

Code No: 55013

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, October - 2020

POWER ELECTRONICS

(Electrical and Electronics Engineering)

Time: 2 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

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- 1.a) Discuss the various mechanisms that can be used to trigger thyristors.
- b) What is an IGBT? Describe its construction and explain its transfer characteristics. [8+7]
2. Explain the two transistor analogy of a thyristor. [15]
3. Explain the operation of a single phase half controlled converter for R-load with neat circuit diagram and draw the necessary waveforms. Derive the expression for E_{dc} , E_{rms} , power factor if $\alpha = \pi/4$ rad. [15]
4. Explain the operation of single phase full wave controlled rectifier fed to an inductive load. Consider the effect of source inductance and derive an expression for output voltage in terms of source inductance and firing angle. [15]
5. Draw the circuit diagram of single phase dual converter and explain its working for both modes of operation. [15]
6. What is a cycloconverter? How it will perform its operation? Mention the applications of cycloconverter. [15]
- 7.a) Describe the operation of oscillation chopper and mention the advantages of it over other chopper circuits.
- b) A stepup chopper is used to deliver load voltage of 400v from a 220v D.C Source. If the blocking period of thyristor is 60μ sec. compute the require Pulse width. [8+7]
8. Explain different forced commutation circuits used for bridge Inverters. [15]

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