D 26890 (Pages 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2006

EE 2K 602/PTEE 2K 502—POWER ELECTRONICS

Time : Three Hours Maximum : 100 Marks

I. (a) Discuss the Hard drive and Over drive factor for BJT.

(b) Compare MOSFET with BJT.

(c) What is forced commutation ? What are the advantages of forced commutation for ac-dc converters ?

(d) What is an inverter ? List a few industrial applications of inverter.

(e) What are the effect of load inductance on the performance of AC voltage controllers ?

(f) What is the principle of operation of a stepdown chopper ?

(g) What is SMPS ? Give its operating principle and Industrial applications.

(h) Why are Nical cadmium batteries preferred over lead acid type batteries in UPS ?

(8 × 5 = 40 marks)

II. (a) Draw the dynamic characteristics of MOSFET during turn on and turn off processes. Discuss briefly the nature of these curves.

(15 marks)

Or

(b) With neat sketch, explain the following :—

(i) Resonant commutation. (8 marks)

(ii) RC Firing circuit. (7 marks)

III. (a) Explain with neat sketch the operation of 1ϕ Half wave controlled rectifier with R load and derive the expression for input, power factor and Harmonic factor.

(15 marks)

Or

(b) Describe the operation of :

(i) Series inverter with unidirectional switches. (7 marks)

(ii) Series inverter with Bidirectional switches. (8 marks)

IV. (a) Describe with neat sketch the operation of 1ϕ AC regulator with R.L load, and derive the performance parameters.

Or

(b) Explain the operation of AC regulator fed Induction motor control and derive the expression for Average and RMS valve of the O/P voltage.

(15 marks)

Turn over

V. (a) Describe the Push-pull converter with relevant circuits and waveforms. Derive the various expressions for voltages and currents involved.

Or

(b) With necessary diagrams explain the operation at UPS and derive the performance parameters.

(15 marks)

[4 × 15 = 60 marks]