LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.C.A. DEGREE EXAMINATION – **COMPUTER APPLICATIONS**

FIRST SEMESTER – NOVEMBER 2015

CA 1807 - COMPUTER ORGANIZATION & ARCHITECTURE

Date : 11/11/2015 Dept. No. Max. : 100 Marks

Time : 01:00-04:00

PART-A

Answer ALL the questions. **10*2=20**

1. Convert $(10110)_2$ to Gray code.
2. Define: Minterm and Maxterm.
3. Differentiate combinational and sequential circuits.
4. Subtract 20 from 24 using 1's complement.
5. What are the types of instruction formats?
6. Mention different registers in computer systems.
7. There are 6 tasks to be performed, each taking 4 clock cycles.
   a. How many clock cycles will be required to complete 6 tasks if they are executed in a 4 segment pipeline?
   b. What is the time difference between executing these tasks in a non-pipeline segment and pipeline segment?
8. What are the ways in which parallel processing can be achieved?
9. What is a bootstrap loader?
10. If a RAM is capable of storing 4096 bytes, what will be the number of address bits to locate a byte?

PART-B

Answer ALL the questions. **5*8=40**

11. a) Convert the following as stated below:

    a. $(4310)_{\mathbf{5}}$ to Decimal. **(3)**

    b. $(F3A7C2)_{\mathbf{16}}$ to Octal. **(3)**

    c. $(703)_{\mathbf{8}}$ to Binary. **(2)**

    (or)

    b) Explain XS3 code with an example to prove that it has self-complementing capability.

12. a) Describe encoder with suitable figure.

    (or)

    b) Explain binary counter.

13. a) Explain general register organization.

    (or)

    b) Elucidate instruction types.

14. a) Describe arithmetic pipeline.

    (or)

    b) Explain handshake while transferring data.

15. a) Give detailed explanation on address mapping using pages in virtual Memory.

    (or)

    b) Explain main memory.

PART-C

Answer any TWO questions. **2*20=40**

16. a) Simplify F(ABCD)= AC' + B'D + A'CD + ABCD in sum-of-products form and product- of-sums-form. **(10)**

    b) Explain adders and subtractors. **(10)**

17. a) Describe addressing modes with diagrams and example. **(15)**

    b) Explain array processors. **(5)**

18. Give detailed explanation on

    a) RISC and CISC. **(10)**

    b) Time shared common bus and multiport memory. **(10)**

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