1. The current I em units, flowing in a coil of a tangent galvanometer is given by the expression where

r = Mean radius of the galvanometer coil.

N = Number of turns of the galvanometer coil.

H = Horizontal component of earth magnetic field.

ϕ = Deflection of galvanometer magnetic needle.

(A) $I = (Hr/2\pi N) * \cos\phi$ (B) $I = (2\pi Nr/H) * \tan\phi$

(C) $I = (Hr/2\pi N) * \tan\phi$ (D) $I = (2\pi N/H) * \cos\phi$

---

2. To measure current, Ammeters are connected in

(A) Series with very low resistance

(B) Series with very High resistance

(C) Parallel with very low resistance

(D) Parallel with very High resistance

---

3. If a circuit is formed consisting of two dissimilar metallic conductors, and if one of the junction has a temperature of T1 and the other is at higher temperature T2, a current flow in the circuit. This effect is called as

(A) Peltier Effect (B) Thompson Effect

(C) Seeback Effect (D) Ferranti Effect

---

4. Two wattmeter connected to measure the input of a balanced 3 Phase circuit indicates 2000 Watts and 500 Watts respectively. What will be the power factor of the circuit, when both of the readings are positive?

(A) 0.800 (B) 0.565 (C) 0.750 (D) 0.696

---

5. Wheatstone Bridge is used for measurement of

(A) Earth Resistance (B) Very High Resistance value

(C) Medium Resistance Value (D) Very Low resistance values

6. In a series RLC circuit, during resonance

(A) Inductive reactance becomes equal to capacitive reactance

(B) Only R becomes zero

(C) Only Capacitive reactance becomes zero

(D) Only Inductive reactance becomes zero

---

7. Which of the following network theorem deals with finding out the circuit values of voltage and current in a restricted portion of the network by replacing the actual source of energy by a single "equivalent voltage source" or by a single "equivalent current source" acting at a terminal pair?

(A) Compensation Theorem (B) Norton's Theorem

(C) Substitute Theorem (D) Thevenin's Theorem

---

8. What will be the base impedance for a three phase system with base MVA = 100 MVA and Base kV as 11 kV?

(A) 1.21 Ohms (B) 3.6 Ohms (C) 5.2 Ohms (D) 2. 78 Ohms

---

9. The differential protection relay may lose us stability for through faults due to saturation of CT magnetic circuit during short circuit condition. To overcome this difficulty which of the following technique is used

(A) Biased differential relay (B) Induction disc relay

(C) Stepped Tap changing method (D) IDMTL Relay

---

10. During single phasing, the unbalanced stator current have a negative sequence component, which cause

(A) Magnetic flux rotating in opposite direction to main flux

(B) Magnetic flux rotating in same direction to main field

(C) Increase the speed of the motor above synchronous speed

(D) Motor Starts rotating in Opposite direction

---

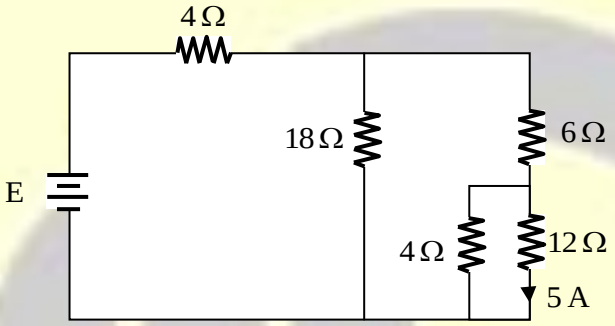
11. The Burden of protective Current Transformer (CT) is specified in

(A) Percentage of load current (B) Percentage Ratio error

(C) Volt-Ampere (D) Percentage Phase Error

---

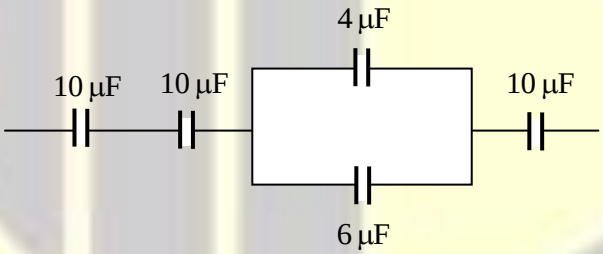
12. In the network shown in the figure below, the current in the 12 Ohm resistor is 5 Amps, the battery voltage E is



(A) 120 Volts (B) 180 Volts (C) 300 Volts (D) 310 Volts

---

13. What is the equivalent capacitance of the following circuit?



(A) 2.5 μF (B) 40 μF (C) 32.4 μF (D) 4 μF

---

14. The relation between the flux density (B) and Magnetic field intensity (H) is given by B = μH. What is μ in this relation?

(A) Magnetic susceptibility (B) Dielectric constant

(C) Permeability of the medium (D) Permittivity

15. Power supply to a 10 pole induction motor is supplied by 4 pole alternator which is driven at 1500 RPM. If the motor runs with slip of 4%, what is its speed?

(A) 750RPM (B) 576RPM (C) 600 RPM (D) 240 RPM

---

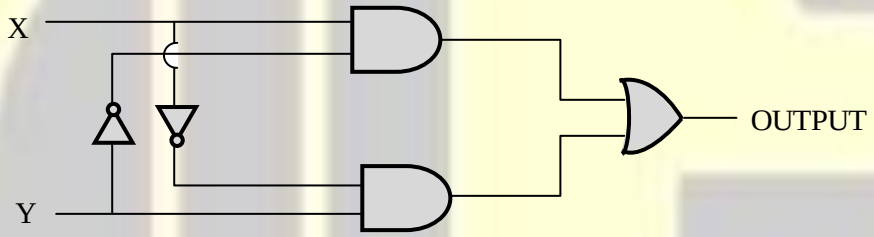
16. A power factor meter connected in a circuit indicates pf of 0.6 lagging. To improve the power factor, we have to insert the following component in the circuit.

(A) Inductors (B) Both inductor and resistance

(C) Capacitors (D) Resistors

---

17. The logic evaluated by the circuit at the output is

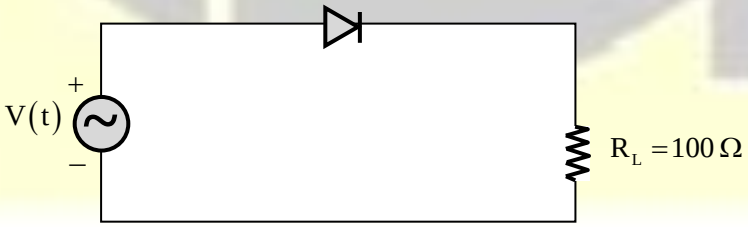


(A) $X\bar{Y}+Y\bar{X}$ (B) $\bar{X}\bar{Y}+XY$ (C) $\left(\overline{X+Y}\right)XY$ (D) $\bar{X}Y+X\bar{Y}+X+Y$

---

18. The figure shows a half wave rectifier circuit with input voltage $u(t)=10\sin(100\pi t)$ volts.

Assuming ideal diode characteristics with zero forward voltage drop and zero reverse current, the average power consumed in watts by the load resistance RL is



(A) 1 Watts (B) 0.25 Watts (C) Zero Watts (D) 0.5 Watts

---

19. The truth table

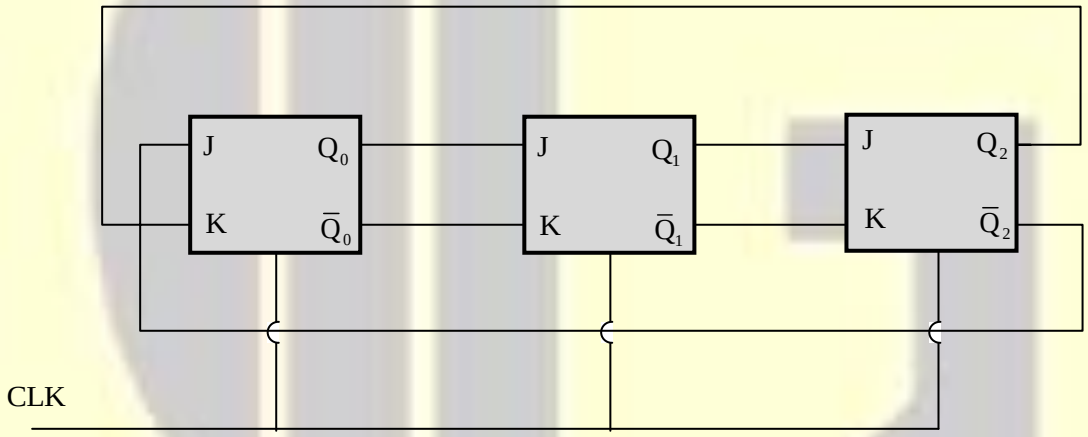
X	Y	F(x, y)
0	0	0
0	1	0
1	0	1
1	1	1

Represent the Boolean function

(A) X (B) X – Y (C) X + Y (D) Y

---

20. A three stage Johnson counter ring in figure is clocked at a constant frequency of f_c from starting state of $Q_0Q_1Q_2 = 101$. The frequency of output $Q_0Q_1Q_2$ will be



(A) $\frac{f_c}{2}$ (B) $\frac{f_c}{6}$ (C) $\frac{f_c}{3}$ (D) $\frac{f_c}{8}$

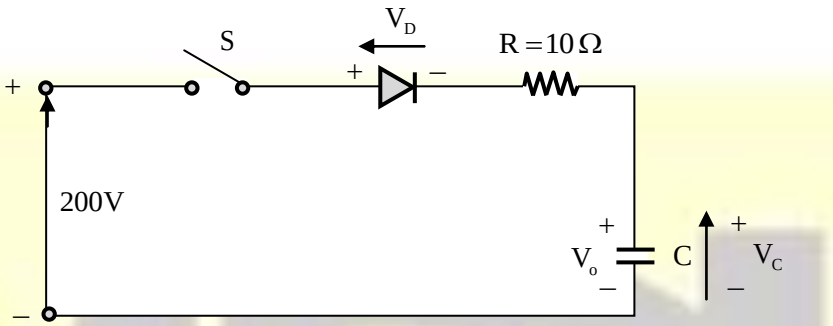
---

21. A 4 bit module - 16 ripple counter uses JK F/F. If the propagation delay of each F/F is 50 nano seconds, the maximum clock frequency that can be used is equal to

(A) 20 MHz (B) 5MHz (C) 10 MHz (D) 4 MHz

---

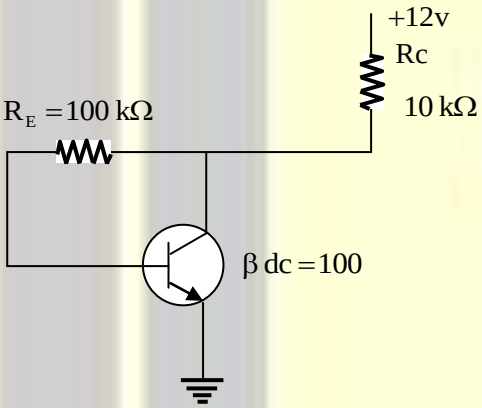
22. Figure shown below, capacitor C is initially charged to $V_o = 50\,V$ with upper plate positive. Switch S is closed at t = 0. Current through the circuit at t = 0 and final voltage across C are respectively



(A) 15A, 200V (B) 25A, 250V (C) 20A, 200V (D) 15A, 150V

---

23. The Q point value I_c for the circuit is



(A) 10.18 Micro Amps (B) 102.5 Milli Amps

(C) 1.018 Milli Amps (D) 6.325 Micro Amps

---

24. The frequency of oscillations of transistorized Colpitts Oscillator having tank circuit parameters $C1 = 150\,\mu F, C2 = 1.5\,nF$ and $L = 50\,\mu H$ is

(A) 500 kHz (B) 3.26 MHz (C) 1.927 MHz (D) 63.5 kHz

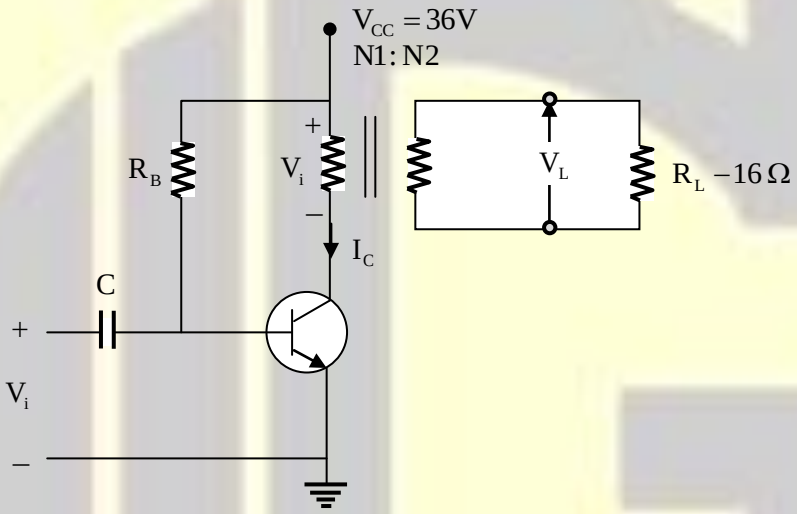
---

25. The following distortion readings are available for a power amplifier. D2 = 0.2, D3 = 0.02 and D4 = 0.06. The Total Harmonic Distortion (THD) is

(A) 30.97% (B) 20.97% (C) 15.67% (D) 13.29%

---

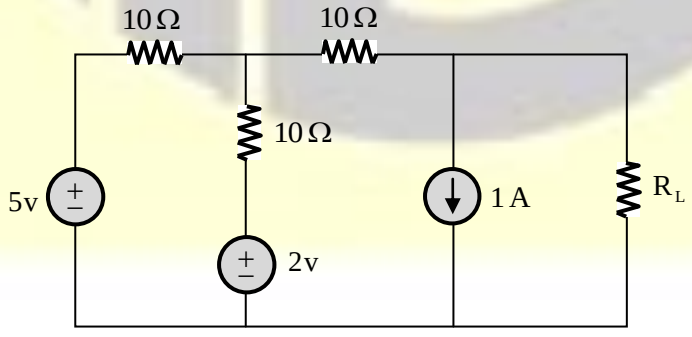
26. A transformer coupled class A amplifier drives a 16 Ohm loud speaker through 4:1 transformer with V_{cc} = 36 V. If the circuit delivers 2 Watts to load, the rms voltage across the load assuming transformer efficiency as 100 % is



(A) 3.9 V (B) 6.29 V (C) 22.6 V (D) 5.65 V

---

27. In the R_L circuit given below, the maximum power will be transferred when value of, R_L is



(A) 5 ohms (B) 15 ohms (C) 20 ohms (D) 25 ohms

28. A source $Vs(t) = V\cos 100\pi t$ has an internal impedance of $(4 + j3)\Omega$. If a purely resistive load is connected to this source has to extract the maximum power out of the source, its value in Ohms should be

(A) 3 ohms (B) 5 ohms (C) 4 ohms (D) 7 ohms

---

29. In a transformer, exciting current is made up of two components namely magnetizing current I_M and core loss current I_C, with negligible leakage impedance drop (V is supply voltage)

(A) Both I_M and I_C lag supply voltage V by 90°

(B) Both I_M and I_C are in phase with V

(C) I_M lags V by 90° whereas I_C is in phase with V

(D) I_M is in phase with V but I_C lags V by 90°

---

30. The leakage flux in a transformer depends upon

(A) The applied input voltage (B) Turns ration of transformers

(C) The load current (D) The mutual flux

---

31. If Excitation of synchronous generator fails, it acts as a

(A) Synchronous motor (B) Induction motor

(C) Synchronous generator (D) Induction generator

---

32. In a tap changer, the voltage at consumer terminals is kept within the prescribed limits by varying the

(A) Ratio of turns between primary and secondary windings

(B) Frequency

(C) Flux density in core

(D) Angle between magnetic axis of the primary and secondary windings

---

33. The residual magnetism of a self excited DC generator is lost. To build up its emf what to be done to regain the residual magnetism?

(A) The field winding must be excited by double the rated DC voltage

(B) The armature connection must be reversed

(C) The field winding connection must be reversed

(D) Field winding must be excited by low voltage DC supply

---

34. Two DC series machines are mechanically coupled. One machine is running as a motor and the other as a generator. The iron and friction loss will be identical when

(A) Their speeds are identical

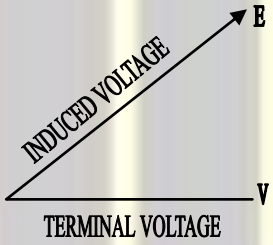
(B) Their speeds and excitation are identical

(C) Their speeds are equal and back emfs are half of the supply voltage

(D) Their excitations are equal and back emfs are half of the supply voltage

---

35. The phaser diagram of a synchronous machine connected to an infinite bus is shown below. The machine is



(A) Generator and operating at lagging pf

(B) Generator and operating at leading pf

(C) Motor and operating at a leading pf

(D) Motor and operating at a lagging pf

---

36. A phase synchronous motor, connected to an infinite bus, operating at a leading pf with a constant load torque, if excitation is increased (δ is load angle and ϕ power factor angle)

(A) Both δ and ϕ decreases
(B) δ and ϕ both increases
(C) δ increases but ϕ decreases
(D) δ decreases but ϕ increases

---

37. Magnetizing in rush current in transformer is rich in

(A) 3^{rd} Harmonics
(B) 7^{th} Harmonics
(C) 2^{nd} Harmonics
(D) 5^{th} Harmonics

---

38. Two Inductor motors A and B are identical except that the air gap of motor 'A' is 50% greater than that of motor B then

(A) The no-load pf of Motor A will be better than that of Motor B
(B) The no-load pf of Motor A will be proper than that of Motor B
(C) The core losses of Motor A will be more than those of Motor B
(D) The operating flux of Motor A will be smaller than that of Motor B

---

39. A 3 phase induction motor draws active power P and reactive power Q from grid. If it is operating as a generator, P and Q will respectively be

(A) Positive and negative
(B) Positive and positive
(C) Negative and negative
(D) Negative and positive

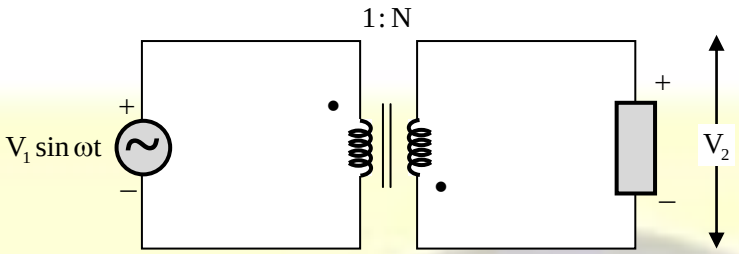
---

40. In case of 3 Phase Short circuit in a system, the power fed into the system is

(A) Mostly active
(B) Mostly reactive
(C) Active only
(D) Active and reactive both

---

41. The output voltage of the ideal transformer with polarities and dots shown in the figure is given by



(A) $(1/N)V_1 \sin(\omega t)$ (B) $(-1/N)V_1 \sin(\omega t)$

(C) $-NV_1 \sin(\omega t)$ (D) $-NV_1 \cos(\omega t)$

---

42. The average real power in watts delivered to a load impedance $ZL = (4 - J2)\Omega$ by an ideal current source $i(t) = 4\sin(\omega t + 20°)A$ is

(A) 78 Watts (B) 32 Watts (C) 0 Watts (D) 64 Watts

---

43. A network contains B branches and N nodes. The number of mesh current equations would be

(A) $N-(B-1)$ (B) $B-N-1$ (C) $(B+N)-1$ (D) $B-(N-1)$

---

44. Superposition theorem is valid for

(A) Linear circuits (B) Non linear circuits

(C) Both linear and non linear circuits (D) Circuits with active elements

---

45. A sine wave as has a peak value of 12 Volts. It crest factor is

(A) 1.732 (B) 1.11 (C) 1.415 (D) 0.706

---

46. A sinusoidal voltage $V = 50\sin\omega t$ is applied to a series RL circuit. The current in the circuit is given by $I = 25\sin(\omega t - 53°)$. The apparent power consumed by the load is

(A) 375 VA (B) 625 VA (C) 2500 VA (D) 750 VA

---

47. A band pass filter is one which

(A) Attenuates frequencies between two designated cut off frequencies and passes all other frequencies

(B) Passes all frequencies

(C) Attenuation all frequencies

(D) Passes frequencies between two designated cut off frequencies

---

48. A bulb in staircase has two switches, one switch being at the ground floor and the other being at first floor. The bulb can be turned ON and also OFF by any one of the switch irrespective of the state of other switch. The logic of switching of bulb resembles

(A) AND gate (B) XOR gate (C) OR gate (D) NAND gate

---

49. Time domain expression for the voltage $V_1(t)$ and $V_2(t)$ is given by

$V_1(t) = V_m \sin(10t - 130°)$ and

$V_2(t) = V_m \cos(10t + 10°)$ which is the correct statement

The anticlockwise direction of rotation of phasor may be taken as positive.

(A) $V_1(t)$ leads $V_2(t)$ by $130°$ (B) $V_1(t)$ lags $V_2(t)$ by $130°$

(C) $V_1(t)$ lags $V_2(t)$ by $-130°$ (D) $V_1(t)$ leads $V_2(t)$ by $-130°$

---

50. In practice, earth is chosen as a place of zero electric potential because it

(A) is non conducting

(B) is easily available reference

(C) keeps losing and gaining electric charge everyday

(D) has almost constant potential

51. Series compensation on EHV lines is resorted to

(A) Improve the stability

(B) Reduce the fault level

(C) Improve the voltage profile

(D) As a substitute for synchronous phase modifier

---

52. The magnetic susceptibility of a specimen is small and positive, the specimen is

(A) Dia magnetic (B) Ferromagnetic

(C) Paramagnetic (D) Non-magnetic

---

53. The rate of rise of restriking voltage depends upon

(A) The type of circuit breaker

(B) Inductance of the system only

(C) The capacitance of the system only

(D) The inductance and capacitance of the system only

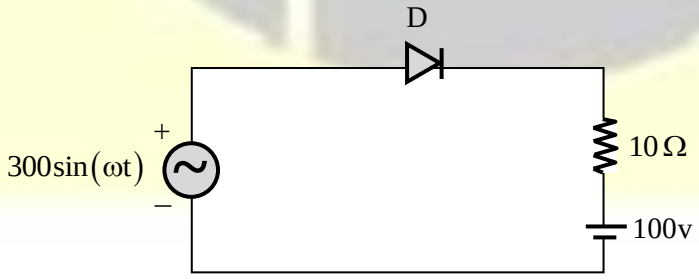
---

54. A Digital Volt Meter (DVM) uses 10 MHz clock and has a voltage controlled generator which provides a width of 5μ sec/volt of unit signal. A 10 V input signal would correspond to a pulse count of

(A) 500 (B) 250 (C) 750 (D) 1000

---

55. In figure shown below, the Peak Inverse Voltage (PIV) required for diode is



(A) 300 V (B) 200 V (C) 100 V (D) 400 V

56. A practical current source consists of

(A) An ideal current source in series with an impedance

(B) An ideal current source in parallel with an impedance

(C) An ideal current source with no impedance in series or in parallel

(D) An ideal current source with h.tgh resistance in series

---

57. The transient current in a loss free LC circuit when excited from an AC source results in _____ sine wave.

(A) Under damped (B) Un damped

(C) Over damped (D) Critically damped

---

58. The transport. layer protocol used for real time multimedia file transfer, DNS and e-mail respectively are

(A) TCP, UDP, UDP and TCP (B) UDP, TCP, UDP and TCP

(C) UDP, TCP, TCP and UDP (D) TCP, UDP, TCP and UDP

---

59. Techniques that automatically move program and data blocks into physical main memory when they are required for execution are called

(A) Main memory techniques (B) Cache memory techniques

(C) Virtual memory techniques (D) Associate memory techniques

---

60. Resistors of microprocessor (μP) which keeps track of the execution of program and which contain the memory address of next instruction to be executed is called

(A) Index resistor (B) Program counter

(C) Memory address resistor (D) Instruction resistor

---

61. OS that permits multiples programs to run simultaneously using single processor is referred as

(A) Multitasking (B) Multi user

(C) Multithreading (D) Multiprocessing

62. The cladding which surrounds the optic fiber line is used

(A) To protect the fiber

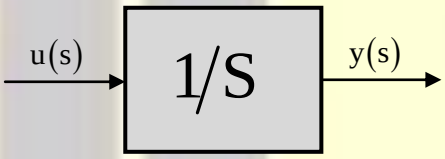
(B) To reduce optical interference

(C) Because it help to guide light in the core

(D) To ensure that refractive index remains constant

---

63. Assuming zero initial condition, the response y(t) of the system given below to a unit step input u(t) is



(A) $u(t)$ (B) $\left(\frac{t^2}{2}\right)u(t)$ (C) $tu(t)$ (D) $e^{-t}u(t)$

---

64. If the unit step response of a network is $\left(1-e^{-at}\right)$ then its unit impulse response is

(A) αe^{-at} (B) $\left(1-\alpha^{-1}\right)e^{-at}$ (C) $\alpha^{-1}e^{-at}$ (D) $\left(1-\alpha\right)e^{-at}$

---

65. The solution of the differential equation $\left(\frac{dy}{dx}\right)=ky, Y(0)=C$ is

(A) $x=ce^{-xy}$ (B) $y=ce^{kx}$ (C) $x=ke^{cy}$ (D) $y=ce^{-kx}$

---

66. The trigonometric Fourier series of an even function does not have the

(A) DC terms (B) Sine terms

(C) Cosine terms (D) Odd harmonic terms

---

67. If $x = \sqrt{-1}$ then the value of x^x is

(A) $e^{-\pi/2}$ (B) x (C) $e^{\pi/2}$ (D) 1

---

68. For the function $f(t) = e^{-t/\tau}$, the Taylor series approximation for $t << \tau$ is

(A) $1 + \frac{t}{\tau}$ (B) $1 - \frac{t}{2\tau^2}$ (C) $1 - \frac{t}{\tau}$ (D) $1 + t$

---

69. If the impedance of an AC circuit is $10\angle 60° \Omega$ then resistance in the circuit is

(A) 5Ω (B) 10Ω (C) 8.66Ω (D) 15Ω

---

70. The dielectric strength of air under normal condition is

(A) 100 kV/cm (B) 150 kV/cm (C) 30 kV/cm (D) 50 kV/cm

---

71. String efficiency of 100% means in string insulators

(A) Self capacitance is zero
(B) Shunt capacitance is maximum
(C) Self capacitance is maximum
(D) Shunt capacitance is zero

---

72. To limit current chopping in Vacuum Circuit Breakers (VCB), the contact material used has

(A) Low vapour pressure and high conductivity properties
(B) High vapour pressure and high conductivity properties
(C) High vapour pressure and low conductivity properties
(D) The inductance and capacitance of the system only

---

73. In a three phase four wire unbalanced system, the current in the neutral wire is 18 A. The magnitude of zero sequence current is

(A) 18 A (B) 6 A (C) 9 A (D) 3 A

74. The positive (Z_1), negative (Z_2) and zero (Z_0) sequence impedance of a solidly grounded system under steady state condition always follow the relation

(A) $Z_1 > Z_2 > Z_0$ (B) $Z_1 > Z_2 < Z_0$

(C) $Z_1 < Z_2 < Z_0$ (D) $Z_0 > Z_1 > Z_2$

---

75. Eddy current loss in core of a transformer is

(A) Directly proportional to resistivity of core material

(B) Directly proportional to square of resistivity of core material

(C) Inversely proportional to square of resistivity of core material

(D) Inversely proportional to resistivity of core material

---

76. The square root of $64 \angle 36°$

(A) $8 \angle 6°$ (B) $8 \angle 18°$ (C) $8 \angle 36°$ (D) $8 \angle 8°$

---

77. Match the correct pairs:

Numerical integration scheme	**Order of fitting polynomials**
P. Simpson's 3/8 rule	**1.** First order
Q. Trapezoidal rule	**2.** Second order
R. Simpson's 1/3 rule	**3.** Third order

(A) P-2, Q-1, R-3 (B) P-1, Q-2, R-3

(C) P-3, Q-2, R-1 (D) P-3, Q-1, R-2

---

78. What is Laplace Transform of (sinh (at))?

(A) $\frac{s}{(s^2 + a^2)}$ (B) $\frac{a}{(s^2 - a^2)}$ (C) $\frac{a}{(s^2 + a^2)}$ (D) $\frac{s}{(s^2 - a^2)}$

---

79. If a phasor is multiplied by j then

(A) Only its magnitude changes

(B) Only its direction changes

(C) Both magnitude and direction changes

(D) Both magnitude and direction remains unchanged

---

80. If two complex numbers are equal

(A) Only their magnitude will be equal

(B) Only their angles will be equal

(C) Their in phase and quadrature components will be separately equal

(D) Only their angles will not be equal
