

- Q.25 What is Laplace transform? Define transfer function.

Q.26 Write any 5 advantages of open loop system.

Q.27 Define manually controlled closed loop system. Draw the block diagram of it.

Q.28 Write any five applications of tachometer.

Q.29 What is potentiometer? Explain its working.

Q.30 What are the differences between poles and zeros of the transfer function. Write any one example of it.

Q.31 Define Routh- Hurwitz criteria. Check whether the given system is stable or not using Routh - Hurwitz criteria.
 $s^4 + 2s^3 + 3s^2 + 5s + 1 = 0$

Q.32 Define the following -

 - a) Root locus b) Bode plot
 - c) Stability d) Delay time
 - e) Feed back

Q.33 What is servo mechanism? Write any 3 applications of it.

Q.34 Write the differences between signal flow graph and block diagram reduction method to find transfer function.

Q.35 Draw the block diagram of loop control system. Explain its basic elements.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

- Q.36 What is stepper motor? What is the working principle of it? Explain all types of stepper motor. Write any 3 applications of it.

Q.37 Define under damped, over damped and critically damped system with example. What is delay time and setting time of a system? Write all the standard test signals in control system.

Q.38 What is first order system? Find the time response of first order system when subjected to impulse input. Write any one example of it.

No. of Printed Pages : 4

Roll No. 031531/073641

3rd Sem / IC, EI

Subject:- Basics of Control System / Const. Sys.

Time : 3Hrs.

M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory
(10x1=10)

- Q.1 Which one of the following is the correct for the open loop control system?

 - a) It must have feedback
 - b) It is simple in design
 - c) It is highly sensitive towards the change in feedback
 - d) Design of such circuit is usually expensive

Q.2 Block diagram reduction technique is used to find the _____ of the system.

 - a) Transfer function of the system
 - b) Frequency response of the system
 - c) Gain margin and phase margin of the system
 - d) Time response of the system

Q.3 In block diagram reduction technique, if two blocks are in series then the overall gain of the system is

 - a) Product of individual gain of both the blocks
 - b) Division of individual gain of both the blocks
 - c) Sum of individual gain of both the blocks
 - d) Exponential of product of individual gain of both the blocks

Q.4 When the first column element of any row of Routh array becomes zero then the system becomes

 - a) Stable
 - b) Marginally stable
 - c) Unstable
 - d) May be either unstable or marginally stable

- Q.5** Which of the following statement is correct about the impulse input signal?
- The magnitude is 1 for time less than 0 and zero otherwise
 - The area is 1 for time greater than 0 and zero otherwise
 - The magnitude is 1 for time equal to 0 and zero otherwise
 - The magnitude does not defined at time equal to 0.
- Q.6** From the Bode plot, we can find
- Stability of the system
 - Transfer function of the system
 - Frequency response of the system
 - All of the above
- Q.7** The system is said to be linear if
- It follows the principle of superposition and homogeneity
 - It is time invariant
 - It does not follows the principle of superposition and homogeneity
 - None of the above
- Q.8** The synchro-pair transformers
- The electric signal into angular speed
 - The linear speed into electric signal
 - Works as electromechanical switch
 - The angular position of shaft into electrical signal
- Q.9** A potentiometer works on the
- Principle of inductance change
 - Principle of resistance change
 - Principle of capacitance change
 - Principle of electric flux change

- Q.10** The time taken by the system response to reach to the final value is known as _____.
- Rise time
 - Peak time
 - Settling time
 - Delay time
- SECTION-B**
- Note:** Objective type questions. All questions are compulsory. (10x1=10)
- Q.11** Open loop system is more complex than closed loop system. (True/False)
- Q.12** Laplace transforms of the unit impulse function is _____.
- Q.13** Define the rise time.
- Q.14** Define stepper motor.
- Q.15** $s^3 - 3s^2 + 5s + 1 = 0$ is a stable system . (True/False)
- Q.16** Time taken by the system response to reach from 0% to 100% of the final value is called as _____.
- Q.17** If the numerator of a system transfer function becomes 0 then the value of s is known as _____ of the system. (pole/zero)
- Q.18** Define closed loop control system.
- Q.19** Define rise time of first order system when subjected to step input.
- Q.20** Define non-linearities.
- SECTION-C**
- Note:** Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)
- Q.21** Write any 5 applications of closed loop system.
- Q.22** What are the basic elements of control system? Draw its block diagram.
- Q.23** Define pole of the system. How Mason's gain rule can be used to find the transfer function of the system.
- Q.24** What are the difference between linear and non-linear system? Give any three examples of non-linearities.

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