

BACHELOR OF VOCATION
Automotive Mechatronics
Subject: Design of Mechatronics
Subject Code: ABME-303
Semester: Fifth
January 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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SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A. The range of control of controller _____ due to presence of offset.
- a) Increases
 - b) Remains constant
 - c) Decreases
 - d) Cannot say
- B. ----- is the time required for the response to reach 50% of the final value in the first attempt.
- a) Rise time
 - b) Peak time
 - c) Settling time
 - d) Delay time
- C. What is the ratio of amplitude of response to that of the input called?
- a) Response
 - b) Gain
 - c) Phase
 - d) Frequency
- D. If the frequency of the input signal to a system is increased, the amplitude of the output _____.
- a) Start reducing
 - b) Start increasing
 - c) Remain constant
 - d) Unpredictable
- E. On-off Control is also called as _____.
- a) One position control
 - b) Two position control

- c) Four position control
 - d) Half position control
- F. How is the speed of operation of conventional relay system as compared to digital controllers?
- a) Very slow
 - b) Very fast
 - c) Same
 - d) Almost similar
- G. Micro-controllers are _____ than the PLCs.
- a) Bulky and expensive
 - b) Bulky but cheaper
 - c) Portable and cheaper
 - d) Portable but expensive
- H. Digital to Analog Conversion is _____ Analog to Digital Conversion.
- a) Less complex than
 - b) More complex than
 - c) Unpredictable
 - d) As complex as
- I. Data acquisition of all the physical quantities in the real world is done in
- a) The analog mode
 - b) The digital mode
 - c) Either analog mode or digital mode
 - d) None of the above
- J. The controller characteristics for on-off controller follow _____
- a) Only one curve
 - b) Two curves
 - c) Four curves
 - d) Unpredictable

SECTION -B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

1. What are the advantages and disadvantages of open loop control System?
2. Explain the main applications of mechatronics
3. Explain the elements of feedback system?
4. Differentiate between physical and experimental modeling
5. Explain different micro sensors used in mechatronics
6. Design a mechatronics system for an automatic Car Park Systems?
7. Explain the following terms
 - (i) Sensitivity
 - (ii) Hysteresis error
 - (iii) Stability
 - (iv) Resolution.
8. Draw the ladder diagram of forward and reverse motor.

-----END OF PAPER-----