No. of Printed Pages : 3

BIEE-035

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

00094

Term-End Examination

June, 2014

BIEE-035 : CONTROL SYSTEMS

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Attempt any **four** questions out of questions no. **2** to **8**.*

1. Attempt all parts : *2×7=14*

(a) The output has no effect on control action in an _____ system.

(b) $\frac{1}{s^2}$ is Laplace transform of _____ .

(c) _____ is a logarithmic plot.

(d) If the oscillations are damped out, the system is said to be _____ .

(e) End effectors are used in _____ .

(f) Stepper motor usually works with discrete signal. (True/False)

(g) Transfer function represents the ratio of output and input signals. (True/False)

2. (a) Give two practical examples of a closed loop system and express them as block diagram. 7

(b) What changes have to be made if take-off point at position A will be shifted to position B in Figure 1 ? 7

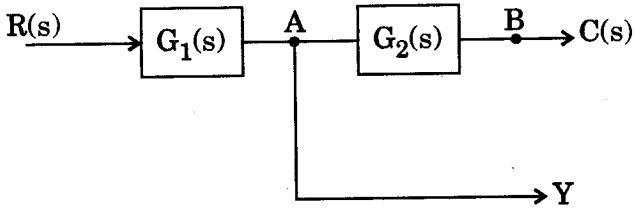

Figure 1

3. (a) Explain potentiometer error detector with neat diagram. 7

(b) Give a comparison chart between AC and DC servomotors. 7

4. (a) Explain the step, ramp and impulse input test signals with their characteristic equations. 7

(b) For a second order control system, define the rise time and maximum overshoot. 7

5. (a) Explain Proportional Integral Derivative controller (PID controller). 7

(b) What are the different control actions performed when electronic controllers are used with OP-AMP ? 7

6. (a) Check the stability by Routh-Hurwitz criterion for the characteristic equation

$$s^5 + 1{\cdot}5s^4 + 2s^3 + 4s^2 + 5s + 10 = 0$$ 7

(b) What are the steps to be followed to obtain the Bode plot ? 7

7. (a) What is the transfer function of the block diagram shown in Figure 2 ? 7

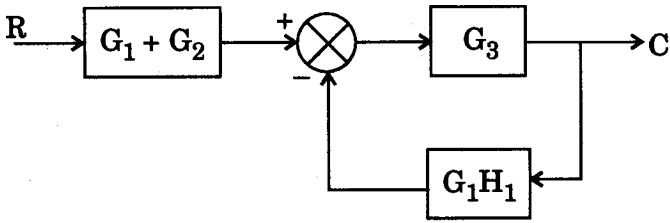

Figure 2

(b) What are the applications of Robotics ? 7

8. Answer any ***two*** of the following : *7×2=14*

(a) Explain the time response of a second order control system having unit step input function.

(b) How does a 2-phase induction motor differ from AC servomotor ?

(c) Explain the root locations in s-plane for stable and unstable systems.

(d) Explain the construction and operation of rotary encoder.