(18)

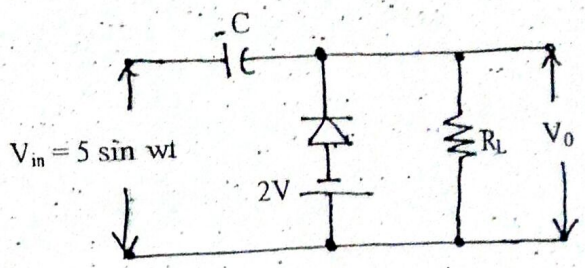
TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2068 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	All (Except B.Arch.)	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

Subject: Basic Electronics Engineering

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

1. What do you mean by a filter circuit? Explain in brief about RC high pass filter. [1+3]
2. Define capacitance. Find the equivalent capacitance when two capacitors of capacitance C_1 and C_2 are connected in series. [1+3]
3. Explain the small signal model of PN junction diode and derive the expression for AC or dynamic resistance. [8]
4. What is a clipper circuit? Find the output waveform for the following circuit. [1+3]



5. In BJT circuit if $V_{CC} = 10V$, and $R_C = 8k\Omega$, draw the dc load line. Determine the Q-point (operating point) for zero input signal if $I_B = 15\mu A$ and $\beta = 40$. [8]
6. Why BJT is a bipolar and MOSFET is a unipolar device? And draw the circuit diagram of differential amplifier using BJT. [2+2]
7. Design the summing amplifier using Op-Amp to get the output voltage: $V_0 = 3V_1 + 2V_2 + V_3$. [6]
8. Explain how square wave can be generated using Op-Amp and write the relation for frequency of oscillation. [4]
9. Define communication system and draw the complete block diagram of communication system. [2+4]
10. What is optical fiber? Write short notes on optical fiber. [1+3]
11. Explain the working principle of n-channel Enhancement type MOSFET. [7]
12. Subtract $(111)_2$ from $(110)_2$ using 2's complement method. Draw the circuit of AND gate using NOR gates only. [3+3]
13. Explain the operation of SR-flip flop with necessary diagrams and characteristic table. [6]
14. Write short notes on: (any three) [3×3]
    a) Regulated power supply
    b) Transducer
    c) Oscilloscope
    d) Data logger

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