DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B. E. SEM V INFORMATION TECHNOLOGY
THIRD SESSIONAL EXAMINATION
SUBJECT: ADVANCE MICROPROCESSOR ARCHITECTURE

Date: 10/10 /11 Seat No._____
Time: 11:00 to 12:00 Max. Marks: 36

Instruction: **No marks without justification.**
Calculator is not allowed.

Q-1 **Answer the following.**

[A] In data parallelism method, speedup is not directly proportional to the no. of processors. State True/False and justify. [2]

[B] Super scalar architecture uses both temporal and data parallelism. True/False and justify. [2]

[C] What is the main advantage of pipeline locking over pipeline stall? And explain how this will help to avoid WAW hazard. [2]

[D] Difference between fine grained and coarse grained jobs. [2]

[E] Instruction Level parallelism is achieved thought. [1]

a. Multi processors
b. Pipelined processors
c. Array processors
d. None of these

[F] The advantage of pipeline processing is, [1]

a. Design of control unit is simplified
b. Instruction throughput is increased
c. Design of ALU is simplified
d. None

[G] The Reasons which prevent the pipeline from operating at its maximum speed are, [1]

a. Resource conflict
b. Data dependency
c. Branch Problem
d. All of these

[H] Assume there are four stages in pipeline with each stage taking 1ns, 2ns, 1ns, and 3ns. Operating system in pipeline mode over non pipeline mode will be benefited by, [1]

a. 1.33
b. 2
c. 1.66
d.2.33

Q-2 **Answer Any Two.** [12]

[A] **The following expressions are to be evaluated.**

$a=\sin(x^2y)+\cos(xy^2)+\exp(-xy^2)$
$b=f(u^2)+\sin(g(p))+\cos^2(h(y^2))$

1. Obtain task graph for calculating a and b.
2. Assuming 4 processors are available. Obtain task assignment to processors assuming the following timing for various operations.
   - Squaring=1, add=1,multiplication=1, sin=cos=exponentiation=2
   - g(x)=h(x)=f(x)=2

[B] Distinguish between true (flow) dependency, anti dependency and output dependency of instructions. Give one example of each of these dependencies. If pipeline locking is allowed will these dependencies matter? Explain why?

[C] Draw the pipeline execution diagram for the following instructions of hypothetical processor SMAC2P:

```
MUL R1,R2,R3
ADD R2,R3,R4
INC R4
SUB R6,R3,R7
```

Find out the delays in pipeline execution due to data dependency of the above instructions. State your assumptions clearly if any.

Q-3 **Answer the following.**

[A]

Instruction	Number of cycle needed	Arithmetic unit needed
I0: R2 ←R2*R6	2	Floating Point
I1: R3 ←R2+R1	1	Integer
I2: R1 ←R6+8	1	Integer
I3: R8 ←R2-R9	1	Integer
I4: R5 ←R4/R8	2	Floating Point
I5: R6 ←R2*4	1	Integer
I6: R2 ←R1+2	1	Integer
I7: R10 ←R9*R8	2	Floating Point

[6]

[6]

1. For the given sequence of instruction develop superscalar pipeline execution (Assume one floating point and 2 integer execution unit).
2. For the given sequence of instruction **given in table,** perform register rename method to reduce the number of execution cycle.

[B] Differentiate data parallelism and temporal parallelism. [4]

[C] Explain delay slot with appropriate example. [2]

OR

Q-3

[A] Explain Hardware modification techniques (BPB, BTB) in details to reduce delay due to Branches. [6]

[B] Consider a 4 stage pipeline processor. The number of cycles needed by the four instructions I1, I2, I3, I4 in stages FI, DI,EX, MI is shown below: [4]

	FI	DI	EX	MI
I1	2	1	1	1
I2	1	3	2	2
I3	2	1	1	3
I4	1	2	2	2

Draw pipeline execution diagram. Assume Ideal conditions of pipelining.
What is the number of cycles needed to execute the following loop?

For (i=1 to 2) {I1; I2; I3; I4;}

Hint: FI cycle is going on no other instruction start its FI cycle.

[C] Differentiate data parallelism with dynamic assignment and data parallelism with quasi-dynamic scheduling. [2]

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

Date: 11/10/2011 **Seat No: _____**
Time: 11:00 a.m. to 12:00 p.m. **Max Marks: 36**

Q.1 Do as Directed **[12]**

a) What is the worst-case behavior of branch and bound? Explain with example. [2]
b) When branch and bound algorithm will perform better than backtracking? Give example. [2]
c) Draw the decision tree for finding largest number of three numbers. [2]
d) Differentiate: Implicit and explicit constraints [2]
e) Prove with an example that NP-Complete problem is also NP-Hard. [2]
f) Show relationship between P, NP, NP-Complete and NP-Hard [2]

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

a) Solve the following knapsack problem (C=10) using branch and bound method: [8]

Item	1	2	3	4	5
Value	8	6	5	1	1
Weight	6	5	5	2	2

b) Prove that for finding minimum and maximum of N unordered elements requires $\lceil 3n/2 \rceil - 2$ comparisons. [4]

OR

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

a) Solve the following job assignment problem using branch and bound method: [8]

Person\Job	J1	J2	J3	J4
A	9	2	7	8
B	6	4	3	7
C	5	8	1	8
D	7	6	9	4

b) Prove that computing the convex hull of n given points in the plane needs $\Omega(n \log n)$ time. [4]

Q.3 Attempt any Two [12]

a) 1) Let n=4 and S is {7, 11, 13, 24}. Using **variable size approach** generate state space tree for Sum=31. [6]
2) How many nodes will be created if fixed size approach is used instead of variable size approach?
b) Write an algorithm for n-queen problem. [6]
c) Color the graph shown in Fig.1 using 3 colors. Show all possible answer nodes using fixed tuple size state-space tree [6]

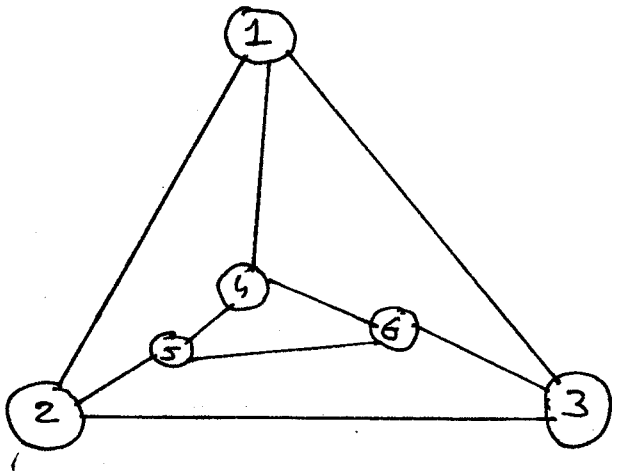

Fig. 1.

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

Date: 12/10/2011 **Max Marks: 36**
Duration: 1 Hr. **Seat No._____**

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

Q.1 Answer the following questions: **[12]**

A (1)In public key cryptography If user A want to send message to user B with authentication then A will encrypt the message with_____key. [1]
(2)In public key cryptography If user A want to send message to user B with confidentiality then A will encrypt the message with_____key.

B Packet filter firewall works on which layers of OSI model? [1]

C During an FTP session, the control connection is opened_____and data connection is opened____ (exactly once, exactly twice, exactly thrice, as many times as necessary). [1]

D MIME allows which type of data to be sent through SMTP. [1]

E Encryption and decryption are functions of the _____layer of OSI model. [1]

F A host can be identified by___while a program running on the host can be identified by___. [1]
(A)IP address; host address(B) IP address; well-known port(C) IP address; port number(D) port number;IP address

G Give difference between TCP and UDP. [2]

H At TCP, When two hosts simultaneously attempt to establish a connection between the same two sockets, two separate connections will be establishment. TRUE/FALSE. Justify. [2]

I Why do we need a DNS system? [2]

Q.2 Answer the following questions (Attempt any two). **[12]**

A **(1)**If TCP round trip-time, RTT, is currently 30 msec and the following acknowledgements come in after22, 25 and 24 msec, respectively, what is the new RTT estimate using Jacobson algorithm? α=0.9. [2]
(2) Mention the third parameter used by internet congestion control algorithm and explain with diagram. [3]
(3) List Berkley socket primitives. [1]

B **(1)**What is silly window syndrome problem explain with diagram? [2]
(2) Explain various flags of TCP segment header. [3]
(3) What is maximum and minimum size of TCP header? [1]

C **(1)**What TSAP and NSAP explain with diagram? [4]
(2) Explain TCP service model. [2]

Q.3 Answer the following questions: **[12]**

A Explain two army problems covering all different cases with diagram. [6]

B A TCP connection is using a window size of 10,000 bytes, and the previous acknowledgment number was22001.it receives a segment with acknowledgment number 24001.Draw a diagram to show the situation of the window before and after. [6]
(1) If the receiver has changed the window size to 11,000.Draw a diagram to show the situation.
(2) If the receiver has changed the window size to 90,000.Draw a diagram to show the situation.

-OR-

Q.3 Answer the following questions: **[12]**

A Explain the protocol scenarios for establishing a connection using Three-way-handshake. [6]

B **(a)**Explain slow start of congestion with reference to TCP. [2]
(b) Describe a method that attempts to prevent the problem of delayed duplicate packets at transport layer. [2]
(c) Which TCP timer is use for the following situation?
(1)To handle the zero window-size advertisement. [2]
(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.
(4)A special segment called a probe is sent by a sending TCP.

DHARMSINH DESAI UNIVERSITY, NADIAD
Faculty of Technology
Department of Instrumentation & Control Engg.
Subject: - Industrial Instrumentation

B.E. III, Semester: - V [IT] **Date : - 13/10/2011**
No. Of hours: 01 **Max. Marks: 36**

Third 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. **State whether the following statements are true or false. Also give justification for your answer.** [10]

1. Sensitivity of a capacitance type of level detector changes with temperature.
2. The purge liquid in liquid purge system should not vapourize at the temperature of pipe line.
3. A tungsten lamp has radiation energy output with wavelength ranging from 4000 A to 7600 A.
4. CdS type of photoconductive cells can be used in color sorting circuits.
5. When PN junction is diffused in Gallium Arsenide, LEDs emit IR radiation.

Q-2. **Answer the following (Any TWO).** [08]

1. Describe hydraulic transmission system for level measurement using float.
2. Explain different junction type of photodiodes with necessary symbols.
3. Explain with a neat sketch any one direct method of liquid level measurement.

Q-3. **State whether the following statements are true or false. Also give justification for your answer.** [10]

1. Resistance thermometers are expansion type of temperature sensors.
2. Thermistors have positive temperature coefficient of resistance.
3. Bimetallic thermometers are unsuitable for dynamic temperature measurement.
4. Optical pyrometers are used to measure very low temperatures.
5. Inert gases cannot be used in gas filled thermometers.

Q-4.(A) Discuss construction and working of a RTD with a suitable diagram. [05]
(B) Enlist all the disadvantages of a thermocouple. [03]

OR

Q-4.(A) Explain optical pyrometers with a suitable diagram. [05]
(B) List all the temperature measurement units and also write the expressions relating them with each other. [03]

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
THIRD SESSIONAL EXAMINATION
B.E. INFORMATION TECHNOLOGY
SEMESTER V
SUBJECT: DATABASE MANAGEMENT SYSTEM

Date: 15/10/2011
Time: 11:00 to 12:00

Max Marks: 36
Seat No: - _____

Q1. Answer the following questions:- **[12]**

(1) Explain working of Undo and Redo operation in recovery management. [2]
(2) Explain various states of Transaction. [2]
(3) Give difference between wait-die and wound-wait. [2]
(4) Explain blocking problem with its solution in distributed database. [2]
(5) Explain Recoverable and Non recoverable schedules with example. [3]
(6) Explain starvation with example. [1]

Q2. Answer the following questions:- **[12]**

(1) What is Log based Recovery. Explain Differed Database Modification Technique. [6]
(2) Explain Graph based Protocol with example. [6]

OR

(2) Explain Multiple Granularity with example. [6]

Q3. Answer the following questions:- **[12]**

(1) Explain the concept of View Serializability. [6]
Is below schedule is View Serializable?

T1	T2	T3
Read(A)		
	Write(A)	
Write(A)		
		Write(A)

Is it also conflict Serializable?

(2) Implement Fibonacci series using function in PL/SQL [6]

OR

Q3. Answer the following questions:- **[12]**

(1) Implement Audit trail with trigger.(Take any table for your reference) [6]
(2) Explain Two Phase Commit Protocol. Also explain any two handling of failures in 2PC. [6]