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

Examination	**: Block Exam**	**Seat No.**	**:**
Date	**: 17/10/2013**	**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.**
5. **Calculator is not allowed.**

Q.1 Answer the following.

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

(b) First 1 Kbytes memory in 8086 system must be non-volatile memory in 8086. State true/false and justify. **02**

(c) If DS=10000, SS=20000, BP=0001 and SI=FFFF, IF MOV AX,[BP+SI] is executed, from which physical memory locations, content will be transferred to AX register ? **02**

(d) 'C' uses processor registers to pass parameters to the function. **02**

(e) What is the difference between superscalar and superpipelining? **02**

(f) When task switching is done through FAR JMP instruction, 386 will set NT flag bit in Protected mode of 80386. **02**

Q.2 Answer any *Two*.

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

EPROM - FC000H TO FDFFFH

EPROM device available is of size 4 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 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**

Q.3 (a) In the examination paper there are 5 questions and each will take on average 5 minutes to correct. 2000 candidates write examination. 4 teachers are employed to correct the papers using pipeline mode. Every question is not answered by all candidates. 20% of candidates do not answer question 1, 5% question 2, 15% question 3, 10% question 4, 12% question 5. **06**

1. How much time is taken to complete grading?
2. What is the efficiency of pipeline processing?
3. If data parallel method is used how much time will be taken to complete grading?

(b) Describe the following descriptor in detail. If this descriptor is accessed by the program during execution, what kind of action will be performed by 80386 in PM? **06**

FFFFh		6
E009h	FFh	4
000Ch		2
FFFFh		0

Which are all the checks 80386 will do and will there be any exception(s) due to these checks ?

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [I.T] Repeater
SUBJECT: (IT-508) DESIGN & ANALYSIS OF ALGORITHM

Examination	**: Block Sessional**	**Seat No.**	**:** _____
Date	**: 17/10/2013**	**Day**	**: ~~Saturday~~ Thursday**
Time	**: 03:00 to 04:15**	**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) Define the P Class and NP class of problems. Also show the relation between them. [2]
(b) Solve the recurrence: $T(n) = 2T(n/4) + \sqrt{n}$ [2]
(c) "Greedy Algorithms may not give optimum solution" state True or False with justification [2]
(d) Dynamic programming is known as a bottom up approach. [2]
(e) Differentiate between backtracking and branch & bound technique. [2]
(f) Explain space complexity with example. [2]

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

(a) Consider the set of 6 jobs to execute as given below. Each job takes unit amount of time. At any time t only one job can be executed (no parallel execution). Job *i* earns a profit $g_i > 0$ if and only if it is executed on or before the given dead line d_i. Explain the step by step process to find the optimum schedule that result into maximum profit using Greedy Algorithm. [6]

i	1	2	3	4	5	6
g_i	20	10	15	30	10	7
g_i	3	1	2	2	3	4

(b) Explain Homogenous method for finding complexity of algorithm with suitable example [6]

(c) Find the Time Complexity of following algorithm [6]

```
Goofy(a, low, high){
K= ((high-low +1)/3) /// division operation is integer division
Goofy(a, low, high -K);
Goofy(a, low +K, High);
Goofy(a, low, high -K);
}
```

Q.3 (a) Write down algorithm for quick sort step by step. [6]
(b) Write down algorithm for LCS problem. [6]

OR

Q.3 (a) Write down algorithm for merge sort step by step. [6]
(b) Write down algorithm for knapsack problem using dynamic programming. [6]

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

Examination	**: Block Exam**	**Seat No.**	**: _____**
Date	**: 18/10/2013**	**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) What are the two reasons for using layered protocols? [2]

(b) Differentiate: ARP & RARP. [2]

(c) Differentiate: Subnetting and supernetting. [2]

(d) Explain the meaning of following socket primitive: [2]
BIND, LISTEN, ACCEPT and CONNECT.

(e) Why Gateways are used during mail transfer? [2]

(f) Give two examples of a 'collision-free' protocol? [1]

(g) What is the use of urgent pointer in TCP segment? [1]

Q.2 Attempt the following questions. [12]

(a) Explain Three-Way Handshake Mechanism used by TCP to terminate a Session. [6]

(b) **(i)**Explain IEEE 802.4 standard. [4]

(ii) What are the differences between TCP and UDP? [2]

Q.3 **(a)** Consider a directed graph shown in fig.1 there are multiple shortest path between vertices S and T. Which one will be reported by Dijkshatra's shortest path. [6]

(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.

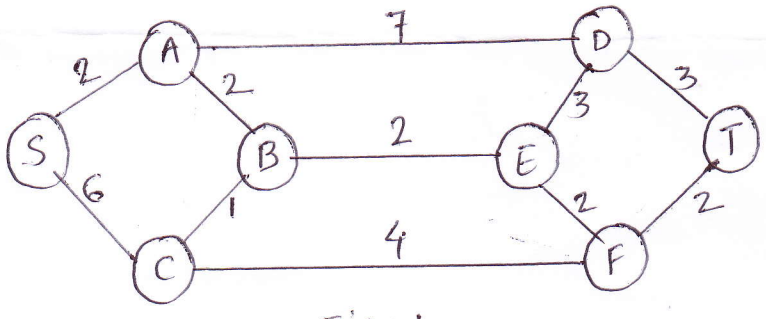

Fig : 1

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
BLOCK EXAMINATION (REGULAR)
SUBJECT: (IT 507) INDUSTRIAL INSTRUMENTATION

Examination	**: B.TECH IT- Semester–V**	**Seat No.**	**:**
Date	**: 18/10/2013**	**Day**	**: Friday**
Time	**:**	**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) Define Thomson effect and Seebeck effect. [2]
(b) State Stefan-Boltzmann law. [2]
(c) State the working principle of radiation pyrometer [2]
(d) Define: 1) Repeatability 2) Backlash [2]
(e) State any two points to be considered while selecting an instrument [2]
(f) Define calibration. Support it by an example. [2]

Q.2 Attempt the following questions. [12]

(a) Explain McLeod Gauge in detail [6]
(b) Draw a neat diagram and explain thermal flowmeter in detail. [6]

Q.3 Attempt the following questions. [12]

(a) What are the different pressure measuring elements? Explain any two. [6]
(b) Explain in brief Mechanical type of Tachometers [6]

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

Examination	**: Block Exam**	**Seat No.**	**: _____**
Date	**: 19/10/2013**	**Day**	**: Saturday**
Time	**: ~~9:00 to 12:15~~ 11:00 - 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.

(a) Prove that $a \vee (b \vee c) = (a \vee b) \vee c$ and $a \wedge (b \wedge c) = (a \wedge b) \wedge c$. **[2]**

(b) Let R be the binary relation on set of all positive integers such that R={(a,b)/ a-b is an odd positive integer}. Is R is Reflexive? Symmetric? Transitive? **[2]**

(c) Prove that R is uncountable. **[2]**

(d) In how many ways can the letters in the words UNIVERSITY be arranged, if the two I's must be separated? **[2]**

(e) Find a deterministic finite state machine that recognizes the set of all binary Sequences that end with the digits 011. **[2]**

(f) Write grammar that specifies the language $L = \{a^i b^j / i, j \geq 1, i \neq j\}$ **[2]**

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

(a) Design a finite state machine for the language $L = \{0^i 1 0^j / i, j \geq 1\}$

(b) Solve the difference equation $a_r - 2a_{r-1} = 3 \cdot 2^r$

(c) Prove that lower bound of the time complexity of the problem of finding largest among n numbers is proportional to n-1

(d) Show that $n^3 + 2n$ is divisible by 3 for all $n \geq 1$ by induction.

Q.3 (a) State and prove Euler's condition for the planar graph. **[4]**

(b) Design a finite state machine with {0,1} as both its input and output alphabet such that output 1 will be produced beginning with the third 1 in any block of three or more 1s in the input sequence. **[4]**

(c) Find Generating function for 1,1,2,2,3,3,4,4,... **[4]**

OR

Q.3 (a) Evaluate the sum: $1^2 + 2^2 + 3^2 + \ldots + r^2$ using generating function method **[4]**

(b) State and prove Langrange's theorem. **[4]**

(c) Determine the number of ways to place 2t+1 indistinguishable balls in three distinct boxes so that any two boxes together will contain more balls than the other one. **[4]**

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

Examination	***:Block (Repeater)***	**Seat No.**	**: _____**
Date	**: 19/10/2013**	**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) In file oriented system there is **[1]**
(A) Data inconsistency (B) Data dependency (C) Duplication of Data (D) All

(c) What is denormalization. **[1]**

(d) State the difference between DELETE and TRUNCATE commands in sql. **[2]**

(e) Every conflict serializable schedule is view serializable. State T/F and Explain. **[2]**

(f) State the advantages of variable length records over fixed length records. **[2]**

(g) State difference between strong and weak entity set. **[2]**

(h) Given the following set of FDies R= {A →BC, CD →E, B →D, E →A}, compute candidate keys. **[2]**

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

(a) Explain the concept of Serializability. **[6]**
Is below schedule Conflict Serializable?

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

(b) Consider following relation **[6]**

Order_No	Cust_No	Unit_price	Qty	Total_Amt
1	100	10	2	20
2	101	50	3	150

Find Highest normal form satisfied by this relation amongst 1NF, 2NF, 3NF, BCNF. Further decompose it to make it in above normal form.

(c) Explain constraints on Generalization. **[6]**

Q.3 (a) Explain Timestamp based protocol **[8]**

(b) Consider schema R(ABCDE) with decomposition into R1(ABC) and R2(ADE) and following set of FDies in F = {A →BC, CD →E, B →D, E →A} **[4]**
I. Show whether that the decomposition is Lossy or Loss less.
II. Show whether that it is dependency preserving or not.

OR

Q.3 (a) Draw the B+ tree for the following search key values
4,9,15,18,8,22,12,20,30,21,35,40,29,33,45,39 where fanout=3. **[8]**

(b) Explain how 2PC protocol responds when failure of coordinator occurs. **[4]**