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BSNL TTA EXAM Control Systems

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1. An open loop control system has its

(a) control action independent of the output or desired quantity

(b) controlling action, depending upon human judgment

(c) internal system changes automatically taken care of

(d) both (a) and (b)

(e) all (a),(b) and (c)

2. A servo system must have

(a) feedback system

(b) power amplifier to amplify error

(c) capacity to control position or its derivative

(d) all of these

(e) none of these

3. The major disadvantage of a feedback system may be

(a) Inaccuracy

(b) inefficiency

(c) Unreliability

(d) instability

(e) Insensitivity

4. Properties of a transfer function

(a) It is ratio of two polynomials is S and assumes zero initial conditions

(b) It depends on system elements and not input and output of the system

(c) Coefficients of the powers of S in denominator and numerator are all real constant. The order of denominator is usually greater than or equal to the order of numerator

(d) All of these

(e) It is a function which transfer one physical system into another physical system.

5. The classical analogous of a simple lever is

(a) Capacitor bridge

(b) transformer

(c) mutual inductor

(d) either of these

6. Two blocks G1(s) and G2(s) can be cascaded to get resultant transfer function as

(a) G1(s) + G2(s)

(b) G1(s) / G2(s)

(c) G1(s) G2(s)

(d) 1+G1(s) G2(s)

(e) 1-G1(s)G2(s)

(f) two blocks cannot be cascaded

7. The principles of homogeneity and super position can be applied to

(a) linear time invariant system

(b) non-linear time invariant system

(c) digital control system

(d) both (a) and (b)

8. Pick up the nonlinear system

(a) automatic voltage regulator

(b) d.c. servomotor with high field excitation

(c) temperature control of a furnaces using thermistor

(d) speed control using SCR

(e) all of these

9. Signal flow graph (SFG) is a

(a) polar graph

(b) semi log graph

(c) log log graph

(d) a special type of graph for analyzing modem control system

(e) a topological representation of a set of differential equations

10. Disadvantages of magnetic amplifier

(a) time lag, less flexible, non-sinusoidal waveform

(b) low power consumption and isolation of the active circuit

(c) saturation of the core

(d) all of these

11. Pick up false statement regarding magnetic amplifiers

(a) The gate coil of an ideal magnetic amplifier has either zero or infinite inductance

(b) Resistance of control and gate winding is very small

(c) Magnetic amplifier gas dropping load characteristics

(d) Magnetic amplifiers are not used to control the speed of d.c. shunt motor

(e) Magnetic amplifiers can be used in automatic control of electric drivers of higher rating.

12. High power amplification is achieved by using

(a) push pull amplifier

(b) amplidyne

(c) magnetic amplifier

(d) DC amplifier

(e) D.C. generator

13. Pick up false statement regarding servomotors

(a) The d.c. servomotors are lighter than equivalent a.c. servomotors

(b) The d.c. servomotors develops higher starting and reversing torque than equivalent a.c. servomotor.

(c) A drag cup a.c. servomotor has one windings on stator and other on rotor

(d) Output power of servomotors varies from 1/20 W to 100 W

14. To reduce steady state error

(a) decrease natural frequency

(b) decrease damping

(c) increase damped frequency

(d) increase time constant

(f) increase gain constant of the system

15. A good factor for Mp should be

(a) less than 1

(b) lying between 1.1 and 1.5

(c) more than 2.2

(d) zero

(e) infinity

16. Pick up false statement. Routh-Hurwitz criterion

(a) is used for determining stability of a system

(b) is an algebraic procedure

(c) gives the exact location of roots of the characteristic equation

(d) does not indicate relative degree of stability or instability

17. Which of the following is the time domain method of determining stability of a control system

(a) Bode plot

(b) Nyquist plot

(c) Nicholos chart

(d) Routh-Hurwitz array

(e) Constant M and (fy) locus

(f) Root locus technique

18. The technique which gives transient response quickly as well as stability information is

(a) Nyquist plot

(b) Routh-Hurwitz criteria

(c) Bode plot

(d) Root locus plot

(e) Nichols plot

19. The bandwidth can be increased by use of

(a) phase lag network

(b) phase lead network

(c) both (a) and (b) in cascade

(d) both (a) and (b) in parallel

(e) none of these

20. Nyquist plot is drawn on

(a) semi log graph paper

(b) log log graph paper

(c) polar graph paper

(d) centimeter graph paper

21. If the gain margin is positive and the phase margin is negative the system is

(a) stable

(b) unstable

(c) indeterminist

22. The Bode plot is applicable to

(a) all phase network

(b) minimum phase network

(c) maximum phase network

(d) lag lead network

(e) none of these

23. The valid relation between setting time ts and rise time tr is

(a) tr>ts

(b) ts>tr

(c) ts=tr

(d) none of these

24. As a root moves further away from imaginary axis the stability

(a) increases

(b) decreases

(c) not affected

(d) none of these

25. Flat frequency response means that the magnitude ratio of output to input over the bandwidth is

(a) variable

(b) zero

(c) constant

(d) none of above

26. How many octaves are between 200 Hz and 800 Hz

(a) Two octave

(b) One octave

(c) Four octave

(d) None of above

27. Human system can be considered as

(a) open loop system

(b) close loop system with single feedback

(c) close loop system with multivariable feedback

(d) none of these

28. In a feedback system the transient response

(a) Decays at constant rate

(b) gets magnified

(c) decays slowly

(d) decays more quickly

29. Transfer function of a system is used to calculate

(a) the steady state gain

(b) the main constant

(c) the order of system

(d) the output for any given input

(e) all of the above

30. Transfer function of a system is defined as the ratio of output to input in

(a) Laplace transform

(b) Z-transform

(c) Fourier transform

(d) Simple algebraic form

31. Introduction of feedback decreases the effect of

(a) disturbances

(b) noise signals

(c) error signals

(d) all the above

32. The system response of a system can be best tested with

(a) unit impulse input signal

(b) ramp input signal

(c) sinusoidal input signal

(d) exponentially decaying input signal

33. Which of the following is a closed loop system

(a) electric switch

(b) car starter

(c) de generator

(d) auto-pilot for an aircraft

34. Which of the following is used as an error detector

(a) potentiometer

(b) field controlled ac motor

(c) amplidyne

(d) armature controlled ac motor

35. The break away point of root loci are

(a) open loop poles

(b) closed loop poles

(c) open loop zeros

(d) closed loop zeros

36. Noise in a control system can be kept low by

(a) reducing the bandwidth

(b) attenuating such frequencies at which external signals get coupled into the system

(c) both (a) and (b)

(d) none of these

37. Main cause of absolute instability in the control system is

(a) parameters of controlling system

(b) parameters of controlled system

(c) parameters of feedback system

(d) error detector where the two signals are compared

38. Basically a controller is

(a) a amplifier

(b) a clipper

(c) a comparator

(d) a summer

39. A system with gain margin close to unity or a phase margin close to zero is

(a) highly stable

(b) highly oscillatory

(c) relatively stable

(d) none of these

40. Which of following elements is not used in an automatic control system

(a) sensor

(b) error detector

(c) oscillator

(d) final control element

41. AC systems are usually preferred to the DC systems in control applications because

(a) AC systems are cheaper

(b) AC systems are more stable

(c) AC systems have better performance characteristics and smaller in size

(d) all of these

42. A system has the transfer function (1-s)/(1+s); It is known as

(a) low pass system

(b) high pass system

(c) all pass system

(d) none of the above

43. In control systems, excessive bandwidth should be avoided because

(a) noise is proportional to bandwidth

(b) it leads to low relative stability

(c) it leads to slow speed of response

(d) none of these

44. In most systems, an increase in gain leads to

(a) larger damping ratio

(b) smaller damping ratio

(c) constant damping ratio

(d) none of these

45. A step function is applied to the input of a system and output is of the form y = t, the system is

(a) stable

(b) unstable

(c) not necessarily stable

(d) conditionally stable

46. Which of the following can be magnified by magnetic amplifier

(a) voltage

(b) current

(c) power

(d) none of above

47. The inductance is not used in lag network because of

(a) big size

(b) time delay and hysteresis losses

(c) high reactance

(d) none of these

48. Saturation in a stable control system can cause

(a) conditional stability

(b) over damping

(c) low level oscillations

(d) high level oscillations

49. Excessive noise in control systems can cause

(a) reduction in bandwidth

(b) reduction in gain

(c) saturation in amplifying stages

(d) oscillations

50. The type-0 system has

(a) net pole at the origin

(b) no pole at the origin

(c) simple at one origin

(d) two poles at the origin