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**GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022**  
**B. Tech Degree Examinations, December – 2020**  
**(Fifth Semester)**  
**BELPC5010 / BEEPC5010 – POWER ELECTRONICS**  
**(EE &EEE)**

Time: 2hrs

Maximum:50 Marks

**The figures in the right hand margin indicate marks.**

**PART – A: (Multiple Choice Questions)****(1 x 10= 10 Marks)**Q.1. Answer ALL questions

- a. The Device used for Switching in a switched Mode power supply is
  - (i) Diode
  - (ii) Thyristor
  - (iii) GTO
  - (iv) Mosfet
- b. In a GTO, anode current begins to fall when the gate current
  - (i) Is negative peak at time  $t=0$
  - (ii) Is negative peak at  $t=$  Storage Period  $t_s$
  - (iii) Just begins to become negative at  $t=$
  - (iv) Just begins to become Positive at  $t= 0$
- c. The uncontrolled electronic switch employed in power electronic converter is
  - (i) Thyristor
  - (ii) BJT
  - (iii) Diode
  - (iv) Mosfet
- d. A switched Mode-Power supply operating at 20KHZ TO 100KHZ range uses which of the following as the main switching element
  - (i) Thyristor
  - (ii) Mosfet
  - (iii) Triac
  - (iv) UJT
- e. The Triac can be used only in
  - (i) Inverter
  - (ii) rectifier
  - (iii) Multi Quadrant chopper
  - (iv) Cycloconverter
- f. For an SCR  $di/dt$  protection is achieved by connecting to the SCR
  - (i) R in series
  - (ii) L in series
  - (iii) RC in Parallel
  - (iv) C in series
- g. In DC Choppers the waveform for input and Output voltage are
  - (i) Discontinuous Continuous
  - (ii) Continuous Discontinuous
  - (iii) both Discontinuous
  - (iv) both continuous
- h. AC to DC Circulating current dual converters are operated with the following relationship between their triggering angle  $(\alpha_1 + \alpha_2)$ 
  - (i)  $\alpha_1 + \alpha_2 = 180^\circ$
  - (ii)  $\alpha_1 + \alpha_2 = 360^\circ$
  - (iii)  $\alpha_1 - \alpha_2 = 180^\circ$
  - (iv)  $\alpha_1 + \alpha_2 = 90^\circ$
- i. A  $3\phi$  Fully controlled converter is Feeding power in to a DC load at a constant Current of 15A the RMS current through each thyristor of converter is
  - (i) 50A
  - (ii) 100A
  - (iii)  $150\sqrt{2}/\sqrt{3}$
  - (iv)  $150/\sqrt{3}$
- j. Four Quadrant chopper cannot be operated as
  - (i) One quadrant chopper
  - (ii) Cycloconverter
  - (iii) inverter
  - (iv) bi-directional rectifier

**PART – B: (Short Answer Questions)**

**(2 x 5 = 10 Marks)**

Q.2. Answer ALL questions

- a. What are the Classification of Power semiconductor devices?
- b. Give an expression for average Output voltage of Single Phase Full converter?
- c. What are the different types of AC Sources?
- d. What are the basic topologies of DC Switching regulators?
- e. What is meant by PWM control?

**PART – C: (Long Answer Questions)**

**(6 x 5 = 30 Marks)**

Answer ANY FIVE questions

Marks

3. With neat sketch explain the constructional details and working of an enhancement type of power MOSFET with its characteristics? (6)
4. (i) Compare IGBT and MOSFET. (6)  
(ii) What is the difference between SCR and Triac?
5. Explain the 3 phase half controlled rectifier with RL load and its waveform? (6)
6. Draw and explain the operation of 1 phase cycloconverter. (6)
7. Explain the operation of two quadrant chopper? (6)
8. Explain the operation of Buck-Boost converter? (6)
9. Draw and explain the 180 degree conduction mode of 3 phase inverter. (6)
10. Write the difference between VSI and CSI? (6)

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