TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

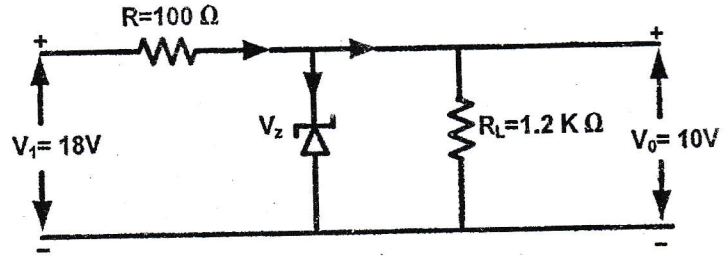
2077 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCE, BEL, BEX, BCT, BME, BAM, BIE, BAG, BGE, BAS	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

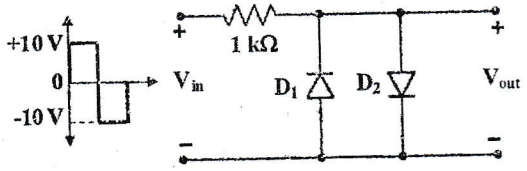
Subject: - Basic Electronics Engineering *(EX 451)*

- ✓ 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.*

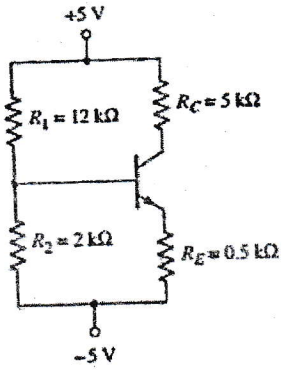
1. Write the color coding of the following values of resistors: [4]
   a) 47 ± 5% k Ω b) 548 ± 10%Ω
2. Explain RC low pass filter with necessary derivations and diagrams. [4]
3. Find the Zener Current in the given circuit when R_L = 1.2 kΩ. Assume V_Z = 10V. [4]



4. Find the output voltage waveform when the input is applied to the circuit a shown in the figure using silicon diodes. [4]



5. Describe the input and output characteristics of common emitter BJT configuration with the help of circuit diagram and graph with various region of operation. [6]
6. Describe the construction and working principal of Depletion MOSFET with necessary diagrams. [5]
7. Find collector current (I_C) and collector emitter voltage (V_{CE}) of the BJT circuit given below with β = 100. [5]



8. List out ideal characteristics of op-amp. Derive voltage gain of non-inverting op-amp configuration. [2+4]

9. Design the summer circuit using operational amplifier: [5]

$$V_0 = V_1 + 2V_2 + 3V_3$$

10. Explain the concept of gain stability. Describe the working principal of square wave generator circuit using operational amplifier. [1+4]

11. Explain the complete block diagram of communication system. [4]

12. What is optical fiber? What are the advantages of optical fibers over traditional communication systems? [1+3]

13. Write short notes on: (Any Two) [2×4]
    a) Strain gauge b) Data logger c) Digital multimeter

14. Convert the following: (Any Three) [3×2]
    a) $(10101.101)_2 = (?)_{10}$
    b) $(9001180)_{10} = (?)_{BCD}$
    c) $(2AB.5E)_{16} = (?)_8$
    d) $(34)_{10} - (12)_{10}$ using 1's complement method.

15. Simplify the expression using K-Map, F(x, y, z) = X'YZ + X'Y'Z + XYZ and realize it using logic gates. [6]

16. Explain the operation of JK flip-flop with necessary diagrams and characteristics table. [4]

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