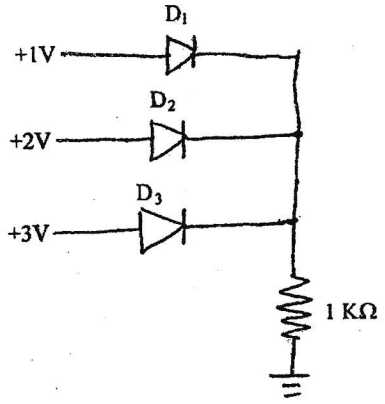
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Bhadra

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 *(EX451)*

- ✓ 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 an ideal voltage source? Why is this voltage source practically unrealizable? Explain practical voltage source with an example. [1.5+1+1.5]
2. Why are resistors, inductors and capacitors called passive elements? How can these components be used to realize a filter circuit that passes high frequency signals only? [1+3]
3. Describe the small signal model of semiconductor diode. And derive the expression for dynamic resistance rd. [6]
4. Assuming diodes used in the circuit are ideal. Find current through 1 KΩ resistor. [4]



5. Design Op-amp circuit to get output $V_0 = 0.5V_1 - 2V_2 - V_3$. Here V_1, V_2 and V_3 are three input voltage source. [4]
6. Explain the working of triangular wave generator with necessary diagram. [5]
7. Draw the circuit diagram of Wien bridge Oscillator. Write frequency of Oscillation. [3]
8. Explain the need of modulation in a communication system. [3]
9. Explain the block diagram of optical fibre communication and explain the advantages of optical communication over copper cable communication. [6]
10. Convert the following numbers as indicated. [1.5×2]

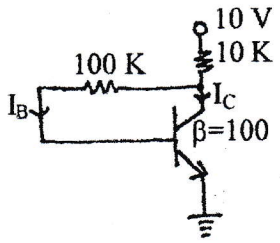
    a) $(EIA)_{16} = (\ )_8$ b) $(35.7)_{10} = (\ )_2$
11. State and prove De-Morgan's Theorems. [3]
12. Define encoder. Explain the operation of octal to binary encoder with logical diagram. [6]

13. Obtain the simplified expression for the following boolean function using K-Map. [3]

$F(x, y, z) = \Sigma m (0, 2, 4, 5, 6)$

14. Construct clocked SR flip-flop with its characteristics table and equation. [5]

15. For the circuit given below determine I_B, I_C and V_{CE}. [2+2+2]



16. Explain the working principle of n-channel Enhancement type MOSFET. [6]

17. Explain the block diagram of data logger briefly. [4]

18. What is a digital multimeter? Draw its block diagram and explain how it measures resistance. [1+4]

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