



বাংলাদেশ আর্মি ইন্টারন্যাশনাল ইউনিভার্সিটি অব সায়েন্স এন্ড টেকনোলজি (বিএআইইউএসটি), কুমিল্লা
BANGLADESH ARMY INTERNATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY (BAIUST), CUMILLA

Department of Electrical and Electronic Engineering
Level-IV, Term-I

Mid Term Examination, Spring-2023

Course Code: EEE 473

Course Title: Power Electronics

Notes:

Time: 1 Hour

Full Marks: 60

- Each question carries 30 marks.
- Figure on the right of each question indicate marks for respective question.
- Answer any two questions including question no.-1

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- For the single-phase half wave-controlled rectifier RMS voltage is 19 volt and firing angle, $\alpha=90^\circ, 60^\circ, 72^\circ$ and 100° . Determine the output average voltage for all firing angle and comment for which angle generate lower average value and which is not valid. (10)
 - If you want to use diode connectivity in HVDC transmission line, what type of arrangement is required? Mention the problem and remedy of such kind of connectivity problems (10)
 - Create a triggering circuit. The parameter of UJT is $V_s=30V$, $\eta=0.51$, $I_p=10\mu A$, $V_v=3.5V$ and $I_v=10mA$, The frequency of oscillation is 60 Hz, and with the triggering pulse $t_g=50\mu s$. Assume $V_D=0.5$. (10)
[Here, Symbols are indicating the usual meaning]
 - Draw the circuit diagram input and output response of single-phase full wave-controlled rectifier for inductive load. Consider the SCR triggering angle $\alpha=72^\circ$ (15)
 - What do you mean by free-wheeling diode? Why it is required? Describe briefly with necessary circuit diagram and mathematical expression. (9)
 - Justify the Statement "SCR is a triggering device" is it true or false? If false explain shortly. (6)
 - Show that, $V_{avg} = \frac{2V_m}{\pi}$ with proper circuit diagram, wave shape and explanation (15)
 - Draw the two-transistor model of SCR and demonstrate the relation among anode current, leakage current and firing angle. (15)