

2112E120

BACHELOR OF VOCATION
Mechatronics
Subject: Applied Mechatronics
Subject Code: MTE-701
Semester: Fifth
December 2021
Theory (External): 35 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number

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===END OF PAPER===

SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A Define firing angle and extinction angle.
- B Enlist scope and applications of mechatronics.
- C Define inverting and non-inverting amplifier with diagram.
- D Sketch the ideal voltage transfer curve of op-amp.
- E Enlist different types of non-isolated switching mode DC-DC converters.
- F A switch mode DC-DC converter converts
- variable dc input voltage to fixed dc output voltage
 - unregulated dc input voltage to controllable dc output voltage
 - uncontrolled dc input voltage to fixed dc output voltage
 - unregulated dc input voltage to regulated dc output voltage

Which one of the above is correct?

- a) III, IV b) I, II
- c) II, IV d) II, III
- G Differentiate between AC voltage controller and cycloconverter
- H What are the advantages of integral cycle control technique for AC voltage controllers?

- I In phase-controlled rectifiers, the nature of load current, i.e. whether load current is continuous or discontinuous (choose the correct option)
- does not depend on type of load and firing angle delay
 - depends both on the type of load and firing angle delay
 - depends only on the type of load
 - depends only on the firing angle delay
- J Each diode of a three-phase half-wave diode rectifier conducts for
- 60°
 - 120°
 - 60°
 - 90°

SECTION -B (ESSAY TYPE QUESTIONS)

(5x5=25 Marks)

- 1 a) Differentiate between Power Electronics and Linear Electronics. 2
- b) Explain Op-amp along with block diagram representation and schematic symbol. 3
- 2 a) Explain working of differential amplifier. 2
- b) Explain the working of op-amp with negative feedback. 3