

Department of Electronics and Telecommunication Engineering, Jadavpur University  
M.E. ELECTRONICS AND TELE-COMMUNICATION ENGINEERING ,FIRST YEAR ,FIRST SEMESTER EXAM 2018  
Attempt any five questions and all question carry equal mark. Missing data may be assumed.

Subject : COMPUTER ARCHITECTURE (COMP)

Time : Three Hours

Full marks : 100

- 1(a). Explain with an example the requirement of a vector processor over the scalar processor. Compare vector processor with array processor. What is meant by horizontal and vertical vector processing? Find out the speed up of vertical vector processing over uniprocessor.
- (b) What are the different types of vector operations? Give different fields in a vector instruction. [14 + 6]
- 2.(a ) How does cache memory increase the throughput? What do you mean by cache coherence problem? Describe one method to remove this problem and its limitations. Which parameter decides the size of the cache memory?
- (b) Write three methods for reducing cache miss rates. Distinguish between direct mapped and set associative caches with examples. Explain memory band width and one technique to improve the main memory bandwidth. [12+8]
3. (a) What do you mean by "data flow computer"? With simple diagram , explain "data flow architecture" and compare it with "control flow architecture". List some potential problems with dataflow computer implementation.
- (b) Compare between centralized and distributed shared memory architecture. Which is the best architecture among them and why? With architecture and timing diagram explain S-access memory organization. [10+10]
- 4(a) What do you understand by instruction pipelining and arithmetic pipelining? Deduce expression to find out speedup, efficiency and throughput of a linear pipelined system.
- (b).What do you mean by parallel processing? What are the different types of parallel processing? Discuss each of them.
- (c) Explain the following: (i)Pipeline stall(ii)Reservation table (iii) Dynamic pipeline (iv) Static pipeline.[ 8+ 6+6].
- 5 (a) Discuss about Flynn's classification of parallel computers
- (b) Explain with one example for each various addressing schemes. [10+10].
6. (a) Explain computer instructions and various fields of an instruction with example. Give different formats of computer instruction.
- (b) ) List most commonly used registers and its operation for a basic computer system.. 13+7=20
- 7 (a) Describe the following parameters with reference to performance evaluation of digital computers : (i) MIPS, (ii) CPI and (iii) Benchmark suites
- (b) Explain Amdahl's law with suitable example. How will you compare the performance of two computers when working in (i) both in same platform and , (ii) in different platforms.
- (c) Distinguish between Computer architecture and organization. 6+ ( 6+4) +4 =20
8. Write notes on any four of the following: 4x5=20
- (a) Booth's algorithm (b) I/O Module (c) Cache Memory (d) Control Unit (e) RISC and CISC architectures