

Code No: P41021

**R10****Set No. 1****IV B.Tech I Semester Supplementary Examinations, March/April - 2016****POWER SEMICONDUCTOR DRIVES****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Answer any FIVE Questions****All Questions carry equal marks**

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- 1 a) Discuss the speed control of a DC motor above its rated speed. [7]  
b) Explain various speed control schemes for Induction motors. [8]
- 2 a) Draw the schematic diagram of a single-phase half-controlled converter fed dc series motor and explain its operation. Assume continuous conduction and draw relevant waveforms. [10]  
b) Discuss the drawbacks of rectifier fed d.c. drives. [5]
- 3 Explain the operation of a three-phase half controlled rectifier fed dc series motor. Assume continuous conduction and draws the voltage and current waveforms when  $\alpha = 60^\circ$ . [15]
- 4 What is four quadrant operation of a drive? Discuss the four quadrant operation of DC motors by dual converters. [15]
- 5 Discuss the operation of a two-quadrant chopper fed separately excited dc motor drive. Draw the output voltage and current waveforms. [15]
- 6 a) What are AC voltage controllers? Explain the control of Induction motors by AC voltage controllers. [7]  
b) Discuss the variable frequency control of induction motor by Voltage source inverter. [8]
- 7 a) Describe the static rotor resistance control of an Induction motor. [7]  
b) With a neat schematic diagram, discuss the operation of Static Kramer Drive. [8]
- 8 With a neat block diagram, discuss the closed loop control operation of synchronous motor drives. Also list various applications of synchronous motors. [15]