Rajasthan Public Service Commission
Assistant Electrical Inspector CBRT Exam,2025

ASSISTANT ELECTRICAL INSPECTOR 2025 – Question Paper

Exam Date: 01-Feb-2026

Exam Time: 12:00PM to 02:30PM

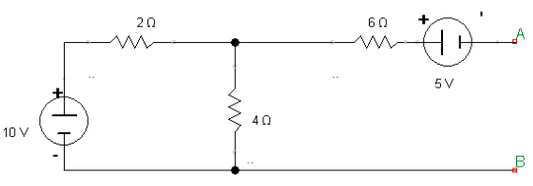
Test Duration: 2:30 hrs

Total Subject Knowledge Questions: 150

Maximum Marks – Subject Knowledge: 150

Subject Knowledge 1	Which of the following best describes how 'intensity of magnetisation' (I) is defined, according to the given statement?
Choice1	It is the magnetic moment per unit cross-sectional area of the material.
Choice2	It is the pole strength developed per unit volume of the material.
Choice3	It is the pole strength developed per unit area of the cross-section of the material.
Choice4	It is the magnetic flux density per unit length of the magnetic material.

Subject Knowledge 2	A capacitor has a reactance of 40 ohm when operated on a 50 Hz supply. Determine the value of its capacitance in μF.
Choice1	64.32
Choice2	89.52
Choice3	79.58
Choice4	25.68

Subject Knowledge 3	What will be the Thevenin equivalent voltage V_{AB} across the load terminals A and B. 
Choice1	5/6
Choice2	10/6
Choice3	-10/6

Choice4	0

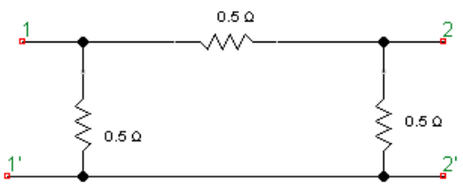
Subject Knowledge 4	The output of a linear time invariant system is $y(t) = 10e^{-t} \cos 4t\, u(t)$, when the input is $x(t) = e^{-t} u(t)$. Find the transfer function of the system.
Choice1	$(s^2+ 2s+1) / (s^2+2s+17)$
Choice2	$10(s^2+2s+1) / (s^2+2s+17)$
Choice3	$(s^2+2s+1) / 10(s^2+2s+17)$
Choice4	$10(2s+1) / (s^2+2s+7)$

Subject Knowledge 5	Condition for reciprocal passive network in terms of hybrid parameters.
Choice1	$h_{12} = -h_{21}$
Choice2	$h_{12} = h_{21}$
Choice3	$h_{12}= 1/h_{21}$
Choice4	$h_{11} = h_{22}$

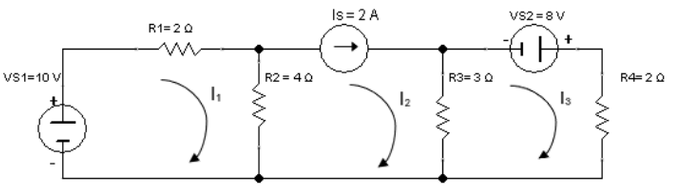
Subject Knowledge 6	A 3 phase, balanced load draws 10 kW power from a 400 V, 3 phase, 50 Hz, 4 wire supply at unity power factor. Determine its line current.
Choice1	14.43 A
Choice2	20.21 A
Choice3	25.18 A
Choice4	10.20 A

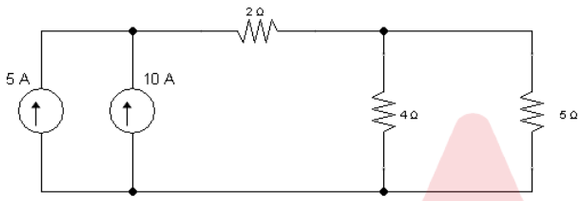
Subject Knowledge 7	Series resonant circuit is also known as:
Choice1	Rejector Circuit
Choice2	Inductive Circuit
Choice3	Acceptor Circuit
Choice4	Capacitive Circuit

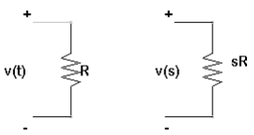
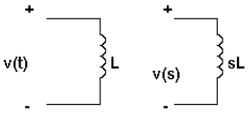
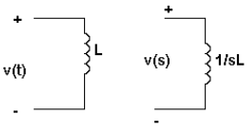
Subject Knowledge 8	In series resonant circuit, if f_0 is the resonance frequency, f_1 is lower half power frequency, f_2 is upper half power frequency then:
Choice1	$f_0 = f_1 f_2$
Choice2	$f_0 = (f_1 f_2)^{1/2}$
Choice3	$f_0 = f_1 + f_2$
Choice4	$f_0 = f_2 - f_1$

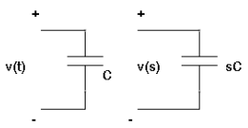
Subject Knowledge 9	For the two-port network shown below, the short circuit admittance parameter matrix is: 
Choice1	$\begin{bmatrix} 4 & -2 \\ -2 & 4 \end{bmatrix}$
Choice2	$\begin{bmatrix} 1 & -0.5 \\ -0.5 & 1 \end{bmatrix}$
Choice3	$\begin{bmatrix} 1 & 0.5 \\ 0.5 & 1 \end{bmatrix}$
Choice4	$\begin{bmatrix} 4 & 2 \\ 2 & 4 \end{bmatrix}$

Subject Knowledge 10	The condition AD - BC = 1 for a two port network implies that the network is a:
Choice1	Reciprocal Network
Choice2	Lossless Network
Choice3	Symmetric Network
Choice4	Lumped Network

Subject Knowledge 11	Determine the mesh current (I_1) in the network shown in Figure: 
Choice1	I_1 = 3 A
Choice2	I_1 = 1.3 A
Choice3	I_1= 4.3 A
Choice4	I_1 = 6.1 A

Subject Knowledge 12	The current passing through 5 ohm resistor is: 
Choice1	15 A
Choice2	5 A
Choice3	15/9 A
Choice4	60/9 A

Subject Knowledge 13	Which one of the following is correct time-domain and s-domain representations of passive elements under zero initial conditions.
Choice1	
Choice2	
Choice3	

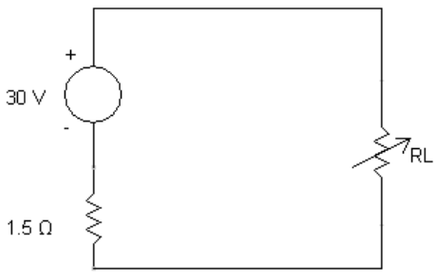
Choice4	

Subject Knowledge 14	If 0.24 coulombs is to be transferred in 15 milliseconds, then the value of current flow will be:
Choice1	8 A
Choice2	16 A
Choice3	32 A
Choice4	4 A

Subject Knowledge 15	Determine the power dissipated by the winding of an electric motor, if a current of 5 A flows in it and the winding resistance is 100 Ω.
Choice1	2000 W
Choice2	2500 W
Choice3	1500 W
Choice4	2100 W

Subject Knowledge 16	The unit of Electrical Energy is:
Choice1	watts
Choice2	kilo-hours
Choice3	kilowatt-hours
Choice4	ohm

Subject Knowledge 17	Find the potential difference across a 4-micro-Farad (μF) capacitor when it is charged with 5 milli-coulombs (mC).
Choice1	1200 V
Choice2	1225 V
Choice3	1250 V
Choice4	1275 V

Subject Knowledge 18	A DC Source has an open-circuit voltage of 30 V and an internal resistance of 1.5 Ω. , then determine the maximum power dissipation in the load resistance (RL) for the circuit shown. 
Choice1	100 W
Choice2	150 W
Choice3	200 W
Choice4	250 W

Subject Knowledge 19	An alternating current completes 5 cycles in 8 milli-seconds. What is its frequency?
Choice1	625 kHz
Choice2	625 Hz
Choice3	125 kHz
Choice4	125 Hz

Subject Knowledge 20	An alternating voltage is given by: v = 75 sin(200πt - 0.25) volts. Find out the Root Mean Square (RMS) value of voltage.
Choice1	75 V
Choice2	150 V
Choice3	53 V
Choice4	83 V

Subject Knowledge 21	A 2 kW load takes a current of 16 A from a 200 V AC supply. Calculate the real component of the current?
Choice1	10 A
Choice2	16 A

Choice3	20 A
Choice4	25 A

Subject Knowledge 22	The desirable characteristic of an electronic instruments is:
Choice1	Lower input impedance and higher loading
Choice2	Higher input impedance and reduced loading effect
Choice3	Slower response
Choice4	Inability to measure remote signals

Subject Knowledge 23	A moving coil voltmeter has uniform scale with 100 divisions, the full scale reading is 200 V and 1/10 of a scale division can be estimated with fair degree of certainty. The resolution of the instrument in volt is:
Choice1	0.2
Choice2	0.3
Choice3	0.4
Choice4	0.1

Subject Knowledge 24	In a.c. circuits, the connection of measuring instruments cause loading errors which may affect:
Choice1	Only the magnitude of quantity being measured
Choice2	Only the phase of the quantity being measured
Choice3	Both the magnitude and phase of the quantity being measured
Choice4	Magnitude, phase and also the waveform of the quantity being measured

Subject Knowledge 25	Calculate the static error, when a voltmeter reads 127.50 V and the true value of voltage is 127.43 V.
Choice1	0.00 V
Choice2	+ 0.05 V
Choice3	+ 0.07 V
Choice4	- 0.07 V

Subject Knowledge 26	A zero to 300 V voltmeter has an error of ±2% of the full scale deflection. If the true voltage is 30 V, then the range of readings on this voltmeter would be:
Choice1	20 V to 40 V
Choice2	24 V to 36 V
Choice3	29.4 V to 30.6 V
Choice4	29.94 V to 30.06 V

Subject Knowledge 27	A Lissajous pattern on an oscilloscope has 5 horizontal tangencies and 2 vertical tangencies. The frequency of the horizontal input is 1000 Hz. What is the frequency of the vertical input?
Choice1	400 Hz
Choice2	2500 Hz
Choice3	4000 Hz
Choice4	5000 Hz

Subject Knowledge 28	Thermo-couple instruments correctly indicate the RMS value of voltage or current because:
Choice1	They depend on the frequency of the input signal
Choice2	They work on the heating effect independent of waveform
Choice3	They measure only peak values
Choice4	They need a uniform air gap for operation

Subject Knowledge 29	A digital voltmeter has a read out range from 0 to 9999 counts. When full scale reading is 9.999 V, the resolution of the full scale reading is:
Choice1	0.1 mV
Choice2	2 mV
Choice3	10 mV
Choice4	1 mV

Subject Knowledge 30	A resistance wire strain gauge with a gauge factor of 2 is bonded to a steel structural member subjected to a stress of 100 MN/m^2. The modulus of elasticity of steel is 200 GN/m^2. The change in the value of gauge resistance due to applied stress will be:

Choice1	0.05 %
Choice2	0.10 %
Choice3	0.30 %
Choice4	0.60 %

Subject Knowledge 31	Which one of the following is not true for a LVDT transducer:
Choice1	It has a movable soft iron core
Choice2	The secondary windings have equal number of turns
Choice3	The primary winding is connected to an alternating current source
Choice4	When core is in its normal (null) position, unequal voltages are induced

Subject Knowledge 32	A simple slide wire potentiometer is used for measurement of current in a circuit. The voltage drop across a standard resistor of 0.1 Ω is balanced at 75 cm. The magnitude of the current if the standard cell emf of 1.45 V is balanced at 50 cm, will be:
Choice1	15.25 A
Choice2	20.05 A
Choice3	21.75 A
Choice4	25.25 A

Subject Knowledge 33	In a dynamometer wattmeter, the controlling torque is provided by:
Choice1	Gravity control
Choice2	Eddy current damping
Choice3	Spring control
Choice4	Air friction damping

Subject Knowledge 34	A dynamometer-type wattmeter with its voltage coil connected across the load side of the instrument read 250 W. If the load voltage be 200 V, what power is being taken by the load? The voltage coil branch has a resistance of 2000 ohm.
Choice1	230 W
Choice2	240 W

Choice3	250 W
Choice4	210 W

Subject Knowledge 35	A moving iron (MI) instrument can be used for current and voltage measurements:
Choice1	In AC circuits only
Choice2	In DC circuits only
Choice3	In both AC and DC circuits
Choice4	MI instrument cannot be used for measurement of current and voltage at any level

Subject Knowledge 36	A megger is used for measurement of:
Choice1	Armature winding resistance of DC generator
Choice2	High voltage winding of transformer
Choice3	Rotor winding resistance of DC motor
Choice4	High valued resistances, particularly insulation resistance

Subject Knowledge 37	Determine the deflection factor, if a Wheatstone bridge requires an change of 7 Ω in the unknown arm of the bridge to produce a change in deflection of 3 mm of the galvanometer.
Choice1	2.33 Ω/mm
Choice2	2.33 mm/Ω
Choice3	0.429 mm/Ω
Choice4	0.429 Ω/mm

Subject Knowledge 38	Find the value of shunt resistance required to convert a 1 mA meter movement with an internal resistance of 100 Ω into a 0-100 mA ammeter.
Choice1	0.01 Ω
Choice2	1.01 Ω
Choice3	2.01 Ω
Choice4	3.01 Ω

Subject Knowledge 39	A moving coil instrument has a resistance of 0.6 Ω and full scale deflection at 0.1 A. To convert it into an ammeter of 0-15 A range, the resistance of shunt should be:
Choice1	0.6 Ω
Choice2	0.06 Ω
Choice3	0.1 Ω
Choice4	0.004 Ω

Subject Knowledge 40	In measurement systems, which of the following is undesirable static characteristics?
Choice1	Sensitivity
Choice2	Accuracy
Choice3	Reproducibility
Choice4	Dead Zone

Subject Knowledge 41	The production of magnetic flux in a machine by circulating current in the field winding is called:
Choice1	Commutation
Choice2	Excitation
Choice3	Regulation
Choice4	Saturation

Subject Knowledge 42	A 4 pole DC shunt generator with a shunt field resistance of 100 ohm and armature resistance of 1 ohm has 378 wave connected conductors in its armature. The flux per pole is 0.02 Wb and the generator speed is 1000 rpm. The induced emf in the generator is _____.
Choice1	252 volts
Choice2	300 volts
Choice3	126 volts
Choice4	200 volts

Subject Knowledge 43	Which type of winding is used in 1-phase shell-type transformer?
Choice1	Cylindrical type

Choice2	Circular type
Choice3	Concentric type
Choice4	Sandwich type

Subject Knowledge 44	Field weakening speed control method in DC shunt motor is suitable to achieve:
Choice1	speeds above the base speed only
Choice2	speeds below the base speed only
Choice3	speeds equal to base speed
Choice4	Both above and below the base speed

Subject Knowledge 45	The armature resistance of a 200 V shunt motor is 0.4 ohm and no load current is 2 A. When loaded and taking an armature current of 50 A, the speed is 1200 rpm. Find the approximate no load speed.
Choice1	1550 rpm
Choice2	1328 rpm
Choice3	1841 rpm
Choice4	980 rpm

Subject Knowledge 46	In a DC machine having wave winding, for an armature having Z conductors, the number of parallel paths and conductors per path are respectively:
Choice1	P parallel paths, Z/P conductors per path
Choice2	2 parallel paths, Z/2 conductors per path
Choice3	Z parallel paths, 2 conductors per path
Choice4	P/2 parallel paths, 2Z conductors per path

Subject Knowledge 47	The torque developed by DC series motor is:
Choice1	Proportional to Armature current
Choice2	Proportional to square of Armature current
Choice3	Independent of Armature current
Choice4	Proportional to square root of Armature current

Subject Knowledge 48	Coil span for 4-pole, 12-slot armature winding is _____ in DC machine
Choice1	24
Choice2	48
Choice3	8
Choice4	3

Subject Knowledge 49	The primary and secondary induced emfs E_1 and E_2 in a two-winding transformer are always:
Choice1	equal in magnitude
Choice2	antiphase with each other
Choice3	in-phase with each other
Choice4	determined by load on transformer secondary

Subject Knowledge 50	For a 2000/200 V, 25 kVA, single phase transformer, the iron and full load copper losses are 350 W and 400 W respectively. The efficiency at unity power factor on full load condition will be:
Choice1	95%
Choice2	97%
Choice3	99%
Choice4	92%

Subject Knowledge 51	If P_1 and P_2 be the iron and copper losses of a transformer on full-load, find the ratio of P_1 and P_2 , such that maximum efficiency occurs at 75% of full-load.
Choice1	$P_1/P_2 = 16/9$
Choice2	$P_1/P_2 = 9/16$
Choice3	$P_1/P_2 = 16/25$
Choice4	$P_1/P_2 = 25/16$

Subject Knowledge 52	As compared to Δ-Δ bank, the capacity of the V-V bank of transformer is _____ percent.

Choice1	57.7
Choice2	66.7
Choice3	50
Choice4	86.6

Subject Knowledge 53	Which of the following transformer connection is best suited for 3-phase, 4-wire service?
Choice1	Delta-Delta
Choice2	Star-Star
Choice3	Delta-Star
Choice4	Star-Delta

Subject Knowledge 54	An auto-transformer supplies a load of 3 kW at 115 volts at a Unity power factor. If the applied primary voltage is 230 volts, then the power transformed inductively will be:
Choice1	3 kW
Choice2	1.5 kW
Choice3	3.5 kW
Choice4	2.5 kW

Subject Knowledge 55	In an ideal transformer, 'no leakage flux' means:
Choice1	Flux links only the primary winding
Choice2	Flux links only the secondary winding
Choice3	The same flux links both primary and secondary windings completely
Choice4	There is no flux produced in the core

Subject Knowledge 56	A 25 kVA transformer is constructed to a turns ratio of N_1/N_2= 10. The impedance of primary winding is 3+j5 ohms and of secondary winding is 0.5+j0.8 ohms. What will be the impedance of transformer when referred to primary?
Choice1	53 + 85j ohms
Choice2	53j + 85 ohms

Choice3	3.5 + 58j ohms
Choice4	3.5 + 5.8j ohms

Subject Knowledge 57	7^{th} harmonics in an induction motor produces a rotating field that rotates-
Choice1	In reverse direction at $N_s/7$
Choice2	In forward direction at $N_s/7$
Choice3	Forward at $7N_s$
Choice4	Reverse at $7N_s$

Subject Knowledge 58	A slip-ring induction motor runs at 290 rpm at full load, when connected to 50 Hz supply. Calculate slip, if number of poles = 20.
Choice1	2.22%
Choice2	3.33%
Choice3	4.44%
Choice4	0%

Subject Knowledge 59	Which is not a type of Single-phase induction motors:
Choice1	Split-phase type
Choice2	Capacitor run type
Choice3	Shaded-pole type
Choice4	Reluctance motor

Subject Knowledge 60	The power input to a 500 V, 50-Hz, 6-pole, 3-phase induction motor running at 975 rpm is 40 kW. The stator losses are 1 kW and the friction and windage losses are 2 kW. The rotor copper loss will be:
Choice1	1 kW
Choice2	39 kW
Choice3	0.975 kW
Choice4	38 kW

Subject Knowledge 61	Which one is not true in the case of torque of a rotor of induction motor?
Choice1	Torque under running condition is maximum at that value of slip s which makes rotor reactance per phase equal to rotor resistance per phase
Choice2	Slip corresponding to maximum torque is $s = R_2/X_2$
Choice3	The maximum torque is independent of rotor resistance as such
Choice4	The maximum torque is independent of rotor reactance as such

Subject Knowledge 62	Which of the following statements is most correct with respect to Universal Motor:
Choice1	It works on DC supply source only
Choice2	It works on 1 phase AC supply source only
Choice3	It works on both DC and 1 phase AC supply
Choice4	It works on 3 phase AC supply source only

Subject Knowledge 63	One of the characteristics of a single-phase induction motor is that it:
Choice1	Is self-starting
Choice2	Is not self-starting
Choice3	Input supply is provided to rotor winding
Choice4	Can rotate in one direction only

Subject Knowledge 64	Cogging in a three-phase induction motor is most accurately described as:
Choice1	Motor running at a sub-synchronous speed due to 7^{th} harmonic torque
Choice2	Rotor oscillating between two speeds because of time harmonics
Choice3	Motor refusing to start because rotor and stator teeth align and radial forces exceed tangential accelerating forces
Choice4	Sudden reversal of torque at full-load due to 5^{th} harmonic

Subject Knowledge 65	A properly shunted centre zero galvanometer is connected in the rotor circuit of a 6 pole, 50 Hz Wound rotor induction motor. If the galvanometer makes 90 complete oscillations in one minute, the rotor speed is:
Choice1	1000 rpm
Choice2	1440 rpm
Choice3	950 rpm
Choice4	970 rpm

Subject Knowledge 66	For a 3-phase induction motor with rotor resistance R_2 , at normal operating speed (small slip), which approximate relationship between torque T and slip s is valid?
Choice1	$T \propto 1/s$
Choice2	$T \propto s$
Choice3	$T \propto s^2$
Choice4	T is independent of s

Subject Knowledge 67	For a 3 phase 400 V alternator having 0.5 pu of synchronous reactance and its excitation voltage of 1.2 pu and terminal voltage of 1 pu. Then the maximum power delivered to the infinite bus is _____.
Choice1	2.4 pu
Choice2	4.8 pu
Choice3	1.44 pu
Choice4	1 pu

Subject Knowledge 68	Hunting in a synchronous motor is primarily caused by:
Choice1	Steady mechanical load on the shaft
Choice2	Sudden changes in mechanical load
Choice3	Constant field excitation
Choice4	Uniform supply frequency and voltage

Subject Knowledge 69	A synchronous condenser is:

Choice1	An over excited induction motor
Choice2	An over excited synchronous motor
Choice3	An under excited synchronous motor
Choice4	An under excited induction motor

Subject Knowledge 70	For a synchronous generator to be connected in parallel with an existing busbar system, which of the following is not a necessary condition for synchronisation?
Choice1	Same voltage magnitude
Choice2	Same frequency
Choice3	Same phase sequence
Choice4	Same power factor

Subject Knowledge 71	The V-curve of a 3-phase synchronous motor is a plot between:
Choice1	Armature current and load power
Choice2	Field current and speed
Choice3	Field current and armature current
Choice4	Power factor and load current

Subject Knowledge 72	The motion of a stepper motor is best described as:
Choice1	Continuous rotation at constant speed
Choice2	Rotor moves in discrete movements
Choice3	Continuous oscillation about a mean position
Choice4	Random rotation depending on load

Subject Knowledge 73	The main purpose of performing open-circuit test on a transformer is to determine its:
Choice1	copper loss
Choice2	core loss
Choice3	friction loss

Choice4	insulation resistance

Subject Knowledge 74	A 50 Hz alternator will run at the greatest possible speed if it is wound for:
Choice1	8 poles
Choice2	6 poles
Choice3	4 poles
Choice4	2 poles

Subject Knowledge 75	A 200 V DC shunt motor takes 22 A at rated voltage and runs at 1000 rpm. Its field resistance is 100 ohm and armature circuit resistance (including brushes) is 0.1 ohm. The counter or back emf is:
Choice1	180 V
Choice2	197.8 V
Choice3	198 V
Choice4	200 V

Subject Knowledge 76	What is the primary function of the Buchholz relay in transformer protection?
Choice1	To detect overheating in the transformer windings
Choice2	To detect oil temperature rise
Choice3	To detect and signal faults such as incipient faults and gas accumulation in oil
Choice4	To regulate the oil level in the conservator

Subject Knowledge 77	Why hydro power plants are used to meet peak load demand in a hydro-thermal interconnected system?
Choice1	Hydro plants have lower capital cost than thermal plants
Choice2	Hydro plants have negligible transmission losses
Choice3	Hydro plants have fast start-up time and high speed of response
Choice4	Hydro plants have higher operation cost than thermal plants

Subject Knowledge	Which of the following materials is MOST commonly used for conductors in a 3-phase, 3-wire transmission system due to its optimal balance of conductivity, mechanical strength, and cost?

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Choice1	Silver
Choice2	Copper
Choice3	Aluminium (or ACSR)
Choice4	Tungsten

Subject Knowledge 79	A turbine is required for a low head (below about 30 m) and very high discharge river-based power station with nearly axial flow of water. Which turbine is most appropriate?
Choice1	Kaplan turbine
Choice2	Pelton wheel
Choice3	Francis turbine
Choice4	Impulse turbine with multiple jets

Subject Knowledge 80	In long transmission lines, the line constants (R, L, C) are considered to be:
Choice1	Negligible
Choice2	Lumped at one point
Choice3	Lumped at several points
Choice4	Distributed uniformly along the length

Subject Knowledge 81	Which of the following is an advantage of corona?
Choice1	Loss of energy in the line
Choice2	Production of ozone causing corrosion
Choice3	Increase in virtual diameter of the conductor
Choice4	Inductive interference with communication lines

Subject Knowledge 82	What is the minimum phase-neutral voltage at which corona occurs, called?
Choice1	Visual critical voltage
Choice2	Breakdown voltage

Choice3	Critical disruptive voltage
Choice4	Dielectric strength

Subject Knowledge 83	Superheating of steam in a boiler provides which of the following benefits?
Choice1	Increase boiler size
Choice2	Reduces overall efficiency of boilers
Choice3	Avoids blade corrosion in the turbine
Choice4	Reduces steam temperature

Subject Knowledge 84	For a 3-phase line with unsymmetrical spacing, the inductance per phase is calculated by:
Choice1	Taking simple average of distances between conductors
Choice2	Taking geometric mean distance (GMD) after transposition
Choice3	Taking only self GMR of conductors
Choice4	Neglecting mutual inductances between phases

Subject Knowledge 85	Apart from the skin effect, the non-uniformity of current distribution in a conductor is also caused by:
Choice1	Proximity effect
Choice2	Corona effect
Choice3	Hysteresis loss
Choice4	Eddy current loss

Subject Knowledge 86	A 3-phase transmission line is being supported by three disc insulators. The potentials across top unit (i.e. near to the tower) and middle unit are 8 kV and 11 kV respectively. The ratio of capacitance between pin and earth to the self-capacitance of each unit will be:
Choice1	0.125
Choice2	0.375
Choice3	0.525
Choice4	0.735

Subject Knowledge 87	A power utility wants to forecast the system demand hour by hour for the next 24 hours to schedule generation and manage economic dispatch. Which type of load forecasting is most appropriate for this purpose?
Choice1	Very long-term load forecasting
Choice2	Long-term load forecasting
Choice3	Medium-term load forecasting
Choice4	Short-term load forecasting

Subject Knowledge 88	Which of the following is NOT a main requirement of insulating materials used for electric cables?
Choice1	High insulation resistance
Choice2	High dielectric strength
Choice3	Being hygroscopic to absorb moisture
Choice4	Good mechanical properties such as tenacity and elasticity

Subject Knowledge 89	What can cause over-fluxing in a transformer?
Choice1	Excessive oil temperature
Choice2	High frequency at rated voltage
Choice3	Increase in voltage or decrease in frequency beyond permissible limits
Choice4	Faulty conservator tank

Subject Knowledge 90	In protection relays, a “seal-in coil” is a coil that is provided to:
Choice1	Hold the relay contacts closed so they do not open while current is flowing
Choice2	Raise the relay pickup value so contacts stay stable during current flow
Choice3	Delay the relay reset action so contacts remain engaged under load
Choice4	Limit relay contact movement so they remain steady during current flow

Subject Knowledge 91	Which type of transformer fault is most commonly caused by the weakening of insulation?
Choice1	Open circuit fault

Choice2	Winding to core fault
Choice3	Over voltage fault
Choice4	Under-frequency fault

Subject Knowledge 92	In an induction disc over-current relay, which mechanical component primarily provides the control (restoring) torque opposing the deflecting torque?
Choice1	Shading coil
Choice2	Aluminium disc
Choice3	Control spring
Choice4	Permanent magnet

Subject Knowledge 93	Under normal operating conditions in simple differential protection, what is the spill current in the relay circuit?
Choice1	Equal to load current
Choice2	Equal to supply current
Choice3	Zero
Choice4	Depends upon type of circuit breaker

Subject Knowledge 94	What is the main function of an economiser in a steam power plant?
Choice1	To dry and superheat the steam
Choice2	To increase temperature of air for combustion
Choice3	To extract heat from flue gases and raise feed water temperature
Choice4	To convert mechanical energy into electrical energy

Subject Knowledge 95	In the context of power systems, energy banking between two utilities mainly refers to:
Choice1	Selling electricity in the short term at a fixed tariff
Choice2	Exchanging reactive power support to maintain voltage profile
Choice3	Supplying surplus energy to another utility now and taking back equivalent energy later
Choice4	Purchasing long-term power from an independent power producer

Subject Knowledge 96	In a single-core underground cable, • The conductor diameter is d (metallic core carrying current), and • The sheath diameter is D (outer metallic layer used for insulation and protection). At which radial position does the maximum electric stress occur inside the dielectric?
Choice1	At the outer sheath surface, radius r = D/2
Choice2	At the surface of the conductor, radius r = d/2
Choice3	At a centre point between surface of conductor and outer sheath
Choice4	Uniform everywhere in the insulating material

Subject Knowledge 97	Which of the following statements is true for a radial distribution system?
Choice1	It is the cheapest and simplest system
Choice2	It gives the highest reliability of supply
Choice3	It always maintains the best voltage regulation at all points
Choice4	It requires duplicate feeders throughout

Subject Knowledge 98	The resonant grounding (Peterson coil) condition is achieved, when there is relation in between charging current (I_c) and fault current (I_L)as:
Choice1	$I_L = I_c$
Choice2	$I_L = 2I_c$
Choice3	$I_L = 3I_c$
Choice4	$I_L = I_c/3$

Subject Knowledge 99	Solid grounding is also referred to as:
Choice1	Resistance grounding
Choice2	Effective grounding
Choice3	Reactance grounding
Choice4	Isolated grounding

Subject Knowledge 100	An inverse definite minimum time (IDMT) overcurrent relay should have the following property:

Choice1	It operates instantaneously for any fault current
Choice2	Its operating time decreases as fault current increases, with a definite minimum time
Choice3	It has constant operating time independent of current
Choice4	It is cheaper than a fuse

Subject Knowledge 101	The SI unit of illuminance (illumination) is:
Choice1	Footlambert
Choice2	Nit
Choice3	Lux
Choice4	Steradian

Subject Knowledge 102	Which of the following is a major advantage of electrical heating systems?
Choice1	They provide uniform heat distribution with precise temperature control
Choice2	They require large space and complex mechanical arrangements
Choice3	They produce high combustion residues needing frequent cleaning
Choice4	They depend strongly on fuel supply variations for stable operation

Subject Knowledge 103	Which of the following is NOT a typical feature of high-frequency eddy-current heating?
Choice1	Heat is generated near the surface and can be produced at very high rates (over several kW/cm^2).
Choice2	The heated surface area and heat quantity can be accurately controlled using timing and coil design.
Choice3	The method is highly energy-efficient (greater than 90%) and has low initial equipment cost.
Choice4	Heating can be performed in vacuum or inert atmospheres and temperature control is straightforward.

Subject Knowledge 104	Which of the following best explains why induction heating (IH) is considered more environmentally friendly than traditional heating methods such as gas-fired furnaces or salt baths?
Choice1	Uses no electricity

Choice2	No cooling needed
Choice3	No combustion; fewer fumes
Choice4	Heats entire chamber uniformly

Subject Knowledge 105	A 0.4 meter diameter diffusing sphere of opal glass (20% absorption) enclosed an incandescent lamp with a luminous flux of 4850 lumens. Calculate the average luminance of the sphere.
Choice1	7722 lumen/m^2
Choice2	2210 lumen/m^2
Choice3	1740 lumen/m^2
Choice4	5740 lumen/m^2

Subject Knowledge 106	The recommended illumination level for Testing Laboratory; instrument repair and manufacturing and drawing board is:
Choice1	Upto 700 lux
Choice2	Upto 400 lux
Choice3	Upto 200 lux
Choice4	Upto 100 lux

Subject Knowledge 107	As per the law of illumination, the luminous flux in the cone in lumens is:
Choice1	Candle power x Solid angle
Choice2	Candle power / Solid angle
Choice3	Candle power - Solid angle
Choice4	Candle power + Solid angle

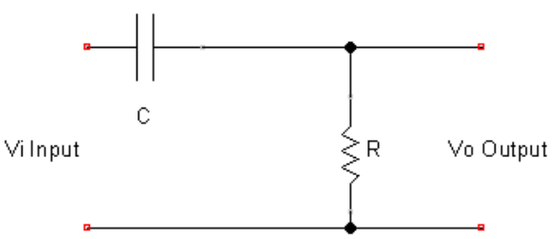
Subject Knowledge 108	One candela is defined as the luminous intensity of how much projected blackbody area at the freezing point of platinum?
Choice1	1/200,000 m^2
Choice2	1/600,000 m^2
Choice3	1/800,000 m^2

Choice4	1/900,000 m^2

Subject Knowledge 109	The magnetising-inrush-current in a transformer is rich in:
Choice1	3^{rd} harmonics
Choice2	5^{th} harmonics
Choice3	7^{th} harmonics
Choice4	2^{nd} harmonics

Subject Knowledge 110	Distance relay measures:
Choice1	Fault current only
Choice2	Line voltage only
Choice3	Voltage (V)/Current (I) ratio
Choice4	Angle between voltage and current

Subject Knowledge 111	A DC servo motor has:
Choice1	High inertia
Choice2	Linear torque-speed characteristics
Choice3	Non-linear speed-torque curve
Choice4	No feedback needed

Subject Knowledge 112	The transfer function for the diagram shown is given by which one of the following: 
Choice1	$\frac{1}{(1+sRC)}$
Choice2	$\frac{sRC}{(1+sRC)}$

Choice3	$\frac{sRC}{(1-sRC)}$
Choice4	$(1+sRC)$

Subject Knowledge 113	Laplace transform of $\sin(wt+\alpha)$ is:
Choice1	$\frac{s\cos\alpha+w\sin\alpha}{(s^2+w^2)}$
Choice2	$\frac{w}{s^2+w^2}\cos\alpha$
Choice3	$\frac{s}{s^2+w^2}\sin\alpha$
Choice4	$\frac{s\sin\alpha+w\cos\alpha}{s^2+w^2}$

Subject Knowledge 114	Consider a characteristic equation $s^4 + 3s^3 + 5s^2 + 6s + K + 10 = 0$ The condition for stability is:
Choice1	K > 5
Choice2	-10 ≤ K
Choice3	K > -4
Choice4	-10 < K < -4

Subject Knowledge 115	The open loop transfer function of a unity feedback control system is given by G(s) = $\frac{K}{s(s+1)}$. If gain K is increased to infinity, then the damping ratio will tend to become:
Choice1	zero
Choice2	0.707
Choice3	Unity
Choice4	Infinite

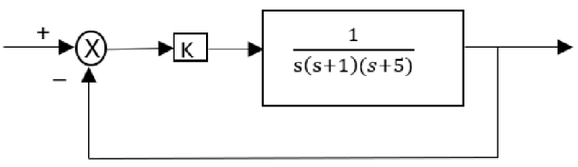
Subject Knowledge 116	The open loop transfer function of a unity negative feedback having value of K (0 < k < ∞), the root locus branches will originate from:
Choice1	open loop poles
Choice2	open loop zeros
Choice3	Real axis only

Choice4	Imaginary axis only

Subject Knowledge 117	A unity feedback system has an open loop transfer function G(s) = $\frac{K}{(s+1)(s+2)(s+3)}$ the angle of asymptotes are given by:
Choice1	45^0, 135^0, 225^0
Choice2	60^0, 180^0, 300^0
Choice3	90^0, 180^0, 270^0
Choice4	45^0, 90^0, 135^0

Subject Knowledge 118	In the Bode-plot of a unity feedback control system, the value of phase of $G(jw)$ at the gain crossover frequency is -125°. The phase margin of the system is:
Choice1	-125°
Choice2	-55°
Choice3	+55°
Choice4	+125°

Subject Knowledge 119	An open loop transfer function of a unity feedback system is given by: G(s) = $\frac{1}{(s+2)^2}$ The closed loop transfer function will have poles at:
Choice1	-2, -2
Choice2	-2, -1
Choice3	-2+j, -2-j
Choice4	-2, 2

Subject Knowledge 120	The closed loop system as shown here, becomes marginally stable if the constant K is chosen to be: 
Choice1	10

Choice2	20
Choice3	30
Choice4	40

Subject Knowledge 121	The transfer function for the state variable representation $\dot{X} = AX + BU$ $Y = CX + DU$ is given by:
Choice1	$D + C (SI - A)^{-1} B$
Choice2	$B (SI - A)^{-1} C + D$
Choice3	$D (SI - A)^{-1} B + C$
Choice4	$C (SI - A)^{-1} D + B$

Subject Knowledge 122	Second order system with unity feedback type-1 System has:
Choice1	Zero steady-state error for step input
Choice2	Zero steady-state error for ramp input
Choice3	Infinite error for step input
Choice4	Zero steady-state error for parabolic input

Subject Knowledge 123	A linear time invariant system is described by the following dynamic equation: $\frac{dx(t)}{dt} = Ax(t) + Bu(t)$ $y(t) = Cx(t)$ Where, $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$, $C = [1 \quad 1]$ The system is:
Choice1	both controllable and observable
Choice2	controllable but not observable
Choice3	observable but uncontrollable
Choice4	both uncontrollable and not observable

Subject Knowledge 124	The transfer function is applicable to which of the following?

Choice1	Linear and time-invariant systems
Choice2	Linear and time-variant systems
Choice3	Non linear systems
Choice4	Both linear and non-linear systems

Subject Knowledge 125	In a second-order system, the peak time (T_p) is given by _____, where ω_n is natural frequency of oscillation ω_d is damping frequency and ξ is damping factor.
Choice1	$\frac{\pi}{\omega_n}$
Choice2	$\frac{\pi}{\omega_n\sqrt{(1-\xi^2)}}$
Choice3	$\frac{1}{\xi\omega_n}$
Choice4	$\frac{2\pi}{\omega_d}$

Subject Knowledge 126	The n- layer introduced in a power diode between p+ and n+ regions is called:
Choice1	Buffer layer
Choice2	Depletion layer
Choice3	Drift region
Choice4	Base region

Subject Knowledge 127	General-purpose power diodes, typically have reverse recovery times of the order of:
Choice1	1 nano-second
Choice2	1 second
Choice3	25 micro-second
Choice4	100 milli-second

Subject Knowledge 128	A power MOSFET is best described as:
Choice1	A current-controlled bipolar device
Choice2	A voltage-controlled unipolar device
Choice3	A current controlled unipolar device
Choice4	A voltage-controlled bipolar device

Subject Knowledge 129	The total thyristor turn-on time is the sum of:
Choice1	Delay time, rise time and spread time
Choice2	Delay time and storage time
Choice3	Rise time and fall time
Choice4	Reverse recovery time and gate recovery time

Subject Knowledge 130	What is the function of snubber circuit across the SCR?
Choice1	Reduces conduction losses
Choice2	Increases holding current
Choice3	Limits the rate of voltage rise $\frac{dv}{dt}$
Choice4	Increases switching speed

Subject Knowledge 131	Which of the following statements correctly describes the turn-off mechanism of a Gate Turn-Off Thyristor (GTO)?
Choice1	GTO can only be turned off by reducing the anode current below the holding current
Choice2	A GTO requires a continuous positive gate current to remain in the on-state
Choice3	A GTO can be turned off by applying a negative gate-cathode voltage
Choice4	A GTO cannot block negative current once it is turned off

Subject Knowledge 132	An IGBT combines the advantages of:
Choice1	SCR and MOSFET

Choice2	BJT and MOSFET
Choice3	TRIAC and DIAC
Choice4	MCT and BJT

Subject Knowledge 133	An MCT can be turned ON and OFF using:
Choice1	Anode current
Choice2	Voltage pulses at the MOS gate
Choice3	Thermal switching
Choice4	Current pulse to cathode

Subject Knowledge 134	A thyristor turns OFF when:
Choice1	Gate signal is removed
Choice2	Anode current falls below holding current
Choice3	Temperature rises
Choice4	Reverse gate current is applied

Subject Knowledge 135	A single-phase fully controlled bridge rectifier is supplied from a 120 V RMS AC source feeding a purely resistive load. The firing angle is α= 60°. What is the exact average output voltage?
Choice1	$\frac{(120\sqrt{2})}{\pi}$
Choice2	$\frac{120}{\pi}$
Choice3	$\frac{(120\sqrt{2})}{(2\pi)}$
Choice4	$\frac{(240\sqrt{2})}{\pi}$

Subject Knowledge 136	A step-down chopper is supplied by a DC source voltage (V_S) of 200 V. The chopper is operating at a duty cycle (α) of 0.4 and a constant switching frequency. If the load is a pure resistor (R) of 10 Ω, what is the average output current (I_o)?
Choice1	2 A
Choice2	8 A
Choice3	20 A
Choice4	40 A

Subject Knowledge 137	A single-phase full-bridge voltage source inverter (VSI) is fed from a DC voltage source of V_S = 200 V. The inverter delivers power to a resistive load of R = 10 Ω. Assuming the output voltage is a square wave, what is the RMS value of the fundamental component of the output voltage?
Choice1	200 V
Choice2	179.605 V
Choice3	127.3 V
Choice4	90.0 V

Subject Knowledge 138	A DIAC can be switched from off-state to on-state when:
Choice1	Gate current is applied
Choice2	Forward voltage exceeds breakover voltage in either direction
Choice3	Reverse current is applied
Choice4	Temperature increases

Subject Knowledge 139	A chopper is defined as a static device that converts:
Choice1	Fixed ac input to variable ac output
Choice2	Fixed dc input to variable dc output
Choice3	Variable dc input to fixed ac output
Choice4	Fixed dc input to fixed dc output

Subject Knowledge 140	Which of the following describes the key characteristic of a single-phase full-converter drive operating in continuous conduction mode?

Choice1	The output voltage is always negative
Choice2	The output voltage contains only fundamental frequency components
Choice3	The DC motor's armature current is ripple-free
Choice4	The armature voltage can be smoothly varied from positive maximum to negative maximum

Subject Knowledge 141	INTEL 8085 is a _____ generation microprocessor.
Choice1	1^{st}
Choice2	2^{nd}
Choice3	3^{rd}
Choice4	4^{th}

Subject Knowledge 142	Which of the following is NOT a flag of 8085 ALU?
Choice1	S - Sign Flag
Choice2	Z - Zero Flag
Choice3	P - Parity Flag
Choice4	C - Count Flag

Subject Knowledge 143	Which of the following is NOT true about 8085 microprocessor?
Choice1	It is 8-bit general purpose microprocessor
Choice2	It is capable of addressing 64K memory
Choice3	It is a 64-pin device
Choice4	It has a 16-bit address bus

Subject Knowledge 144	Which of the following is an illegal C variable name?
Choice1	_total_score
Choice2	file123_data

Choice3	switch#case
Choice4	studentName

Subject Knowledge 145	Which operator is used to get the memory address of a variable in C programming?
Choice1	?
Choice2	&
Choice3	%
Choice4	@

Subject Knowledge 146	What is the output of the following C programming code snippet?
	int x = 10, y = 5;
	int z = (x > y) ? x + y : x – y;
	printf('%d', z);

Choice1	5
Choice2	10
Choice3	15
Choice4	50

Subject Knowledge 147	What will be value of A[2] in following C programming code?
	`#include <stdio.h>`
	`int main() {`
	`  int A[] = {1, 2, 3, 4};`
	`  printf("%d", A[2]);`
	`  return 0;`
	`}`

Choice1	1
Choice2	2
Choice3	3
Choice4	4

Subject Knowledge 148	What will be the output after the execution of the following C programming code?
	`#include <stdio.h>`
	`int main() {`
	`  char str[] = "programming";`
	`  printf("%d", sizeof(str));`
	`  return 0;`
	`}`

Choice1	11
Choice2	12
Choice3	10

Choice4	13

Subject Knowledge 149	What will be the output after the execution of the following C programming code?
	`#include <stdio.h>`
	`int fun(int a, int b) {`
	`  int c;`
	`  a = b++;`
	`  c = ++a;`
	`  return c;`
	`}`
	`int main() {`
	`  printf("%d", fun(6, 7));`
	`  return 0;`
	`}`

Choice1	6
Choice2	7
Choice3	8
Choice4	9

Subject Knowledge 150	What will be the output after the execution of the following C programming code?
	`#include <stdio.h>`
	`int main() {`
	`  char str[] = "programming";`
	`  printf("%c", *(str + 3));`
	`  return 0;`
	`}`

Choice1	Error
Choice2	p
Choice3	o
Choice4	g