Mid-West University

Examinations Management Office

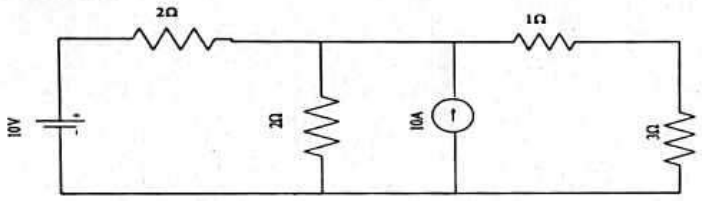
End-Semester Examinations -2080

Bachelor level/ B.E. Hydropower/ II Semester — Full Marks: 50
Time: 3 hours — Pass Marks: 25
Subject: Basic Electronics Engineering (EX421)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. a) Explain linear and non-linear circuits. **2**

b) Determine the current through 3Ω resistor in the circuit given below using Thevenin's Theorem: **4**



2. a) Explain varactor diode and zener diode in detail **2+2**

b) A Si diode has the saturation current of 0.3 pA at 25°C. Find its current when it is forward biased by 0.5 V. Find the current in the same diode when the temperature rises to 95°C. **4**

3. a) Explain about CB biasing of the BJT. **4**

b) Find the value of collector current, Q point and DC load line for common emitter circuit having $V_{cc} = 15V$, $R_c = 10K\Omega$, $I_B = 10\mu A$ and $\beta = 50$. **4**

4. a) Explain about the substractor circuit using Op-amp with necessary expression. **4**

b) Explain in detail about the generation of triangular wave using op-amp. **4**

5. a) Explain about the digital communication system and write its advantages over analog communication system. **2+1**

b) What is modulation? Why it is necessary? **1+2**

6. a) Explain about the types of basic logic gates with truth tables. **3**

b) What is encoder? Explain it with necessary circuit diagram. **3**

c) Simplify the following expression in POS form using k- map and draw the circuit diagram. $F(W,X,Y,Z) = \sum(0,1,3,5,6,12,13,14)$ **4**

7. What is transducer? Explain its type. **1+3**

The End