

**GANPAT UNIVERSITY**  
**B.TECH. SEM. IV- MECHANICAL ENGINEERING**  
**CBCS (NEW) REGULAR EXAMINATION APRIL-JUNE 2017**  
**(2MC405) INDUSTRIAL ELECTRONICS**

Time: 3 Hours

Total Marks: 60

**Instructions:**

- 1) All questions are **compulsory**.
- 2) Figures to the **right** indicate full marks.
- 3) Answers to the two sections must be written in **separate** answer books.

**SECTION – I**

- Que:-1** (A) What do you mean by forward blocking mode of thyristor? Explain it in detail. [05]
- (B) Discuss two transistor model of thyristor with circuit diagram. [05]

**OR**

- Que:-1** (A) Explain all the methods to Turn-on a thyristor. [05]
- (B) The latching current for a thyristor inserted between a dc source voltage of 100V and a load being 75mA. Calculate the minimum width of the gate-pulse required to turn-on the thruster when the load is [05]
- 1) Purely inductive having an inductance of 100 mH and
  - 2) Consisting of resistance and inductance of 10 ohm and 100 mH respectively.

- Que:-2** (A) Explain Series operation of Thyristor. [05]
- (B) Write short note on: (dV/dt) over voltage protection of thyristor. [05]

**OR**

- Que:-2** (A) What do you mean by Reverse blocking mode of thyristor? Explain it in detail. [05]
- (B) How can DIAC and TRIAC be used to control the illumination? [05]

- Que:-3** Attempt any two. [10]
- (A) Draw the PLC Architecture and write down its applications.
  - (B) Explain (di/dt) over Current protection in thyristor.
  - (C) Enlist and write down full form of PLC Programming Languages. Explain any one of them with appropriate example.

## SECTION – II

**Que:-4 (A)** Explain the Equivalent circuit of Induction Motors. [05]

**(B)** Explain the different applications of Variable-frequency drive used in industrial electronics [05]

**OR**

**Que:-4 (A)** Explain the Principle Operation of 3-phase induction motor in AC Drive. [05]

**(B)** What is chopper? Explain the principle operations of chopper with diagram. [05]

**Que:-5 (A)** Explain the different types of Variable-frequency drive. [05]

**(B)** Explain the various techniques of PWM. [05]

**OR**

**Que:-5 (A)** A step up chopper has input voltage of 220V and output voltage of 660 Volts. If the non-conducting time of thyristor chopper is  $100\mu$  second, compute the pulse width of output voltage. In case pulse width is halved for constant frequency operation, find the new output voltage. [05]

**(B)** Explain the performance parameter of inverters. [05]

**Que:-6 Attempt any two.** [10]

**(A)** What is power electronics? Explain the power electronics system with block diagram.

**(B)** What is Microprocessor? Explain different types of buses used in Microprocessor.

**(C)** Write a short note on: Step down choppers

**END OF PAPER**