Code No. : 5142

# FACULTY OF ENGINEERING
## B.E. 3/4 (ECE) I Semester (Main) Examination, Dec. 2011
## COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3 Hours] [Max. Marks: 75



***Note** : Answer **all** questions of Part **A**.*
*Answer **five** questions from Part **B**.*

PART – A **(25 Marks)**

1. Draw the Block diagram of 4-bit combinational circuit shifter and write its function table. **3**
2. Show the hardware for implementing Booth's algorithm. **3**
3. How many clock pubes are required to execute the following micro-operations ? **3**
   a) IR ← M[Pc] b) AC ← AC + TR c) DR ← DR + AC
4. Differentiate between a memory-mapped I/O and an isolated mapped I/O. **2**
5. Explain Flynn's classification of processor. **2**
6. Explain Hand-shaking method of Asynchronous data transfer. **3**
7. Mention different phases in an instruction cycle. **2**
8. What is bootstrap loader ? **2**
9. Differentiate between complier Assembler and language translator. **3**
10. Write briefly about multiprocessor. **2**

PART – B **(50 Marks)**

11. a) Derive an algorithm in flow chart form for the non-restoring method of fixed point binary division. **6**
    b) Draw the logic diagram of a 4-bit adder-subtracter and explain with the help of a truth table. **4**
12. Draw the flow chart for interrupt cycle and explain in detail all the phases. **10**
13. a) Discuss SIMD processor organization. **4**
    b) Explain instruction pipeline conflicts and their remedies. **6**

14. a) Explain Daisy-chain interrupt priority and draw the logic circuit for one stage of diary chain priority arrangement. 6

    b) Explain CPU-IOP communication. 4

15. a) Explain read and write operations with respect to Association Memory. 7

    b) A magnetic disc system has the following 3

    $P_s$ – Average time to position the magnetic head over the track.

    R – Rotation speed in revolutions/sec.

    $N_t$ – No. of bits/track

    $N_s$ – No. of bits/sector

    Calculate the average time $T_a$ that will take to read one sector.

16. a) Explain DMA transfer in detail with all relevant Block diagrams. 6

    b) Draw the circuit diagram of a 4 × 4 FIFO buffer and explain its operation. 4

17. Write short notes on :

    a) Functional aspects of operating systems 3

    b) RISC/CISC – Differentiate 4

    c) Stored program organization. 3