$10X1 + 2X2 + X3 <= 100$

$7X1 + 3X2 + 2X3 <= 77$

$2X1 + 4X2 + X3 <= 80$

$X1, X2, X3 >= 0$

b) Find an initial basic feasible solution to the following transportation problem by VAM Method **[10]**

Plant	Distribution centre					Supply
1	2	3		11	7	6
2	1	0		6	1	1
3	5	8		15	9	10
Requirement	7	5		3	2	

Q.3) a) Solve the following assignment problem and find the optimum assignment that will result in the minimum man hours needed.

		Jobs				
		A	B	C	D	E
Workers	P	10	12	15	12	8
	Q	7	16	14	14	11
	R	13	14	7	9	9
	S	12	10	11	13	10
	T	8	13	15	11	15

b) Find the optimal strategies and value of the game for the following problem: [10]

	Player B		
Player A	1	-1	-1
	-1	-1	3
	-1	2	-1

Q.4) a) The data collected in running a machine, the cost of which is Rs 60,000 are given

Year	1	2	3	4	5
Resale Value (Rs.)	42000	30000	20400	14400	9650
Cost of spare (Rs.)	4000	4270	4880	5700	6800
Cost of Labour	14000	16000	18000	21000	25000

Determine the optimum of replacement of the Machine? [10]

b) The following are set of activities and different time estimates for a project in days

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Optimistic(to)	1	1	2	1	2	2	3
Most likely™	1	4	2	1	5	5	6
Pessimistic(tp)	7	7	8	1	14	8	15

i) Draw the network.
ii) Determine the expected duration and variance of each activity.
iii) Find the expected project length.
iv) Calculate the variance and standard deviation of project length. If the project due date is 18 weeks, what is the probability of not meeting the due date [P(z=0.33)= 0.623] [10]

Q. P. Code: 38581

Q.5)a) A salesman has to visit five cities A, B., C, D, E. The distance between 5 cities are as below. If the salesman starts from city A and has to come back to city A which route will he select so that the total time to visit all cities will be minimum? [10]

	TO CITY					
From		A	B	C	D	E
city	A	0	7	6	8	4
	B	7	0	8	5	6
	C	6	8	0	9	7
	D	8	5	9	0	8
	E	4	6	7	8	0

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

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

Subject to $2x1 + 3x2 + 5x3 \geq 2$

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

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

$x1, x2, x3 \geq 0$

Q.6) a) Solve the following LPP by Big-M method:

Maximize $Z = 3x1 - x2$

Subject to $2x1 + x2 \leq 2$

$x1 + 3x2 \geq 3$

$x2 \leq 4$

$x1, x2 \geq 0$

b) Consider the data shown below for a project [10]

i) Draw the network diagram and determine the project duration and the critical path

ii) Determine total float, free float and independent float for each activity

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
Duration(weeks)	2	4	3	1	6	5	7

Paper / Subject Code: 56305 / Software Testing and Quality Assurance / NOV-2018

Sem- III choice based

Q.P. Code: 25401

Total Marks: 80

(3 Hours)

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) ISO 9126 Quality characteristics? **(05)**

(b) What is testing? How is debugging different from testing? **(05)**

(c) Explain the Five Views of Software Quality. **(05)**

(d) Explain the V Model. **(05)**

2. (a) Explain statement coverage and path coverage with the example? **(10)**

(b) What is mean by review? Explain different work steps involved in review process? **(10)**

3. (a) What is Incident Management? Explain Incident reporting and Incident Status Model in detail? **(10)**

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

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

(b) Explain cause effect graphing and decision table technique with suitable example? **(10)**

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

(b) Explain the test objectives, test environment and test strategies for unit testing **(10)**

6. Write short notes on (any four) **(20)**

(a) OO testing.

(b) ISO 9000:2000 Principles (any 5 principles)

(c) Regression testing

(d) Data flow anomaly

(e) Use case testing.
