

# POWER ELECTRONICS (For EE Only)

Written by Administrator

Friday, 06 November 2009 06:47 -

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**Sub Code**

:

**06EE45**

**IA Marks**

:

**25**

**Hrs/ Week**

:

**04**

:

**Exam Hours**

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:

03

**Total Hrs.**

:

52

:

**Exam Marks**

:

100



**UNIT 3:**

**Thyristors**

Introduction, characteristics. Two Transistor Model. Turn-on and turn-off.  $di/dt$  and  $dv/dt$  protection.

Thyristor types. Series and parallel operation of Thyristors. Thyristor firing circuits.

Thy

Simple design of firing circuits using UJT, op-amps, and digital IC's. –

**7 Hours (20 Marks).**

**UNIT 4:**

**Commutation Techniques:** Introduction. Natural Commutation. Forced commutation: self commutation, impulse commutation, resonant pulse commutation and complementary commutation. –

**6 Hours (20 Marks).**

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## PART – B

### UNIT 5:

**AC Voltage Controllers:** Introduction. Principle of ON-OFF and phase control. Single-phase bidirectional controllers with resistive and inductive loads.–

**6 Hours (20 Marks).**

### UNIT 6:

**Controlled Rectifiers:** Introduction. Principle of phase controlled converter operation. Single-phase semi-converters. Full converters. Three-phase half-wave converters.

Three-phase full-wave converters. –

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**7 Hours (20 Marks).**

### UNIT 7:

**DC Choppers:** Introduction. Principle of step-down and step-up chopper with R-L load. Performance parameters.

Chopper classification.

Analysis of impulse commutated thyristor chopper (only qualitative analysis) –

**7 Hours (20 Marks).**

### UNIT 8:

**Inverters:** Introduction. Principle of operation. Performance parameters. Single-phase bridge inverters. Threephase inverters. Voltage control of single-phase inverters – single pulse width, multiple pulse width, and sinusoidal pulse width modulation.

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Current source inverters.

Variable D.C. link inverter. –

**7 Hours (20 Marks).**

### Text Book:

1) **“Power Electronics”**, M.H.Rashid 2<sup>nd</sup> Edition, P.H.I. /Pearson, New Delhi, 2002.

### References

1. **“Power Electronics – Converters, Applications and Design”**, Net Mohan, Tore M. Undeland, and William P. Robins, Third Edition, John Wiley and Sons.

2. **“Thyristorised Power Controllers”**, G.K. Dubey, S.R. Doradla, A. Joshi and R.M.K. Sinha, New Age International Publishers.

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3.     **“Power Electronics”**, M.D. Singh and Khanchandani K.B., T.M.H., 2001.
  
4.     **“Power Electronics”**, Cyril Lander, 3<sup>rd</sup> Edition, McGraw-Hill.
  
5.     **“Power Electronics: Principles and Applications”**, J.M. Jacob, Thomson – Vikas Publications.
  
6.     **“Power Electronics : A Simplified Approach”**, R.S. Ananda Murthy and V. Nattarasu, Sanguine Technical Publishers.