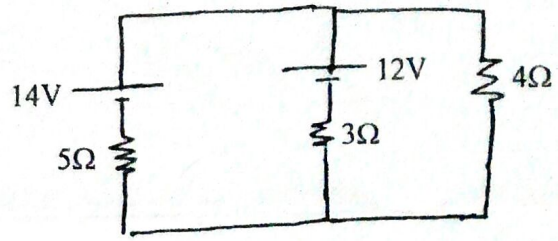
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2070 Bhadra

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

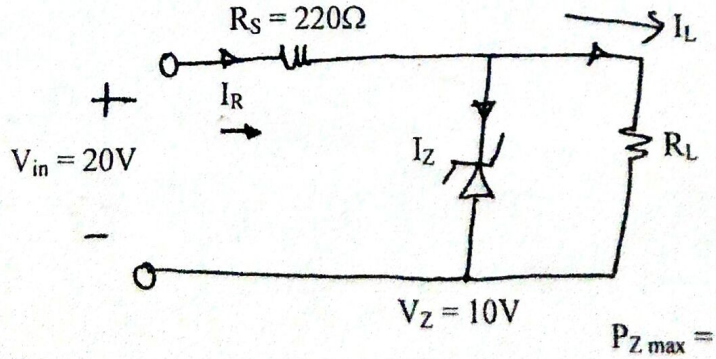
Subject: - Basic Electronics Engineering ***(EX451)***

- ✓ 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 superposition theorem. In the following figure find the current flow in 4 ohm resistor using superposition theorem. [2+4]



2. Explain the principle of operation of RC low pass filter with necessary diagrams and derivation. [4]
3. Explain the working principle of full wave bridge rectifier circuit with the help of necessary circuit diagrams and expressions. [6]
4. Determine V_L, I_L, I_Z and I_R for the network shown in figure below for following condition. [3+3]
   a) If $R_L = 180\ \Omega$
   b) If $R_L = 470\ \Omega$



5. Define DC load line? Explain the common emitter configuration circuit with the help of input and output characteristics curve. [2+4]
6. Explain the construction and working principle of MOSFET. [6]
7. Write the four properties of ideal operational amplifier. [2+4]
8. Explain how square wave can be generated using Op-Amp. [6]

9. Define communication system. Explain amplitude modulation communication system with the help of necessary block diagrams. [6]

10. Discuss the role of antenna in communication system. What are the advantages and disadvantages of optical fiber communication? [2+4]

11. Draw the circuit of X-OR gate using NAND gates only. Perform the subtraction using 2's complement method. [2+2]

    $42_{(10)} - 115_{(10)}$ [4]

12. Simplify the expression using k-map

    $F(x, y, z) = xyz + x'y'z + xy'z' + x'y'z' + x'yz$ [4]

13. Discuss the operation of S-R flip flop. [5×2]

14. Write short notes: (any two)

    a) Clipper circuit
    b) Strain gauge transducer
    c) Data logger

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