DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [I.T.]
SUBJECT: (IT506) ADVANCED MICROPROCESSOR ARCHITECTURE

Examination	**: Block Exam- Repeaters**	**Seat No.**	**:**
Date	**: 16/10/2014**	**Day**	**: Thursday**
Time	**: 11 '00 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 Answer the following.

(a) Bubbles will not affect the temporal parallel processing. State true/false and justify. **02**

(b) Determine the addressing modes for following 8086 instructions. **02**

ADD BX, 59H[DI]

XCHG CH, ES:[BX]

(c) The size of IVT and IDT tables are same. State T/F and justify (show your calculation also) **02**

(d) 'C' uses processor registers to pass parameters to the function. State true/false and justify **02**

(e) List the Protected mode registers and their function that are not the part of the real mode. **02**

(f) Calculate the displacement for jump. **02**

```
        MOV CX,5
NEXT:   ADD AX,BX
        NOP
        NOP
        JMP NEXT
```

Q.2 Answer any *Two*.

(a) The 8086 system requires following memory map : **06**

RAM - 00000 TO 03FFFH

EPROM - FC000H TO FFFFFH

RAM & EPROM devices available are of size 8 Kbytes.

Use only ONE 3625 bipolar PROM to decode and map above devices. Write down the truth table and draw the complete circuit diagram. State your assumptions, if any, very clearly.

(b) Write a program for TASM to add four 16-bit unsigned numbers which are stored in logical segment named NUMBER. Store the result in another logical segment named RESULT. Draw neat flow chart and state any assumptions if any clearly. **06**

(c) Draw the pipeline execution diagram for the following instructions of hypothetical processor SMAC2P : **06**

```
DIV  R1, R5, R1
ADD R2, R1, R3
SUB R2, R5, R1
```

Draw the space-time diagram for above instructions by stalling the instruction for various hazards. Specify very clearly the cause of the stall. State the types of data dependency present in the above instructions set. Assuming register forwarding available, redraw the space-time diagram again.

Q.3 (a) In the examination paper there are 5 questions and each will take on average 10 minutes to correct. 2000 candidates write examination. 5 teachers are employed to correct paper using pipeline mode. Every question is not answered by all candidates. 10% of candidates do not answer question 1, 15% question 2, 5% question 3, 5% question 4 , 25% question 5. **06**

i) How much time is taken to complete grading?

ii) What is the efficiency of pipeline processing?

iii) If data parallel method is used how much time will be taken to complete the grading?

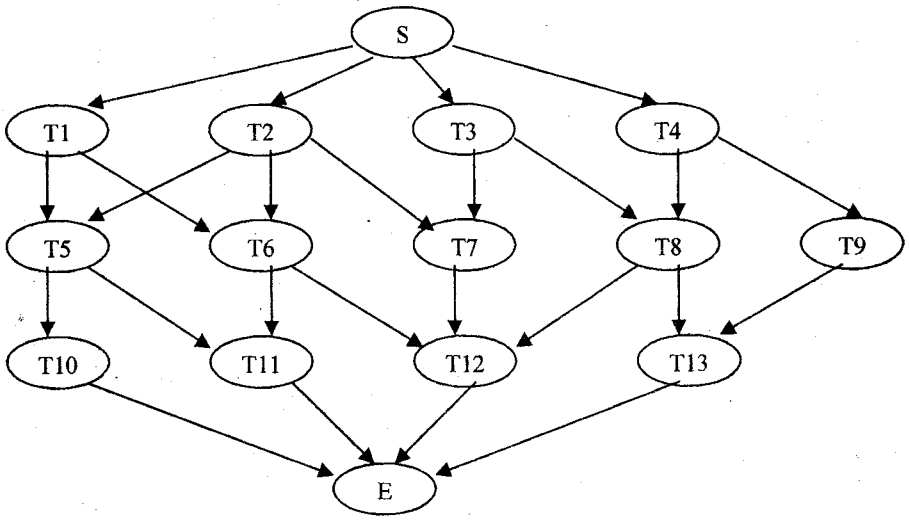
(b) Describe the following descriptor in detail. Selector of this descriptor must be loaded into which register of 80386 in PM? Which are all the checks 80386 will do and will there be exception(s) due to this checks ? **06**

0040h		6
9Bh	80h	4
0000h		2
0020h		0

OR

Q.3 **(a)** Explain how 48-bit far pointer (virtual address in program) of 80386 in PM is translated into physical address space in detail and how 80386 manages the 32 Tbytes local virtual memory and 32 T bytes global virtual memory address space in detail. **06**

(b) A Task graph with various tasks timing is given in Figure below. Assuming that 4 processors are available assign tasks to processors. Draw neat and clean timelines. **06**



T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13
3	4	5	4	6	7	6	5	6	8	9	10	9

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
BLOCK SESSIONAL (Repeater)
SUBJECT: (CT 506) Design And Analysis of Algorithm

Examination	**: B.TECH Semester - V**	**Seat No.**	**:**
Date	**: 16/10/2014**	**Day**	**: Thursday**
Time	**: 3:00 to 4:15**	**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.

(a) Find the asymptotic relation between function $f(n)= n^n$ and $g(n) = n!$ **[2]**

(b) In Merge sort, If we divide array of size N into two partitions with size 1 and (N-1) respectively Then What is the time Complexity? Explain your answer **[2]**

(c) Discuss difference between Branch & bound and Backtracking techniques. **[2]**

(d) Discuss difference between NP complete and NP Hard problem. **[2]**

(e) How many minimum numbers of comparisons required to find the minimum and the maximum from the array of 100 different numbers? **[2]**

(f) Give difference between Prim's and Kruskal's greedy algorithm. **[2]**

Q.2 Attempt ***Any TWO*** of the following questions. **[12]**

(a) Discuss backtracking solution for knapsack Problem using appropriate example.

(b) Discuss dynamic programming solution for String editing distance Problem using appropriate example.

(c) Write and analyze MergeSort algorithm using suitable method to find the time complexity.

Q.3 (a) Solve following recurrence relation. **[6]**

$T_n = n$ if $n=0,1,2$

$T_n = 5T_{n-1} - 8T_{n-2} + 4T_{n-3}$, otherwise

(b) Discuss Greedy Programming solution for Job scheduling problem with profit and deadline using appropriate example. **[6]**

OR

Q.3 (a) Find 10^{th} smallest element of given numbers using K^{th}-smallest element selection algorithm. **[6]**
[15, 7, 12, 45, 99, 51, 63, 44, 75, 28, 79, 34, 18, 39, 81]. (Clearly show the algorithm steps).

(b) 4 job agents and 4 jobs are exists. Cost matrix for assignment of jobs is given below. **[6]**

Agents/jobs	1	2	3	4
A	11	12	18	40
B	14	15	13	22
C	11	17	19	23
D	17	14	20	28

Using Branch and Bound, assign one job to one agent such that total cost of assignment is Minimum.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]
SUBJECT: (IT-505) COMPUTER & COMMUNICATION NETWORK

Examination	**: Block(Regular)**	**Seat No.**	**: ___**
Date	**: 17/10/2014**	**Day**	**: Friday**
Time	**: 11:00 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) Differentiate: TCP and UDP **[2]**

(b) What is the difference between routing and forwarding? **[2]**

(c) Define: (a) Encryption. (b) Confidentiality. **[2]**

(d) If a computer host's dotted decimal representation is 192.228.17.57 and its subnet mask is 255.255.255.224. What are the corresponding subnet address, subnet number and host number, respectively? **[2]**

(e) What is piggybacking? Give Example. **[2]**

(f) What is optimality principle? **[2]**

Q.2 Attempt the following questions. **[12]**

A Which TCP timer is use for the following situation? **[6]**
(1)To handle the zero window-size advertisement.
(2)To keeps track of the time between sending of a segment and the receipt of an acknowledgement
(3)To prevents long idle connection between two TCPs.

B Differentiate: Virtual Circuit subnet and Datagram subnet. **[6]**

Q.3 Attempt the following questions. **[12]**

A Host A is sending a 10,000-byte file to Host B using a sliding window protocol. Frames are limited to 1000 bytes each, frames are numbered by frame number starting at 1, and the window size is 5 frames. Frame 3 is lost. **[6]**
(1) Which frames are retransmitted if Host A and Host B are using the Go-Back-N protocol?
(2) Which frames are retransmitted if Host A and Host B are using the selective repeat protocol?

B Explain IEEE-802.5 LAN standard in detail. **[6]**

DHARMSINHDESAIUNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
BLOCKEXAMINATION (REGULAR)
SUBJECT: (IT 507) INDUSTRIAL INSTRUMENTATION

Examination	**: B.TECH IT- Semester –V**	**Seat No.**	**:**
Date	**: 17/10/2014**	**Day**	**: Friday**
Time	**: 03 00 to 06 : 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) Define 1) Accuracy 2)Precision **[2]**
(b) State the equation governing the resistance change of RTD. **[2]**
(c) State the working principle of piezoelectric crystal. **[2]**
(d) State different types of calibration methods **[2]**
(e) Define transducer. State some examples. **[2]**
(f) State two restriction elements. Which restriction element results in lowest pressure loss? **[2]**

Q.2 Attempt the following questions. **[12]**
(a) Derive the formula for gauge factor of strain gauge. **[6]**
(b) Draw a neat diagram and explain Magnetic flowmeter in detail. **[6]**

Q.3 Attempt the following questions. **[12]**
(a) Explain Pirani Gauge in detail for pressure measurements. **[6]**
(b) Explain in brief 1) Eddy current tachometer 2)Centrifugal Tachometer **[6]**

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

Examination : Block (Regular) **Seat No.** : _____
Date : 18/10/2014 **Day** : Saturday
Time : 11.00 to 12.15 pm **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) Given the value of $p \to q$ is false, determine the value of $(\overline{p} \vee \overline{q}) \to q$. **[2]**

(b) How many four digit numbers can be formed form six digits 1,2,3,5,7,8 , when repetition is not allowed. How many of them are even? **[2]**

(c) Can we sketch a graph with 5 vertices of odd degree? Justify your answer. **[2]**

(d) Determine the particular solution for the difference equation $a_r - 3a_{r-1} + 2a_{r-2} = 2^r$ **[2]**

(e) Find $\Delta a, \Delta^2 a$ where $a_r = r^3 - 2r^2 + 3r + 2$. **[2]**

(f) Let T be a tree with 30 edges. Removal of a certain edge from T yields two disjoint trees T_1 and T_2 . Given that the number of vertices in T_1 equals the number of edges in T_2, determine the number of vertices and edges in T_1 and T_2. **[2]**

Q.2 Do as directed. **[12]**

(a) Let R be a binary relation on the set of all positive integers such that R ={(a,b)| a – b is an odd positive integer}. Is R reflexive? Symmetric? Transitive? An equivalence relation? **[4]**

(b) Find a deterministic machine that recognizes the set of all strings of 0s and 1s in each of which the number of 1s is not a multiple of 4. **[4]**

(c) Prove by induction that for $n \geq 1, 1 \cdot 2 + 2 \cdot 3 + \ldots + n(n+1) = \frac{n(n+1)(n+2)}{3}$ **[4]**

Q.3 (a) Show that $(Z_4, \oplus_4)$ is a group. **[4]**

(b) State and prove De' Morgan's law for lattice. **[4]**

(c) Define the following with an example:
(i) Connected graph (ii) Branch node in tree

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]
SUBJECT: (IT502) DATABASE MANAGEMENT SYSTEM

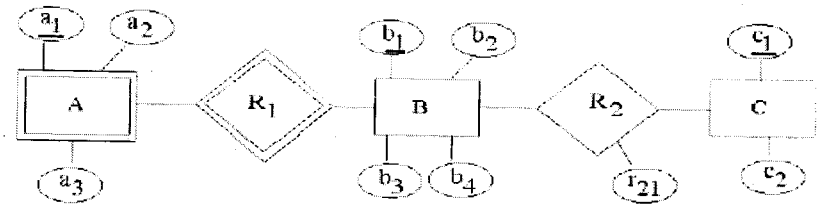
Examination	**: Block Examination (Regular)**	**Seat No.**	**: _____**
Date	**: 18/10/2014**	**Day**	**: Saturday**
Time	**: 3:00 to 4.15**	**Max. Marks**	**: 36**

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) Difference between E-R diagram and schema diagram. **[2]**

(b) Convert following E-R Diagram into a relational database (Tables). **[2]**



(c) Compare the shadow paging with the log-based techniques **[2]**

(d) Two deadlock prevention techniques that use timestamps are _____ and _____. **[2]**

(e) Explain the functionalities of the DROP, DELETE and TRUNCATE commands. **[2]**

(f) "Each site requires a transaction manager." Justify this statement as true or false. **[2]**

Q.2 Answer the following questions. **[12]**

(a) What is the purpose of assertions and triggers? Explain with appropriate example. **[6]**

(b) Explain Two-phase locking protocol with example. Differentiate between strict two-phase and rigorous two-phase with conversion protocol **[6]**

Q.3 (a) What is deadlock? And How to handle deadlock detection and recovery? **[6]**

(b) Explain the concept of Conflict Serializability. **[6]**

Is below schedule is Conflict Serializable?

T1	T2
Read(A)	
Write(A)	
	Read(B)
	Write(B)
Read(B)	
Write(B)	
	Read(A)
	Write(A)