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INSTITUTE OF COMPUTER SCIENCE

UNIVERSITY QUESTION PAPERS (ICS)

RE-EXAM PAPER MAY-2010

SEM-III

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RE-EXAM PAPER MAY-2010

SEM-III

SR.NO	SUBJECT	REMARK
1	OBJECT ED ORIENTED PROGRAMMING C++	✓
2	DATA BASE MANAGEMENT SYSTEM	×
3	DATA COMMUNICATION NETWORKS	✓
4	OPERATION RESEARCH	✓
5	SOFTWARE ENGINEERING	✓
6	MANAGEMENT INFORMATION SYSTEM	✓

MCA Sem III May-2010

OOPC++

on No–4

Con. 3290–10. (REVISED COURSE) JR–1234

(3 Hours) [Total Marks : 100

N.B.: (1) Question No **1** is **compulsory**
(2) Answer any **four** questions from Q.2 to 7
(3) **All** questions carry **equal** marks

1a) What is Inheritance? Explain public, private and protected inheritance in detail. 10

b) What is Operator Overloading? Write a program in C++ to Overload [] operator to create an array of integers that checks the bounds (Safe Array). 10

2a) Explain the difference between – 10
1) Function Overloading and Function Overriding
2) Associative and Sequence Containers

b) Design an Employee class and Write Function to Calculate Gross Salary. 10

3a) Design a Class Bank with acno, name and balance attributes. Define functions to withdraw, deposit and check balance. Design an exception to handle a minimum balance condition of Rs. 500. 10

b) Explain file handling mechanism of C++. 10

4a) Write notes on : – 20
i) Function Templates
ii) Static and Dynamic casts
iii) Scope resolution operator
iv) Void pointers

5a) What is Constructor? Explain Default constructor, Parameterized constructor and constructor overloading with a suitable example. 10

b) Explain Inline and Virtual Functions with a suitable example 10

6a) Explain the use of following operators in C++ 10
1) * 2) & 3):: 4) . dot operator 5) ++

b) What are manipulators? Explain different manipulators with suitable examples.

7a) Explain New and Delete operator with suitable example. 10

b) Explain data types and Control structures in C++. 10

SEM - III - DBMS

Un. 3283-10. (REVISED COURSE) JR-1232

(3 Hours) [Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**. Attempt any **four** from the remaining **six**.
(2) **All** questions carry **equal** marks.
(3) Assumptions made should be **clearly** stated.

1. Consider a university database for a university registrar's office. The office maintains data about each class, including the instructor, the number of students enrolled, and the time and place of the class meetings. For each student-class pair, a grade is recorded. 20
   (a) Construct an ER diagram for the above system. Document all assumptions that you make for designing.
   (b) Write schema definition and normalize all tables to 3NF for the above ER diagram.

2. (a) Consider the following relational schema : 10
   Person (**driver-id**, name, address)
   car (**carID**, model, year)
   accident (**report-number**, date, location)
   participated (**driver-id, carID, report-number**, damage-amount)

   Write SQL query for the following :
   (i) Find the people who owned cars that were involved in accident in 2002.
   (ii) Find the number of accidents in which the cars belonging to "rahul" were involved.
   (iii) Find all the cars whose model number starts from "M".
   (iv) Delete the record in own table where car belongs to Vishal.
   (v) Update the damage amount for the car with car number "AABB2000" in the accident with report number "AR2197" to $3000.

   (b) Differentiate following (any **two**) :– 10
   (i) ER Model vs Relational Model
   (ii) Dense Index vs Sparse Index
   (iii) FD vs MVD.

3. (a) Briefly explain the architecture of database system. Explain how is it different from the conventional file system. 10
   (b) Explain the responsibilities of DBA. 10

4. (a) What is transaction ? Explain the ACID properties for transaction. 10
   (b) What is Bell-LaPadula model ? Explain. 10

5. (a) What is an index on a file of records ? What is a search key for an index ? Why do we need indexes ? 10
   (b) Write a short note on query processing. 10

6. (a) What is locking protocol ? Explain two phase, strict two phase and rigorous two phase locking protocol. 10
   (b) What is recoverable schedule ? Why is recoverability of schedule desirable ? 10

7. Write short note on the following (any four) :– 20
   (a) Foreign Key
   (b) Strong Entity
   (c) Deadlock
   (c) Shadow Paging
   (e) Triggers.

MCA-SEM-III-MAY-2010
Subj.-Data Communication Network.
DATE- 28/05/2010.

JR–1222

on. 3287–10.

(3 Hours) [Total Marks : 100

N.B. : (1) **All** question carry **equal** marks.
(2) Question No. **1** is **compulsory**.
(3) Attempt any **four** of remaining.
(4) Assume **suitable** data if **required**.

1. A] Explain why layered architecture is preferred in communication model. Explain ISO-OSI Reference model. Compare ISO and TCP/IP. 10

B] Explain Optimality principle. Explain Link State Routing algorithm in detail. 10

2. A] what is the difference between CSMA. CSMA/CD and collision free protocol? Explain any one collision free protocol. 10

B] Discuss Un-Guided media of transmission. 10

3. A] Explain three way handshakes for TCP connection establishment. 10

B]With respect to IP address Explain class of IP address, Subnet and masking and superneting in detail. 10

4. A] Explain any 2 IEEE standards with frame format. 10

B]Explain the concept of sliding window. Compare sliding window protocol with stop and wait protocol for noisy channel. 10

5. A] Explain HDLC frame format in detail. 10

B] Explain fragmentation? why is it needed? How is it done. 10

6. write short notes on(any 4) 20

i) ARP
ii) MIME
iii) Hamming code
iv) Multiplexing
v) Tunneling.

7. A] with respect to satellite define orbit, period , footprint ? Discuss categories of satellite network. 10

B] Explain IPV6 header in detail. 10

OR SEM - III May 2010

. half-Exm.10-Mina-(e)

n. 3294-10. JR-1225

(3 Hours) [Total Marks : 100

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume any **necessary** data but justify the **same**.
(4) **Figures** to the **right** indicate **full** marks.
(5) Use of calculator is **allowed**.

1. (a) A Co. produces two types of hats. Each hat of the first type requires twice as much labour time as the second type. Taken consideration of labour time the Co. can produce a total of 500 hats a day. The maximum daily sales of the first and second type are 150 and 250 hats. Assuming that the profits per hat are Rs. 8 for type A and Rs. 5 for type B. Formulate the problem as a LPP and solve it graphically. 10

(b) The activities of a project are tabulated below with jobs with normal and crash time cost : 10

Job	Normal		Crash	
	Cost (Rs.)	Time (days)	Cost (Rs.)	Time (days)
1 – 2	1400	6	1900	4
1 – 3	2000	8	2800	5
2 – 3	1100	4	1500	2
2 – 4	800	3	1400	2
3 – 4	–	Dummy	–	Dummy
3 – 5	900	6	1600	3
4 – 6	2500	10	3500	6
5 – 6	500	3	800	2

Indirect cost for the project is Rs. 300 per day :—
(i) Draw the network of the project
(ii) Determine the critical path an the normal duration and cost of the project.
(iii) Find the optimum duration and minimum project cost.

2. (a) Use Big M method to solve the following LLP :— 10

Max $z = 4x_1 + 5x_2 - 3x_3$ subject to the constraints

$x_1 + x_2 + x_3 = 10$

$x_1 - x_2 \geq 1$

$2x_1 + 3x_2 + x_3 \leq 40$

$x_1, x_2, x_3 \geq 0$.

(b) A car hire company has one car at each five depots a, b, c, d and e,. A customer requires a car in each town, namely A, B, C, D and E. Distance (in kms) between depots (origins) and towns (destinations) are given in the following distance matrix. 10

	a	b	c	d	e
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

How should cars be assigned to customers so as to minimize the distance travelled ?

[TURN OVER

3. (a) Use two-phase simplex method to solve the following LPP :— **10**

Min $z = x_1 + x_2$ subject to the constrains

$2x_1 + x_2 \geq 4$

$x_1 + 7x_2 \geq 7$

$x_1, x_2 \geq 0$

(b) Give the following data :— **10**

		Destinations			Capacity
		1	2	3	
Sources	1	92	89	90	32
	2	91	91	95	27
	3	87	90	92	19
Demand		10	18	35	

How many units should be transported from sources to the destinations so that the total cost of transporting all the units to their destinations is a minimum ?

4. (a) Use the dual simplex method to solve the following LPP :— **20**

Min $z = 2x_1 + x_2$ subject to the constraints

$3x_1 + x_2 \geq 3$

$4x_1 + 3x_2 \geq 6$

$x_1 + 2x_2 \geq 3$

$x_1, x_2 \geq 0$

(b) Four jobs 1, 2, 3 and 4 are to be processed on each of the five machines A, B, C, D and E in the order ABCDE. Find the total minimum elapsed time an idle time for machines if no passing of jobs is permitted. **20**

		Machine				
		A	B	C	D	E
Job	1	7	5	2	3	9
	2	6	6	4	5	10
	3	5	4	5	6	8
	4	8	3	3	2	6

5. (a) A baking company sells one of its types of cakes by weight. It makes a profit of 95 paise a pound on every pound of cake sold on the day it is baked. It disposes of all cakes not sold one the day they are baked at a loss of 15 paise a pound. If the demand is known to be rectangular between 3000 and 4000 pounds, determine the optimum amount to be baked. **20**

(b) Following mortality rates have been observed for a certain type of fuses : There are 1000 fuses in use and it costs Rs. 5 to replace an individual fuse. If all fuses were replaced simultaneously it would cost Rs. 1·25 per fuse. It is proposed to replace all fuses at fixed intervals of time whether or not they have burnt out, and to continue replacing burnt-out fuses as they fail. At what intervals, the group replacement should be made ? Also prove that this optimal policy is superior to the straight-forward policy of replacing each fuse only when it fails. **20**

Week	1	2	3	4	5
% failing by the end of week	5	15	35	75	100

(a) Use the relation of dominance to solve the rectangular game whose payoff matrix to A is given :— 10

	I	II	III	IV	V	VI
I	0	0	0	0	0	0
II	4	2	0	2	1	1
III	4	3	1	3	2	2
IV	4	3	7	–5	1	2
V	4	3	4	–1	2	2
VI	4	3	3	–2	2	2

(b) Use Gomory's Cutting Plane Method to solve the following LPP : 10
Max $z = 7x_1 + 9x_2$ Subject to the constraints
$-x_1 + 3x_2 \leq 6$
$7x_1 + x_2 \leq 35$
$x_1, x_2 \geq 0$ and integers.

(a) The demand for an item in a company is 18000 units per year, and the company can produce the item at a rate of 3000 per month. The cost of one set-up is Rs. 500 and the holding cost of one unit per month is 15 paise. The shortage cost of one unit is Rs. 200 per year. Determine the optimum manufacturing quality and the number of shortages. Also, determine the manufacturing time and the time between set-ups. 10

(b) Draw the network diagram. Find total, free and independent floats. 10

Activity	Duration
1 - 2	2
1 - 3	2
1 - 4	2
2 - 5	4
3 - 6	5
3 - 7	8
4 - 7	4
5 - 8	2
6 - 8	4
7 - 9	5
8 - 9	3
9 - 10	4

6. (a) Use the relation of dominance to solve the rectangular game whose payoff matrix to A is given :— 10

	I	II	III	IV	V	VI
I	0	0	0	0	0	0
II	4	2	0	2	1	1
III	4	3	1	3	2	2
IV	4	3	7	–5	1	2
V	4	3	4	–1	2	2
VI	4	3	3	–2	2	2

(b) Use Gomory's Cutting Plane Method to solve the following LPP : 10

Max $z = 7x_1 + 9x_2$ Subject to the constraints

$-x_1 + 3x_2 \leq 6$

$7x_1 + x_2 \leq 35$

$x_1, x_2 \geq 0$ and integers.

7. (a) The demand for an item in a company is 18000 units per year, and the company can produce the item at a rate of 3000 per month. The cost of one set-up is Rs. 500 and the holding cost of one unit per month is 15 paise. The shortage cost of one unit is Rs. 200 per year. Determine the optimum manufacturing quality and the number of shortages. Also, determine the manufacturing time and the time between set-ups. 10

(b) Draw the network diagram. Find total, free and independent floats. 10

Activity	Duration
1 - 2	2
1 - 3	2
1 - 4	2
2 - 5	4
3 - 6	5
3 - 7	8
4 - 7	4
5 - 8	2
6 - 8	4
7 - 9	5
8 - 9	3
9 - 10	4

Con No. File

MCA-SEM-III- May-2010.
Subj-Software Engineering

Con. 3378-10. GR-1237

(3 Hours) [Total Marks : 100

N.B. (1) Question No.1 is compulsory.
(2) Answer any four from the remaining questions.

1. a) Discuss the various stages of COCOMO II model. Explain the categories of projects for which COCOMO II is applicable. 10

   b) What is meant by Software reliability? How do you measure it in terms of MTBF, MTTF, MTTR . 10

2. a) Discuss the various key process areas of CMM at various maturity level. 10

   b) What is SRS? Why SRS known as the black box specification of a system. 10

3. a) Explain in brief module coupling and module cohesion. 10

   b) Define software configuration items. Explain how they are used in SCM process 10

4). a) Discuss the relationship between quality factor & quality criteria in Mc. Call's software quality model. 10

   b) Discuss any two white-box testing techniques with suitable examples along with the control flow graphs. 10

5. a) Enumerate Boehm's top ten software risks. What is meant by RMMM plan? Develop a RMMM plan for any IT risk and explain its contents 10

   b) Explain the Putman resource allocation model. What are the limitations of the model? 10

6. a) Explain any two decomposition techniques with suitable examples. 10

   b) What are size metrics? How is a function point metrics advantage over LOC metric? Explain. 10

7. Write shorts notes on :- 20

   A) FAST

   B) System Testing

   C) Wok Breakdown Structure

   D) Reverse Engineering.

MCA-SEM-III-May-2010.
Sub:-MIS.

...on. 3302-10. (REVISED COURSE) JR–1228

(3 Hours) [Total Marks : 100

N.B. 1)Question 1 is compulsory.
2) Attempt any Four out of remaining six Questions.
3) Answers to questions should be grouped and written together.

1.(a) Explain how quality of information improves the knowledge and decision making capability of the people? (10)

(b) What is business process? Explain types of Business Information systems from a functional perspective. (10)

2.(a) What is strategic planning? What are the different types of strategies? (10)

(b) What is MIS. "Development of MIS is linked with the business plan of organization" comment on this. (10)

3.(a) What is enterprise system ? How does it work ? Explain e-business enterprise with e-commerce ,e-communication and e-collaboration. (10)

(b) MIS support managers in his functional responsibilities explain? (10)

4.(a) Explain how Organization is a system? What are parameters on which an organization is structured? (10)

(b) Distinguish among top, middle and operational management plans in terms of goal, scope and content. (10)

5.(a) When would you resort to prototype approach and when would you resort to life cycle approach in development of MIS? (10)

(b) What problem does the System Analyst face in Ascertaining the information requirement at various level of management and how are these problems tackled? (10)

6.(a) The selection of Information Technology is a Strategic Decision in MIS development, explain it. (10)

(b) What is DSS? Explain various components of DSS? (10)

7. Write short notes on any four: - (20)

(a) Porter's Competitive Model
(b) push v/s pull based S.C.M
(c) Short range v/s Long Range Planning
(d) Analytical and Operational C.R.M.
(e) T.P.S.
