

V.I.T
I-sess
A.M.A
1/8/2011

- (a) In 8086, starting address of memory segment could be 000A1H.
(b) Memory segmentation makes task switching slow in timesharing multiuser OS.
(c) It is preferable to start word array at odd address in 8086.
(d) If DS=2000H, SS=1000H, BP=E000H, SI=E000H, the instruction MOV AL, [BP+SI] will move the data from physical memory location 2C000H.
(e) Address 003FCH in IVT contains 0000H and address 003FEH contains 1000H. To what interrupt type do these locations correspond? What is starting physical address for the interrupt service procedure?
(f) At particular instant of time, 8086 can access maximum 256 Kbytes memory only, even though it has a capacity to access 1 Mbytes of physical memory. Why?

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(no marks without justification)

Q.2

(12)

(A) The 8086 system requires following memory map :

EPROM - 80000H TO 8FFFFH

EPROM device available is of size 32 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.

(B) Write a main line program which calls the procedure ADDITION to add two 16 bit numbers num1 and num2 which have been passed on the stack by main line program and returns the 16-bit result in AX (assuming result does not exceed to 16-bit). Write main line and procedure program for turbo assembler. Draw the stack frame neatly.

OR

(B) Define an ASCII string "DDU" and assign a name SOURCE_STRING in one logical segment. Define string of same size and assign a name DESTINATION_STRING in another logical segment and initialize with value zero. Write A program to move SOURCE_STRING to DESTINATION_STRING using MOVES instruction and make use of REP prefix instruction. Draw neat flow chart also.

Q.3

(12)

- (a) Write the content of CS and IP after the reset. (01)
(b) The instruction "JE LABEL" is an example of
(i) indirect addressing (ii) indexed addressing (iii) relative addressing (iv) immediate addressing
(c) The call instruction stores the return address for a procedure
(i) on the stack (ii) in the stack pointer (iii) in the Instruction Pointer (iv) in the BP
(d) Conditional instructions typically inspect the
(i) segment register (ii) instruction pointer register (iii) flags register (iv) accumulator
(e) The BP register is typically used for accessing
(i) strings (ii) memory (iii) stack (iv) data segment
(f) The near call instruction modifies
(i) the IP and SP register (b) flag register (c) bp register (d) nothing
(g) Conditional branch instruction modifies
(i) CS and IP (ii) IP only (iii) CS only (iv) Flag register
(h) IRET instruction modifies
(i) CS only (iii) IP only (iii) CS and IP (iv) CS, IP and flag register
(i) When a program is translated by the TASM assembler, the machine code is stored in a file with the extension
(i) .lis (ii) .obj (iii) .exe (iv) .out
(j) Which of the following is an illegal 8086 instruction
(i) mov ax, [bx] (b) INC [bx] (c) ADD bx, [bx] (d) ADD ax, [cx]
(k) If all the memory segments are separate and consecutive, how many memory segments are possible in 8086?
(l) Data bus of 8088 processor (i) 16 bit (ii) 8 bit (iii) 32-bit (iv) 12 bit

OR

Q.3

(12)

- (a) Even though all the registers are 16-bit in 8086, how 20 bit Physical address is generated by 8086?
(b) MOV AL, FFH
MOV BL, FFH
ADD AL, BL

In the above program OF flag will not set. State true/false and justify. (Hint: if you add two negative numbers, answer will be negative.)

- (c) In which condition, more than one logical address can point to same physical address in 8086. Justify your answer by giving example.
(d) Specify the addressing mode for the following instruction:
(I) MOV AX, 1234H (II) MOV AX, [1234H]

Also specify the content of AL and AH after the execution of the instructions.

- (e) It is preferable to use 8253 type programmable timer/counter device in 8086 system when accurate time delay required in the system. Why?
(f) 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.

Dharmsinh Desai University, Nadiad
Faculty of Technology
B. Tech. CE/IT Semester – V
Subject: Design & Analysis of Algorithms

Date: 02/08/2011

Time: 11:00 a.m. to 12:00 p.m.

Seat No: _____

Max Marks: 36

Q.1 Do as Directed [12]

- a) Define following asymptotic notations: i) Big-Oh (O) ii) Big-Theta (Θ) [2]
b) Arrange the following functions in increasing order of growth rate: [2]
i) $n!$ ii) n^2 iii) 2^n iv) $n \log n$
c) Prove that $10n^2 + 4n + 2 = \Theta(n^2)$ [2]
d) Multiply given 2X2 matrices using stressen's matrix multiplication method: [3]
$$\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} \quad \begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$$

e) How many comparisons are carried out for a **successful search** for $n=10$ in binary search? [2]
f) What are the characteristics of good algorithm? [1]

Q.2 Answer the following [12]

- a) Solve the following recurrence relation using substitution method: [6]
$$T(n) = \begin{cases} 0 & \text{if } n=0 \\ 3T(n/2)+n & \text{otherwise} \end{cases}$$

b) long power(long a, long b) { [6]
if (b == 0) return 1;
if (b == 1) return a;
if (b % 2 == 0)
return power(a, b/2) * power(a, b/2);
else
return power(a, b/2) * power(a, b/2) * a;
}
i) Give a worst case running time of the algorithm as a function of **b**.
ii) Is this divide and conquer approach to calculate a power?

OR

Q.2 Answer the following [12]

- a) Solve the following recurrence relation: [6]
$$a_n = \begin{cases} n & \text{if } n = 0, 1, 2 \\ 5a_{n-1} - 8a_{n-2} + 4a_{n-3} & \text{otherwise} \end{cases}$$

b) Write an algorithm for multiplying two $N \times N$ matrices. Give an analysis of the **best-case** running time of this algorithm as a function of the array size N . [6]

Q.3 Attempt any Three [12]

- a) What is the value returned by the given function? **Express your answer in terms of "n"**: [4]
Function mystery(n) {
r=0;
for i = 1 to n-1
for j = i+1 to n
for k = 1 to j
r = r+1
return (r)
}
b) Describe **step-by step** operation of merge sort on dataset: 5, 2, 4, 7, 1, 3, 2, 6 [4]
c) Solve the following recurrence using recurrence tree method. [4]
$$T(n) = \begin{cases} 1 & n=1 \\ 2T(n/2)+6n-1 & n \geq 2 \end{cases}$$

d) Write Divide and Conquer algorithm to find maximum & minimum of N ~~number~~ [4]

Dharmsinh Desai University Faculty of Technology
First Sessional Examination
B.Tech –Semester: V (IT)
Subject: Computer and Communication Network

Date: 3/8/2011
Duration: 1 Hr.

Max Marks: 36
Seat No. _____

Instructions: 1. Assume the data if necessary and mention it.
2. Figure to the right indicate full marks.

- Q.1** Answer the following questions: [12]
- A** Chose the best answer from the give options.X and Y are communicating. [2]
- (1)Which layer provides service to data link layer on computer X?
(a)Data link layer of computer X(b) Data link layer of computer Y(c)Physical layer of computer X
(d) Physical layer of computer X
- (2)Which layer is peer of data link layer of computer Y?
(a)Data link layer of computer X(b) Data link layer of computer Y(c) Network layer of computer X
(d) Network layer of computer Y
- B** The following data fragment occurs in the middle of a data stream for which the byte-stuffing [2]
algorithm used: A B ESC C ESC FLAG FLAG D .what is the output after stuffing?
- C** In binary count down algorithm, higher numbered stations have a higher priority than lower [2]
numbered stations. True/False Justify.
- D** Sketch the Manchester encoding and Differential Manchester encoding for the bit [2]
stream:0001110101011.
- E** At which layer following devices work? [2]
Hub, Gateway, Bridge, Repeater, Switch, Router.
- F** What do you mean by Limited contention protocols? [2]
- Q.2** Answer the following questions (Attempt any two). [12]
- A** (a)What are the merits of OSI reference model over a TCP/IP reference model? [3]
(b)Which difficulties encounter when trying to build a bridge between 802.X to 802.Y? [3]
- B** (a) Give applications of infrared waves and radio waves. [2]
(b)Indicate the window size for go-back-N and for selective repeat protocols, with four bit sequence [2]
numbers.
(c) Give the reason behind the flow control and error control on both data link and transport layer. [2]
- C** Eight bit messages are transmitted using a hamming code. How many check bits are needed to [6]
ensure that receiver can detect and correct single bit error? Show the bit pattern transmitted for
the message 11010011. Assume that even parity is used in hamming code. Suppose the 6th bit
position from right has been changed during the transmission. Show that this error is detected at
the receiver's end.
- Q.3** Answer the following questions: [12]
- A** Explain IEEE 802.5 LAN standard in detail. [5]
- B** A bit stream 10011101 is transmitted using standard CRC method, the generator polynomial is [7]
 x^3+1 . Show the actual bit string transmitted. Suppose the third bit from left is inverted during
transmission. Show that error is detected at the receiver's end.
- OR-
- Q.3** Answer the following questions: [12]
- A** Draw the sender and receiver windows for a system using Go-Back-N ARQ ,Given the following [8]
(a)Frame 0 is sent, Frame 0 is acknowledged.
(b)Frame 1 and 2 are sent, Frame 1 and 2 are acknowledged.
(c) Frame 3, 4 and 5 are sent, Frame 4 is acknowledged and timer for Frame 5 expires.
(d) Frame 5, 6 and 7 are sent, Frames 4 through 7 are acknowledged.
- B** Differentiate: Connection oriented and Connectionless communication. [2]
- C** What are the two reasons for using layered protocol? [2]



DHARMSINH DESAI UNIVERSITY, NADIAD

Faculty of Technology

Department of Instrumentation & Control Engg.

Subject: - Industrial Instrumentation

B.E. III, Semester: - V[IT]

No. Of hours: 01

Date : -

Max. Marks: 36

First Sessional Examination

- Instructions: -
1. Figures to the right indicate maximum marks for that question.
 2. Make suitable assumption wherever necessary & mention them clearly.

Q-1. Answer the following in brief.

[06]

1. Define deterministic signal.
2. What is dead zone?
3. How white noise is generated?
4. Which are the different types of error associated with a measurement system?
5. List out all the functional elements of an instrumentation system.
6. Define signal to noise ratio.

Q-2. Answer the following(Any TWO).

[12]

1. Classify different types of noise and explain any three in brief.
2. Explain different calibration procedures briefly.
3. Explain the following types of instruments-
 - i. Null and deflection type
 - ii. Self generating and power operated
 - iii. Analog and digital

Q-3. Do as directed.

[06]

1. A resistance wire strain gauge is with a gauge factor of 2 is bonded to a steel structural member subjected to a stress of 100 MN/m^2 . the modulus of elasticity of steel is 200 GN/m^2 . calculate the percentage change in the value of the gauge resistance due to the applied stress.
2. A simple pendulum has a period of 1.95 s at a point on the surface of the earth where $g=32.17 \text{ ft/s}^2$. what is the value of g at another point on the surface of the earth where the period is 1.97 s?
3. An oscillating LC circuit has an inductance $L=20 \text{ mH}$ and a capacitance $C=2.0 \mu\text{F}$. What is the frequency of oscillation of this circuit?

Q-4.

- i. Explain electromagnetic oscillator used for measurement of frequency with diagram.
- ii. Explain working principle of potentiometer with suitable equations and diagram. What are various forms available commercially?
- iii. Write a short note on torque cells.

[03]

[03]

[06]

OR

- i. How tuning fork is used for measurement of frequency. Explain its working principle with suitable diagram and equations.
- ii. Write a short note on torque cell data transmission.
- iii. Explain working of link type load cell with suitable diagram. Give necessary equations.

[03]

[03]

[06]