

**367833(67)**

**B. E. (Eighth Semester) Examination, 2020**

APR-MAY

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**(New Scheme)**

**(Mechatronics Engg. Branch)**

**MECHATRONICS SYSTEMS DESIGN**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.***

1. (a) Define mechatronics design approach. 2
- (b) Describe the seven stages of design process. 7
- (c) Discuss about any one mechatronics system with various elements and its block diagram. 7

- (d) Convert the given transfer function into block diagram : 7

$$T(s) = Y(s)/R(s) = 3 / (5s^2 + 8s + 13)$$

2. (a) Give two difference between a sensor and a transducer. 2
- (b) Describe the various characteristics and quality parameter of a sensor. 7
- (c) Name the sensor's used for linear and rotary motion measured and explain construction and working of any two of these. 7
- (d) Describe about acceleration sensing using strain gauges. 7
3. (a) What is the purpose of actuators in mechatronics systems? 2
- (b) Explain the working of the brushless DC motor. 7
- (c) Name the fluid power design elements and describe the relationship of input/output elements. 7
- (d) Convert decimal number 99 into binary form. 7

4. (a) Name the two types of behaviour of a signal. 2
- (b) Describe transfer function form for system representation. 7
- (c) What is artificial intelligence? Why or why not a thermostatic control system in a refrigerator on intelligent or smart system? 7
- (d) Describe data acquisition systems basic input/output process with an example. 7
5. (a) What is the purpose of a case study in mechatronics system design? 2
- (b) Explain the architecture and ship control of a disk drive system. 7
- (c) Describe the design steps of a coin counter. 7
- (d) Give and explain the various components of lab view in creating a virtual instrument. 7