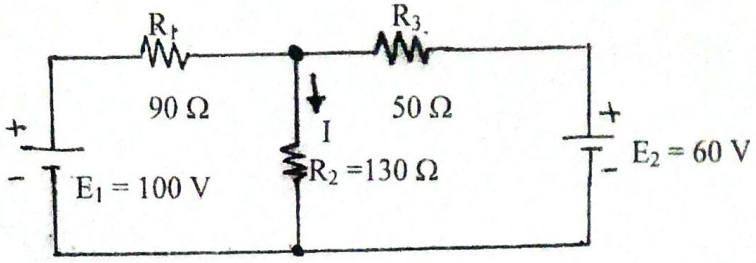
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2072 Magh

Exam.	New Back (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. Describe the principle of Thevenins theorem by solving the following problem. [4]



Find the current through R_2.

2. Draw the circuit diagram of RC high pass filter and explain its operation with the help of frequency dependent response at the output. [1+3]
3. Draw and explain the operation of the full-wave rectifier circuit using center tapped transformer. [4]
4. Explain the piece wise linear models of PN junction diode. [4]
5. What is a clamper circuit? Draw the clamper circuit that adds +5volts DC level on AC voltage. [1+3]
6. Draw collector feedback type dc biasing circuit. If Vcc = 10V, R_B = 950 KΩ, R_C = 2.2 KΩ and β = 150, Calculate dc operating collector current (IcQ) [4]
7. Describe the construction and working principle of n-channel Enhancement type MOSFET. [6]
8. Draw the circuit diagram of differential amplifier using BJT and sketch the waveform at the collector terminals for sinusoidal differential input. [4]
9. State four important properties of ideal operational amplifier and determine the voltage gain of non-inverting operational amplifier circuit. [2+4]
10. Draw circuit diagram of triangular wave generator with square wave a input signal. Explain the working principle of square wave generator circuit using operational amplifier. [2+4]
11. Define communication system. Draw and explain the block diagram of communication system. [2+4]
12. Subtract $(1111)_2$ from $(1100)_2$ using 2's complement method. [2]
13. State De Morgan's theorem and Duality theorem with two examples for each. [4]
14. Simplify the following expression: [3+3]
    i) $F(x,y,z) = xyz + x'y'z + xy'z' + x'y'z' + x'yz$
    ii) $F(x,y,z) = \sum (0,2,5,6)$
15. Write short notes on: [4×4]
    a) Oscilloscope
    b) Digital voltmeter
    c) Positive and negative feedbacks
    d) Varactor diode