



Register Number:.....

**B.E. DEGREE EXAMINATIONS: MAY 2015**

(Regulation 2009)

Fifth Semester

**MECHANICAL ENGINEERING**

ECE281: Electronics & Microprocessor

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

- In an intrinsic semiconductor, the Fermi level is
  - closer to the valence band
  - closer to the conduction band
  - midway between conduction and valence band
  - within the valence band
- The breakdown mechanism in a lightly doped PN junction under reverse biased condition is called
  - Zener breakdown
  - Avalanche breakdown
  - Breakdown by tunneling
  - High voltage breakdown
- If both the emitter- base and the collector-base junctions of a bipolar junction transistor are forward biased, the transistor is in the
  - Active region
  - Cut-off region
  - Saturation region
  - Inverted region
- In JFET, the drain current is primarily controlled by
  - Channel resistance
  - Size of depletion region
  - Voltage drop across the channel
  - Reverse biased gate
- Which of the following Boolean rules is correct?
  - $A + 0 = 0$
  - $A + AB = A' + B$
  - $A + A' = A'$
  - $A + 1 = 1$
- In a voltage shunt negative feedback amplifier system, the input resistance  $R_i$  and the output resistance  $R_o$  of the basic amplifier are modified as follows:
  - $R_i$  is decreased and  $R_o$  increased.
  - Both  $R_i$  and  $R_o$  are decreased.
  - Both  $R_i$  and  $R_o$  are increased
  - $R_i$  is increased and  $R_o$  is decreased.

7. Which one of the following is a data transfer operation?
  - a) ADD B
  - b) SUB B
  - c) CMA
  - d) MOV A,B
8. ----- register sequences the execution of instructions
  - a) Program counter
  - b) Accumulator
  - c) Stack pointer
  - d) Temporary register
9. All the functions of the ports of 8255 are achieved by programming the bits of an internal register called
  - a) Control register
  - b) Program counter
  - c) Buffer
  - d) Temporary register
10. The port---- of 8255 can be operated as bidirectional I/O port.
  - a) B
  - b) D
  - c) C
  - d) A

**PART B (10 x 2 = 20 Marks)**

11. Define cut in voltage and break down voltage of a PN junction diode.
12. Define i) Ripple Factor ii) Efficiency iii) Transformer utilization Efficiency
13. Compare BJT with JFET.
14. Define the following a) Holding current b) Latching current
15. Given the two binary numbers a = 1010100 and b = 1000011, perform the subtraction b - a using 2's complement method.
16. Simplify the following logic function:  
 $ABC + AB'C + ABC' + AB'C'$
17. What is the use of ALE signal in 8085 Microprocessor?
18. Give the addressing modes of the following instructions:
  - a) ADI 01H
  - b) LDA 4500H
  - c) HLT
  - d) MOV A,M
19. What are the different operating modes of 8255?
20. What is purpose of 'IN' and 'OUT' instructions?

**PART C (5 x 14 = 70 Marks)**

21. a) i) Illustrate the operation of PN junction diode under forward and reverse bias conditions with neat diagram. (10)
  - ii) Differentiate avalanche and zener break downs. (4)
- (OR)**
- b) i) Explain the functioning of bridge rectifier with necessary diagrams. (10)

ii) Compare bridge rectifier with center tapped full wave rectifier. (4)

22. a) Explain the construction, operation and characteristics of UJT with neat diagram.

**(OR)**

b) Explain the operation and characteristics of a transistor in common emitter configuration.

23. a) Construct a 4 bit ripple counter and explain the operation with neat diagram and wave forms.

**(OR)**

b) Draw the flash type Analog to digital converter and explain its functioning.

24. a) i) Highlight the features of 8085 microprocessor. (4)

ii) Explain the different types of instructions with suitable examples. (10)

**(OR)**

b) Write the algorithm and assembly language program to sort the numbers in ascending order.

25. a) Explain the various modes of operation of the 8255 programmable peripheral interface.

**(OR)**

b) Explain temperature control system using 8085 with necessary diagrams and write assembly language program for the same.

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