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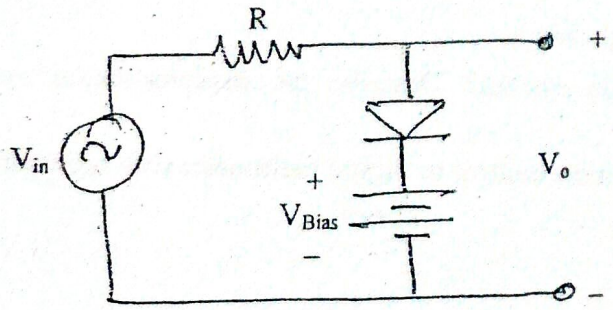
TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2071 Magh

Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	All Except (B.Arch.)	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

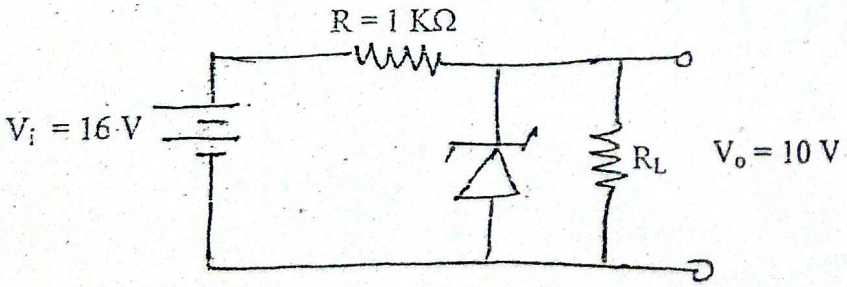
Subject: - Basic Electronics Engineering *(EX451)*

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

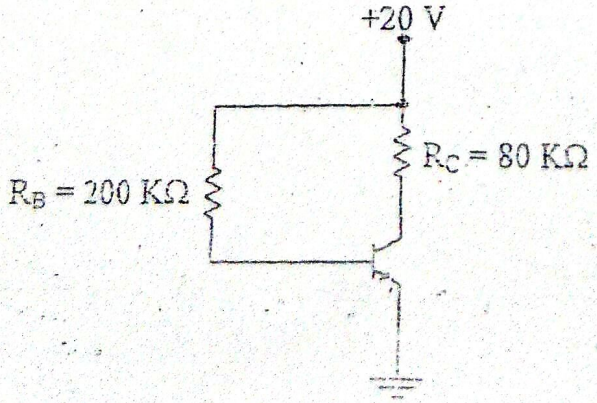
1. What do you mean by filter? Explain the RC low pass and high pass filter with corresponding transfer function and magnitude. [1+4]
2. State Thevenin's Theorem. Write down the steps for determining V_{th} and R_{th} with necessary circuit diagrams. [1+4]
3. What is rectification? Explain the operation of half wave rectifier with necessary diagrams. [1+4]
4. What are clippers? Draw the sinusoidal waveform of the following circuit and indicate the output voltage. Assume diode is ideal. [1+4]



5. Find the zener current from the given zener diode network when R_L = 3 KΩ and V_o = 10 V. [5]



6. For the given circuit with β = 75, determine I_B, I_C and V_{CE}. [2+2+2]



7. Explain the construction and working principle of enhancement type MOSFET? [6]

8. Explain the concept of feedback theory. Describe the working principal of square wave oscillator circuit using op-amp. [2+4]

9. State any 4 important properties of ideal Op-Amp. Draw the circuit diagram of differentiator using Op-Amp and show that output is the differentiation of input signal. [2+4]

10. What is modulation? Explain AM and FM modulated wave. [1+2+2]

11. What do you mean by electromagnetic waves? How are they propagated? Explain. [2+3]

12. Perform the following: [4×1]

    a) $(375.37)_8 = (?)_{16}$
    b) $(169.03125)_{10} = (?)_2$
    c) $(905)_{10} = (?)_{BCD}$
    d) Subtract $(25)_{10}$ from $(49)_{10}$ using 2'S complement method

13. Simplify the following Boolean expression using K-map and realize it by using universal gate of your interest. [3+2]

$$F(x, y, z) = xy + \bar{x}z + yz$$

14. Explain SR flip-flop with circuit. [4]

15. What is instrumentation system? Describe the instrumentation system with block diagram. [4]

16. Explain briefly about remote control or digital multimeter with necessary diagrams. [4]

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