UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018

COURSE NO: CE379
COURSE NAME: CONTROL SYSTEM
CLASS: CE IV **TIME:** 3 HOURS

Name**:** _____Index Number: _____

SECTION A

INTRUCTION: Choose the best answer from the comma-separated pool of answers below to fill in the spaces provided in this SECTION.

System, Output, Actuating signal, Plant, Controller, Feedback Element, Feedback, Negative feedback, Positive feedback, Feedback, Torque, Loop gain, Settling time, Peak overshoot, Transient response, Steady state response, Compensators, Electrical, Mechanical, Analogous, Displacement, Velocity, Acceleration

1. It is an arrangement of physical components related in such a manner as to form an entire unit is called…….
2. …….. is the actual response obtained from a control system, which must be maintained at a prescribed value.
3. …… is the difference between the reference input and feedback signal.
4. The process/body/ machine, of which a particular quantity or condition is to be controlled is known as….
5. The component required to generate the appropriate control signal applied to the plant is the …..
6. ……. is the component required to generate the appropriate control signal applied to the plant.
7. …….. is a control action, in which the output is sampled and a proportional signal is given to input for automatic correction of any changes in desired output.
8. The types of feedback are: …….. and ……..
9. What type of feedback is employed in control system?
10. …….. is said to exist in a system, when a closed sequence, of cause and effect relations exist between system variables.
11. This is the motion about a fixed axis. In such systems, the force gets replaced by a moment about the fixed axis.
12. The product of all the gains of the branches forming a loop is called……..
13. ……. is defined as the time taken by the response to reach and stay within a specified tolerance band of its final value.
14. …… is defined as the difference between the peak value of step response and the steady output.
15. The output variation during the time, it takes to achieve its final value is known as ……..
16. …… is that part of the time response which remains after complete transient response vanishes from the system output.

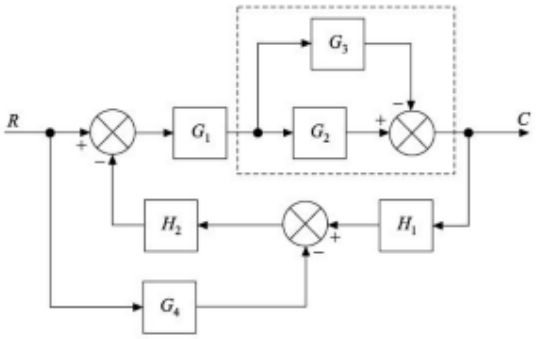
17. In control systems design, under certain circumstances it is necessary to introduce some kind of corrective subsystems to force the chosen plant to meet the given specifications. These subsystems are known as …… and their job is to compensate for the deficiency in the performance of the plant.
18. Most control systems contain ---------- and well as ---------- components.
19. From mathematical point of view, the description of mechanical and electrical elements are ---------
20. Variables that are used to describe translational motion are ----------

[20marks]

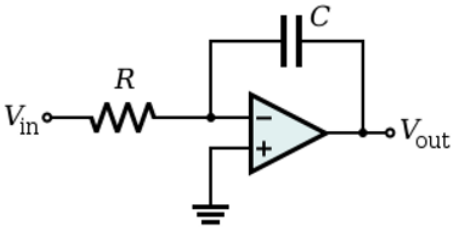
SECTION B
INSTRUCTION: Answer all Questions in this section

1. Obtain the transfer function of the control system whose block diagram is shown below.

a.



b.



[25marks]

2.
a. Differentiate between servomechanism and regulators as applied in control systems.
b. Briefly explain why the mobile phone is an open loop system.
c. Briefly explain the steps involved in the design of a typical Level CS.
d. Discuss the advantages and disadvantages of transfer functions.

[15marks]

NB: Answer all questions in the ANSWER BOOKLET.

E. Effah