



K16P 0099

Reg. No. :

Name :

I Semester M.C.A. Degree (Reg./Sup./Imp.) Examination, February 2016
(2014 Admn. Onwards)
MCA1C02 : DIGITAL SYSTEMS AND INTRODUCTION TO
MICROPROCESSORS

Time : 3 Hours

Max. Marks : 80

Instructions : Section – A : Answer any ten questions. Each question carries three marks.

Section – B : Answer all questions. Each question carries ten marks.

SECTION – A

Answer any ten questions. Each question carries three marks. (10×3=30)

1. Convert $(153)_{10}$ to octal.
2. Explain DeMorgans theorem in Boolean algebra.
3. Give the truth table of full subtractor.
4. Write a note on encoders.
5. With a block diagram explain combinational circuit.
6. Write a note on universal shift register.
7. State various applications of shift registers.
8. Compare synchronous and asynchronous counters.
9. Explain Fan-in and Fan-out.
10. How a transistor can be used as a switch ?
11. What is the function of the accumulator ?
12. Explain the complete functioning of the following instructions in 8085 processor :
 - i) ADD B
 - ii) RSTI.

P.T.O.



SECTION - B

Answer all questions. Each question carries ten marks.

13. a) i) Convert the following expression in standard POS Form
 $f(A, B, C) = (A + B)(B + C)(A + C)$. 5
- ii) Simplify the expression $Z = AB + A\bar{B} \cdot \overline{(A \bar{C})}$. 5
 OR
- b) i) Explain the following function in standard SOP Form $F = AB + \bar{C}D + A\bar{B}C$. 5
- ii) Prove that $\bar{X}\bar{Y}Z + \bar{X}YZ + X\bar{Y} = \bar{X}Z + X\bar{Y}$. 5
14. a) i) Simplify the following expression using Karnaugh map
 $Y = \overline{ABC} + \overline{A\bar{B}C} + \overline{A\bar{B}C} + \overline{ABC} + \overline{A\bar{B}C}$. 5
- ii) Compare the functions and applications of ROM, PLA and PAL. 5
 OR
- b) i) Reduce the following expression using k-map technique
 $f(P, Q, R, S) = \sum m(0, 1, 4, 8, 9, 10) + d(2, 11)$. 5
- ii) Implement the following boolean function with 8 : 1 multiplexer
 $F(A, B, C, D) = \pi m(0, 3, 5, 8, 9, 10, 12, 14)$. 5
15. a) i) What is a race condition and explain how it is eliminated using J-K master slave flip flop? 5
- ii) Explain the operation of simple SR flip flop using NAND gates. 5
 OR
- b) i) Give the details of a master slave S-R flip flop and draw the logic diagram. 5
- ii) What is a sequential circuit? Discuss the different types of sequential circuits. 5
16. a) i) Give the comparison between TTL and CMOS families. 4
- ii) Draw a standard TTL gate and explain its working. 6
 OR
- b) i) Draw and explain basic CMOS inverter circuit. 5
- ii) Compare the Totem-pole and open-collector outputs. 5
17. a) i) Explain the architecture of intel 8085 with the help of a block diagram. 10
 OR
- b) i) Write a note on 8085 interrupts. 5
- ii) How do the instructions of 8085 is classified based on their function and word length? Give with an example. 5