END SEMESTER/ RE-TEST EXAMINATION, 2020
(OLD&NEW)
Semester: 5th semester
Subject code: ET -503
Subject: Power Electronics
Full Marks= (Part A-25 + Part B- 45)
Duration: 3 hours

Questions on Part-A are compulsory
Answer any five questions from Part-B

Q1. **Fill in the blanks:** 1X10=10

1. a. A SCR IS two ----------analogy.

1. b. A TRIAC is a ---------- directional thyristor.

1. c. A thyristor can be turned on by ---------- gate signal.

1. d. IGBT is a---------- controlled device.

1. e. The conversion of ac to dc is known as----------.

1. f. Rectifier circuit using thyristors are known as ----------

1. g. An inverter is a ---------- converter.

1. h. SMPS is multistage ---------- supply and is used for high rating.

1. i. UPS stands for ---------- .

1. j. A ---------- Regulator gives an output voltage which is more than input voltage.

Q.2. **Write true or false.** 1X10=10

2. a. SCR is a unidirectional device.

2. b. A TRIAC has two terminals.

2. c. All inverter uses forced commutation.

2. d . A switching regulator uses PWM.

2. e. A SMPS have four different configurations.

2. f. A CSI (Current Source Inverter) has simple commutation circuit.

2. g. Both MOSFET and IGBT have high input impedance.

2. h. A snubber circuit uses L and C in series.

2. I.The output voltage of a controlled rectifier is maximum when firing angle is zero.

2. j. SMPS stands for Single Mode Power Supply.

Q.3. **Choose the correct answer:** 1X5=5

3. a. The two-transistor model of a thyristor consists of two transistors

i) One n-p-n and other p-n-p ii) Both p-n-p

iii) Both n-p-n iv) One n-p-n and other UJT

3. b. Freewheeling diode is useful when the load is

i) Inductive ii) Capacitive

iii) Resistive iv) None of the above

3. c. Which rectifier requires two diodes and two SCRs

i) Half wave controlled rectifier ii) Full wave controlled bridge rectifier

iii) Half controlled bridge rectifier iv) Semi converter

Q.3.d. UPS is never used in

i) Street lighting ii) Computers

iii) Communication link iv) Instrumentation

3e. If we need a low noise device, we should use

i) BJT ii) FET

iii) Thyristor iv) UJT

PART B
MARK-45

Q.4.

Q.4.a. What is a thyristor? 2

Q.4.b.Name the members of Thyristor family. 5

Q.4.c. Draw the symbol of SCR, DIAC, TRIAC and IGBT. 2

Q.5.

Q.5.a. What is a power diode? 2

Q.5.b. Name some applications of power diode 3

Q.5.c. Compare power MOSFET and IGBT. 4

Q.6.

Q.6.a. What is a controlled rectifier. 2

Q.6.b. Explain the working of a single phase half wave controlled rectifier feeding a purely resistive load. 5

Q.6.c Draw the waveform of input voltage, firing pulses, output voltage and output current. 2

Q.7.

Q.7.a.What is an inverter? 2

Q.7.b. Give a brief classification of inverter. 3

Q.7.c. Draw a neat circuit diagram of voltage driven inverter and explain its working. 4

Q.8.

Q.8.a. what is SMPS? What are the different configurations of SMPS? 4

Q.8.b.Explain the principle of operation of Buck regulator with a proper circuit diagram. 5

Q.9.

Q.9.a. What is UPS? How is it classified? 5

Q.9.b. Explain the working of OFF-LINE UPS in brief with a proper diagram. 4

Q.10. What is an ac regulator? Explain the working of static load tap changer with a proper circuit diagram. 9

Q.11. State and explain various methods of speed of control of stepper motor. 9

OR

State and explain various methods of speed of control of DC motor. 9

Q.12. Write a notes on Snubber circuit and three phase bridge inverter. 9

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