Eighth Semester B.E. Degree Examination, June/July 2016
Control Engineering and Automation

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1   a.   Derive the transfer function of field – controlled DC motor.   **(10 Marks)**
    b.   Reduce the block diagram as show in Fig. Q1(b) to the simplest possible form of find its
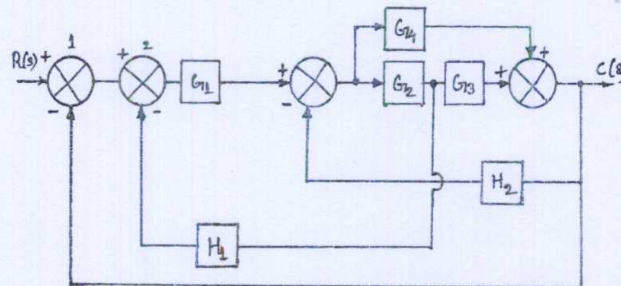   c.   closed loop transfer function.   **(10 Marks)**

Fig. Q1(b)

2   a.   Explain Nyquist stability criterion.   **(10 Marks)**
    b.   By applying Routh criterion, discuss the stability of the closed loop system as a function of K for the following open loop transfer function :

$$G(s)H(s) = \frac{K(s+1)}{s(s-1)(s^2 + 4s + 16)}.$$

                                                     (10 Marks)

3   a.   Write brief about proportional integrate derivative controller.   **(10 Marks)**
    b.   State of explain stack type controller principle.   **(10 Marks)**

4   a.   Sketch and describe the functioning of a diaphragm actuator.   **(10 Marks)**
    b.   Sketch and describe the functioning of a valve positioner. What are the advantages of using of a valve positioner?   **(10 Marks)**

PART – B

5   a.   With a neat sketch explain variable inductance transducer and capacitance transducer.   **(10 Marks)**
    b.   Write about the force–balance transducer.   **(10 Marks)**

6   a.   Write neat sketch explain. Marine boiler combustion control system.   **(10 Marks)**
    b.   Explain steam pressure control and fuel oil temperature control system with neat sketch.   **(10 Marks)**

7   a.   With a neat sketch, explain direct reversing diesel engine by bridge control method.   **(10 Marks)**
    b.   With a neat sketch, explain working of jacket cooling water.   **(10 Marks)**

8   a.   What is PLC? Explain basic components of the PLC.   **(06 Marks)**
    b.   Explain integrated automation control and monitoring [ICAMS] system.   **(06 Marks)**
    c.   How does the micro controller operates?   **(08 Marks)**

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