

| SEM | SET  | PAPER CODE | TITLE OF THE PAPER |
|-----|------|------------|--------------------|
| IV  | 2013 | 12PEL4114  | POWER ELECTRONICS  |

**SECTION – A****Answer all the questions:****20 x 1 = 20****Choose the correct answer:**

- Transformer utilization factor (TUF) is given by
  - $P_{dc} / V_S I_S$
  - $P_{dc} / V_S$
  - $P_{dc} / I_S$
  - $P_{dc} V_S I_S$
- Rectification is given by
  - $P_{dc} P_{ac}$
  - $P_{dc} / P_{ac}$
  - $P_{dc} I_S$
  - $P_{dc} V_S$
- MMF reset control in a magnetic amplifier firing circuit introduces \_\_\_\_\_ time delay compared to voltage reset control.
  - Larger
  - Smaller
  - Equal
  - Equal and smaller
- Constant firing scheme using UJT in three pulse output generator delivers \_\_\_\_\_ pulse per output per period.
  - Four
  - Three
  - Two
  - One
- Type B chopper is a \_\_\_\_\_ quadrant chopper.
  - Four
  - Three
  - Two
  - One



**State True or False:**

16. Crest factor is  $I_{sp} + I_s$ .
17. Six pulse output circuits differ in power supply synchronising arrangement from three pulse output circuit.
18. Single SCR chopper is used for low and medium power output.
19. Current source inverter does not require feedback diodes.
20. Single Phase SCR drives is limited to low and medium horse power motor.

**SECTION – B**

**Answer all the questions:**

**5 x 4 = 20**

21. a. Explain input performance parameters of rectifier.

**OR**

- b. Draw the circuit for half wave controlled rectifier with RL load with flywheel diode and explain its operation.
22. a. With a neat circuit diagram, explain the operation of voltage reset controlled half wave magnetic amplifier SCR firing circuit.

**OR**

- b. Discuss about constant firing scheme using UJT.
23. a. Explain the operation of type B chopper.

**OR**

- b. Draw the circuit for basic chopper and explain its function.

24. a. With a neat diagram, explain the working of series – inverter control in external control of ac output voltage.

**OR**

- b. Discuss the drawbacks of basic series inverters.
25. a. Explain the operation of one quadrant single phase SCR drive.

**OR**

- b. Discuss about viscous friction load of DC motor.

### **SECTION – C**

**Answer any FOUR questions:**

**4 x 15 = 60**

26. Draw the circuit diagram, I-V characteristics and transfer characteristics of IGBT and explain its working.
27. Describe about the working of phase locked oscillator pulse timing controlled firing circuit.
28. With a neat circuit diagram, explain the operation of series turn-off chopper.
29. A single phase full bridge inverter is connected to RL load. For a dc source voltage  $V_s$  and output frequency  $f = 1/T$ , obtain expressions for load current as a function of time for the first two half cycles of the output voltage.
30. Explain with a neat sketch, torque-speed characteristics of the induction motor.

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