

Question	The instantaneous power in ac circuits can be obtained by taking product of the instantaneous values of _____ and _____. [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	current, voltage	correct
Option	frequency, voltage	incorrect
Option	frequency, current	incorrect
Option	frequency (max), voltage	incorrect
Solution	<p>Power (P) = $V \times I$ (DC)</p> <p>Power (P) = $I_{rms} \times V_{rms} \times \cos \phi$ (AC)</p> <p>$\frac{I_m \times V_m}{2} \times \cos \phi$</p> <p>Instantaneous power = Instantaneous voltage x Instantaneous current</p>	
Marks	4	1

Question	A circuit possess an inductance of 1 H when a current through coil is changing uniformly at the rate of 1 A/s inducing an opposing emf of 'X' Volts in it. What is the value of 'X'? [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	1	correct
Option	1.5	incorrect
Option	2	incorrect
Option	2.5	incorrect
Solution	$V = L \frac{di}{dt} \quad \text{then} \quad \overset{L}{\textcircled{1}} \times \overset{\textcircled{di/dt}}{\textcircled{1}} = \overset{\textcircled{1}}{\textcircled{1}} \leftarrow V$ $\boxed{V = 1}$	
Marks	4	1

Question	Inductive reactance is defined as the opposition offered by the _____ of a circuit to the flow of an alternating sinusoidal current? [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	Resistance	incorrect
Option	Inductance	correct
Option	Capacitance	incorrect
Option	Voltage	incorrect
Solution	$\textcircled{X_L} = \omega \textcircled{L} \leftarrow \text{Inductance}$ <p style="text-align: center;">Inductive Reactance</p>	
Marks	4	1

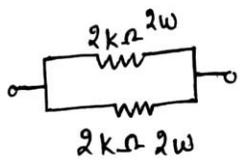
Question	Write the equation of current for the following system. A 50 Hz sinusoidal current has peak factor 1.25 and form factor 1.0. Its average value is 15 A. Also, the instantaneous value of current is 10 A at $t = 0$ second. [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	$I = 18.75 \sin(50\pi t + 0.56)$ A	incorrect
Option	$I = 10.8 \sin(100 + 0.5)$ A	incorrect
Option	$I = 10.8 \sin(50\pi t + 0.5)$ A	incorrect
Option	$I = 18.75 \sin(100\pi t + 0.56)$ A	correct
Solution	$I_{rms} = \text{form factor} \times I_{av} \Rightarrow 1 \times 15 = \boxed{15 \text{ Amp}}$ $I_{max} = \text{Peak factor} \times I_{rms} \Rightarrow 1.25 \times 15 = \boxed{18.75 \text{ Amp}}$ $\omega t = 2\pi f t \Rightarrow 2\pi \times 50 t \Rightarrow \boxed{100 t \pi}$ $\therefore I = (18.75 \sin 100\pi t + 0.56) \text{ Amp.}$	
Marks	4	1

Question	How many classes of insulating material are there?	
Type	multiple_choice	
Option	6	incorrect
Option	7	correct
Option	5	incorrect
Option	8	incorrect
Solution	Y-90°C, A-105, E-120, B-130, F-155, H-180, C Above 180 (all degree celcius)	
Marks	4	1

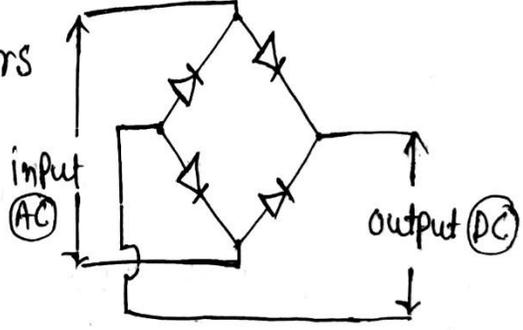
Question	In purely resistive circuit, the _____ and the _____ applied are _____ phase with each other. [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	current, voltage, out of	incorrect
Option	frequency, voltage, in	incorrect
Option	frequency, voltage, out of	incorrect
Option	current, voltage, in	correct
Solution	 <p>Purely Resistive Circuit Current and voltage same phase</p>	
Marks	4	1

Question	Following data is known about a resultant current wave which is made-up of two components: 1. A direct current of 10 A 2. A sinusoidal alternating current of 50 Hz with a peak value of 10A Calculate the r.m.s. value of the resultant wave. [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	24.12 A	incorrect
Option	12.24 A	correct
Option	1.24 A	incorrect
Option	2.14 A	incorrect
Solution	$I_{rms} = \sqrt{(10)^2 + \frac{1}{2}(10)^2} = \sqrt{150}$ $\Rightarrow \boxed{12.24 \text{ Amp.}}$	

Marks	4	1
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Question	It is known that two 2kΩ, 2W resistors are connected in parallel. Find the combined resistance and wattage rating. [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	2Ω, 4W	incorrect
Option	1Ω, 4W	correct
Option	1Ω, 2W	incorrect
Option	2Ω, 2W	incorrect
Solution	 <p>Resistance in parallel = $\frac{R}{N} = \frac{2}{2} = 1\Omega$</p> <p>Power in parallel = $P_1 + P_2 = 2 + 2 = 4W$</p>	
Marks	4	1

Question	Which of the following rectifiers requires four diodes? [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	Half-wave voltage doublers	incorrect
Option	Full-wave voltage doublers	incorrect
Option	Full-wave bridge circuits	correct
Option	Voltage quadrupler	incorrect

Solution	<p>full wave bridge Rectifiers four diodes used</p> 	
Marks	4	1

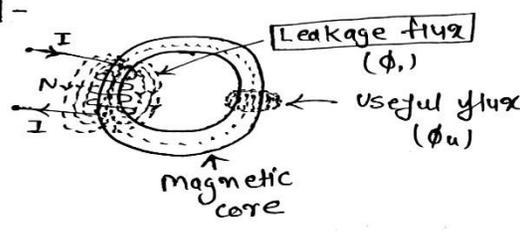
Question	<p>What is the effect on the diode current in a forward biased photo diode with increase in incident light intensity? [UPRVNL-JE-2014]</p>	
Type	multiple_choice	
Option	It decreases	incorrect
Option	It increases	correct
Option	It remains constant	incorrect
Option	Can't be determined	incorrect
Solution	<p>Photodiode is a semiconductor device which convert light in to a electrical current. The current is generated when photons are absorbed in the photodiode. Dark current also flow in Photodiode (very important). Current increased in forward biased with increase in incident light intensity.</p>	
Marks	4	1

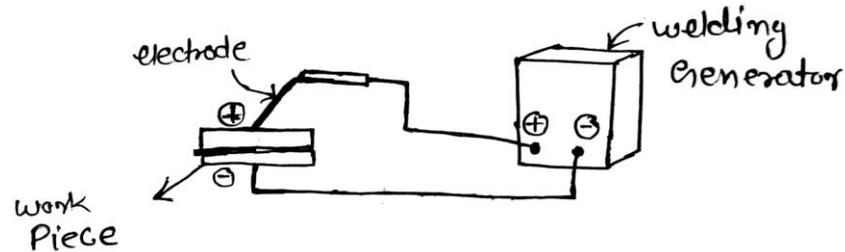
Question	<p>The minority carries in n-type semiconductors are: [UPRVNL-JE-2014]</p>	
Type	multiple_choice	
Option	Elections	incorrect
Option	Holes	correct
Option	Positrons	incorrect
Option	Protons	incorrect

Solution	(Semiconductors)	(Majority)	(Minority)
	N- Type semiconductors	Electrons	Holes
	P- type semi conductors	Holes	Electrons
Marks	4	1	

Question	A diode can be used as a frequency multiplier because of: [UPRVNL-JE-2014]	
Type	multiple_choice	
Option	Charge carrier concentration	incorrect
Option	Junction capacitance	incorrect
Option	Non linearity	correct
Option	Avalanche voltage	incorrect
Solution	Frequency multiplier is an electronics circuit that generates an output signal whose output frequency is a harmonic (multiple) of its input frequency. Frequency multiplier consists of a nonlinear circuit that distorts the input signal.	
Marks	4	1

Question	The flux that follows a path not intended for it is known as: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Leakage flux	correct
Option	Total flux	incorrect
Option	Peak flux	incorrect
Option	Main flux	incorrect

Solution	 <p>Leakage flux (ϕ_l)</p> <p>useful flux (ϕ_u)</p> <p>magnetic core</p> <p>Leakage Co. efficient</p> $\lambda = \frac{\text{total flux}}{\text{useful flux}}$ $\lambda = \frac{\phi_l + \phi_u}{\phi_u}$ <p>$\lambda = (1.1 \text{ and } 1.25)$ for modern electric machine</p>	
Marks	4	1

Question	Which of the below is true with regard to DC arc welding? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Both electrode as well as work piece are made positive	incorrect
Option	Electrode is made negative and work piece positive	incorrect
Option	Electrode is made positive and work piece negative	correct
Option	Both electrode as well as work piece are made negative	incorrect
Solution	<p>DC Arc welding →</p>  <p>electrode</p> <p>work piece</p> <p>welding generator</p>	
Marks	4	1

Question	The rms value of a half-wave rectified current is in 5A. Its value for full-wave recitation would be [PGCIL-DT-2018]	
Type	multiple_choice	
Option	$10/\sqrt{2}A$	correct
Option	20A	incorrect
Option	$40/\pi A$	incorrect
Option	$20/\pi A$	incorrect
Solution	<p>rms half wave Rectifire</p> $\boxed{rms = \frac{V_m}{2}} \Rightarrow 5 = \frac{V_m}{2}$ <p>for rms full wave Rectifire</p> $\Rightarrow rms = \frac{V_m}{\sqrt{2}} = \boxed{10/\sqrt{2}}$ <p style="text-align: right;">$V_m = 10$</p>	
Marks	4	1

Question	The SI unit of conductivity is: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Ohm-meter	incorrect
Option	Ohm/meter	incorrect
Option	Siemens/meter	correct
Option	Siemens-meter	incorrect

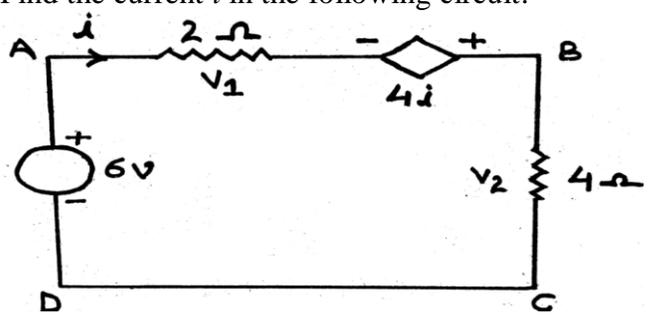
Solution	<p>Conductivity (σ) = $1/\rho$ (resistivity) \leftarrow $\boxed{\Omega^{-1}\text{-m}}$</p> <p>$\therefore \sigma = \frac{1}{\Omega\text{-m}}$ $\boxed{1/\Omega} \rightarrow (\text{mho/cm}) \& \text{Siemens}$</p> <p>$\therefore \boxed{\sigma = \text{Siemens/m}}$</p>	
Marks	4	1

Question	The instrument used to measure resistance is called: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Energy meter	incorrect
Option	CRO	incorrect
Option	Ohm meter	correct
Option	Wattmeter	incorrect
Solution	<p>Measurement of low resistance ($R < 1\text{ohm}$) Potentiometer, Kelvin double bridge. Measurement of Medium ($1 < R < 100\text{KOHM}$) Voltmeter-ammeter method, Wheatstone bridge, Ohm meter, Carry Foster bridge and Substitution method Measurement of High ($R > 100\text{KOHM}$) Loss of charge method, Direct Deflection method, Megger, Mega ohm meter</p>	
Marks	4	1

Question	In a 4-pole induction motor the rotor speed is 1100 rpm. What will be the air gap field speed? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	1500 rpm	correct
Option	1700 rpm	incorrect
Option	1600 rpm	incorrect

Option	1400 rpm	incorrect
Solution	Air gap field speed = N_s (stator flux speed) At 50 Hz , 4 pole, maximum [$N_s = 1500$ rpm]	
Marks	4	1

Question	How can we increase the frequency of the voltage generated by a generator? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Using reactors	incorrect
Option	Increasing the load	incorrect
Option	Reducing the terminal voltage	incorrect
Option	Adjusting the governor	correct
Solution	Adjusting the governor	
Marks	4	1

Question	<p>Find the current i in the following circuit:</p>  <p style="text-align: right;">[PGCIL-DT-2018]</p>	
Type	multiple_choice	
Option	4A	incorrect
Option	5A	incorrect
Option	3A	correct
Option	2A	incorrect

Solution	Applied KVL = $-6+2i-4i+4i = 0$ [$i= 3\text{Amp}$]	
Marks	4	1

Question	In case of induction heating, the depth up to which the current will penetrate is proportional to: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	$(\text{Frequency})^2$	incorrect
Option	$1/\sqrt{\text{Frequency}}$	correct
Option	Frequency	incorrect
Option	$1/\text{Frequency}$	incorrect
Solution	For induction heating depth $(\delta) = \frac{1}{2\pi} \sqrt{\frac{\rho \times 10^9}{\mu r f}} \text{ cm}$ $(\delta) \propto \frac{1}{\sqrt{f}}$ Very important already asked in ssc	
Marks	4	1

Question	A combinational circuit is the one in which the output depends on the: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Present and the previous output	incorrect
Option	Present input combination and the previous input combination	incorrect
Option	Present input combination and the previous output	incorrect
Option	Input combination at that time	correct
Solution	Input combination at that time, No feedback, No memory	

Marks	4	1
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Question	When a 400V 50 Hz 6 pole induction motor is running at 960 rpm on no load the slip is [PGCIL-DT-2018]	
Type	multiple_choice	
Option	4%	correct
Option	2%	incorrect
Option	1%	incorrect
Option	3%	incorrect
Solution	$N_s = \frac{120 \times 50}{6} = 1000 \text{ rpm}$ $\text{slip}(s) = \frac{N_s - N}{N_s} = \frac{1000 - 960}{1000} = \frac{40}{1000} \times 100 = [4\%]$	
Marks	4	1

Question	The leakage current in a pn junction is of the order of: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Mircoampere	correct
Option	Milliampere	incorrect
Option	Kiloampere	incorrect
Option	Ampere	incorrect
Solution	Microampere [μA] Leakage current across pn junction is due to (minority carriers) It is also called thermally generated current.	
Marks	4	1

Question	A synchronous condenser is usually a/an: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	DC motor	incorrect
Option	Under-excited synchronous motor	incorrect
Option	Induction motor	incorrect
Option	Over-excited synchronous motor	correct
Solution	In over-excited mode it work at the leading power factor .In this situation when no load connected at the shaft then it is used as synchronous condenser.	
Marks	4	1

Question	Candela is a unit of	
Type	multiple_choice	
Option	Luminous intensity	correct
Option	Frequency	incorrect
Option	Lamp efficiency	incorrect
Option	Power	incorrect
Solution	Luminous intensity (lv)= $\frac{\text{Lumen}}{\text{Steradian}}$ & $\left(\frac{\text{Luminous flux}}{\text{unit solid angle}}\right)$ SI unit = [Candela] Very important.	
Marks	4	1

Question	The ratio of maximum value/rms value is known as: [PGCIL-DT-2018]	
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Type	multiple_choice	
Option	Diversity factor	incorrect
Option	Crest factor	correct
Option	Form factor	incorrect
Option	Average factor	incorrect
Solution	Crest factor = $\frac{Maximum}{rms}$ Form factor = $\frac{rms}{Avrage}$ CREST FACTOR ALSO KNOWN AS PEAK FACTOR Important.	
Marks	4	1

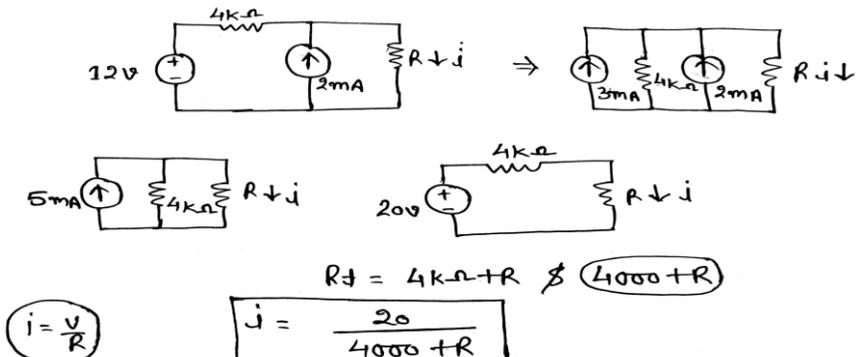
Question	Reciprocating pumps and compressors are characterized as: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Impact loads	incorrect
Option	Short time loads	incorrect
Option	Continuous loads	incorrect
Option	Pulsating loads	correct
Solution	Pulsating loads	
Marks	4	1

Question	In alternators, damper winding are used to: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Make the rotor dynamically balanced	incorrect
Option	Prevent hunting	correct

Option	Reduce armature reaction	incorrect
Option	Reduce eddy current loss	incorrect
Solution	Hunting means after the sudden application of load the rotor has to search or Hunt for its new equilibrium position. That phenomena is referred to as Hunting in a synchronous motor.	
Marks	4	1

Question	For constant speed operation the most suitable motor used is: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Separately excited DC motor	incorrect
Option	DC shunt motor	correct
Option	Synchronous motor	incorrect
Option	DC series motor	incorrect
Solution	DC shunt motor best suited for constant load application. We have synchronous motor another option but SM not self start so we don't preferred synchronous motor.	
Marks	4	1

Question	Which of the following materials is extensively used in "electric heating"? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Gold	incorrect
Option	Copper	incorrect
Option	Silver	incorrect
Option	Nichrome	correct
Solution	Nichrome	
Marks	4	1

Question	What is the relation between i and R in the following circuit? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	$i = \frac{2}{R}$	incorrect
Option	$i = \frac{12}{4000 + R}$	incorrect
Option	$i = \frac{2}{4000 + R}$	incorrect
Option	$i = \frac{20}{4000 + R}$	correct
Solution	 <p> $R_T = 4k\Omega + R \quad \cancel{4000 + R}$ $i = \frac{V}{R}$ $i = \frac{20}{4000 + R}$ </p>	
Marks	4	1

Question	What is the binary equivalent of decimal number 26? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	11001	incorrect
Option	11111	incorrect
Option	11010	correct
Option	11110	incorrect

Solution	$(26)_{10} = (\dots\dots\dots)_2$ $\begin{array}{cccccc} & 16 & 8 & 4 & 2 & 1 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \text{option } \odot - & \boxed{1} & \boxed{1} & \boxed{0} & \boxed{1} & \boxed{0} \end{array} \Rightarrow \boxed{16+8+2 = 26}$ <p style="text-align: center;">Binary</p>	
Marks	4	1

Question	Which gas can be filled in GLS lamps? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Xenon	incorrect
Option	Carbon dioxide	incorrect
Option	Oxygen	incorrect
Option	Any inert gas	correct
Solution	The gases used in light bulbs are known as inert gases – Helium , Neon , Nitrogen , Krypton etc.	
Marks	4	1

Question	The octal equivalent of $(177)_{10}$ is: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	$(251)_8$	incorrect
Option	$(261)_8$	correct
Option	$(231)_8$	incorrect
Option	$(231)_8$	incorrect

Solution	$\begin{array}{r l} 8 & 177 \\ \hline 8 & 22 \quad \quad 1 \\ \hline & 2 \quad \quad 6 \end{array}$ <p>Read bottom (MSB) to top (LSB) as $\boxed{261}$</p> <p>$\therefore (177)_{10} = (261)_8$</p>	
Marks	4	1

Question	Bundle conductors are used to: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Reduce regulation	incorrect
Option	Reduce corona loss	correct
Option	Reduce line capacitance with respect to ground	incorrect
Option	Reduce total weight of the line	incorrect
Solution	For reducing the corona For Ultra High voltage-Hollow conductor For EHV-Bundle conductor For High voltage-composite conductor	
Marks	4	1

Question	A sine wave has a maximum value of 20 V. Its value at 135° is	
Type	multiple_choice	
Option	10 V	incorrect
Option	14.14 V	correct
Option	15 V	incorrect
Option	5 V	incorrect
Solution	$V = V_m \sin \theta$ $V = 20 \sin 135^\circ$ $V = 20 \times 0.707$	

	[V = 14.14 Volt]	
Marks	4	1

Question	Which type of impurity is to be added to a pure semiconductor get an n-type semiconductor? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Indium	incorrect
Option	Trivalent impurity	incorrect
Option	Pentavalent	correct
Option	Gallium	incorrect
Solution	N – type semiconductor – Pentavalent P- Type semiconductor – Trivalent	
Marks	4	1

Question	The flicker effect of fluorescent lamps is more pronounced at: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Higher frequencies	incorrect
Option	Higher voltages	incorrect
Option	Lower frequencies	correct
Option	Higher voltages	incorrect
Solution	Flicker effect (flickering) – When your webpage is loading , it can sometimes occur that the original page displays for a split second instead of the variation . This twinkling is called flicker effect .	
Marks	4	1

Question	Over-speed protection of the alternator is done with the help of: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Governor	correct
Option	Alarm	incorrect
Option	Over current relay	incorrect
Option	Differential relay	incorrect
Solution	Governor	
Marks	4	1

Question	When a pure semiconductor is heated, its resistance: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	cannot be determined	incorrect
Option	goes down	correct
Option	goes up	incorrect
Option	remains the same	incorrect
Solution	Pure semiconductors is (- Ve) temperatures coefficient then heated resistance is (goes down)	
Marks	4	1

Question	Insulators are generally made of which material? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Styrofoam	incorrect
Option	Rubber	incorrect

Option	Glass	incorrect
Option	Porcelain	correct
Solution	Porcelain	
Marks	4	1

Question	The primary function of a capacitor across the supply to the fluorescent tube is to: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Reduce the noise	incorrect
Option	Stabilises the arc	incorrect
Option	Reduce the starting current	incorrect
Option	Improve the supply power factor	correct
Solution	Capacitor is connected in parallel with fluorescent tube circuit The gives advantage 1):- it improves the transient response at starting 2):- It improves the overall power factor of the system .	
Marks	4	1

Question	The main part(s) of a CRO is/are: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Screen	incorrect
Option	Vertical plates	incorrect
Option	Horizontal plates	incorrect
Option	CRT	correct
Solution	CRT- (Cathode ray tube)	

	<p>Is the heart of the oscilloscope The CRT makes the applied signal visible by the deflection of a thin beam of electrons</p> <ul style="list-style-type: none"> - Generates the electrons beam - Accelerates the beam to a high velocity - Deflects the beam to create an image 	
Marks	4	1

Question	<p>The minority carries of an NPN transistor are: [PGCIL-DT-2018]</p>	
Type	multiple_choice	
Option	Donor ions	incorrect
Option	Free electrons	incorrect
Option	Acceptors ions	incorrect
Option	Holes	correct
Solution	Holes	
Marks	4	1

Question	<p>The percentage differential protection of a transformer protects the transformer against: [PGCIL-DT-2018]</p>	
Type	multiple_choice	
Option	Overloading	incorrect
Option	Internal faults	correct
Option	Magnetizing currents in rush	incorrect
Option	External faults	incorrect
Solution	Differential protection schemes are mainly used for protection against phase -to- phase fault . The differential protection used for power transformer. It is based on Merz- prize circulating current principal	
Marks	4	1

Question	Chances of corona are maximum during: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Dry weather	incorrect
Option	Winter	incorrect
Option	Humid weather	correct
Option	Summer heat	incorrect
Solution	Humid weather	
Marks	4	1

Question	A diode will work satisfactorily in: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	First and forth quadrant only	incorrect
Option	First and third quadrant only	incorrect
Option	Third quadrant only	incorrect
Option	First quadrant only	correct
Solution	<p>diode work only</p> <p>If we are talking about Zener diode then third quadrant.</p>	
Marks	4	1

Question	1 Newton meter (N- m)= ?	
Type	multiple_choice	
Option	1 Watt	incorrect
Option	1 Joule	correct
Option	1 Joule second	incorrect
Option	5 Joule	incorrect
Solution	1 Joule	
Marks	4	1

Question	In illumination, what is lamp efficiency represented in: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	total flux in lumen/ 2π	incorrect
Option	lumen -watt	incorrect
Option	lumen/watt	correct
Option	total flux in lumen/ 4π	incorrect
Solution	Lamp efficiency is the ratio of the light output from a light source to the power consumed, measured in lumens per watt [lm/w]. The higher the efficiency value of a lamp or lighting system , the more energy efficiency it is	
Marks	4	1

Question	Pin type insulators are used for transmission lines: [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Below 33 kV	incorrect
Option	Up to 33 kV	correct
Option	Above 33 kV	incorrect
Option	Of 400 kV and above	incorrect

Solution	Pin insulators is used in power distributions for the voltage up to 33 kV. The pin insulators has grooves on the upper end for keeping the conductor	
Marks	4	1

Question	Which of the following materials has the highest resistivity? [PGCIL-DT-2018]	
Type	multiple_choice	
Option	Polystyrene	correct
Option	Aluminum	incorrect
Option	Silicon	incorrect
Option	Carbon	incorrect
Solution	Polystyrene	
Marks	4	1

Question	LVDT is always used as [WBSETCL -2017]	
Type	multiple_choice	
Option	secondary transducer	correct
Option	primary transducer	incorrect
Option	primary signal generator	incorrect
Option	none of these	incorrect
Solution	LVDT- Linear Variable Differential Transformer (secondary transducer) is a type of electrical transformer used for measuring linear displacement	
Marks	4	1

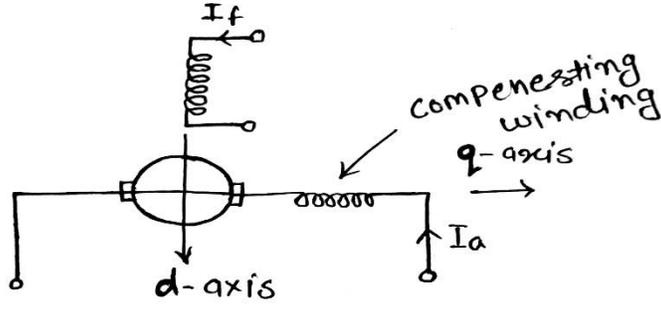
Question	A flip-flop is a [WBSETCL -2017]	
Type	multiple_choice	

Option	combinational logic circuit and edge sensitive	incorrect
Option	sequential logic circuit and edge sensitive	incorrect
Option	combinational logic circuit and level sensitive	incorrect
Option	sequential logic circuit and level sensitive	correct
Solution	Flip- flops and latches are used as data storage elements . A flip – flop is a device which store a single bit (binary digit)	
Marks	4	1

Question	Nuclear Reactor generally employs: [WBSETCL -2017]	
Type	multiple_choice	
Option	Fusion	incorrect
Option	Fission	correct
Option	Both fusion and fission	incorrect
Option	None of these	incorrect
Solution	All nuclear reactors are devices designed to maintain a chain reaction producing a steady flow of neutrons generated by the fission of heavy nuclear	
Marks	4	1

Question	The capital cost per MW is highest in case of [WBSETCL -2017]	
Type	multiple_choice	
Option	Steam power plants	incorrect
Option	Nuclear power plants	correct

Option	Gas turbine power plants	incorrect
Option	Diesel engine power plants	incorrect
Solution	Nuclear power plants	
Marks	4	1

Question	Compensating winding is provided in a dc motor [WBSETCL -2017]	
Type	multiple_choice	
Option	to increase main field ampere-turns	incorrect
Option	to prevent large speed drop	incorrect
Option	to prevent commutator flash-over upon sudden change in load	incorrect
Option	to achieve good commutations	correct
Solution	 <p>Compensating winding are used for this purpose the cross magnetizing effect of armature reaction may cause trouble in d.c. machines</p>	
Marks	4	1

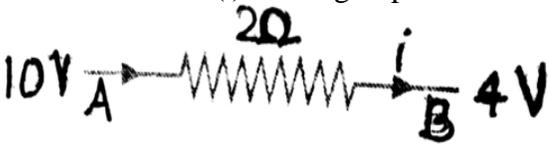
Question	For delta connected circuit the correct relationship is [WBSETCL -2017]	
Type	multiple_choice	
Option	$V_L = V_{ph}$	incorrect
Option	$I_{ph} \times \sqrt{3} = I_L$	incorrect

Option	$V_L = I_L \times \sqrt{3}$	incorrect
Option	both a) and b)	correct
Solution	Δ connection $V_L = V_{ph}$ $I_L = \sqrt{3} I_{ph}$ Y connection $I_L = I_{ph}$ $V_L = \sqrt{3} V_{ph}$	
Marks	4	1

Question	The deflecting torque of a moving iron instrument is [WBSETCL -2017]	
Type	multiple_choice	
Option	$I^2 \frac{dL}{d\theta}$	incorrect
Option	$\frac{1}{2} I^2 \frac{dL}{d\theta}$	correct
Option	$I \frac{dL}{d\theta}$	incorrect
Option	$\frac{1}{2} I \frac{dL}{d\theta}$	incorrect
Solution	The deflecting torque in any moving – iron instrument is due to force on a small piece of magnetically $Td = \frac{1}{2} I^2 \frac{dL}{d\theta}$	
Marks	4	1

Question	Inductance is measured by which one of the following: [WBSETCL -2017]	
Type	multiple_choice	
Option	Wien bridge	incorrect
Option	Schering bridge	incorrect

Option	Maxwell bridge	correct
Option	Schering	incorrect
Solution	Maxwell bridge	
Marks	4	1

Question	Calculate current (i) flowing in part of the circuit shown in figure: 	
Type	multiple_choice	
Option	7A	incorrect
Option	- 3A	incorrect
Option	5A	incorrect
Option	3A	correct
Solution	$I = \frac{V_A - V_B}{R}$ $= \frac{10-4}{2}$ $6/2 = 3 \text{ A.}$	
Marks	4	1

Question	A wire is stretched to increase the length by 1% find the percentage change in the Resistance:	
Type	multiple_choice	
Option	1%	incorrect
Option	2%	correct
Option	0.5%	incorrect
Option	4%	incorrect

Solution	$l_2 = (1 + \frac{1}{100} \%)$ At percentage change $1+0.01= (1.01)$ $(1-(1.01)^2) \times 100 = (1- 1.02) \times 100= -0.02= 2 \%$	
Marks	4	1

Question	The efficiency of a power transformer is maximum at [WBSETCL -2017]	
Type	multiple_choice	
Option	nearly full load	correct
Option	1/2 full load	incorrect
Option	1/4 full load	incorrect
Option	1/8 full load	incorrect
Solution	In the case of transmission demand fluctuation is very low so it is design to have maximum efficiency at full load .	
Marks	4	1

Question	The essential condition for parallel operation of two single-phase transformers is that they should have same: [WBSETCL -2017]	
Type	multiple_choice	
Option	Polarity	correct
Option	Same X/R ratio	incorrect
Option	Same voltage drop	incorrect
Option	percentage impedance	incorrect
Solution	An incorrect polarity of transformer will short circuit .	
Marks	4	1

Question	In an RCL series circuit, during resonance, the impedance will be: [WBSETCL -2017]	
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Type	multiple_choice	
Option	zero	incorrect
Option	minimum	correct
Option	maximum	incorrect
Option	none of these	incorrect
Solution	In RLC series circuit during resonance $X_L = X_C$. Total impedance of circuit becomes minimum $Z = R$ So Z is minimum then R is minimum $I = V/R$. Current (I) in increase Then Resistance (R) is decrease	
Marks	4	1

Question	Torque/weight ratio of an instrument indicates: [WBSETCL -2017]	
Type	multiple_choice	
Option	selectivity	incorrect
Option	accuracy	incorrect
Option	fidelity	incorrect
Option	sensitivity	correct
Solution	Torque/weight ratio of an instrument indicate sensitivity. If pointer of instrument has less weight so it will be having high Torque/weight ratio.	
Marks	4	1

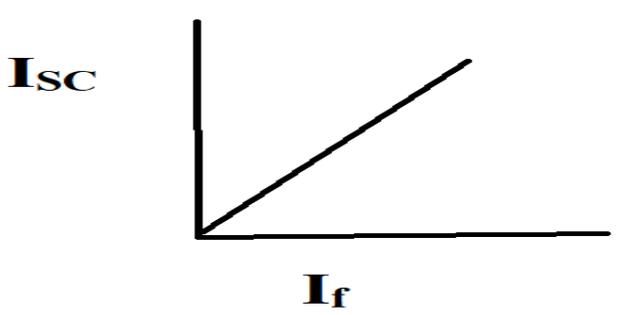
Question	A 10 mH inductor carries a sinusoidal current of 1A at a frequency of 50 Hz. The average power dissipated by the inductor is [WBSETCL -2017]	
Type	multiple_choice	
Option	0W	correct
Option	0.25W	incorrect
Option	0.5W	incorrect
Option	1.0W	incorrect

Solution	A pure inductor does not dissipate any power	
Marks	4	1

Question	In forward region of its characteristics, a diode appears as: [WBSETCL -2017]	
Type	multiple_choice	
Option	an ON switch	correct
Option	an OFF switch	incorrect
Option	a capacitor	incorrect
Option	a high resistor	incorrect
Solution	In the forward diode resistance get decreased so diode acts as a closed switch.	
Marks	4	1

Question	Synchronous machines generally have: [WBSETCL -2017]	
Type	multiple_choice	
Option	Salient pole rotor	incorrect
Option	smooth cylindrical rotor	incorrect
Option	either salient pole or smooth cylindrical	correct
Option	none of the above	incorrect
Solution	It may be salient pole rotor or non salient pole rotor .	
Marks	4	1

Question	200 resistance of 200Ω each are connected in parallel . There equivalent resistance will be	
Type	multiple_choice	
Option	200 Ω	incorrect
Option	1 Ω	correct
Option	400 Ω	incorrect
Option	4000 Ω	incorrect
Solution	Resistance connected in parallel then $R_t = R/N$ $200/200=1 \Omega$	
Marks	4	1

Question	The short-circuit characteristic of an alternator is [WBSETCL -2017]	
Type	multiple_choice	
Option	always linear	correct
Option	always nonlinear	incorrect
Option	either of a) or b)	incorrect
Option	none of these	incorrect
Solution		
Marks	4	1

Question	In a synchronous motor [WBSETCL -2017]	
Type	multiple_choice	
Option	stator mmf rotates slightly faster in comparison to stator mmf.	incorrect
Option	the rotor mmf and stator mmf are stationary with respect to each other.	correct
Option	rotor mmf rotates slightly faster in comparison to stator mmf.	incorrect
Option	none of the above	incorrect
Solution	In a synchronous motor slip (S) = 0. Then $N_s = N$ So rotor mmf and stator mmf stationary with respect to each other .	
Marks	4	1

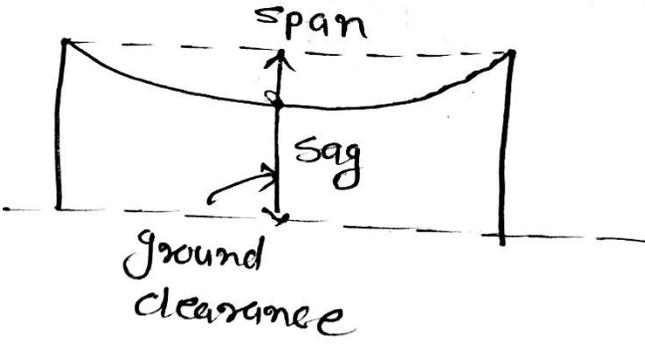
Question	Varistors are	
Type	multiple_choice	
Option	Insulator	incorrect
Option	Non- linear resistor	correct
Option	Carbon resistor	incorrect
Option	Linear resistor	incorrect
Solution	A varistors is a electronic component with an electrical resistance that varies with the applied voltage . also know as a voltage depended resistor. It is a non – linear , Non ohmic current voltage characterises that is smaller to that of a diode .	
Marks	4	1

Question	If the current is going away from the observer then the direction of magnetic lines of force will be _____.	
	[WBSETCL -2017]	
Type	multiple_choice	
Option	Outside the plane	incorrect
Option	Anti-clockwise	correct
Option	Inside the plane	incorrect
Option	Clockwise	incorrect
Solution	<p>The solution contains two hand-drawn diagrams. The first diagram on the left shows a central circle with an 'X' inside, representing current entering the page. Dashed concentric circles around it represent magnetic field lines, with arrows indicating a clockwise direction. Below it is the word 'clockwise'. The second diagram on the right shows a central circle with a dot inside, representing current leaving the page. Dashed concentric circles around it represent magnetic field lines, with arrows indicating an anticlockwise direction. Below it is the word 'anticlockwise'.</p>	
Marks	4	1

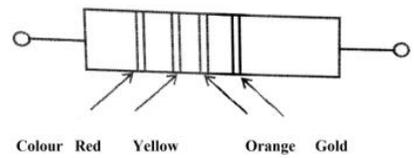
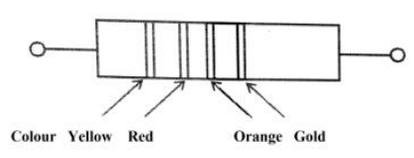
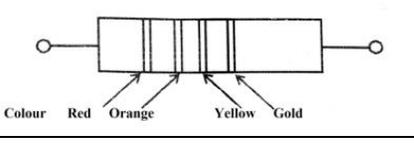
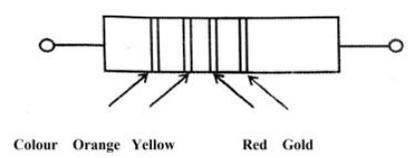
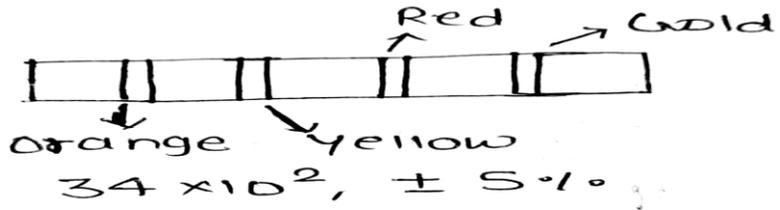
Question	Suspension type insulators are used for voltages beyond _____.	
	[WBSETCL -2017]	
Type	multiple_choice	
Option	220 V	incorrect
Option	400 V	incorrect
Option	11 kV	incorrect
Option	33 kV	correct
Solution	Suspension type insulator is used beyond 33 KV	
Marks	4	1

Question	The peak value of a sine wave is 200 V . Its average value _____.
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Type	multiple_choice	
Option	127.4V	correct
Option	141.4V	incorrect
Option	282.8V	incorrect
Option	200V	incorrect
Solution	$\text{Avg} = V_m \times .636$ $= 200 \times .636 = 127.4 \text{ V}$	
Marks	4	1

Question	The distance between two poles is called	
Type	multiple_choice	
Option	Sag	incorrect
Option	Span	correct
Option	Strand	incorrect
Option	Armouring	incorrect
Solution		
Marks	4	1

Question	According to colour code of the given resistance, the least valued resistor is	
Type	multiple_choice	

Option		incorrect
Option		incorrect
Option		incorrect
Option		correct
Solution		
Marks	4	1

Question	A 3- phase induction motor operating at slip (S).If its two supply leads are interchange then its slip at the stand will be	
Type	multiple_choice	
Option	(2-S)	correct
Option	2S	incorrect
Option	2+S	incorrect

Option	S^2	incorrect
Solution	$Slip = \frac{N_s - N_r}{N_s}$ When the two leads from the supply mains are reverse synchronous speed - N_r $Slip = \frac{N_s - (-N_r)}{N_s}$ two $N_s - (N_s - N_r) / N_s = (2 - S)$	
Marks	4	1

Question	Unit of resistance is	
Type	multiple_choice	
Option	Ohm	correct
Option	Mho	incorrect
Option	Ohm/ meter	incorrect
Option	Ohm/ meter ²	incorrect
Solution	Ohm	
Marks	4	1

Question	Convert the 127 decimal number into binary. [WBSETCL -2017]	
Type	multiple_choice	
Option	1100111	incorrect
Option	1111111	correct
Option	1111011	incorrect
Option	111111	incorrect
Solution	1111111	
Marks	4	1

Question	The following truth-table belongs to which one of the four gates: <table border="1" style="margin: 10px auto;"> <thead> <tr> <th><i>A</i></th> <th><i>B</i></th> <th><i>X</i></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> </tr> </tbody> </table> [WBSETCL -2017]		<i>A</i>	<i>B</i>	<i>X</i>	1	1	0	0	1	0	1	0	0	0	0	1
<i>A</i>	<i>B</i>	<i>X</i>															
1	1	0															
0	1	0															
1	0	0															
0	0	1															
Type	multiple_choice																
Option	OR	incorrect															
Option	NAND	incorrect															
Option	XOR	incorrect															
Option	NOR	correct															
Solution	When both inputs are low output become high .it is NOR gate																
Marks	4	1															

Question	If in a transformer copper loss is of 500 watt then how much should be the iron loss for maximum efficiency _____. [WBSETCL -2017]	
Type	multiple_choice	

Option	400 watt	incorrect
Option	700 watt	incorrect
Option	500 watt	correct
Option	1000 watt	incorrect
Solution	<p>at maximum efficiency $Cu \text{ loss} = \text{Iron loss}$</p> <p>$Cu \text{ loss} = 500 \text{ watt}$</p> <p>$\therefore \boxed{\text{Iron loss} = 500 \text{ watt}}$</p>	
Marks	4	1

Question	<p>A 5 kW, 50 Hz, 6 pole slip ring induction motor runs at 960 rpm. Calculate Synchronous Speed and Percentage Slip.</p> <p style="text-align: right;">[WBSETCL -2017]</p>	
Type	multiple_choice	
Option	1000 rpm and 2%	incorrect
Option	1100 rpm and 2%	incorrect
Option	1100 rpm and 4%	incorrect
Option	1000 rpm and 4%	correct
Solution	<p>$N_s = \frac{120 \times 50}{6} = 1000 \text{ rpm}$ $\boxed{N_s = 1000 \text{ rpm}}$</p> <p>$N = 960 \text{ rpm}$ $S = \frac{1000 - 960}{1000} = \frac{40}{1000} = 4\%$</p> <p>$\boxed{\text{slip (s)} = 4\%}$</p>	
Marks	4	1

Question	The method for speed control of DC motor _____.	
	[WBSETCL -2017]	
Type	multiple_choice	
Option	Field control	incorrect
Option	Armature control	incorrect
Option	Tapped field control	incorrect
Option	All of the above	correct
Solution	Following are methods speed control of DC series motor- 1- Field flux control method 2- Armature control method 3- Tapped field control	
Marks	4	1

Question	The capacity of a battery is 60 Ah. For how long can the current of 5 ampere be drawn from this battery _____.	
	[WBSETCL -2017]	
Type	multiple_choice	
Option	12 hours	correct
Option	300 hours	incorrect
Option	7.2 hours	incorrect
Option	8.5 hours	incorrect
Solution	$\text{Battery Ah} = \text{Ah}$ $60 = 5 \times h$ $h = \frac{60}{5} = 12$ $\boxed{h = 12}$	
Marks	4	1

Question	Find equivalent resistance of the circuit between the terminal A and B.	
	[WBSETCL -2017]	
Type	multiple_choice	
Option	14/6 ohms	incorrect
Option	16/6 ohms	incorrect
Option	16/3 ohms	correct
Option	8/3 ohms	incorrect
Solution		
Marks	4	1

Question	An amplifier has a gain 10000 expressed in decibels the gain is	
Type	multiple_choice	
Option	10	incorrect
Option	40	correct
Option	100	incorrect
Option	80	incorrect
Solution	Power gain = 10000 Gain in dB = $10 \log (10000) = 40 \text{ dB}$	
Marks	4	1

Question	The d.c. series motor should always be started with load because [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	at no-load, it will at dangerously high speed	correct
Option	it will fail to start	incorrect
Option	it will not develop high starting torque	incorrect
Option	all are true	incorrect
Solution	At low load the dc series motor runs at very high speed so it should be always started with load	
Marks	4	1

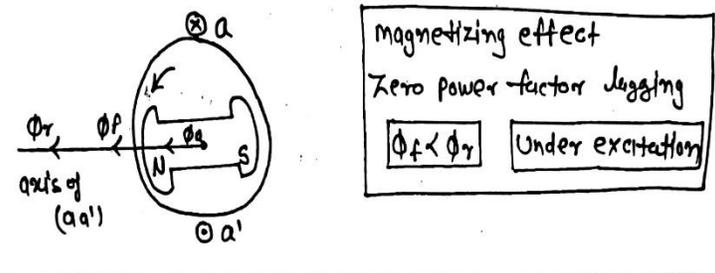
Question	During open circuit test of a transformer [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Primary is supplied rated voltage	correct
Option	Primary is supplied full load current	incorrect
Option	Primary is supplied current at reduced voltage	incorrect
Option	Primary is supplied rated kVA	incorrect
Solution	During open circuit test of a transformer primary is supplied to rated voltage . So Watt meter denote iron losses .	
Marks	4	1

Question	In a 3-phase induction motor running at slip 's' the mechanical power developed in terms of air gap power P_g is [KTPCL-AE(EE)-2017]	
Type	multiple_choice	

Option	$(s - 1)P_g$	incorrect
Option	$(1 - s) P_g$	correct
Option	$(2 - 5) P_g$	incorrect
Option	$s \times P_g$	incorrect
Solution	$P_{md} = (1 - s)P_g$	
Marks	4	1

Question	The armature of a dc machine is laminated to reduce: [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	eddy current loss	correct
Option	copper losses	incorrect
Option	hysteresis loss	incorrect
Option	friction and windage losses	incorrect
Solution	eddy current loss	
Marks	4	1

Question	If the field of a synchronous motor is under excited, the power factor will be [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Lagging	correct
Option	Leading	incorrect
Option	Unity	incorrect
Option	More than unity	incorrect

Solution	 <p>The diagram shows a squirrel cage induction motor with a rotor axis labeled $a-a'$. The rotor has North (N) and South (S) poles. Magnetic flux components are shown: Φ_r (rotor flux) and Φ_f (field flux) entering from the left, and Φ_m (magnetizing flux) entering from the rotor. A note box contains the text: "magnetizing effect", "Zero power factor lagging", and "$\Phi_f < \Phi_r$ Under excitation".</p>	
Marks	4	1

Question	The power factor of a squirrel cage induction motor is [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	low at light load only	correct
Option	low at heavy load only	incorrect
Option	low at light and heavy load both	incorrect
Option	low at rated load only	incorrect
Solution	Low at light load	
Marks	4	1

Question	The unit of permeance [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Henery	incorrect
Option	Wb/AT	incorrect
Option	AT/Wb	incorrect
Option	Both A and B	correct
Solution	Permeance=1/Reluctance	
Marks	4	1

Question	The direction of rotation of a synchronous motor can be reversed by reversing [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Current to the field winding	incorrect
Option	Supply phase sequence	correct
Option	Polarity of rotor poles	incorrect
Option	none of the other	incorrect
Solution	Direction of rotation of synchronous motor is reverse by interchanging phase sequence of supply given 3 phase windings	
Marks	4	1

Question	Synchronous capacitor is [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	An ordinary static capacitor bank	incorrect
Option	An over excited synchronous motor driving mechanical load	incorrect
Option	An over excited synchronous motor running without mechanical load	correct
Option	Not an ordinary static capacitor bank or an over excited synchronous motor driving mechanical load or an over excited synchronous motor running without mechanical load	incorrect
Solution	When synchronous motor running without a mechanical load in overextend mode is called Synchronous capacitor . It can generate or absorb Var.	

Marks	4	1
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Question	In a 3-phase induction motor the maximum torque [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Is proportional to rotor resistance r_2	incorrect
Option	Does not depend on r_2	correct
Option	Is proportional to r_2	incorrect
Option	None of these	incorrect
Solution	3 – phase induction motor maximum torque $T_{max} = \frac{1}{2\omega_s} \frac{V_1^2}{X_2}$ So according to formula maximum torque does not depend on R_2	
Marks	4	1

Question	If a DC voltmeter is made from an ammeter having a fed of $100\mu A$ then its sensitivity (in $k\Omega/V$) will be [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	1	incorrect
Option	100	incorrect
Option	10	correct
Option	1000	incorrect
Solution	Sensitivity=1/deflection current	
Marks	4	1

Question	In DC generators, armature reaction is produced actually by: [KTPCL-AE(EE)-2017]	
Type	multiple_choice	
Option	Its field current	incorrect
Option	Armature conductors	incorrect
Option	Field pole winding	incorrect
Option	Load current in armatures	correct
Solution	Armature reaction = Effect of armature flux on the main field flux. The armature field is produced by the armature conductors when current flows through them .	
Marks	4	1