



POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name of The Student: _____ Enrolment No. _____

Department: _____

BENNETT UNIVERSITY, GREATER NOIDA

SUPPLEMENTARY EXAMINATION, FALL SEMESTER 2018-19

COURSE CODE: EECE105L MAX. TIME: Two Hours

COURSE NAME: Fundamentals of Electronics

COURSE CREDIT: Five

MAX. MARKS: 100

Instruction to Candidates

EXCHANGE of CALCULATORS IS NOT PERMITTED

1. Answer all questions in SI units.
2. Make any suitable assumptions and indicate on the question paper.

Questions

1. Determine whether the Boolean equation in Eq. (1) is true or false. **(6 Marks)**

$$\overline{xy} + \overline{xz} + \overline{xz} = \overline{zx} + \overline{yz} + \overline{xz} \quad \text{Eq. (1)}$$

2. Implement a two-input XNOR gate using NAND gates. **(6 Marks)**
3. Convert the decimal number 37.0625 into binary. **(7 Marks)**
4. Draw a logic circuit for $(\overline{A + B}) \cdot (C + D) \cdot \overline{C}$ **(6 Marks)**
5. Draw a circuit of a full-wave rectifier. **(6 Marks)**
6. A 1 kΩ resistance 1 μF capacitance are used to make an RC filter circuit. The output is taken across the capacitor. Draw voltage transfer characteristics and derive the transfer function $|H(\omega)|$. **(10 Marks)**

7. Consider the circuit shown in fig. 1. Assume that the input to the circuit is a triangular wave with a peak-to-peak amplitude of 20 V and a zero time-average value. Let R_L be 1 k Ω , R_f be 20 Ω and cut-in voltage of diode be 0.6 V. Sketch the output voltage versus time over one cycle and label all appropriate values. **(10 Marks)**

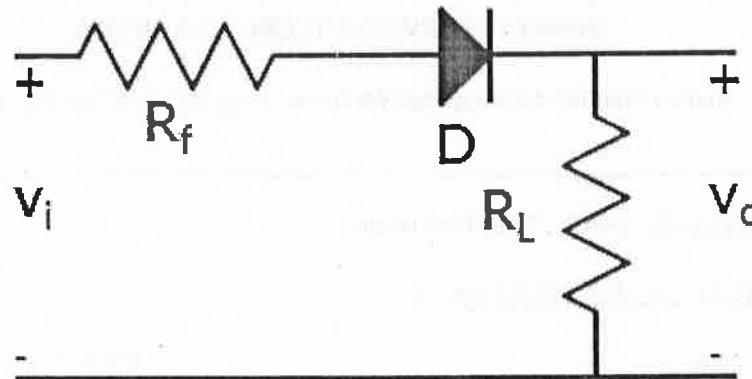


Fig. 1

8. In the voltage regulator circuit shown in fig. 2, let $V_i = 6.3$ V, $R_i = 12$ Ω , and $V_Z = 4.8$ V. The Zener diode current is to be limited to the range $5 \leq I_Z \leq 100$ mA. (i) Determine the range of possible load currents and load resistances. (ii) Determine the power rating required for the Zener diode and the load resistor. **(14 Marks)**

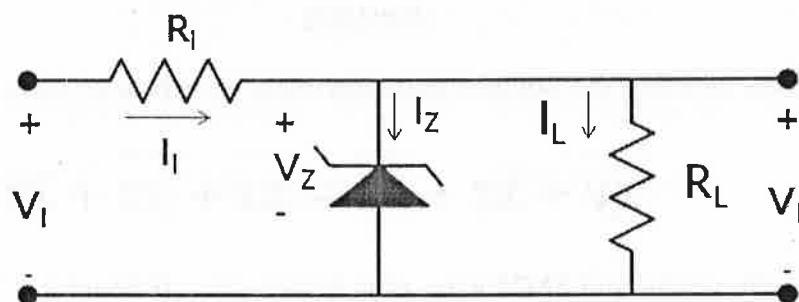


Fig. 2

9. Find the Thevenin equivalent circuit for the network across R in Fig. 3. **(10 Marks)**

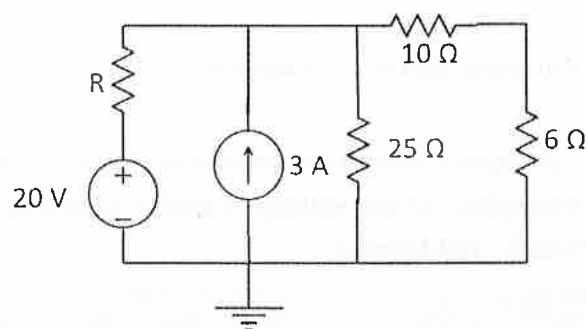


Fig. 3

10. Derive an expression of ac resistance of a diode. If the voltage across the diode is 0.6 V, evaluate the ac resistance. Given that $V_t = 26 \text{ mV}$ and $I_0 = 10^{-9} \text{ A}$. **(10 Marks)**
11. Consider the circuit shown in fig. 4. Find the transfer function of the circuit if the output is taken between nodes A and B. What is the value of cut-off frequency of the filter circuit? **(15 Marks)**

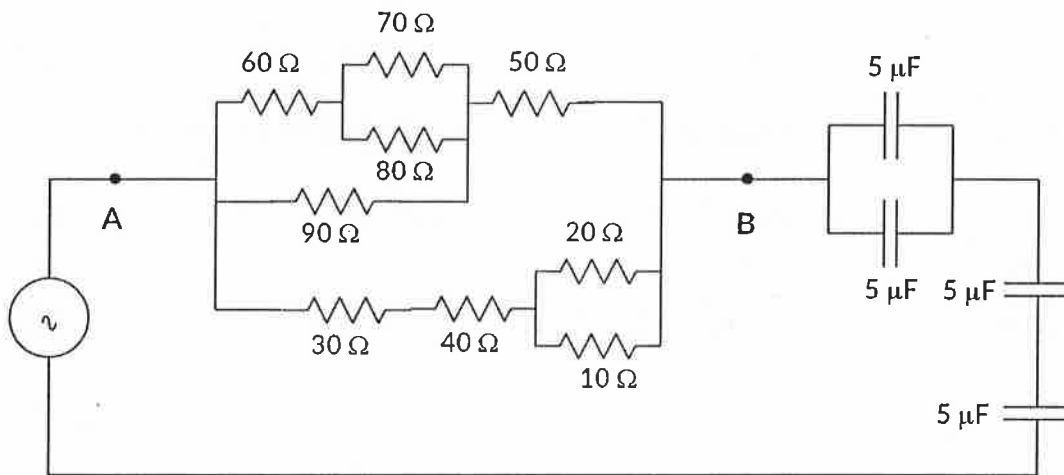


Fig. 4

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