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322741(22)

B. E. (Seventh Semester) Examination, April-May 2021

(New Scheme)

(CSE & IT Engg.)

ADVANCED COMPUTER ARCHITECTURE

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all the questions. Part (a) from each question is compulsory. Attempt any* ***two*** *parts from parts (b), (c) and (d) of each question. Part (a) carry 2 marks & rest of carries 7 marks.*

Unit-I

1. (a) Define speedup factor in pipeline.

(b) A reservation table of a 3 stage pipeline is given

below :

	1	2	3	4	5	6
S_1	×				×	
S_2			×			
S_3		×		×		×

(i) Determine latencies in the forbidden list and the collision vector.

(ii) Draw the state diagram for this pipeline.

(iii) Determien the minimal average latency.

(c) Explain Instruction pipeline and operations in it in detail.

(d) What do you mean by super-scalar processor? Explain it with design and functionalities.

Unit-II

2. (a) What is write back and write through cache?

(b) Describe associative and set-associative cache memory organization in detail.

(c) What do you mean by memory bandwidth? Explain how it can be increased.

(d) Write short notes on :

(i) Snoopy bus protocol

(ii) Interleaved memory organization

Unit-III

3. (a) Explain control dependency.

(b) What are Bernstein's conditions? Draw the dependency graph for the following set of statements :

1 : A = B + C

2 : Do 5 I = 1, N

3 : D(I) = A*E (I)

4 : S = E(I) * 5

5 : T = T + S

6 : A = D(N) – 7

(c) Explain data-flow computers and show its advantages over control-flow systems with the help of any suitable examples.

(d) Explain SISD and SIMD machines in detail.

Unit-IV

4. (a) Define distributed memory.

   (b) Explain vector instruction types in detail.

   (c) Explain parallel algorithms for SIMD computers.

   (d) Describe performance of parallel processing in multiprocessor architectures.

Unit-V

5. (a) What is diameter of a Network?

   (b) Explain dynamic interconnection networks.

   (c) Explain multistage network with example.

   (d) Write short notes on :

   (i) Network size and node degree 2

   (ii) Broad cast and multicast 2

   (iii) Static networks 3