



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
FIRST SESSIONAL

SUBJECT CODE : (IT506) SUBJECT NAME : Advanced Microprocessor Architecture

Examination	: B.TECH - Semester - V	Seat No.	:
Date	: 03/08/2012	Day	: Wednesday
Time	: 10 to 11	Max. Marks	: 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 State true/false and justify your answer (no marks without justification).

- | | |
|--|----|
| (a) If string related instructions are not used in the program, 8086 will never access ES automatically. | 02 |
| (b) After reset, 8086 fetches its first instruction from physical address 00000H. | 02 |
| (c) Even though 8086 has 1 Mbytes of physical memory, it can access only 64 kbytes memory at a time. | 02 |
| (d) Two different logical addresses can point to the same physical address in 8086. | 02 |
| (e) Interrupt subroutine can not be single stepped. | 02 |
| (f) MOV AX,7FFFEH
MOV BX,02H
ADD AX,BX
INTO | 02 |

When INTO instruction is executed, type 4 response will be generated.

Q.2

- | | |
|--|----|
| (a) The 8086 system requires following memory map :
EPROM - 80000H TO 80FFFFH
EPROM device available is of size 2 Kbytes. Use 3625 bipolar PROM as decoder to map above devices using absolute decoding. Write down the truth table and draw the complete circuit diagram. State your assumptions, if any, very clearly. | 06 |
| (b) Write a program to move a string 'DDIT' which is defined in a logical segment named DATA1 to another logical segment named DATA2 using MOVS instruction. Draw neat flow chart and state your assumptions, if any, very clearly. | 06 |

OR

- | | |
|--|----|
| Q.2 (a) MOV AX,FFFFH
MOV BL,02H
DIV BL
Describe the response of 8086 after the execution of DIV BL instruction. | 06 |
| (b) The 8086 system requires following memory map :
EPROM - 40000H TO 43FFFFH
EPROM device available is of size 8 Kbytes. Use 3625 bipolar PROM as decoder to map above devices using absolute decoding. Write down the truth table and draw the complete circuit diagram. State your assumptions, if any, very clearly. | 06 |

- | | |
|--|----|
| Q.3 (a) The instruction "JE LABEL" is an example of
(i) Short jump (ii) near jump (iii) far jump (iv) intersegment jump | 01 |
| (b) (e) The BP register is typically used for accessing
(i) extra segment (ii) code segment (iii) stack segment (iv) data segment | 01 |
| (c) Which of the following is an illegal 8086 instruction
(i) mov ax,[bx] (b) INC [bx] (c) ADD bx,[bx] (d) ADD ax,[cx] | 01 |
| (d) IRET instruction modifies
(i) CS only (ii) IP only (iii) CS and IP (iv) CS, IP and flag register | 01 |
| (e) If you align your word array to odd address boundary, it will take less time to read the word from this array compared to the array aligned to even boundary address. State true/false and justify. | 02 |
| (f) Far CALL instruction will push first IP and then CS on stack. State true/false and justify. | 02 |
| (g) If the variable TEMP is defined as TEMP DW 1234h. Write the instruction to move a MSB byte of variable TEMP into AL register such that assembler should not give any error. | 02 |
| (e) Address 00010H in IVT contains 0000H and address 00012H contains 1000H. To what interrupt type do these locations correspond? What is starting physical address for the interrupt service procedure? | 02 |

OR

- | | |
|---|----|
| Q.3 (a) Which addressing mode allows to have two different machine codes to an instruction? | 02 |
| (b) State the addressing mode for the following instructions :
(i) Mov ax,[1234] (ii) mov ax,[bx] (iii) mov ax,[bx+si] (iv) mov ax,[bx+1234] | 04 |
| (c) When processor is executing DIV instruction, a low to high going edge has occurred on NMI pin. Divide by zero error has occurred at the end of the DIV instruction. Describe the response of 8086 for this situation. | 06 |



Examination : First Sessional

Seat No. : _____

Date : 04/08/2012

Day : Saturday

Time : 10:45 to 12:00

Max. Marks : 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

- (a) Which of following is not $O(n^2)$. Justify your answer. [2]
A. $n + 10000n$ B. $n1.9999$ C. $105n + 26n$ D. $n3/\sqrt{n}$
- (b) Prove that $n^2 \log n \neq \theta(n^2)$ [2]
- (c) $\sum 2^i = \theta(f(n))$ where $i=1$ to n , what is $f(n)$? [2]
- (d) $T(n) = 3T(n/3) + \sqrt{n}$ Solve using master theorem. [2]
- (e) Define limit rule. [2]
- (f) Write recurrence relation for the tower of Hanoi and calculate running time for the no of disk=6. [2]

Q.2 Attempt *Any Three* from the following questions. [12]

- (a) Write Divide and Conquer algorithm to find maximum & minimum of N numbers and derive running time. [4]
- (b) Describe step by step operation of merge sort on given dataset. [4]
3, 4, 1, 8, 5, 9, 7, 2
- (c) Determine the frequency count for given statements for given algorithm segment. [4]
for $i = 1$ to n do
 for $j = 1$ to i do
 for $k=1$ to j do
 $x = x + 1$;
- (d) Calculate worst case time complexity for given algorithm. [4]
Integer *fastExp*(Integer a , Integer n , Integer m)
{
 if ($n == 0$) return 1;
 if ($n == 1$) return a ;
 $x = \text{fastExp}(a, n/2, m)$;
 if (*even*(n)) return $x^2 \pmod{m}$;
 else return $x^2 a \pmod{m}$;
}

Q.3 (a) Write an algorithm for Quick Sort and analyze running time of this algorithm. [6]

- (b) Solve the following recurrence relation using the substitution method. [6]

$$T(n) = 1 \quad n \leq 4$$
$$2T(\sqrt{n}) + \log n \quad n > 4$$

OR

Q.3 (a) Solve given 2X2 matrix multiplication using stressor's algorithm and calculate the running time of the algorithm. [6]

$$\begin{matrix} 4 & 5 & 3 & 4 \\ 3 & 2 & 2 & 1 \end{matrix}$$

- (b) Solve the following recurrence using recurrence tree method. [6]

$$T(n) = 1 \quad n = 1$$
$$T(n/3) + T(2n/3) + cn \quad n > 1$$



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]

SUBJECT: (IT-505) COMPUTER & COMMUNICATION NETWORK

Examination	: First Sessional	Seat No.	: _____
Date	: 06/08/2012	Day	: Monday
Time	: 11 to 12:15	Max. Marks	: 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. [12]

(a) Fill In The Blanks: [2]

- (I) 100Base-T means _____
- (II) In ATM reference model the physical layer is divided into two sub layers _____ and _____.
- (III) The frame status (FS) byte is set by the _____ and checked by the _____ station which removes its frame from the ring and generates another token.

(IV) In _____ technique, each node gets a chance to access the medium by rotation.

- (b) (I) Your company has a LAN in its downtown office and has now set up a LAN in the manufacturing plant in the suburbs. To enable everyone to share data and resources between the two LANs, what type of device(s) are needed to connect them? Choose the most correct answer. [2]**
- a) Modem (b) Repeater (c) Hub (d) Bridge

(II) The slowest transmission speeds are those of :

(a) twisted-pair wire (b) coaxial cable (c) fiber-optic cable (d) microwaves

- (c) What are the two reasons for using layered protocols? [2]**
- (d) What is the advantage of token passing protocol over CSMA/CD protocol? [2]**
- (e) Why does ATM use the cell of small and fixed length? [1]**
- (f) Is there any drawback of using piggybacking? [1]**
- (g) What is the difference between network layer delivery and transport layer delivery? [1]**
- (h) Give two examples of a 'collision-free' protocol? [1]**

Q.2 Attempt Any Two from the following questions. [12]

- (a) (I) Consider a message D, presented by the following polynomial [4]**
- $$x^{19} + x^{17} + x^{16} + x^{13} + x^{12} + x^{11} + x^9 + x^5 + x^2 + 1$$
- Calculate the CRC code R for that message using a "generator-polynomial"
- $$x^7 + x^5 + x^4 + x^3 + x^2 + 1.$$
- Represent in binary code the message to be sent (D and R)

(II) List the functions performed by the physical layer of 802.3 standards? [2]

- (b) The following character encoding is used in a data link protocol: [6]**
- A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000
- Show the bit sequence transmitted (in binary) for the four character frame : A B ESC FLAG when each of the following methods are used:
- (a) Character count.
- (b) Flag bytes with byte stuffing.
- (c) Starting and ending flag bytes, with bit stuffing.
- (c) (I) Explain IEEE 802.5 standard. [4]**
- (II) Draw Manchester and differential Manchester encoding for the following binary pattern [2]**
- 100011110111011

- Q.3** (a) Test if these code words are correct, assuming they were created using an even parity Hamming Code. If one is incorrect, indicate what the correct code word should have been. Also, indicate what the original data was. Assume that not more than 1 bit is in error. [6]
 (I) 010101100011 (II) 111110001100 (III) 000010001010
- (b) (I) Explain High level data link control protocol. [4]
 (II) In Go-Back-N protocol, what will be the maximum sender's window size if four bit sequence field is used? [2]

OR

- Q.3** (a) (I) ACK 7 has been received by the sender in a go-back-N sliding window system. now frames 7,0,1,2& 3 are sent .For each of the following separate scenarios, discuss the significance of the receiving of [6]
 (a) An ACK 1
 (b) An ACK 4
 (c) An ACK 3
 (II) Repeat the above question using selective-repeat protocol for following separate scenarios, discuss the significance of the receiving of
 (a) A NAK 1
 (b) A NAK 3
 (c) A NAK 7
- (b) (I) What is the principle difference between connectionless communication and connection-oriented communication? [3]
 (II) Match the following [3]
- | | |
|----------------------|---|
| (A) Stop & Wait | (1) Receives out of order Frames |
| (B) Go-Back-N | (2) Sends only one Frame at a time. |
| (C) Selective Repeat | (3) Used in connectionless communication |
| (D) Pipelining | (4) Used in connection oriented communication |
| | (5) Receive only one packet at a time. |
| | (6) Sends Frame & ACK together. |



DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [INFORMATION TECHNOLOGY]
SUBJECT: (IT 502) DATABASE MANAGEMENT SYSTEM

Examination : First Sessional
Date : 09/08/2012
Time : 10.45 to 12.00

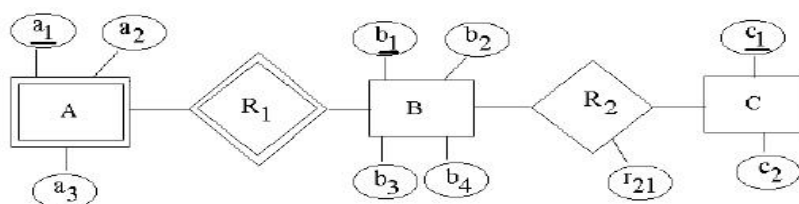
Seat No. :
Day : Thursday
Max. Marks : 36

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
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4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

- (a) Compare file system and database management system in terms of Concurrent-access anomalies. [2]
- (b) Explain the functionalities of the DROP, DELETE and TRUNCATE commands. [3]
- (c) Convert following E-R Diagram into a relational database (Tables). [2]



- (d) Define referential integrity with example. [2]
- (e) Explain discriminator with example. [1]
- (f) Define unsafe expression in TRC with example. [1]
- (g) If the closure of an attribute set is the entire relation then the attribute set is a _____. [1]
(primary key, candidate key, super key)

Q.2 Attempt Any Two from the following questions. [12]

- (a) Draw an E-R diagram for Hostel Management System. (Min. 4 Entity Sets) [6]
- (b) Explain constraints on Generalization. [6]
- (c) (i) What is the purpose of Triggers explain with appropriate example. [3]
(ii) Explain Audit Trails with its usage. [3]

Q.3 (a) Answer the following questions. [6]

Consider the following relations with key underlined.

Movie(movieTitle, movieYear, length, studioName, producer#)

MovieStar(starName, address, city, gender, birthdate)

StarsIn(movieTitle, movieYear, starName)

Multiplex(mNo, movieTitle, name, address, netWorth)

Studio(studioName, address, pres#)

Write the following queries in SQL:

- (i) Find star name who has worked in movie ABC. [2]
- (ii) Apply a constraint on relation Movie that movie title should be in upper case. [1]
- (iii) Retrieve all the information from MovieStar where address is not specified. [1]
- (iv) Change netWorth of a Multiplex 'M101' to 20000. [1]
- (v) Select all the information of Movie where the movie's title must contain the character 'h' at third position and 'a' at last position in the name. [1]
- (b) **Write the Tuple Relational Calculus for the following queries:** [6]
 - (i) Retrieve all the information of MovieStar who has worked in movie 'ABC'. [2]
 - (ii) Find starName, address who live outside 'Bombay' and gender is Male. [2]
 - (iii) Retrieve Movies whose netWorth is above 20000. [2]

OR

- Q.3** (a) **Answer the following questions.** [6]
(Consider above relation schema)
Write the Relation Algebra for following queries:
- (i) Delete all the movieTitle associated with studio name is 'xyz'. [3]
 - (ii) Retrieve all movieTitle and its netWorth for multiplex 'M101'. [3]
- (b) **Write Domain Relational Calculus for the following queries:** [6]
- (iii) (i) Retrieve all the information of MovieStar who has worked in movie 'ABC'. [2]
 - (ii) Find starName, gender who live outside 'Bombay' and gender is Male. [2]
 - (iii) Retrieve Movies whose netWorth is above 20000. [2]