

MOSEM
D. - 18/05/2015

STUDENT EXAM NO. _____

GANPAT UNIVERSITY
B.TECH SEM. IV MECHANICAL ENGINEERING
REGULAR EXAMINATION April - June 2015
2ME 403-INDUSTRIAL ELECTRONICS

TIME: - 3 HOURS

TOTAL MARKS-70

INSTRUCTIONS:-

1. All questions are compulsory.
2. Figure to the right indicates full marks of the respective question.
3. Support answers with appropriate diagram.

SECTION - I

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|-------|------------------------------------------------------------------------------------------------------------|----|
| Que-1 | Attempt All. | 12 |
| (A) | How can you split a Thyristor in two transistors? | 4 |
| (B) | How can thyristors be connected in series? | 4 |
| (C) | Write short note on methods to Turn-on a thyristor. | 4 |
| OR | | |
| Que-1 | Attempt All. | 12 |
| (A) | Explain working of Thyristor with its symbol. Describe thyristor V-I characteristics with its regions. | 4 |
| (B) | Describe series capacitor commutation method. | 4 |
| (C) | Explain working of two-thyristor chopper. | 4 |
| Que-2 | Attempt All. | 11 |
| (A) | Explain one practical application utilizing Variable frequency drive. | 3 |
| (B) | Explain about optocoupler and pulse transformer. | 4 |
| (C) | Write a short note on AC drives. | 4 |
| OR | | |
| Que-2 | Attempt All. | 11 |
| (A) | Write down the use of Half-wave rectifier? Write down its performance parameters. | 3 |
| (B) | What is DIAC? Draw its symbol and cross section view. Explain its V-I characteristics. | 4 |
| (C) | Describe Reverse Recovery characteristics and derive necessary equations. | 4 |
| Que-3 | Attempt All. | 12 |
| (A) | Derive necessary equations for diodes with RLC loads. | 4 |
| (B) | Describe two types of commutation in Thyristor. | 4 |
| (C) | Draw and explain the circuit showing utilization of UJT for triggering thyristor with necessary waveforms. | 4 |

SECTION-II

- Que-4 Attempt All.** 12
- (A) Explain about overload protection of dc motors. 4
 - (B) Explain speed control of single phase induction motor using TRIAC. 4
 - (C) Describe bridge configuration of single-phase cycloconverter to reduce frequency to half. 4
- OR**
- Que-4 Attempt All.** 12
- (A) Describe the basic electronics components used in Industrial Electronics. 4
 - (B) What is the function of cycloconverter? Explain center tapped transformer configuration of cycloconverter to reduce frequency to one third. 4
 - (C) Explain about different types of PLC. 4
- Que-5 Attempt All.** 11
- (A) Differentiate between Microprocessor and Microcontroller. 3
 - (B) Draw the block diagram of Microprocessor and explain about its units. 4
 - (C) Explain speed control of single phase induction motor using single phase inverter circuit. 4
- OR**
- Que-5 Attempt All.** 11
- (A) Define Holding current, Turn-off time and reverse recovery charge. 3
 - (B) What are the different operating modes of dc motors? 4
 - (C) Write short note on speed control of Universal series motor. 4
- Que-6 Attempt All.** 12
- (A) Describe speed control of dc motor using dual converter. 4
 - (B) Describe cycloconverter scheme for speed control of a single-phase induction motor with diagram. 4
 - (C) Explain dc motor speed control by armature voltage control method with its features. 4

END OF PAPER