No. of Printed Pages : 4 221531

Roll No. .....

3rdSem / Instrumentation and Control

Subject : Control System Engineering

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 For stable system.

a) GM >0 & PM <0 b) GM >0 & PM >0

c) GM <0 & PM <0 d) GM <0 & PM > 0

Q.2 Breakaway point is determined by

a) dk/ds = 0 b) ds/dK=0

c) dK*ds=0 d) none of above

Q.3 Washing machine is an example of.

a) Open loop b) Close loop

c) Both (a) and (b) d) None of above

Q.4 The transfer function is defined as

a) C(s)* R(s) b) R(s)/C(s)

c) C(s) /R(s) d) C(s) + R(s)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Derive response of 1st order system subjected to Unit step.

Q.24 Draw and explain any three nonlinearity.

a) Dead zone

b) Friction

c) Relay

d) Backlash

e) Friction

Q.25 Explain the procedure to draw root locus in details.

Q.5 Which of the following is not test signal.

a) Impulse b) Unit step

c) Exponential d) Ramp

Q.6 Linear system follows_____ theorem.

a) Norton b) Thevenin

c) Superposition d) De Morgan.

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Write two example of close loop control system.

Q.8 Define Laplace transform.

0.9 Root locus is used to find close loop poles. (T/F)

Q.10 Write 1st order Transfer function.

Q.11 Define take off point.

Q.12 Draw saturation nonlinearity.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

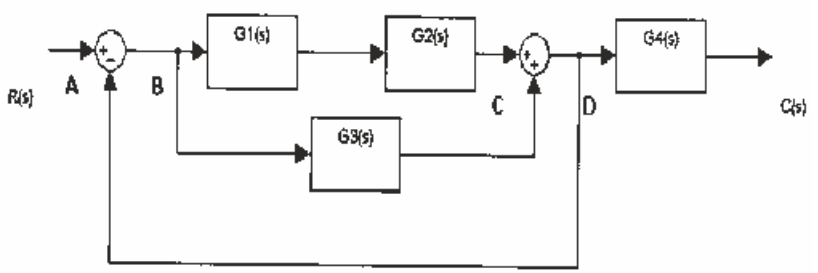
Q.13 Write the difference between linear system and nonlinear system.

Q.14 Explain servomechanism with block diagram.

Q.15 Derive transfer function of spring mass damper system.

Q.16 Write the difference between open loop system and close loop system.

Q.17 Determine the take off points and summing points of following system



Q.18 Explain Mason gain formula.

Q.19 Explain delay time and settling time.

Q.20 Write short note on all test signal.

Q.21 Determine stability using routh array criterion of following system C.E.

$$S^4 + 8s^3 + 18s^2 + 16s + 5 = 0$$

Q.22 What do you mean by phase margin and gain margin in bode plot?