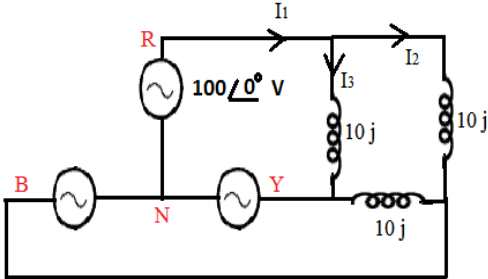


ELECTRICAL AND ELECTRONICS ENGINEERING

1.	A series RC circuit is suddenly connected to a dc voltage source of V volts. The current in the circuit, just after the switch is closed is equal to
	V/R
2.	What is the number of chords of a connected graph of e edges and n vertices?
	$e - n + 1$
3.	Three parallel resistive branches are connected across a dc supply. What will be the ratio of the branch currents $I_1:I_2:I_3$ if the branch resistances are in the ratio $R_1:R_2:R_3::2:4:6$?
	6:3:2
4.	A network has 4 nodes and three loops. What is the number of branches in the network?
	6
5.	The phase difference between I_2 and I_3 is
	
	30°
6.	If the reading of two wattmeter's are equal and positive in two-wattmeter method, the load pf in a balanced 3-phase 3-wire circuit will be
	Unity
7.	A balanced delta connected load of $(8 + j6)\Omega$ per phase is connected to a 40V, 50Hz, 3- Φ power supply. If the input pf is to be improved to 0.9 by connecting a star connected capacitor bank, required kVAR of the bank is
	10.2
8.	A two port device is defined by the following pairs of the equations $I_1=2V_1+V_2$ and $I_2=V_1+V_2$. Its impedance parameters ($Z_{11}, Z_{12}, Z_{21}, Z_{22}$) are given by
	(1,-1,-1,2)
9.	If the permeability of a material is 0.999991 it can be classified as
	diamagnetic
10.	A d'Arsonal meter of 200Ω dc coil and 0-1 mA sensitivity gives full scale reading of 10 Amps on using a shunt resistance of
	0.02 Ω
11.	A good dielectric should have all the following properties except
	high dielectric loss
12.	In a ballistic galvanometer, damping follows
	logarithmic decay
13.	Frequency compensation in moving iron instrument is achieved by connecting

	a capacitor across the fixed coil
14.	A capacitor consists of two metal plates each 500 x 500 mm ² and 6 mm apart. The space is filled with 4mm thick glass plate and a layer of paper of 2mm thickness. The relative permittivity of the glass and paper are 8 and 2 respectively. Neglecting fringing effect, the capacitance will be
	1475 pF
15.	While solving networks using nodal analysis, the choice of reference node
	affect the voltages of various nodes
16.	Which of the following theorems can be applied to any linear or nonlinear, active or passive, time-variant or invariant network?
	Tellegen's
17.	The dynamic impedance of the ideal tank circuit under resonance condition with L = 10MH and C = 1 μF is
	infinity
18.	Which of the following statement is valid for series resonance circuit
	Voltage magnification circuit
19.	Ideal voltage source have
	Zero internal resistance
20.	Kirchhoff's Current Law is based on
	Law of conservation of charge
21.	Mesh analysis is not applicable for
	Non-planar circuits
22.	The ratio of number of loop and nodal equations required to solve a given network containing 6 branches and 3 nodes will be
	4:2
23.	The unit of L/R^2
	farad
24.	If $v(t) = 2 + 3\sqrt{2} \cos(10t + 45^\circ) - 3 \cos 10t$ volts then the average and rms values are respectively
	2, $\sqrt{8.5}$
25.	The condition for reciprocal network in case of hybrid parameters is
	$h_{12} = -h_{21}$
26.	What is the maximum possible mutual inductance with $L_1=8\mu\text{H}$ $L_2=2\mu\text{H}$
	4μH
27.	The abcd parameters of two two-port networks can be multiplied when they are connected in
	Cascade
28.	Which of the following is not Maxwell's equation
	$\nabla \times H = -\frac{\partial B}{\partial t}$

29.	The rank of a tie-set matrix is given by number of
	Links
30.	The polarization of a dielectric material is
	$\mathbf{P} = \epsilon_0(\epsilon_r - 1)\mathbf{E}$
31.	Which of the following is zero as applied to electromagnetic fields
	$\nabla \cdot (\nabla \times \mathbf{A})$
32.	The number of fundamental cut-sets is given by number of
	Twigs
33.	Magnetic field intensity due to an infinite sheet current of current density K A/m is
	K/2
34.	The dual element value of a 6 ohms resistor is
	6 mhos
35.	A sinusoidal source of voltage V and frequency f is connected to a series circuit of variable resistance R and fixed reactance X. The locus of the tip of the current phasor as R varied from 0 to ∞ is
	a semicircle with a diameter of V/X
36.	The flux in a magnetic circuit is analogous to..... in the electric circuit
	current
37.	Frequency compensation in moving iron instrument is achieved by connecting
	a capacitor across the fixed coil
38.	The <i>Lorentz Force Law</i> is
	$q\mathbf{E} + q(\mathbf{v} \times \mathbf{B})$
39.	Inductance is measured in terms of capacitance and resistance by using
	Anderson bridge
40.	Electronic instruments are not free from the effect of
	stray electrostatic field
41.	In lap winding resultant pitch is
	difference of back and front pitches
42.	The de-magnetising component of armature reaction in a D.C. generator
	reduces generator e.m.f
43.	The cross-magnetising component of armature reaction increases with
	increase in armature current
44.	To neutralize de-magnetising effect of armature reaction
	add extra turns per pole
45.	If θ is the shift, Z is the no. of conductors and I is the current through them then demagnetizing AT per pole is
	$\frac{\theta \times ZI}{360}$
46.	If θ is the shift, Z is the no. of conductors, P is no. of poles and I is the current through them then cross magnetizing AT per pole is

	$\frac{ZI}{2P} - \frac{\theta \times ZI}{360}$
47.	The voltage due to self inductance of the coil under commutation is neutralized by interpoles
48.	If the speed in N rpm, time taken for one revolution in seconds is 60/N
49.	A circular disc is placed in a vertical magnetic field of constant induction in the downward direction. If the disc is rotated in horizontal plane, the induced emf be zero
50.	A 4-pole dc machine with wave wound armature has 32 coils of 6 turns each and is running at 250 rpm. Its flux per pole is 0.06 Wb. The induced armature voltage is 192
51.	At certain speed and flux, the voltage generated by a dc generator is 230 volts. If the speed is increased by 20% and the flux is reduced by 20%, the voltage will be decreased by 4%
52.	A 6-pole lap wound dc machine has 720 conductors and it draws 50 A from supply mains. What is the flux distribution produced by armature reaction per pole? Triangular wave with peak of 500AT
53.	If Magnetic neutral axis is shifted by an angle + θ armature conductors under the poles are redistributed
54.	Interpoles carry armature current
55.	Magnetic neutral axis is the axis of commutation
56.	Specific magnetic loading is not governed by armature reaction and commutation
57.	Torque in rotating machine is associated with displacement of stator field and rotor field from alignment
58.	A dc series generator has full load output of 9.5 kW, constant losses are 100 W and full load copper losses are 400 W and the full load efficiency is 95 %
59.	The hysteresis loss decreases with the increase in number of poles
60.	In a d.c. machine, the armature mmf is stationary with respect to field
61.	A synchronous motor on load draws a current at a leading pf angle ϕ . If the internal pf angle, which is the phase angle between the excitation emf and the current in the time-

	phasor diagram, is ψ , then the air-gap excitation mmf lags the armature mmf by
	$\frac{\pi}{2} + \psi$
62.	The rotor power output of 3-phase IM is 15kW and the corresponding slip is 4%. The rotor ohmic loss will be
	625W
63.	For a 3-phase, 50 Hz, SCIM, rotor leakage reactance at standstill is twice of its resistance. The frequency of the supply at which maximum torque is obtained at starting is
	25Hz
64.	In a transformer the voltage regulation will be zero when it operates at
	leading p.f.
65.	The frequency of the rotor current in a 3 phase 50 Hz, 4 pole induction motor at full load speed is about
	2 Hz
66.	A salient pole synchronous motor is running at no load. Its field current is switched off. The motor will
	continue to run at synchronous speed
67.	The power factor of a squirrel cage induction motor is
	low at light load only
68.	When a synchronous motor is running at synchronous speed, the damper winding produces
	no torque
69.	If a transformer primary is energized from a square wave voltage source, its output voltage will be
	A square wave
70.	In a 3 – phase induction motor the maximum torque
	does not depend on r_2
71.	In a 3 – phase induction motor running at slip ‘s’ the mechanical power developed in terms of air gap power P_g is
	$(1-s)P_g$
72.	In a stepper motor the angular displacement
	can be precisely controlled
73.	The change in stored energy in a rotational system is
	$id\lambda - Td\theta$
74.	The co-energy in a doubly-excited system is
	$\frac{1}{2}L_{11}(\theta)i_1^2 + \frac{1}{2}L_{22}(\theta)i_2^2 + L_{12}(\theta)i_1i_2$
75.	The torque in a rotational system is
	$\frac{i^2 dL(x)}{2d\theta}$

76.	The maximum torque of d.c. motors is limited by commutation
77.	The ratio of starting torque to full load torque is minimum in case of differential compound motors
78.	If a synchronous motor (properly synchronized to the supply) is running on no load with negligible loss then the stator current will be very small
79.	A synchronous motor on load draws a current at a leading pf angle ϕ . If the internal pf angle, which is the phase angle between the excitation emf and the current in the time-phasor diagram, is ψ , then the air-gap excitation mmf lags the armature mmf by $\frac{\pi}{2} + \psi$
80.	The rotor power output of 3-phase induction motor is 15kW and the corresponding slip is 4%. The rotor ohmic loss will be 625W
81.	For a 3-phase, 50 Hz, squirrel cage induction motor, rotor leakage reactance at standstill is twice of its resistance. The frequency of the supply at which maximum torque is obtained at starting is 25Hz
82.	The Potier triangle separate the armature leakage reactance and armature reaction mmf
83.	Reference input is also called as set point
84.	For strictly proper transfer function, the order of the numerator is smaller than that of the denominator
85.	Measurement of water level in a 'U' type tube is open loop measurement
86.	In servomechanism the controlled variable is time derivative of angular position
87.	In the field-controlled dc servomotor, the transfer function $\theta(s)/E(s)$ contains three poles in which one pole is at origin
88.	Three blocks G_1 , G_2 and G_3 are connected in some fashion such that overall transfer function is $\frac{G_1 + G_3(1 + G_1G_2)}{1 + G_1G_2}$. The blocks are connected in the following manner: G_1, G_2 with negative feedback and combination in parallel with G_3
89.	No. of combinations of non-touching loops in the given signal flow graph

	two
90.	As type of the system increases stabilization is difficult
91.	The roots of the characteristic equation are the same as the poles of the closed loop transfer function
92.	The rise time of a second order system subjected to step input is $\frac{(\pi - \varphi)}{\omega_d}$
93.	The settling time of second order system subjected to step input increases as time constant increases
94.	The % peak overshoot of a second order system subjected to step input is given by $e^{\frac{-\xi\pi}{\sqrt{1-\xi^2}}} \times 100$
95.	The proportional plus derivative controller connected in cascade with second order system increases the effective damping
96.	Sampled- data signals converted into analog signals using Hold circuits
97.	The unity feedback system has an open-loop transfer function, $G(j\omega) = \frac{K}{j\omega(1+j0.2\omega)(1+j0.05\omega)}$. The phase cross-over frequency is given by 10 rad/sec
98.	Resonant peak and phase margin are measures of relative stability
99.	Band width of a system generally represents gain cross over frequency
100.	The stability of the system is higher if both gain margin and phase margin is high
101.	The Polar plot of a system of a system with transfer function $G(s) = \frac{K}{s(s+T)}$ for $-T$ and $+K$ is in the second quadrant
102.	$G(s) = \frac{1+s}{s(1+0.5s)}$. The corner frequencies are 1 and 2
103.	What does the Boolean expression $AD + ABCD + ACD + \overline{A}B + A\overline{C}D + \overline{A}\overline{B}$ on minimization result into $\overline{A} + D$

104.	A memory system of size 32kbytes is required to be designed using memory chips which have 12 address lines and 4 data lines each. What is the number of such chips required to design the memory system?
	16
105.	The gate voltage in a JFET at which drain current becomes zero is called
	pinch-off voltage
106.	The constant-current region of a JFET lies between
	pinch-off and breakdown
107.	Secondary breakdown occurs in
	BJT but not in MOSFET
108.	Which of the following devices should be used as a switch in a low power switched-mode power supply (SMPS) ?
	MOSFET
109.	For an SCR, $\frac{dv}{dt}$ protection is achieved through the use of
	RC across SCR
110.	Doping materials are called impurities because they
	change the chemical properties of semiconductors
111.	Avalanche breakdown is primarily dependent on the phenomenon of
	Collision
112.	The ripple factor of a power supply is a measure of
	purity of power output
113.	In a BJT, if the emitter junction is reverse-biased and the collector junction is reverse-biased, it is said to operate in
	In cut-off region
114.	A device whose characteristics are very close to that of an ideal current source is
	a BJT in CE mode
115.	How many 10 digit numbers can be formed by using the digits 1 and 2 ?
	2^{10}
116.	The average load voltage of a 3- Φ half-wave controlled circuit using thyristors is given by
	$(3\sqrt{6}/\pi)E_m \cos\alpha$
117.	A thyristor controlled inductor will work as a variable inductor or as a fixed inductor respectively for firing angles
	$< 90^\circ, \geq 90^\circ$
118.	1- Φ full converter is connected across 250V AC. For 30° firing angle the output voltage will be
	210V
119.	A four quadrant chopper can be operated as
	Inverter, bi-directional rectifier and one quadrant chopper

120.	Relay
	is a force producing device
121.	Transducer
	is a device operates under linear input-output relation with relatively small signals
122.	A short transmission line having zero resistance and total series reactance of 0.4 pu is provided with reactive power compensation at the midpoint of the line such that the midpoint voltage is held at 0.96pu when the voltage at both ends are 1.0 pu. What is the steady state power transmission limit of such a system?
	2.4 pu
123.	Air filter is used in
	diesel power plants
124.	Which of the following is not an accessory for a boiler?
	condenser
125.	The steady-state stability limit of a synchronous generator can be increased by
	A decrease in the moment of inertia of the machine
126.	Which of the following correctly represents the sequence of operations of isolator, circuit breaker and earthing switch while opening a circuit?
	close circuit breaker –close isolator – open earthing switch
127.	A device required a power of P Kw, its power factor is $\cos\theta_1$. If a capacitor is put in parallel with to improve the power factor to $\cos\theta_2$. The KVA input will decrease by
	$P(1/\cos \theta_1 - 1/\cos \theta_2)$
128.	A power system has a rating S kVA . The improvement of pf., from 0.8 lagging to 0.9 lagging increases active power by 0.1S. The increase in active power due to improvement of p.f., from 0.9 lagging to unity will be
	0.1S
129.	In a 3phase, 4 wire cable, the x-sectional area of neutral conductor is
	equal to the area of phase conductor
130.	The positive, negative and zero sequence impedances of a transmission line are 0.5, 0.5 and 1.1 pu respectively. The self (Z_s) and mutual (Z_m) impedances of the line will be given by
	$Z_s = 0.7$ pu, $Z_m = 0.2$ pu
131.	A transmission line has a pu reactance of 30 %. If the working voltage is now increased to 110% of its original voltage (the MVA rating of the line remaining the same), the pu reactance of the line will now be
	24.8%
132.	The tie-line power equation is $\Delta P_{12} =$
	$T(\Delta\delta_1 - \Delta\delta_2)$
133.	The critical clearing time of a fault in power systems is related to
	Transient stability limit

134.	If the sending end and receiving end voltages for a 3-phase transmission line are each 33kV(line), and if the reactance of the line is 13 ohms per phase, the maximum power transmitted per phase will be
	28 MW
135.	Steady-state stability of power systems is improved by
	Using double circuit line instead of single circuit line
136.	In the solution of load-flow equation, Newton-Raphson (NR) method is superior to the Gauss-seidel (GS) method, because
	Convergence characteristics of the NR method are not affected by the selection of slack bus
137.	If the time of operation of a relay for unity TMS is 10 sec, the time of operation of 0.5 TMS will be
	5 Sec
138.	Where the voltages are high and current to be interrupted is low, the breaker preferred is
	Vacuum CB
139.	To prevent maloperation of differentially connected relay while energising a transformer, the relay restraining coil is biased with
	Fifth harmonic current
140.	In electric traction, Quadrilateral speed-time curve is the closer approximation for
	main line
141.	KVAR is equal to
	KW tanθ
142.	What is the surge impedance loading of 400kv line with surge impedance given as 160 ohms
	1000 MW
143.	In EHV lines _____
	X/R > 3
144.	The maximum transmission voltage in India is----
	765kV
145.	Fusing facto (FF) of HRC fuses is
	FF > 1
146.	Following effects are associated with transmission lines: I. Corona effect II. Proximity effect III. Skin effect. The effect resistance of a conductor is increased by
	II and III only
147.	Series capacitors on transmission lines are of little use when load VAR requirement is
	small
148.	The voltage regulation in magnetic amplifier type voltage regulator is effected by
	varying the reactance
149.	A 66 kV system has string insulator having five discs and the earth to disc capacitance ratio of 0.10. The string efficiency will be
	67%
150.	Earth resistance for LT installation 400v should be
	5 to 15 ohms