

University of Dhaka
Department of Electrical and Electronic Engineering
Professional Masters in EEE (PMEEE) Admission Test
Session: 2025-2026 (Batch 2); Semester: January-June



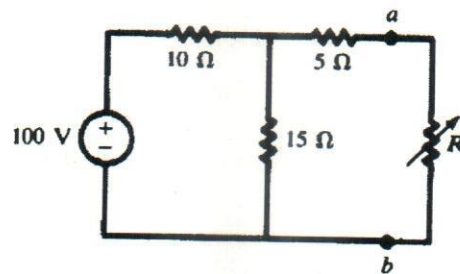
Total Marks: $20 \times 4 = 80$

Time: 90 Minutes

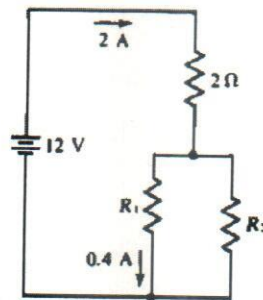
Answer all of the questions:

100/100

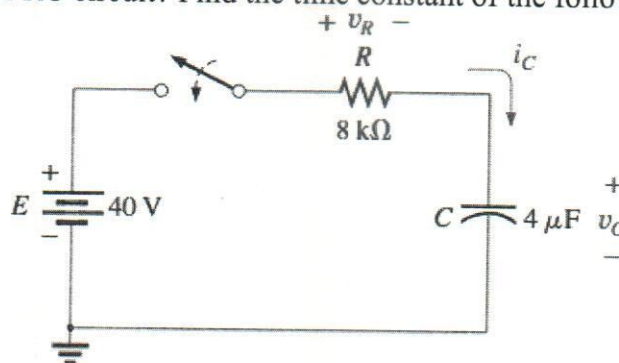
1. Draw the circuit diagram of a full-wave bridge rectifier circuit and explain its operation. [4]
2. Which logic gates are called Universal Gates? Draw a half adder circuit using basic logic gates. [4]
3. Compare and contrast between BJT and FET. [4]
4. Draw a circuit diagram of an inverting amplifier using operational amplifier and derive the expression for the voltage gain. [4]
5. Find the value of the adjustable resistance R which results in maximum power transfer across the terminals ab of the following circuit. [4]



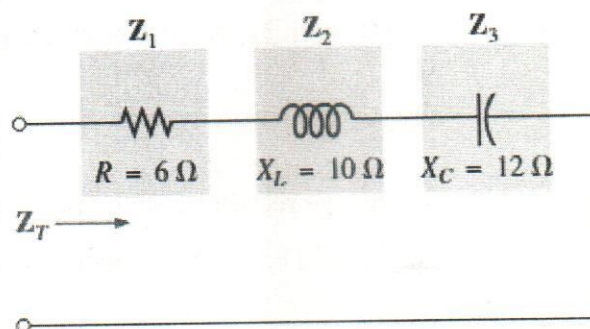
6. What current does a 1200 W toaster draw from 120 V line? Find the voltage across the resistor, R_2 , shown in the following circuit. [4]



7. What is time constant of RC circuit? Find the time constant of the following circuit. [4]



8. Determine the input impedance (Z_T) to the series network given below. [4]



9. Define electric power. Is electric power a scalar quantity or vector quantity? How can we express power using Ohm's law? [4]
10. An electric motor has a rated current of 30 A when powered from a 240 V supply. What is the power input to the motor? If the motor runs for 5 h, what is the total energy input? If the motor has an efficiency of 80%, what is the total output energy. [4]
11. What are the various losses occurring in the transformer? Why transformers are rated in kVA instead of kW? [4]
12. What can be the possible types of motors used in Dhaka Metro rail? Will the power consumption of those motors vary during peak and off-peak hours? Explain. [4]
13. Differentiate between hardware and software with suitable examples. [4]
14. Explain the functions of the main components of the CPU. [4]
15. Explain the difference between Stack and Queue data structures. [4]
16. Draw the truth table for a 2-input NAND and NOR gate. [4]
17. What is sampling theorem? Write the steps to convert an analog signal to digital signal. [4]
18. Differentiate Finite Impulse Response (FIR) filter and Infinite Impulse Response (IIR) filter in terms of their key features and performance. [4]
19. Compare Amplitude Modulation (AM) and Frequency Modulation (FM) in terms of modulation technique, bandwidth requirements, power efficiency and noise immunity. [4]
20. Mention some important features of Geosynchronous Earth Orbit (GEO) satellite. [4]