Roll No. QP Code:131388

PSG POLYTECHNIC COLLEGE, COIMBATORE - 641 004

DIPLOMA ODD SEMESTER EXAMINATIONS – OCT 2014

Z12303 COMPUTER ORGANIZATION
MODEL QUESTION PAPER

Time : 3 Hours **Max.Marks: 100**

Instructions:

1. **Group A** and **Group B** questions should be answered in the Main Answer book.
2. Answer any **TEN** questions in **Group A**. Each question carries three marks.
3. Answer **ALL** questions either **(a)** subdivision or **(b)** subdivision in **Group B**. Each question carries 14 marks.

Group – A **Marks: 10 x 3 = 30**

1. Convert the given octal number $(237)_8$ into decimal, hexadecimal and binary equivalent.
2. State the one variable Boolean theorem.
3. Differentiate positive and negative logic system.
4. Simplify: a) $\overline{AB}\,(\overline{A} + B)(B + \overline{B})$,

   b) $[(X+Y).(XZ+YZ)]+[(XZ).(YX+Z)]$
5. Which gates are called universal gates? Why are they called so?
6. Design Ex-OR gate using basic gates.
7. Differentiate SOP and POS.
8. Draw the logic diagram and truth table for half subtractor.
9. Can a demultiplexer be used as a decoder? Justify your answer.
10. Differentiate edge triggering and level triggering.
11. Why is D flip flop preferred over RS flip flop? Write the truth table of D flip flop.
12. Draw the diagram and truth table for Serial in Serial Out shift registers.
13. Compare synchronous counters with asynchronous counters.
14. Define accuracy and resolution. What are the factors that affect the accuracy of an ADC?
15. Discuss about variable resistor method.

Group– B **Marks: 5 x 14 = 70**

16. a) (i) Specify the rules for Boolean algebra (6)

    (ii)Convert the given Decimal number into octal, binary and hexadecimal numbers. (8)

    (a) $(9648)_{10}$

    (b) $(1324)_{10}$

    (OR)

    b) (i) State and prove the Demorgan's theorem. (6)

    (ii) Convert te given numbers into equivalent decimal number. (8)

    (a) $(B342F)_{16}$

    (b) $(6547)_8$

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(c) $(0100111100101)_2$

17.a) (i) Explain the following gates with its truth table, Boolean expression and logic symbol

a) OR b) NAND c) Ex- OR (6)

(ii) Realize OR, NOT, NAND using NOR gates. (8)

(OR)

b) (i) Draw the logic diagram of multiplexer and explain its operation (6)

(ii) Simplify the Boolean expression using Boolean laws. (8)

1. $Y= (A + C)(AD + \overline{AD}) + AC + C$
2. $Y= A(A + B) + (B + AA)(\overline{A} + B)$

18. a) (i) Simplify the following expression using k-map. (6)

1. $F(X,Y,W) = \sum(1,3,4,5,6,7)$.
2. $F(A,B,C)=\sum(1,2,3,5,6)$.

(ii) Design a Full Adder using two Half Adders and explain its operation in detail. (8)

(OR)

b) (i) Discuss in detail about 3 to 8 decoder with diagram and truth table. (7)

(ii) Explain BCD to seven segment decoder with its truth table and logic diagram (7)

19. a) Explain the operation of JK and master slave JK flip-flops with suitable diagrams (14)

(OR)

b) Design SIPO and PIPO shift registers. Explain how data is shifted in the above registers. (14)

20.a) (i) Design a decade counter and explain it with a truth table. (7)

(ii) Design a 4 bit up down binary counter and explain. (7)

(OR)

b) (i) Draw the block diagram of binary ladder network and discuss it in detail. (6)

(ii) Illustrate how analog signal is converted into digital signal using successive approximation method. (8)

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Note :

i) Group A should have three questions from each unit.
ii) Group B should have Five long answer questions, i.e., one question in each unit with either OR type. (may have subdivisions if necessary)