

Total No. of Questions – [06]

Total No. of Printed Pages: 2

G.R. No.	
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**DECEMBER 2021 - ENDSEM EXAM**  
**T. Y. B. TECH. (E&TC) (SEMESTER - I)**  
**COURSE NAME: Mechatronics Systems**  
**COURSE CODE: ETUA31183D**  
**(PATTERN 2018)**

Time: [1Hr]

[Max. Marks: 30]

**(\*) Instructions to candidates:**

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1 a Design an interface for testing BASIC and UNIVERSAL GATES truth tables by using Ladder diagram programs [4]

Q.1 b Construct a paper design and write program for SMART washing machine with weight sensor and bacteria detection sensor in LADDER Diagram [6]

**OR**

Q2 a Design a system for controlling three Induction motors such that at any given time ONLY ONE motor will be allowed to be in RUN mode. [4]

Q2 b Construct an ELEVATOR system design with the provision of DIRECTORS FLOOR arrangement for a 3 story building. Also justify the logic implemented in ladder Dia. [6]

Q.3 a Justify use of composite smart materials used in protection suits used for security forces. [4]

Q.3 b "The micro machined sensors are pillars for the modern Industrial automations." Justify [6]

**OR**

Q.4 a Compile the applications of the Micro actuators. [4]

Q.4 b Elaborate the different types of composite structures of the smart material [6]

Q.5 a "VR and AR based mechanical designs will be more process oriented", [4]  
discuss your views on the above statement

Q.5 b Compile advantages of DIGITAL factory [6]

**OR**

Q.6 a Evaluate the advantages of the Industrial IOT [4]

Q.6 b Estimate the use cases of the Artificial Intelligence in the field of Medical in [6]  
current COVID-19 scenario