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**Question Paper Code : 51207**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Third Semester

Electronics and Communication Engineering

EC 1201 — DIGITAL ELECTRONICS

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define bit, byte and nibble.
2. Find the complement of  $A\bar{B} + \bar{B}C + C\bar{D}$ .
3. What do you mean by weighted code? Give example.
4. Draw the symbol and Truth Table for J-K flip-flop.
5. Draw the logic circuit for the expression  $F = \bar{x}\bar{y}z + \bar{x}yz + x\bar{y}$ .
6. Define modulus of a counter.
7. Give significance of priority encoder.
8. Distinguish between EPROM and EEPROM.
9. What is universal shift register?
10. What is the difference between static and dynamic RAM?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Design the circuit for one bit comparator. (8)  
(ii) Design a full adder circuit using NAND gates only. (8)

Or

- (b) (i) Write a detailed technical note on the Hardware Description Language. (8)  
(ii) What is Karnaugh Map? A truth table has output 0 for input ABCD = 0000, 0010, 1100, 1101, 1110, 1111, 0101, 0111. Simplify using karnaugh Map & draw the simplified circuit. (8)

12. (a) Draw the circuit of TTL NAND gate and explain its operation. Compare the TTL and ECL logic families. (16)

Or

- (b) (i) Write a detailed technical note on the interfacing of CMOS and TTL families. (8)
- (ii) Explain the switching operation and characteristics of PN junction diode. (8)
13. (a) (i) Implement the following function using 3 to 8 decoder. (8)
- $$f(A, B, C) = \sum m (0, 1, 4, 5, 7)$$
- (ii) Discuss in detail, about the multiplexer and demultiplexer as logic elements with examples. (8)

Or

- (b) (i) Explain the combinational logic design using MSI devices. (6)
- (ii) What is the importance and applications of Gray code? Convert the binary number 10100111 to Gray code. (6)
- (iii) Explain 1-bit magnitude comparator. (4)
14. (a) (i) Design a synchronous decade counter to count in the following sequence. 1, 0, 2, 3, 4, 8, 7, 6, 5. (8)
- (ii) What is sequential circuit? Explain S-R and J K flip flop. (8)

Or

- (b) (i) Draw and explain 4-bit synchronous Up / Down counter. (8)
- (ii) Design a serial 2's complementer with a shift register and a flip-flop. The binary number is shifted out from one side and its 2's complement shifted into the other side of the shift register. (8)
15. (a) (i) Draw the circuit of a BJT RAM cell and explain its operation. (8)
- (ii) Give the classification of memory and explain the block diagram of ROM. (8)

Or

- (b) Along with neat diagrams write a detailed technical note on the following
- (i) MOSFET RAM cell. (8)
- (ii) FPGA. (8)