

UNIT - IV

8. (a) What is a ripple counter ? How is it different from synchronous counter ? Design a ripple counter and discuss its working. 8
- (b) What do you mean by controlled shift registers ? Design a 3-bit controlled shift register and illustrate its working. 8
9. (a) What is Modulo Counter ? Design Modulo-5 Counter. 8
- (b) What is Static RAM ? How is it designed ? Illustrate ? 8

<http://haryanapapers.com>

Whatsapp @ 9300930012

Your old paper & get 10/-

पुराने पेपर्स भेजे और 10 रुपये पायें,

Paytm or Google Pay से

Roll No.

67008

MCA 1st Semester (Current) CBCS

Scheme w.e.f. Dec., 2016

Examination - December, 2016

DIGITAL DESIGN

Paper : MCA-103 (C)

Time : Three Hours]

[Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) What is Excitation Table ? State its use. $8 \times 2 = 16$
- (b) What is Excess-3 Code ?
- (c) What are applications of ROM ?
- (d) What are PLAs ?
- (e) What is a Johnson-Counter ?
- (f) Differentiate between Edge-triggered and Level-triggered flip-flops.

- (g) What are race-conditions ?
- (h) What is an Encoder ?

UNIT - I

- 2. (a) Why is 2's complement preferred in binary arithmetic ? Also perform the following operations using 2's complement arithmetic : 6
 - (i) $(15)_{10} + (17)_{10}$
 - (ii) $(34)_{10} + (47)_{10}$
- (b) What are Error-Detecting and Error-Correcting Codes ? Illustrate their usefulness with suitable examples. 6
- (c) What are Gray Codes ? Where are these useful ? Illustrate. 4
- 3. (a) What are Cyclic Codes ? How are these useful ? Illustrate. 7
- (b) What is the minimum and maximum integer and floating-point number stored in a 64-bit register assuming 1 bit as a sign-bit, 16 bits for exponent and rest of the bits for significant ? Provide its complete layout indicating overflow and underflow and regions. 9

UNIT - II

- 4. (a) What is a Logic Family ? What criteria make one logic family to differ from another ? Differentiate between TTL and CMOS Logic families. 7

- (b) What is Border Expression ? Simplify the following Boolean Expression. 9

$$F(a,b,c,d) = \sum_m(0,1,2,3,8,9,10,11) + \sum_d(4,5,6,7,12,14)$$

- 5. (a) What do you mean by the following terms ? 6
 - (i) Noise Margin
 - (ii) Propagation delay
 - (iii) Fan-in and Fan-out
- (b) What are Universal Gates ? How Universal gates are realized into basic gates ? Illustrate. 6
- (c) What is Principle of Duality ? Illustrate. 4

UNIT - III

- 6. (a) What is T flip-flop ? How is it designed ? Illustrate. 8
- (b) What is combinational circuit ? Design a combinational circuit that receives 4-bit binary number as input and produces its Gray Code at its output. 8

- 7. Illustrate the purpose of the following and implement :
 - (a) Magnitude Comparator 8
 - (b) Master Slave Flip-Flop. 8