

MCA SEM-I

22nd May 2009

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Computer Organisation and Architecture

Con. 2270-09.

(REVISED COURSE)

BB-9285

(3 Hours)

[Total Marks : 100

- Q.1 (a) Draw the instruction cycle state diagram. 5
- (b) Using K-Map simplify the following expression in four variables A,B,C,D
 $F(A,B,C,D) = A'BC + ABD' + ABCD + A'B'CD$ 5
- (c) Depict diagrammatically a Micro programmed Control Unit. 5
- (d) Draw the block diagram of an I/O Module. 5
- Q.2 (a) Explain memory hierarchy. What is cache memory? Why is it used? 10
- (b) What are interrupts? Explain a complete instruction cycle with interrupts, using diagrams. 10
- Q.3 (a) One of the major problems in designing an Instruction Pipeline is assuring steady flow of instructions to the initial stages of the pipeline. How would you deal with conditional branches? 10
- (b) What is bus arbitration? Explain daisy chaining & polling with suitable block diagram 10
- Q.4 Differentiate between following (Any Four):- 20
- (a) Sequential Vs Combinational Circuits
- (b) SRAM Vs DRAM
- (c) RISC Vs CISC
- (d) Asynchronous Vs Synchronous Transmission
- (e) I/O mapped I/O Vs Memory mapped I/O
- Q.5 (a) Discuss 4 to 1 multiplexer using Truth Table. Draw its implementation using the appropriate gates. 10
- (b) (i) Explain Flynn's classification of parallel processing 05
- (ii) What is a Shift Register. 05
- Q.6 (a) Explain different RAID levels in detail. 10
- (b) What is locality of reference? Explain the different types of localities. Explain performance characteristics of two level memory. 10
- Q.7 Write short note on the following (any four):- 20
- (a) DMA
- (b) Flip-flop
- (c) Half-adder
- (d) Associative Memory.

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MCA SEM-I
System Analysis Design

20th May 2009

Con. 2267-09.

BB-9282

(3 Hours)

[Total Marks : 100

- N.B.:** (1) question **No.1 is compulsory**
 (2) attempt **any four questions** out of remaining six questions
 (3) answer to the questions should **be grouped and written** together
 (4) use legible hand writing use a blue /black ink pen to write answers. Use of pencil should be done only to draw diagram and graphs
 (5) all questions carry equal marks.

Q1.	(A) Built a matrimonial system . Draw CLD, DFD up to two level, ER diagram, draw input and output screen.	10
	(B) Compare and contrast white box and black box testing	10
Q2.	(A) Explain H/S & S/S and which source do you consider the most reliable and why?	10
	(B) Which is the most important and serious system security why?	10
Q3.	(A) What is the purpose of Normalization, illustrate the method of normalization of database	10
	(B) Discuss the six special system test	10
Q4.	(A) What cost elements are considered in the cost/benefit analysis what do you think is most difficult to estimate why?	10
	(B) Explain fact finding techniques?	10
Q5.	(A) Explain RAD and waterfall model	10
	(B) What is the reason for selecting the prototype development method?	10
Q6.	(A) Describe component of CASE tools, indicating the function performed by each	10
	(B) What are structured walkthroughs and how are they carried out?	10
Q7.	(A) explain decision Table and decision Tree	10
	(B) what is the requirements of good system analyst?	10

V-Ex-I-09-E-Scan-122

MCA SEM-I
Programming with 'C'

18th May 2009

Con. 3026-09.

BB-9279

(3 Hours)

[Total Marks : 100

- N.B.:** (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** from the remaining **six** questions.
(3) Assumptions should be **clearly** stated.
(4) Give **programming examples** and **syntax** where **required**.
(5) Answers to the questions should be **grouped** and written **together**.
1. (a) What is a symbolic constant ? How is a symbolic constant defined ? How is the definition written ? Where must a symbolic constant definition be placed with in a C Program. 15
(b) What is an expression ? What are its components ? 5
2. (a) How to initialize the structure variable ? Explain with suitable examples. 10
(b) Write a complete C program to compare 10 nos and print maximum and minimum no. 10
3. (a) What is a file ? Compare binary and text file. Give the example to open and close the files. 10
(b) Write a complete C program to print following format— 10
1
121
12321
1234321
123454321
4. (a) Write a function that will scan a character string passed as an argument and convert all lower case character into their uppercase equivalents. 10
(b) What are the Storage classes ? Explain with suitable example. 10
5. (a) Summarize the use of gets and puts function to transfer strings between the computer and the standard input/output device. Compare the use of these functions with the string transfer features in scanf and printf statements. 12
(b) Write a program to accept an unsorted list of names and sort them. 8
6. (a) How is a pointer variable declared ? What is the purpose of data type included in the declaration ? Explain pointers to 1D array. 10
(b) Write a complete C program to check whether the given number is palindrome. 10
7. Write short notes (any **four**) :— 20
(i) Stream File
(ii) Actual Parameters and Formal Parameters
(iii) Type casting
(iv) Relational operators
(v) Multi Dimensional Arrays
(vi) Structure within a structure.

MCA SEM-I

27th May 2009

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Con. 2483.09

Principles Of Economics and Management

BB-9292

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.
(2) Attempt any **two** questions from Question Nos. 2 to 4.
(3) Attempt any **two** questions from Question Nos. 5 to 7.
(4) All questions carry **equal** marks.

1. (a) "Economies of scale may be either internal or external they may be technical, managerial, financial or risk-bearing" — Elucidate. 10
(b) "One cannot be successful without planning". Give an overview of planning as a Management function. 10
2. (a) Monopolistic Competition does not offer equilibrium in the short run to the industries. Why? 10
(b) What do you understand by law of demand? What factors are important in explaining the law of demand? 10
3. Write short notes on :—
(a) Oligopoly 5
(b) Law of Supply 5
(c) Distinguish between Micro and Macro Economics 5
(d) Managerial Economics. 5
4. (a) What does the term 'market' mean in economics? What are the assumptions made in defining perfect competition? 10
(b) Explain why MC cuts AC at the bottom of its U. Also trace the relationship between cost curves while explaining the law of variable proportion. 10
5. (a) What do you perceive are the major challenges that HR managers will have to face in the near future? 10
(b) Discuss the importance of performance appraisals and its types. 10
6. (a) Trace briefly the development of management thoughts and highlights major contributions to it. 10
(b) Define Authority, Accountability and Responsibility as learnt in management. 10
7. Write short notes on :—
(a) Marketing Mix 5
(b) Product Life Cycle 5
(c) Theory of X and Y 5
(d) Matrix Organization. 5

Con. 2280-09.

BB-9294

(3 Hours)

[Total Marks : 100

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

1. (a) Attempt any two of the following : [10]
 i. Distinguish between GET and POST method.
 ii. Date Object in Javascript.
 iii. Block-level tags in HTML.

- (b) Write JavaScript code to convert temperature by using following GUI. Add event on Convert button to convert temperature from Fahrenheit to Degree Celsius and vice versa if the user enter any value of any temperature. [10]

Fahrenheit <input type="text"/>	Convert
Degree Cel <input type="text"/>	

Use the following formula for the conversion.
 $Celsius = 5/9 * (Fahrenheit - 32)$

2. (a) Write a differences and similarities between HTML, DHTML and XHTML. [10]
 (b) What is CSS? Explain different types and the usefulness of it. [10]
3. (a) Explain user-defined and built-in objects in JavaScript along with example. [10]
 (b) What is Event, Event handlers and Event handler attributes in JavaScript? Write a code to demonstrate events handling in JavaScript. [10]
4. (a) Explain Request and Response object available in ASP. [10]
 (b) What is the difference between Application and Session object? Explain with example. [10]
5. (a) Explain different steps in Web development cycle. [10]
 (b) Explain different types of website with suitable example. [10]
6. (a) Write JavaScript program demonstrating the inter-window communication by changing background color and text color of the new window and from new window changing the colors of current window. Accept the colors using following GUI from current window and develop similar for the new window. [10]

This is current window.	
Background color of new window	<input type="text"/>
Text color of new window	<input type="text"/>
Open new window	Change colors of new window
Close Window	

- (b) What is Cookies? Explain along with example advantages of cookies. [10]

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Con. 2280 HW-0104-00.

2

7. (a) Write HTML coding to develop following GUI.

[10]

First Name:	<input type="text"/>	Last Name:	<input type="text"/>
Address:	<input type="text"/>		
City:	State: <input type="text"/>	Zip:	<input type="text"/>
Country:	<input type="text" value="United State"/>		
Product:	<input type="text"/>		
Date Purchased:	<input type="text"/>		
Serial #:	<input type="text"/>		
Used for:	<input type="checkbox"/> Home		
	<input type="checkbox"/> Business		
	<input type="checkbox"/> Government		
	<input type="checkbox"/> Educational Institution		
	<input type="checkbox"/> Other		
System (check all that apply):	<input type="checkbox"/> Windows		
	<input type="checkbox"/> Macintosh		
	<input type="checkbox"/> UNIX		
	<input type="checkbox"/> Other		
Comments?:	<input type="text"/>		
	<input type="button" value="Send Registration"/> <input type="button" value="Cancel"/>		

(b) Create web page that take any number from user & print triangle for that number. E.g

[10]

```
5
5 4
5 4 3
5 4 3 2
5 4 3 2 1
5 4 3 2
5 4 3
5 4
```

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MCA SEM-I
Discrete Mathematics

25th May 2009

Con. 27/1-11/09

BB-9288

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

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

1. (a) (i) Obtain a disjunctive normal form of $(P \wedge \neg(Q \vee R)) \vee (P \rightarrow Q)$ [5]
(ii) Let $S = \{1, 2, 3, 4\}$ and let $A = S \times S$. Define the following relation R on A :
 $(a, b) R (a', b')$ if and only if $a+b = a'+b'$
Verify that R is an equivalence relation. Determine A/R . [5]
- (b) (i) Determine whether the set $S = \{1, 2, 3, 6, 12\}$ with $a * b = \text{G.C.D.}(a, b)$ is a semigroup, a monoid or neither. If it is a monoid, specify the identity. If it is a semigroup or a monoid determine whether it is commutative. [5]
(ii) Determine whether the sequence $\{a_n\}$ is a solution of the recurrence relation $a_n = 2a_{n-1} - a_{n-2}$, for $n = 2, 3, 4, \dots$, where $a_n = 2^n$ for every non-negative n . [5]
2. (a) (i) Construct the truth table of $\neg(P \vee (\neg Q \vee \neg R))$ [5]
(ii) What are quantifiers? Explain with suitable examples. [5]
- (b) Let $A = \{1, 2, 3, 4, 12\}$. Consider the partial order of divisibility on A . That is, if a and $b \in A$, aRb iff 'a divides b'. Draw the Hasse diagram of the poset (A, R) . [10]
3. (a) (i) Using mathematical induction prove that (n^3+2n) is divisible by 3 for every positive integer n . [5]
(ii) Test the validity of the following arguments. [5]
If milk is black then every cow is white. If every cow is white then it has four legs. If every cow has four legs then every buffalo is white and brisk. The milk is black. So every buffalo is white.
- (b) (i) Establish the following result without using truth tables. [5]
 $P \rightarrow (Q \rightarrow R) \Leftrightarrow (P \wedge Q) \rightarrow R$
(ii) Find the solution to the recurrence relation [5]
 $a_n = 3a_{n-1} - 2a_{n-2}$
with the initial conditions $a_1 = 5$ and $a_2 = 3$.
4. (a) (i) Find the particular solution of $a_r - 3a_{r-1} + 3a_{r-2} - a_{r-3} = 4$. [5]
(ii) Let $\{a_n\}$ and $\{b_n\}$ be sequence of real numbers then show that [5]
 $\nabla(a_n b_n) = a_{n-1} \nabla(b_n) + b_n \nabla(a_n)$
where Δ denotes the forward difference.
- (b) State the Tower of Hanoi problem. Obtain its recurrence relation with suitable initial conditions. Solve the recurrence relation. [10]
5. (a) (i) Let G be a group. Show that the function $f: G \rightarrow G$ defined by $f(a) = a^{-1}$ is an isomorphism if and only if G is abelian. [5]
(ii) Let $A = \{1, 2, 3, 4, 5, 6\}$ and $P = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 4 & 3 & 1 & 5 & 6 \end{pmatrix}$ be permutation on A Find the smallest positive integer k such that $P^k = \text{Identity permutation}$. [5]

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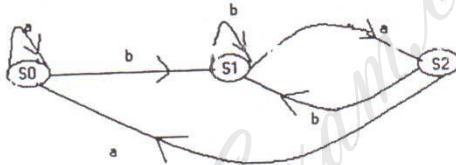
(b) (i) Let $H = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ be a parity check matrix. [5]

Determine the (2,5) group code $e_H: B^2 \rightarrow B^5$.

(ii) Let $H = \begin{bmatrix} 1 & 1 \\ 0 & 1 \\ 1 & 0 \\ 0 & 1 \end{bmatrix}$ be a parity check matrix. Decode 0110 relative to a maximum likelihood decoding function associated with e_H . [5]

6. (a) (i) Let d be the (4, 3) decoding function defined by $d: B^4 \rightarrow B^3$. If $y = y_1y_2 \dots y_{m+1}$ $d(y) = y_1y_2 \dots y_m$ Determine $d(y)$ for the word y in B^4 for (1) $y = 0110$ (2) $y = 1011$ [5]

(ii) Construct the state transition table of the finite state machine whose diagram is shown below. [5]



(b) (i) Let $V = \{v_0, w, a, b, c\}$ $S = \{a, b, c\}$ and let \mapsto be the relation on V^* given by
 1. $v_0 \mapsto aw$ 2. $w \mapsto bbw$ 3. $w \mapsto c$ [5]

Consider the phrase structure grammar $G = (V, S, v_0, \mapsto)$. Derive the sentence ab^4c . Also draw the derivation tree.

(ii) Let the state transition table for a finite state machine be [5]

	0	1
S_0	S_0	S_1
S_1	S_1	S_2
S_2	S_2	S_3
S_3	S_3	S_0

List values of the transition function f_w for (a) $w=01001$, (b) $w=11100$.

7. (a) Determine whether the relation R on a set A is reflexive, irreflexive, symmetric, asymmetric, antisymmetric or transitive. Give necessary explanation to your answer. $A =$ set of all positive integers, aRb iff $|a-b| = 2$. [10]

(b) Perform the following. [10]

- (i) $(11011.110)_2 = (?)_{10}$
- (ii) $(213)_8 = (?)_{10}$
- (iii) $(1101)_2 - (1001)_2 = (?)_2$
- (iv) $1011 \times 1010 = ?$
- (v) $10100 \div 100 = ?$