1428

Code : 15MC54B

Register Number | | | | | | | |

V Semester Diploma Examination, April/May-2018

CONTROL ENGINEERING

Time : 3 Hours] **[Max. Marks : 100**

Note : (i) Answer any **six** questions from Part-A.
(ii) Answer any **seven** questions from Part-B.

PART – A

Answer any **six** question.

1. Explain closed loop control system with a block diagram. **5**
2. List advantages of control system. **5**
3. Explain transfer function with an example. **5**
4. Explain Mason's Gain formula with equation. **5**
5. Explain Time response of control system. **5**
6. Explain Relative stability of control system. **5**
7. Explain Breakaway of root locus Branches. **5**
8. List general procedure for constructing Bode plots. **5**
9. Explain polar plots. **5**

PART – B

Answer any **seven** question.

1. (a) Explain open loop control system with examples. 5
   (b) Explain force current analogy. 5

2. (a) Explain mass – spring dash pot system with its free body diagram with related force equations. 5
   (b) Explain thermal system with an example. 5

3. (a) Explain Laplace transform with example. 5
   (b) Explain block diagram of control system with example. 5

4. Briefly explain construction of signal flow graph. 10

5. (a) Explain Lead-Lag compensation. 5
   (b) Explain time response of first order system. 5

6. Solve the breakaway points of the root locus for the loop transfer function

$$G(S)H(S) = \frac{K}{S(S+2)(S^2+2S+10)}$$ 10

7. Using Routh Hurwitz criterian, explain the stability of closed loop system that has the characteristic equation.

   $S^4 + 2S^3 + 8S^2 + 4S + 3 = 0$

   Solve the number of roots of each equation that are in right half of S-plane and on jw-axis. 10

8. Explain the breakaway points of root locus for the loop transfer function O. 10

9. (a) Explain Phase margin and gain margin. 5
   (b) Explain frequency response test on a system. 5

10. (a) Explain minimum phase transfer and all pass systems. 5
    (b) Explain the significance of a log Magnitude Versus phase plot. 5