

MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

MED-PR 303: CONTROL SYSTEMS

DATE: 4/8/2016

TIME: 8:30 – 10:30 AM

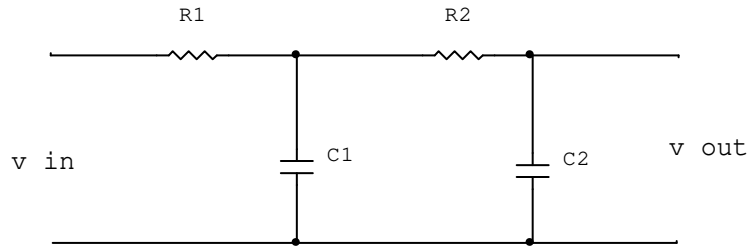
INSTRUCTIONS

Chose Any Five Questions To Answer.

QUESTION ONE (COMPULSORY)(30 MARKS)

- (a) List any two advantages of open loop over closed loop control systems (2 marks)
- (b) State with reasons wheather the control system used in each of the following systems is closed loop or open loop
 - (i) furnace temperature controller (4 marks)
 - (ii) washing machine (4 marks)
- (c) Differentiate between the following (i) manipulated variable
 - (ii) feedback element and feedback path (10 marks)

(d) Determine the transfer function of the network shown below



(20 marks)

QUESTION TWO

(a) With an aid of a canonical block diagram of a closed loop system derive

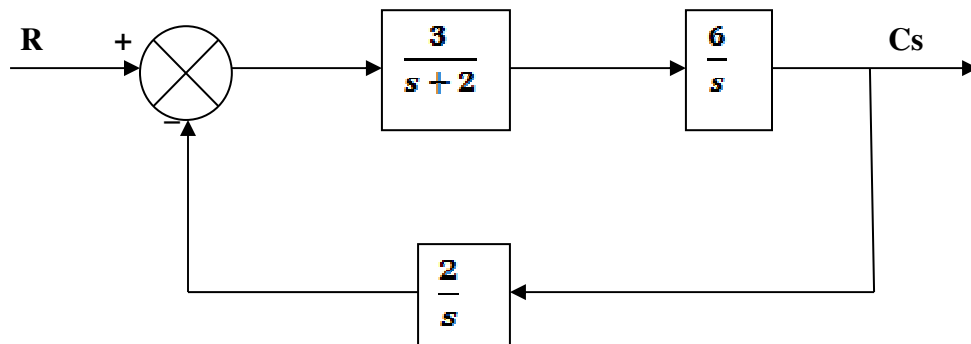
- (i) closed loop transfer function
- (ii) error ratio
- (iii) primary feed back ratio.

(20 marks)

QUESTION THREE

For the system shown below, determine

- i) open loop transfer function
- ii) closed loop transfer function
- iii) error ratio
- iv) feed back transfer function.

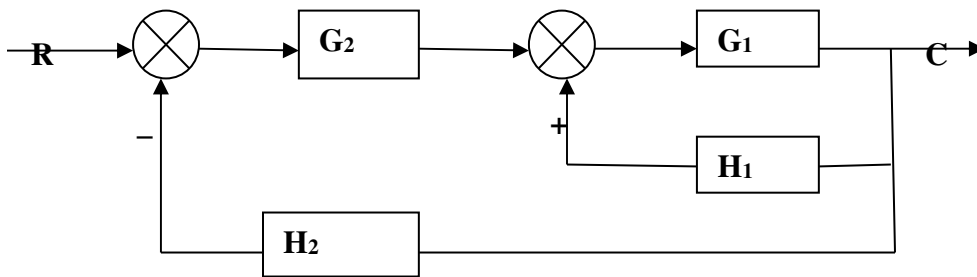


(20 marks)

QUESTION FOUR

With an aid of a block diagram algebra, reduce the block diagram of figure below to its canonical form and hence determine

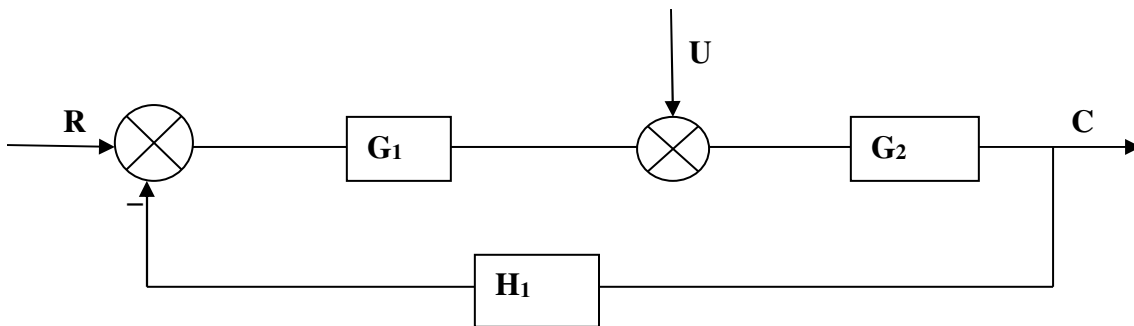
- i) forward transfer function
- ii) feed back transfer function
- iii) error ratio
- iv) primary feedback ratio
- v) open loop transfer function



(20 marks)

QUESTION FIVE

- (a) For the multi input system below, obtain the transfer function



(20 marks)