VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. II Year (C.S.E.) I-Semester Supplementary Examinations, May/June-2017
Basic Electronics

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 X 2=20 Marks)

1. Write about the significance of Hall effect.

2. Differentiate between conductivity and resistivity of a semiconductor.

3. Describe the concept of Early effect in transistors.

4. List out the advantages of IC voltage regulators.

5. Discuss the concept of feedback in amplifiers and differentiate between feedback factor and open loop gain.

6. Classify the different types of oscillators.

7. Define slew rate and CMRR of an operational amplifier.

8. Justify with examples, which logic gates are called as universal gates.

9. Differentiate between photo diode and photo transistor.

10. Explain the working principle of temperature transducer.

Part-B (5 × 10 = 50 Marks)

11. a) Draw the circuit diagram of half wave rectifier and explain its working. Derive the expressions for its ripple factor, efficiency, transformer utilization factor. [7]

    b) A half wave rectifier is used to supply 24 V dc to a resistive load of 500 Ω and the diode has a forward resistance of 50 Ω. Calculate the maximum value of the ac voltage required at the input. [3]

12. a) With neat diagrams explain the operation of NPN and PNP transistors. [4]

    b) With the help of neat sketches and characteristic curves explain the operation of JFET. [6]

13. a) Indicate how an amplifier can be converted into an oscillator? Draw the circuit diagram of Colpitts oscillator and explain its working. [7]

    b) A voltage series negative feedback amplifier has a voltage gain (without feedback) of $A = 500$, input resistance $R_i = 3$ KΩ, output resistance $R_o = 20$ KΩ and feedback ratio $\beta = 0.01$. Calculate the voltage gain A_f, input resistance R_{if} and output resistance R_{of} of the amplifier with feedback. [3]

14. a) Justify the name operational amplifier and discuss any two applications of OP-AMP with neat diagrams. [5]

    b) Draw and explain the circuit of instrumentation amplifier. [5]

15. a) Explain the construction and working principle of SCR with a neat circuit and its characteristics. [7]

    b) Differentiate between piezoelectric and photoelectric transducer. [3]

16. a) A half wave rectifier, having a resistive load of 1000 Ω. rectifies an alternating voltage of   [7]
      325 V peak value and the diode has a forward resistance of 100 Ω. Calculate

      i)   peak, average and rms value of current

      ii)   d.c. power output

      iii) a.c. input power

      iv) efficiency of the rectifier

   b) In brief, explain about Zener and Avalanche thermal breakdown mechanisms.   [3]

17. Write short notes on any *two* of the following:

     a)   CRO   [5]

     b)   Half adder and Full adder   [5]

     c)   LVDT   [5]

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