

(b) Discuss the Routh's stability criterion. 10

9. For the system with transfer function : 20

$$\frac{X(S)}{U(S)} = \frac{8}{(S+1)(S+2)(S+4)}$$

Write the state-space equation using partial fraction method.

od

Roll No.

24357

B. Tech. 6th Semester (ME)

Examination – May, 2016

AUTOMATIC CONTROL

Paper : ME-308-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Students will have to attempt *five* questions in total, at least *one* question from each Section. Question No. 1 is *compulsory*.

1. (a) Give the transfer function representation. 5
- (b) What is closed loop transfer function ? 5
- (c) What is parametric variation ? 5
- (d) Discuss the transfer function from the state equation. 5

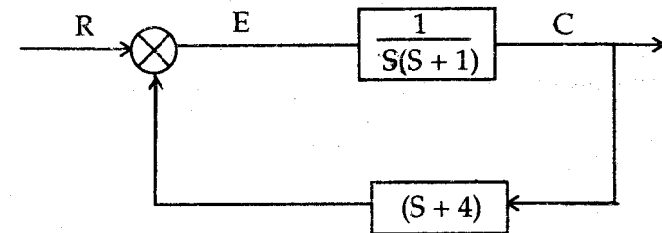
SECTION - A

2. (a) Discuss the representation of feedback control system. 10
- (b) What are different types of control system? 10
3. Explain the following: 20
- (i) Pneumatic controllers.
- (ii) Electronic controllers.

SECTION - B

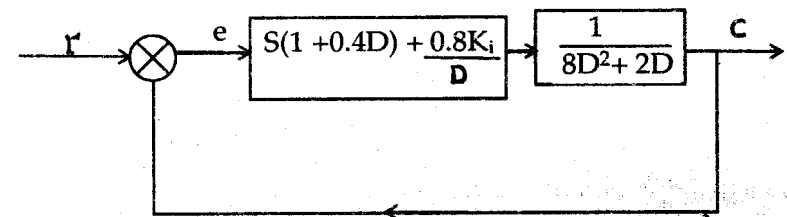
4. In a second order system with transfer function $\frac{1}{12D^2 + 24D}$, it is proposed to use proportional plus derivative control. It is reg. that $W_n = 5cps$ and $\epsilon = 0.6$. What should be the values for constant k and kd . 20
5. For the system of fig. shown below, find out the beak valve of M and the frequency at which it's occurs. Use

M circle/Bode/Nichols charts after findings the equivalent using feedback system. Check the result by calculation. 20



SECTION - C

6. For the control system shown in fig. below, find the range of values of K_i for the system to be stable. 20



7. For the system with $GH(J) = \frac{K}{S(S+2)(S+3)}$ draw the root loci and discuss the results. 20

SECTION - D

8. (a) Discuss the representation of sampled signal. 10