FAR WESTERN UNIVERSITY
Semester End Examination-2078
Electronic Principles (CSIT.114)

Faculty: Science and Technology (CSIT)
Level: Undergraduate
Semester: First

Full Marks: 100
Time: 3hrs.

Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Group – A

Attempt all questions (Very Short Questions) **8×3 = 24**

1. What is ideal constant current source and ideal constant voltage source?
2. What is the biasing rule for proper functioning of a transistor?
3. What are alpha (α) and beta (β) of a transistor? Write the relation between α and β.
4. What do you understand by JFET and MOSFET?
5. What do you mean d.c. load line? Explain
6. Write your understanding about Barkhausen criteria.
7. Distinguish between regulated and unregulated power supply.
8. Write down the differences between photodiode and LED.

Group – B

Attempt any five questions. (Short Questions) **5×8 = 40**

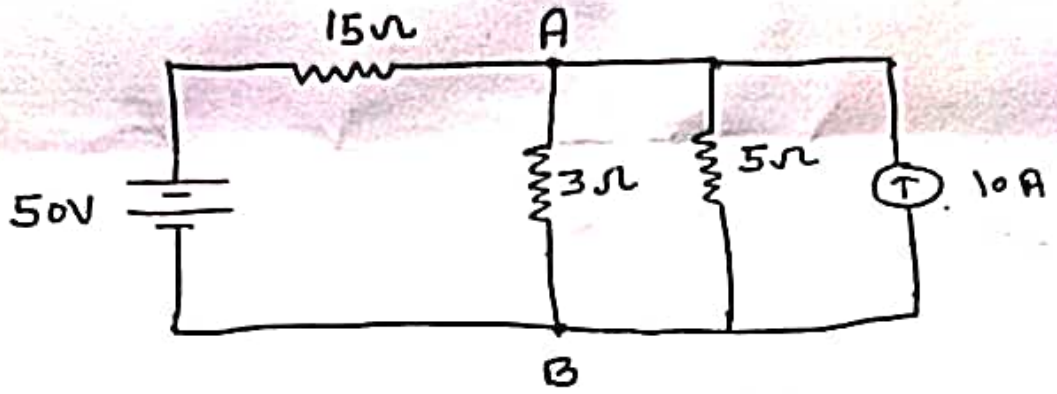
9. What is Zener diode? How the Zener diode can be used as voltage regulator?
10. How transistor can be used as an amplifier and as a switch.
11. Define oscillator? Explain the working of Colpitts oscillator.
12. Discuss the working of common emitter (CE) amplifier by drawing its circuit diagram. Also derive the expression for voltage gain.
13. Plot and discuss the JFET drain characteristics with $V_{GS} = 0$. Also discuss transfer characteristics of JFET.
14. Write short notes on following topics:
    a. Series voltage regulator
    b. Shunt voltage regulator
    c. Load regulation
    d. Line Regulation

Group – C

Attempt any three questions. (Long Questions) $3 \times 12 = 36$

15. a. State and explain the Thevenin's theorem with the help of circuit diagram. [6]

b. By using the Norton's theorem find the current passing through 3 Ω. [6]

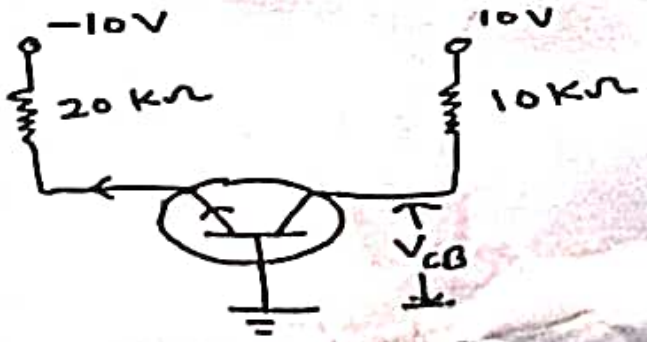


16. a What is operational amplifier? Explain with the help of circuit diagram the working of inverting operational amplifier. Also deduce the voltage gain for inverting amplifier. [2]

b. Show that voltage gain of voltage follower amplifier is unit (4)

17. a. Draw the circuit diagram for Common Emitter (CE) configuration of a transistor. Also describe the input and output characteristics of CE-transistor. [6]

b. In the CB circuit given below find the value of V_{CB}. Neglect junction voltage V_{EB}. [6]



18. a. Describe the construction of DE MOSFET. Discuss the characteristics of a DE MOSFET. [6]

b. Using the ideal Zener diode approximation, find the maximum and minimum currents through the Zener diode. ($V_z = 30V$) [6]