

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

(4)

- (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.

Total Pages-4

(Set-1)

B.Tech-8th

Advanced Computer Architecture

Full Marks : 70

Time : 3 hours

Answer Q. No. I which is compulsory
and any five from the rest

The figures in the right-hand margin indicate marks

- I. 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.

- (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