

1428

Code : 15MC54B

Register  
Number

--	--	--	--	--	--	--

V Semester Diploma Examination, April/May-2018

## CONTROL ENGINEERING

Time : 3 Hours ]

[ Max. Marks : 100

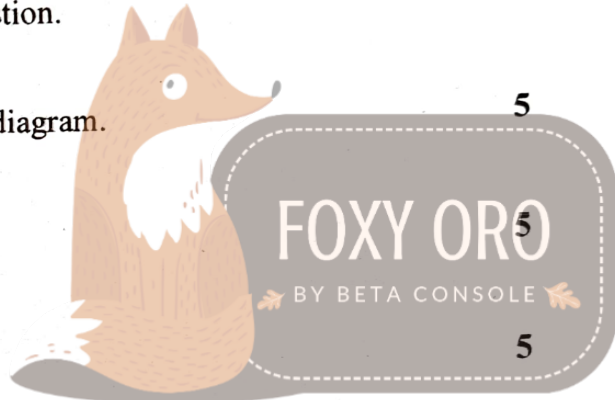
- Note :
- (i) Answer any **six** questions from Part-A.
  - (ii) Answer any **seven** questions from Part-B.

Published By:

### PART – A

Answer any **six** question.

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



**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 criterion, 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