Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 27156

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Second Semester

Computer Science and Engineering

CS 6201 – DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Common to Information Technology)

(Regulations 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Convert $(126)_{10}$ to octal number and binary number.

2. Write short notes on weighted binary codes.

3. Discuss NOR operation with a truth table.

4. Draw the truth table of half adder.

5. Write short notes on propagation delay.

6. Draw the diagram of T flip flop and discuss its working.

7. What is a shift register?

8. What is a race condition?

9. What is memory address register?

10. Write short notes on PLA.

PART B — (5 × 16 = 80 marks)

11. (a) Simplify the following switching functions using Karnaugh map method and realize expression using gates $F(A,B,C,D) = \Sigma(0,3,5,7,8,9,10,12,15)$. (16)

Or

(b) Simplify the following switching functions using Quine McCluskey's tabulation method and realize expression using gates $F(A,B,C,D) = \Sigma(0,5,7,8,9,10,11,14,15)$. (16)

(a) Design a full subtractor and derive expression for difference and borrow. Realize using gates. (16)

Or

(b) Design a code converter that converts a 8421 to BCD code. (16)

13. (a) Design a sequence detector that detects a sequence of three or more consecutive 1 's in a string of bits coming through an input line and produces an output whenever this sequence is detected. (16)

Or

(b) Design a three bit synchronous counter with T flip flop and draw the diagram. (16)

14. (a) Analyze the following clocked sequential circuit and obtain the state equations and state diagram. (16)

Or

(b) Design a serial adder using a full adder and a flip flop. (16)

15. (a) Implement the following function using PAL F1 $(A, B, C) = \Sigma(1,2,4,6)$; F2 $(A, B, C) = \Sigma(0,1,6,7)$; F3 $(A, B, C) = \Sigma(1,2,3,5,7)$. (16)

Or

(b) Design a combinational circuit using ROM that accepts a three bit binary number and outputs a binary number equal to the square of the input number. (16)

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Question Paper Code : 27273

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Second Semester

Civil Engineering

GE 6252 — BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to all Branches except Electronics and Communication Engineering, Medical Electronics Engineering, Biomedical Engineering, Computer Science and Engineering, Information Technology, Computer and Communication Engineering, Electrical and Electronics Engineering, Electronics and Instrumentation Engineering, Instrumentation and Control Engineering and Pharmaceutical Technology)

(Regulations 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   State Ohm's law and its limitations.

2.   Mention the errors in Moving iron instruments.

3.   List out the types of single phase induction motors.

4.   Calculate the e.m.f generated by a 4-pole, wave-wound armature having 45 slots with 18 conductors per slot when driven at 1200 r.p.m. the flux per pole is 0.016 Wb.

5.   Find the values of I_C, I_B and β, Transistor values are $\alpha = 0.95$, $I_E = 1$ mA.

6.   What is the total current at the junction of PN junction diode?

7.   Define the logic operation of AND gate with Boolean equation.

8.   Convert $(634)_8$ to binary.

9.   Define analog and digital signals.

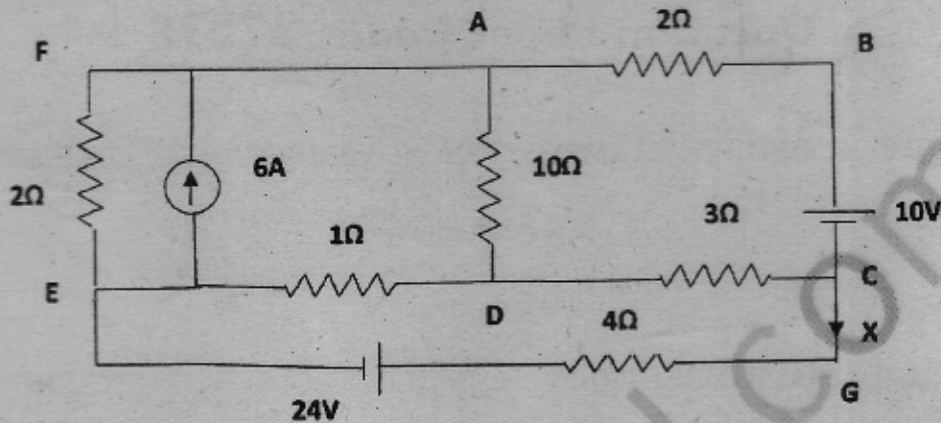10. What are the advantages of optical fibre communication?

PART B — (5 × 16 = 80 marks)

11. (a) Determine the current, power X in the 4Ω resistance of the circuit shown below : (16)

Or

(b) Draw and explain the working principle of attraction type, repulsion type M.I. instruments and derive its deflecting torque. (16)

12. (a) With neat sketches, explain the working principle and the construction of DC motor. Also derive the torque and speed equation. (16)

Or

(b) (i) Derive the torque and speed equations of DC motor. (8)

(ii) Explain the construction details of single phase transformer. (8)

13. (a) Describe the working of a PN junction diode with neat diagrams. Also explain its V-I characteristics. (16)

Or

(b) (i) Let $V_{BB} = 10\,V$, $R_B = 1\,M$, $\beta = 100$, $V_{CC} = 15$, $R_L = 10\,\Omega$ in the transistor circuit, find (1) I_B (2) I_c (3) I_E (4) V_{CE}, Neglect V_{BE}. (8)

(ii) Explain the working of zener diode and its applications. (8)

14. (a) (i) Draw the logic symbol of OR, NAND, NOT gate and explain its logic operation. (8)

(ii) Draw and explain the operation of following flip-flops, (1) RS flip-flops using NOR gate (2) D flip-flops using NAND gate. (8)

Or

(b) With necessary diagrams describe the operation of a 4-bit binary, ripple counter. (16)

15. (a) Describe the principle of modulation and its needs. Write the short note on amplitude modulation and frequency modulation. (16)

Or

(b) Describe the functional block diagram of Monochrome TV transmitter and receiver with a neat sketch.

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