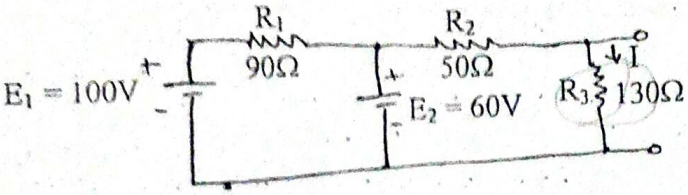
04 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2067 Mangsir

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

- ✓ 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. a) Describe the principle of Thevenins theorem by solving following problem. [7]



Find the current I in R_3.

b) Draw the circuit diagram of RC low filter and explain its operation with the help of frequency dependent output waveform. [7]

2. a) Draw and explain the I-V characteristics curve of P-N junction diode for forward and reverse bias region. [7]

b) Draw Zener voltage regulator circuit and explain clearly the working principle of this circuit to produce a regulated dc output. [7]

3. a) Describe output characteristics of common emitter configuration with the help of circuit diagram and IV characteristics graph. [7]

b) Describe the construction and working principle of N Channel E-MOSFET. [7]

4. a) State four important properties of ideal op-amp. Draw the circuit diagram of differentiating amplifier using op-amp and derive the expression for V_{out}. [2+5]

b) i) Draw the circuit diagram of Wien Bridge oscillator circuit for sinusoidal wave form. [4+3]

ii) Draw square wave oscillator circuit.

5. a) Perform the conversion of the following: [6]

i) $(10111.101)_2 = (?)_{10}$
ii) $(AFC.00)_{16} = (?)_8$
iii) $(901)_{10} = (?)_{BCD}$

b) Simplify the expressions and draw the circuits [6]

i) $\bar{A}\,\bar{B}\,\bar{C} + \bar{A}\,\bar{B}\,C + A\,\bar{B}\,\bar{C} + A\,\bar{B}\,C$

ii) $A\bar{C} + ABC + A(C + A\bar{C})$

6. Write short notes on any two: [2×6]

a) Strain Gauge
b) λ/2 Dipole Antenna
c) Transducer
d) Amplitude Modulation (AM)

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