Roll No. ...............................

Subject Code—2088

## M.C.A. (Fifth Year) EXAMINATION

(5 Years Integrated Course)

ADVANCED ARCHITECTURE AND
PARALLEL PROCESSING

MCA-502

*Time : 3 Hours*                    *Maximum Marks :* 100

Note : Attempt any *Five* questions. All questions
carry equal marks.

1.  (a)  State and explain Flynn's classification
         of various computer architectures with the
         help of suitable diagrams.                **8**

    (b)  Distinguish between multiprocessor and
         multicomputers. Also discuss UMA,
         NUMA and COMA models in detail. **12**

**2.** (a) Define data dependence and resource dependence. Explain five different types of data dependence. **10**

(b) Compare control flow, data flow and reduction computer architecture. **10**

**3.** (a) Draw the diagram for 16×16 Omega network using 2×2 switches and explain it. **10**

(b) Write short notes on the following :

    (i) Bernstein Conditions

    (ii) Flow Dependence and Antidependence. **10**

**4.** (a) Explain the pipelining process in superscalar and VLIW processor. **14**

(b) Differentiate between vector and symbolic processors. **6**

**5.** (a) What do we mean by page replacement ? Explain different page replacement policies. **10**

(b) Explain inclusion, coherence and locality properties of the memory hierarchy. **10**

6. (a) State and explain different cache memory organization procedure in detail. **15**

   (b) Write a short note on memory interleaving. **5**

7. (a) Differentiate beween linear and nonlinear pipelines. **3**

   (b) Discuss the speedup of a pipeline system and the factors on which speedup depends. **5**

   (c) How can you evaluate optimum number of pipeline stages ? Explain. **4**

   (d) Discuss superscalar and superpipeline design. **8**

8. Write short notes on the following :

   (i) Cache coherence **6**

   (ii) Message passing mechanisms **9**

   (iii) RISC characteristics. **5**