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Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(EE)/(Pow System) (Sem.-1) ADVANCED POWER ELECTRONICS Subject Code : ELE-503/PEE-503 M.Code : 36001

Time: 3 Hrs.

Max. Marks: 100

INSTRUCTION TO CANDIDATES :

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carries TWENTY marks.
- Q1. a) Explain reverse recovery characteristics of diode. Hence, draw their characteristics curves.
 - b) Why simultaneous firing of thyristor is required? Explain.
- Q2. a) What are applications of series parallel connections of diodes? Illustrate with examples,

b) Compare the characteristics of thyristor, UJT, PUJT and DIAC.

- Q3. a) Compare the applications of BJT, MOSFET, SIT IGBT based on their operating characteristics.
 - b) A thyristor has a junction capacitance of 50 PF. The charging current is limited to 20 mA. What is the value of dv/dt ? If this is to be limited to 250 V/ μ s .Determine the value of capacitance to be connected across the thyristor ?
- Q4. a) Write the principle of phase control converters. Draw and explain behaviour of three phase full wave cycloconverter.
 - b) What are reasons for poor power factor in converter? Explain method for overcoming it.
- Q5. a) Classify choppers. Design a chopper circuit for DC Shunt motor speed control.
 - b) Draw and explain the operation of a three phase dual converter. Draw its wave forms also.

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- Q6. a) What are performance parameter of PWM inverters? Explain in brief.
 - b) A three phase fully controlled bridge converter is feeding a load drawing a constant and ripple free load current of 10A at a firing angle of 30°. Determine the approximate Total Harmonic Distortion (%THD) and the terms value of fundamental component of the input current.
- Q7. a) What are Boost and Buck converter? Where are they preferred?
 - b) Write the principle of PWM Control technique of voltage.
- Q8. Write Short notes on :
 - a) AC Voltage regulator
 - b) Harmonic reduction
 - c) Bridge inverter
 - d) Chopper

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NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.