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Question Paper Code : 21853

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

Fourth Semester

Mechanical Engineering

ME 2255/ME 46/EC 1265/080120019/10122 ME 406 — ELECTRONICS AND MICROPROCESSORS

(Common to Automobile Engineering, Production Engineering and Third Semester Mechanical and Automation Engineering)

(Regulations 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write down the diode current equation.

2. How does the zener breakdown voltage vary with temperature?

3. Draw the symbol for PNP/NPN transistor?

4. What is thyristor? Why it is called a Triggering device?

5. State the commutative property of Boolean algebra.

6. Draw the Half adder circuit.

7. List the allowed register pairs of 8085.

8. Write instructions to load the hexadecimal numbers 65H in register C, and 92h in the accumulator A. Display the number 65H at PORT0 and 92H at PORT1?

9. Give few applications of 8085 microprocessor.

10. What is the angle through which a stepper motor will rotate for every output step pulse from the microprocessor?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw and explain the energy band diagram for conductor, insulator and semiconductor. (8)

(ii) Discuss the working of zener diode with its V-I characteristics. (8)

Or

(b) (i) Draw half controlled bridge rectifier with R-L load. How o/p voltage can be varied? (8)

(ii) A silicon has a saturation current of 1 PA at 20°C. Find,

(1) Diode bias voltage when diode current is 3mA.

(2) Diode base current when temperature is 100°C, assuming the diode voltage to be a constant. (8)

12. (a) (i) With neat diagram, explain the operation and input and output characteristics of CE configuration. (10)

(ii) Compare SCR and TRIAC. (6)

Or

(b) (i) State the purpose for which UJT is used in triggering circuit. Describe the working with circuit diagram. (8)

(ii) Draw transistor as switch. What is voltage across transistor and current through transistor when transistor is ON and OFF? (8)

13. (a) (i) Reduce the following function and implement using universal gates : (10)

$$F = \overline{A}\overline{B}\overline{C} + \overline{A}\overline{B}C + \overline{A}BC + \overline{A}B\overline{C} + A\overline{B}C + ABC$$

(ii) Discuss the operation of RS flip flop and D flip flop. (6)

Or

(b) (i) Draw and explain the Operation of A/D and D/A converters. (10)

(ii) Give the comparison between synchronous and Asynchronous counters. (6)

14. (a) (i) List the internal registers in 8085A, their abbreviations and lengths. Describe the primary function of each register. (8)

(ii) Write a 8085 assembly program to add the contents of memory locations 2000H to 2009 H and place the result in the memory locations 2010H and 2011 H. (8)

Or

(b) Explain the following 8085 Instructions with an example

(i) ADI

(ii) CALL

(iii) EI

(iv) JPE

(v) ORA

(vi) RAR

(vii) SHLD

(viii) XCHR. (16)

15. (a) With necessary hardware and software details explain how to interface LCDs with 8085 microprocessor. (16)

Or

(b) Explain the procedure of interfacing the temperature monitoring system with 8085. (16)