TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

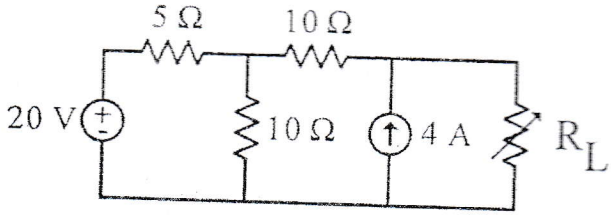
2081 Baishakh

Exam.	Regular(New Course -2080 Batch)		
Level	BE	Full Marks	60
Programme	BEI,BCT,BME, BAM,BIE,BAS	Pass Marks	24
Year / Part	I / I	Time	3 hrs.

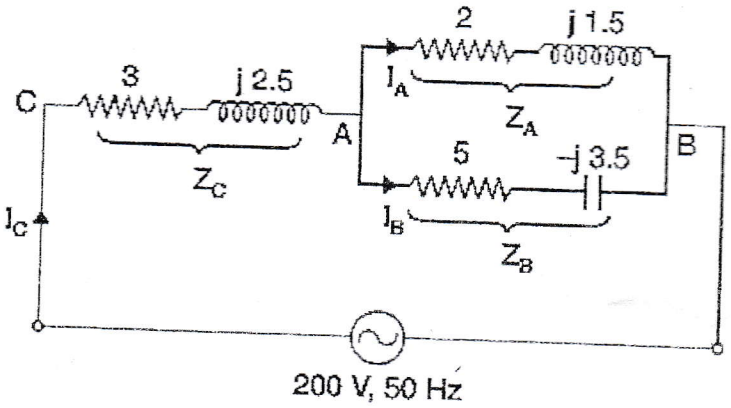
Subject: - Fundamental of Electrical and Electronics Engineering *(EX 101)*

- ✓ 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. Explain superposition theorem with suitable example. Find the maximum power that can be delivered to the load resistor R_L of the circuit shown in the figure below. [2+4]



2. Define trans-conductance, trans-impedance and gain. [3]
3. Define RMS and average value of ac signal. Find the RMS and average value of half wave rectified sinusoidal waveform $V = V_m \sin wt$. [2+4]
4. What are the two ways of connecting a 3-phase system and mention their relation between phase and line quantities. Derive the expression for series connected RC with phasor diagram. [2+4]
5. From the given circuit, find the branch current, total current, overall power factor, real power and reactive power. [6]

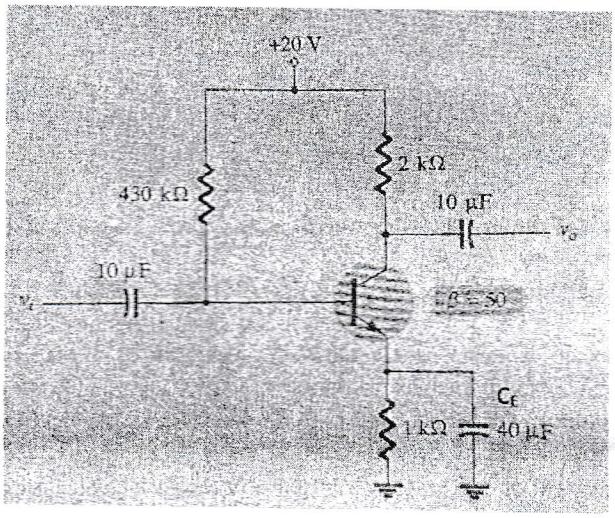


6. Explain the clipper and clamper circuits with suitable examples. [2+2]
7. Draw the circuit diagram of half wave rectifier with its input output voltage waveforms and explain in brief. [4]

8. Design a Zener diode voltage regulator that will maintain an output voltage of 20 V across 1-KΩ load with an input that will vary between 30 V and 50 V. Determine the proper value of R_S and the maximum Zener current I_{ZM}. [2+2]

9. Describe the input and output characteristics of Common Emitter BJT configuration with various region of operation. [4]

10. For the given Emitter-bias BJT network, find Q point. Draw dc load line and find region of operation. [2+1+1]



11. Describe the construction and working principle of n-channel enhancement type MOSFET. [4]

12. Derive voltage gain of closed loop non-inverting op-amp configuration. [4]

13. State Barkhausen criteria. Draw and explain circuit diagram of Relaxation oscillator (square wave generator). Write its frequency of oscillation. [1+3+1]

***