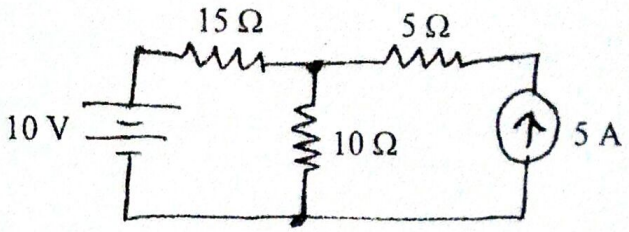
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2071 Bhadra

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

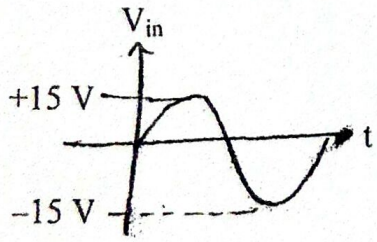
Subject: - Basic Electronics Engineering *(EX451)*

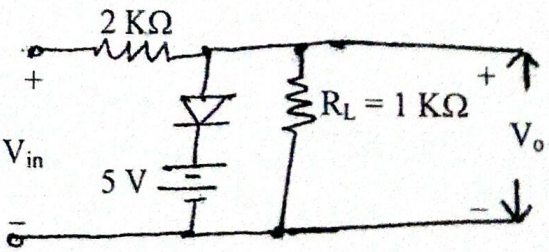
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

1. Define active and passive circuit component. Determine the color code of the following resistor 75 KΩ ± 10%. [2+2]
2. Determine the current through 10 Ω resistance using Thevenin's theorem. [4]

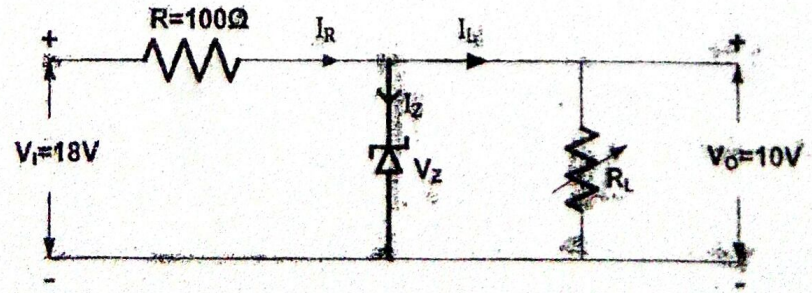


3. What is a filter? Explain the types of filter with necessary diagrams. [1+3]
4. Explain large signal models of PN junction diode. [4]
5. Define clipping circuits. Draw the output waveform of circuit shown below. Assume real silicon diode. [2+2]





6. Find the Zener current in the given circuit when R_L = 1.2 KΩ. Assume V_Z = 10 V. [4]



7. Explain the common emitter configuration circuit of npn transistor with the help of input and output characteristics. [6]

8. Explain the working principle of N channel depletion type MOSFET with necessary diagrams. [6]
9. State any four properties of an ideal op-amp. Design a summing amplifier usign Op-Amp to get the output voltage $V_0 = -V_1 + 2V_2 + 3V_3$. [2+3]
10. Explain how square wave can be generated using Op-Amp and write the relation for frequency of oscillation. [4+1]
11. Define communication system and draw the complete block diagram of communication system. [2+3]
12. What is optical fiber? Explain the advantages of optical fiber communication over traditional communication system. [2+3]
13. Simplify the expression using K-map, Y = A'BC' + ABC' + ABC. [3]
14. Explain the operation of SR-flip flop with necessary diagrams and characteristics table. [6]
15. (a) $(10101.101)_2 = (?)_{10}$ (b) $(9001180)_{10} = (?)_{BCD}$ (c) $(2AB\ .\ 5E)_{16} = (?)_8$ [1×3]
16. What is instrumentation system? Explain the instrumentation system with the help of simple block diagram. [1+3]
17. Write short notes of any two: [2×4]
    a) Data Logger
    b) DMM
    c) Strain Gauge

***