Total No. of Questions – [8]

Total No. of Printed Pages 2

G.R. No.	

Paper code – U229 – 155 (BE-F&FS)

DEC 2019/ENDSEM Backlog Exam.

S. Y. B. TECH. (Mechanical Engineering) (SEMESTER - II)

COURSE NAME: Mechatronics

COURSE CODE: MEUA22175

(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
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) Explain Inductive Proximity sensor-neat sketch [6]

OR

b) Explain different static characteristics of measurement system? [6]

Q.2) a) Write different mechanical aspects of motor selection? [6]

OR

b) Explain synchronous motor with neat diagram? [6]

Q.3) a) Write down Difference between synchronous and asynchronous signal communication? [6]

OR

b) Explain block diagram reduction technique rules [6]

Q.4) a) Explain PID controller and show block diagram? [4]

OR

b) Write down Stepwise Procedure for Manual Tuning of PID? [4]

Q.5) a) Draw ladder logic for traffic light control [6]
Condition: Red light on for 90 sec then off
Yellow light on for 30 sec then off
Green light on for 60 sec and repeat

b) Explain the concept of latching with one application [4]

c) Draw ladder logic for AND and XOR gates? [4]

OR

Q.6) a) Draw ladder logic for bottle filling plant and explain? [6]

b) Draw a ladder logic for cutting machine [4]
Process: When we press start button lubricant should flow, after 25 second the cutter should start.

c) Explain architecture PLC with neat diagram? [4]

Q.7) a) Find transfer function for mechanical system with spring and damper system with m=1kg d=0.5 and k=2 also locate poles on s-plane? [6]

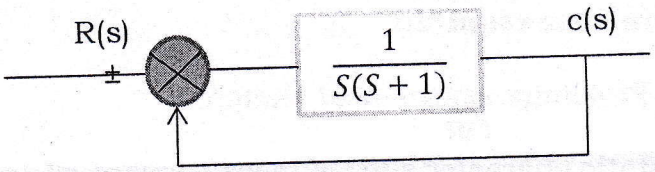
b) Find the value of zeta and report the kind of response expected? [4]

$$G(S) = \frac{12}{S^2 + 8S + 12}$$

c) Explain Routh Hurwitz criterion? [4]

OR

Q.8) a) Determine T_d, T_r, T_p when a control system shown in fig [6]



b) Define hydraulic systems with examples? [4]

c) Explain mechatronics system design with flow chart? [4]