

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
& INFORMATION TECHNOLOGY  
SESSION 2014-2015 (EVEN SEMESTER)

( 4 )	Total Pages—4
	(Set-1)
	<b>B.Tech-8th</b>
	<b>Advanced Computer Architecture</b>
	Full Marks : 70
	Time : 3 hours
	Answer Q. No. 1 which is compulsory and any five from the rest
	<i>The figures in the right-hand margin indicate marks</i>
(b) Derive the expression for speed up of a pipeline processor with 'r' no. of stalls per instruction. 5	
7. (a) Describe and draw the figures of each Flynn's classifications. 5	
(b) Compare between loosely coupled and tightly coupled system. 5	
8. Write short notes on (any two) : 5 × 2	
(i) C vs. S-access memory organization	
(ii) Vector processor	
(iii) Amdhal's Law.	
	1. Answer the following : 2 × 10
	(a) Justify how the introduction of cache memory enhances the parallelism ?
	(b) How does multiplicity of functional unit support both software and hardware parallelism ? Give an example.
	(c) Give two examples of resource dependence.
	(d) Write the limitations of rescheduling in pipelining.
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	( Turn Over

- (e) What do you mean by program partitioning? What is its contribution towards parallel program execution?
- (f) Which data flow technique is preferred to be implemented? Justify your answer.
- (g) Explain how many to one data routing function leads to blocking?
- (h) Compare cube and cube connected cycle network in terms of network latency and bandwidth.
- (i) Which hazard is reduced due to the use of a latch in pipelining?
- (j) Which of the Flynn's category supports vector processing architecture?
2. (a) How many parallel computer models exist in architecture? Explain each with their diagrams. 5
- (b) Describe the techniques to achieve parallelism in uniprocessor computers. 5

3. (a) Do you agree that data, resource and controlled dependence lead to data hazard? Justify your answer with examples. 5
- (b) Enlist sufficient conditions parallelism in instruction pipelining. Give examples of flow, anti and output dependence. 5
4. (a) Differentiate between dynamic and static data flow computer with their architecture. 5
- (b) Draw the data flow diagram for the following expression : 5
- $$C_i = \sum_{i=1}^8 (a_i * b_i)$$
5. (a) Explain five characteristics of ring, star, bus, cube and completely connected networks. 5
- (b) Describe perfect shuffle exchange routing functions with example. 5
6. (a) Differentiate between linear vs. non-linear pipelines. 5