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Ph.D. Entrance Examination of Electrical Engineering

Q1. A triac
a) conducts when not triggered
b) conducts when not triggered in both directions
c) conducts when triggered in one direction
d) none of the above

Q2. In an induction motor, the rotor resistance and reactance are 0.2 ohm and 5 ohm respectively. In order that torque of the motor may be maximum, the value of slip should be
a) 10%
b) 8%
c) 4%
d) 1%

Q3. A class A amplifier is one in which
a) base is biased to cut-off
b) I_C flows most of the time
c) I_E flows all the time
d) none of the above

Q4. A single-phase full wave controlled bridge rectifier, minimum output voltage is obtained at conducting angle .....and maximum at conduction angle.....
a) 0°, 180°
b) 180°, 0°
c) 0°, 0°
d) 180°, 180°

Q5. A pointer of an instrument once deflected returns to zero position, when the current is removed, due to
a) action of gravity
b) mass of the pointer
c) controlling torque
d) damping torques

Q6. Two alternators are running in parallel. If the driving force of both the alternators is changed, this will result in change in
a) frequency
b) back emf
c) generated voltage
d) all of the above

Q7. A single-phase bridge inverter delivers power to a series connected RLC load with R= 2 Ω, ωL= 8 Ω. For this inverter load combination, load commutation is possible in case the magnitude of 1/ ωC in ohms is
a) 10
b) 8
c) 6
d) zero

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Q8. The bridge used for precision measurement of inductance over a wide range, is
a) Maxwell bridge
b) Wein's bridge
c) Anderson bridge
d) Hay's bridge

Q9. Which of the following chopper configurations is used for both motoring and regenerative braking?
a) first quadrant configuration
b) second quadrant configuration
c) two quadrant configuration
d) four quadrant configuration

Q10. In which of the following condition an oscillator can stop oscillating?
a) increase in transistor gain
b) reduction in transistor gain
c) elimination of triggered pulses
d) none of the above

Q11. A MOSFET can be operated with
a) negative gate voltage only
b) positive gate voltage only
c) with both positive and negative gate voltage
d) none of the above

Q12. Which of the following type of instruments depends upon the magnetic effect of current for their action?
a) hot wire and induction
b) PMMC and thermocouple
c) hot wire and PMMC
d) PMMC and moving iron

Q13. The transfer function of the system described by $\frac{d^2y}{dt^2} + \frac{dy}{dt} = \frac{du}{dt} + 2u$ with u as input and y as output is
a) $\frac{(s+2)}{(s^2+s)}$
b) $\frac{(s+1)}{(s^2+s)}$
c) $\frac{2}{(s^2+s)}$
d) $\frac{2s}{(s^2+s)}$

Q14. A transformer having 100 turns of primary side is applied with 200 V AC, In order to get 400 V AC on secondary side the number of turns on the secondary side must be
a) 200
b) 800
c) 50
d) 100

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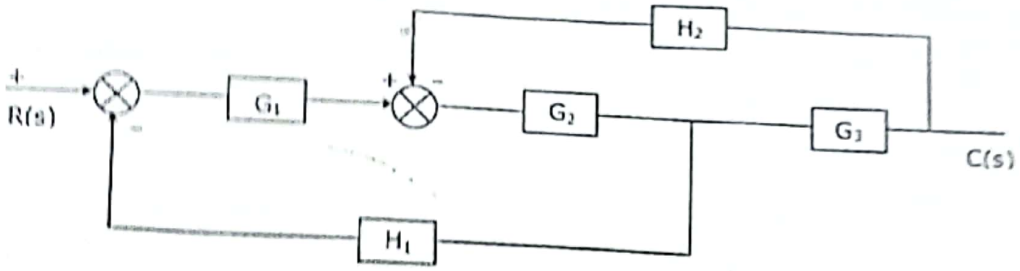
Q15. For the block diagram shown in Figure C(s)/R(s) is given by



a) $\frac{G_1G_2G_3}{1+H_2G_2G_3+H_1G_1G_2}$

b) $\frac{G_1G_2G_3}{1+H_1H_2G_1G_2G_3}$

c) $\frac{G_1G_2G_3}{1+H_1G_1G_2G_3+H_2G_3G_1G_2}$

d) $\frac{G_1G_2G_3}{1+H_1G_1G_2G_3}$

Q16. The Thevenin equivalent consists of
a) a single voltage source
b) a single resistor
c) a single source of voltage in series with single resistor
d) a single source of voltage in parallel with single resistor

Q17. An idealized physical system is called a
a) control model
b) physical model
c) ideal system
d) linear system

Q18. According to connections of thyristors, inverters can be classified as
a) series type
b) parallel type
c) bridge type
d) all of these

Q19. The number of roots on the equation $2s^4 + s^3 + 3s^2 + 5s + 7 = 0$ that in lie in the right half of s-plane is
a) zero
b) one
c) two
d) three

Q 20. A passive two-port network is in a steady state. Compared to its input, the steady output can never offer
a) higher voltage
b) lower impedance
c) greater power
d) better regulation

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Q21. Which of the following relationships between A,B,C,D constants is correct for an equivalent symmetrical T or π network of a long transmission line?

a) A = C
b) B = C
c) A = D
d) D = B

Q22. The open circuited voltage at the terminals of load R_L is 30 V, under the conditions of maximum power transfer, the load voltage will be

a) 30 V
b) 10 V
c) 15 V
d) 5 V

Q23. A cascade of 3 linear time-invariant systems is causal and unstable. From this, it is concluded that

a) each system in the cascade is individually causal and unstable
b) at least one system is unstable and at least one system is causal
c) at least one system is causal and all systems are unstable
d) the majority are unstable and the majority are causal.

Q24. If an AC voltage wave is corrupted with an arbitrary number of harmonics, then the overall voltage waveform differs from its fundamental frequency component in terms of

a) only the peak values
b) only the rms values
c) peak and rms values
d) all the three measures (peak, rms and average values)

Q25. A current impulse of $5\delta(t)$,is forced through a capacitor C. The voltage $V_c(t)$,across the capacitor is given by

a) 5t
b) 5u(t)-C
c) $\frac{5}{C}t$
d) $\frac{5u(t)}{C}$

Q26. A capacitor start capacitor run single phase induction motor is basically a

a) ac series motor
b) dc series motor
c) 2 phase induction motor
d) 3 phase induction motor

Q27. If the field of synchronous motor is under excited, the power factor will be

a) lagging
b) leading
c) unity
d) none of these

Q28. The efficiency of transformer does not depends on

a) current
b) load
c) power factor
d) all of the above

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Q29. When a line to ground fault occurs, the current in the faulted phase is 100 A. The zero sequence current in this case will be
a) 33.3 A
b) zero
c) 66.6 A
d) 100 A

Q30. A 200 V dc machine has an armature resistance of 0.5 ohm. If the full armature current is 30 A, the induced e.m.f, when the machine act as (i) generator (ii) motor will be
a) 170 V, 230 V
b) 175 V, 225 V
c) 185 V, 215 V
d) 120 V, 210 V

Q31. In a dc series motor, shaft torque is less than the armature torque due to
a) stray losses
b) eddy current losses
c) hysteresis losses
d) all of the above

Q32. The intersection of root locus branches with the imaginary axis can be determined by the use of
a) polar plots
b) rouths criteria
c) nyquist criterion
d) none of the above

Q33. The characteristic impedance of a transmission line depends upon
a) shape of the conductor
b) surface treatments of the conductor
c) conductivity of the material
d) geometrical configurations of the conductors

Q34. In a circuit breaker the time duration from the instant of fault to the extinction of arc is known as
a) operating time
b) total clearing time
c) lag time
d) lead time

Q35. A time varying magnetic field produces
a) magnetic field only
b) electric field only
c) both electric and magnetic fields
d) magnetic, electric and thermal fields.

Q36. In load flow studies PV bus is treated as PQ bus when
a) phase angle becomes high
b) reactive power goes beyond limits
c) voltage at the bus becomes high
d) any of the above

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Q37. Find the value of the definite integral:

$\int_0^{\pi/2} Sin\ x\ dx$

a) 1
b) 2/3
c) -2
d) 0

Q38. The number of arbitrary constants in the general solution of a differential equation is equal to its

a) order
b) degree
c) linearity
d) homogeneity

Q39. The Laplace Transform of the function $f(t) = e^{at}$ is

a) a / (s - a)
b) 1 / (s + a)
c) s / (s - a)
d) 1 / (s - a)

Q40. In a Gauss Seidel method of power flow problem, the number of iterations may be reduced if the correction in voltage at each bus is multiplied by

a) gauss constant
b) acceleration constant
c) blocking factor
d) deceleration factor

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Answer Key Ph.D. Entrance Examination of Electrical Engineering

Question Number	Answer	Question Number	Answer
Q1	b	Q21	c
Q2	c	Q22	c
Q3	c	Q23	b
Q4	a	Q24	c
Q5	c	Q25	d
Q6	d	Q26	c
Q7	a	Q27	a
Q8	c	Q28	c
Q9	c	Q29	a
Q10	b	Q30	d
Q11	c	Q31	a
Q12	d	Q32	b
Q13	a	Q33	d
Q14	a	Q34	b
Q15	a	Q35	c
Q16	c	Q36	b
Q17	b	Q37	a
Q18	d	Q38	a
Q19	c	Q39	d
Q20	c	Q40	b

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