04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Magh

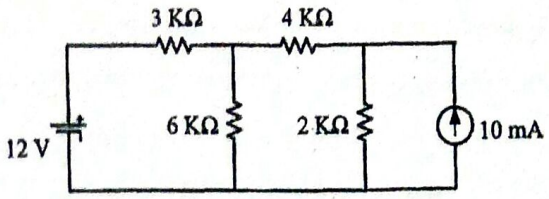
96+66

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.

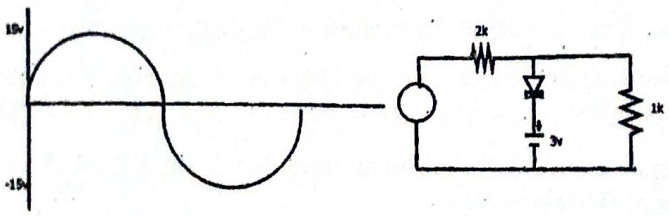
Subject: - Basic Electronics Engineering *(EX451)*

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

1. State Thevenin's theorem and use it to find the current through 4 kΩ resistor. [1+5]



2. Explain the operation of RC low pass filter with its transfer function and frequency response. [4]
3. What is diode? Explain the I-V characteristics of PN junction diode. [1+4]
4. Define pulse shaping circuits. Find the output wave form of the given circuit. [1+4]



5. Draw emitter feedback bias circuit of BJT by labeling all the circuit components. Find I_C and V_{CE} in the circuit if V_{CC} = +12V, R_B = 430 kΩ, R_C = 2 kΩ, R_E = 1 kΩ and β = 50. [2+3]
6. Draw the structure of CMOS. Describe the operation of CMOS logic inverter. [5]
7. Explain the concept of virtual ground. Design a summer circuit using op-amp to get the output voltage as: $V_0 = -(V_1+10V_2+25V_3)$ [1+4]
8. Define positive feedback. Draw the circuit diagram for Wien Bridge oscillator and explain the principal of operation. [1+4]
9. Draw a block diagram of communication system and explain each block briefly. [6]
10. Write short note on optical fiber. What are the advantages of optical fiber communication over traditional communication system? [2+2]
11. State and prove De-Morgan's theorems. [4]
12. Explain the operation of SR flip-flop with necessary diagram. [5]
13. Convert the following number system. [3]

    (a) $(25.5)_{10} = (?)_2$ (b) $(EAB)_{16} = (?)_{10}$ (c) $(9180)_{10} = (?)_{BCD}$

14. Write short notes on: (any two) [2×5]
    a) Strain Gauge
    b) Data Logger
    c) DMM
15. Describe the construction and working principal of N-channel Depletion type MOSFET. [8]

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