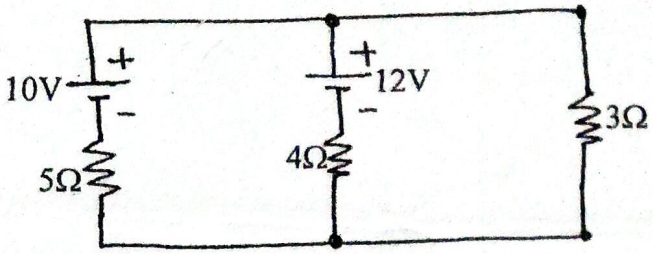
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2069 Bhadra

Exam.	Regular (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	All (Except B. Arch)	Pass Marks	32
Year / Part	I / II	Time	3 hrs.

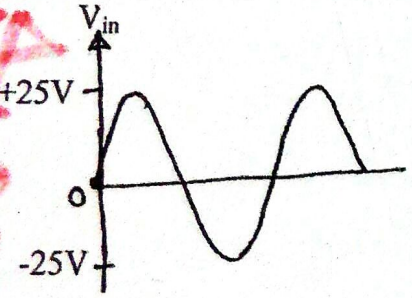
Subject: - Basic Electronics Engineering ***(EX451)***

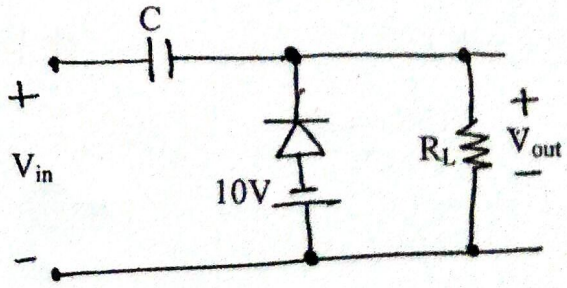
- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ *Attempt **All** questions.*
- ✓ *The figures in the margin indicate **Full Marks**.*
- ✓ *Assume suitable data if necessary.*

1. Define transconductance and voltage gain with reference to BJT. [3]
2. Draw RC high pass filter circuit and its characteristics graph. [2]
3. Find current flow in 3Ω resistance. Use superposition theorem to solve the problem. [5]

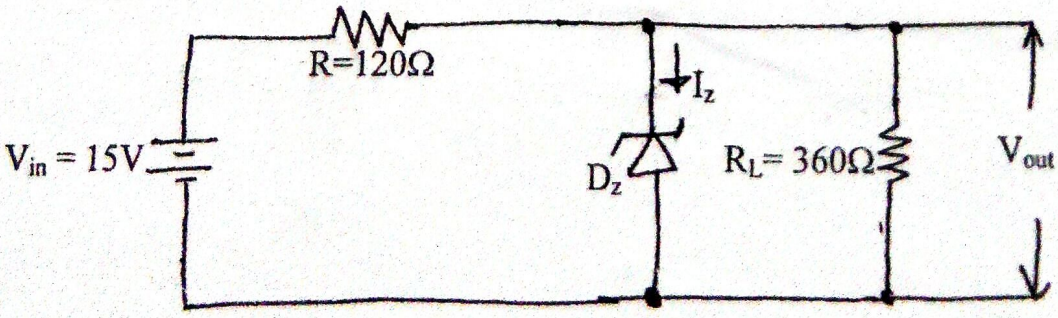


4. What is clamping circuit? Find the output waveform of the given circuit. [1+3]





5. Deduce AC resistance of PN junction diode at forward biased region. [3]
6. Draw bridge rectifier circuit and its output waveform. Assume input is Sinewave voltage. [3]
7. Find I_z, assuming $V_z = 9V$. [3]



8. Find the volume of collector current, Q-point, DC load line for common emitter circuit having $V_{CC} = 15V$, $R_C = 10K\Omega$, $I_B = 10\mu A$ and $\beta = 50$. [5]

9. Draw the circuit diagram and I-V characteristic curve to investigate output static characteristics of common emitter amplifier configuration. [3]

10. Describe the operation of CMOS NOT-gate circuit. [4]

11. State four important properties of ideal op-amp. Draw the circuit diagram of a differentiator using op-amp and show that the output is the derivative of the input. [2+4]

12. Describe the operation of Wien bridge RC-sinewave Oscillator. State Barkhausen criteria. [4+2]

13. Draw the block diagram of communication system and explain each block. [4]

14. Define amplitude modulation and frequency modulation and draw the necessary waveforms. [2+3]

15. State DeMorgan's theorems with example in each case. [4]

16. a) Verify the following: [2+2]

i) $AB+\bar{A}C = (A+C)(\bar{A}+B)$ ii) $XY + \bar{X}Z + YZ = XY + \bar{X}Z$

b) Find: $(15)_{10}-(20)_{10}=?$, use 2's complement method. [2]

17. Draw and explain the block diagram of data logger and remote control. [5+5]

18. Define encoder . Draw truth tables of NAND and XOR gates. [2+2]

***