SSC JE 2024

Paper-II Electrical Answer Key PDF in #English Held on 6 November

Follow on Social Media

Click To Follow

YouTube

Telegram

Instagram

Whats App

Twitter & X

Career Will App

Junior Engineer Civil Mechanical and Electrical Examination 2024 Paper II 6th Nov 2024

Exam Date	06/11/2024
Exam Time	9:00 AM - 11:00 AM
Subject	Junior Engineer 2024 Paper II Electrical

Section : **General Engineering Electrical**

Q.1 A 15-V source is applied to a capacitive circuit that has an impedance of $(6 - j8)\ \Omega$. Find the angle by which the current leads the voltage.

Ans A). $tan^{-1}\frac{0.9}{1.2}$ B). $tan^{-1}\frac{12}{9}$ C). $tan^{-1}\frac{1.2}{9}$ D). $tan^{-1}\frac{1.2}{0.9}$

Correct Answer: B

Q.2 Which of the following pair of typical diodes and their corresponding threshold voltages is INCORRECT?

Ans A). Germanium diode : 0.3 V B). Silicon diode : 0.7 V C). Light emitting diode : 0.1 V D). Schottky diode : 0.2 V

Correct Answer: C

Q.3 **Match the Following:**
Terms: Definitions:
1. Phase A. The divisional part of a cycle through which the quantity moves forward from a selected origin.
2. Phase Difference B. The angular phase difference between the maximum possible value of two alternating quantities having the same frequency.
3. Cycle C. When the alternating quantity goes through a complete set of positive or negative values or goes through 360° electrical degrees.

Ans A). 1-A, 2-C, 3-B B). 1-B, 2-A, 3-C C). 1-C, 2-B, 3-A D). 1-A, 2-B, 3-C

Correct Answer: D

Q.4 **When applying Thevenin's Theorem to a circuit, if the Thevenin voltage is 40 V and the Thevenin equivalent resistance is 5 Ω, what is the current through a load resistor of 15 Ω connected across the terminals?**

Ans A). 2A B). 2.5A C). 0.5A D). 1A

Correct Answer: A

Q.5 The _____ turbine is a reaction turbine in which the runner receives water axially.

Ans A). Kaplan B). Pelton C). Propeller D). Francis

Correct Answer: A

Q.6 **Explore the components and systems related to the thermal power plant. Assess the following statements and determine their correctness.**
Statements:
I. Water economizers in boiler installations increase efficiency by utilizing the heat of exhaust gases.
II. The electrical thermal plant involves supplying medium voltage, low voltage, and direct current power to all loads in the power plant, covering aspects from power evacuation to switchyard control.

Ans A). Both Statements I and II together are incorrect B). Statements II is correct C). Statement I alone is correct D). Both Statements I and II together are correct

Correct Answer: D

Q.7 Match the transistor configuration with the corresponding output resistance of the configuration.

(i) Common emitter	(a) Low
(ii) Common collector	(b) Very high
(iii) Common base	(c) High

Ans A). (i)-(c), (ii)-(a), (iii)-(b) B). (i)-(a), (ii)-(b), (iii)-(c) C). (i)-(c), (ii)-(b), (iii)-(a)
D). (i)-(b), (ii)-(c), (iii)-(a)

Correct Answer: A

Q.8 Which of the following pairs of typical diodes and their corresponding threshold voltages is correct?

Ans A). Schottky diode : 2 V B). Germanium diode : 0.9 V C). Silicon diode : 0.7 V
D). Light-emitting diode : 0.1 V

Correct Answer: C

Q.9 A generating station has installed capacity of 50,000 kW and delivers (250×10^6) units per annum. If the annual fixed charges are ₹160 per kW installed capacity and running charges are 4 paise per kWh, determine the cost per unit generated.

Ans A). 7.0 paise B). 7.4 paise C). 7.2 paise D). 7.6 paise

Correct Answer: C

Q.10 A 36-pole alternator running at a speed of _____ RPM will produce a frequency of 60 Hz.

Ans A). 300 B). 200 C). 600 D). 400

Correct Answer: B

Q.11 In a transformer, the core loss is found to be 52 W at 40 Hz and 90 W at 60 Hz, measured at same peak flux density. Compute the eddy current loss at 50 Hz.

Ans A). 45 W B). 35 W C). 55 W D). 25 W

Correct Answer: D

Q.12 If an electrical device consumes 50 watts of power for 10 minutes, what is the total electrical energy consumed by the device?

Ans A). 30,000 J B). 10,000 J C). 2500 J D). 3,60,000 J

Correct Answer: A

Q.13 Under no-load conditions, if the frequency of the AC supply is decreased while maintaining a constant magnetic flux in a single-phase transformer, what is the anticipated impact on the induced voltage in the secondary winding?

Ans A). The induced voltage undergoes a linear increase.
B). The induced voltage experiences a linear decrease. C). The induced voltage remains constant.
D). The induced voltage demonstrates a sinusoidal variation.

Correct Answer: B

Q.14 **Explore the components and systems related to the thermal power plant. Assess the following statements and determine their correctness.**
Statements:
I. Ash handling plants (AHPs) remove ash from furnace ash hoppers, convey it through mechanical, hydraulic, or pneumatic transport, and dispose of the stored ash.
II. The electrical thermal plant involves supplying medium voltage, low voltage, and direct current power to all loads in the power plant, covering aspects from power evacuation to switchyard control.

Ans A). Both Statements I and II together are correct B). Both Statements I and II together are incorrect C). Statement I alone is correct
D). Statements II is correct

Correct Answer: A

Q.15 Which of the following motors divides the full rotation into equal number of steps?

Ans A). Hysteresis motor B). Stepper motor C). Synchronous motor D). Universal motor

Correct Answer: B

Q.16 Which of the following is the correct sequence of layers from the outermost to the innermost in underground cables?

Ans A). Metallic sheath → Bedding → Armouring → Serving → Conductor

B). Bedding → Metallic sheath → Conductor → Serving → Armouring

C). Conductor → Metallic sheath → Bedding → Armouring → Serving

D). Serving → Armouring → Bedding → Metallic sheath → Conductor

Correct Answer: D

Q.17 **In the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below:**
Assertion (A):
Stepper motors are suitable for positioning applications where holding a position is essential, and they are generally less expensive.
Reason (R):
Servomotors are true feedback positioners with encoders, providing precise control over motion and speed.

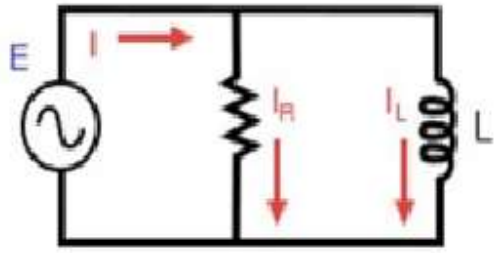
Ans A). Assertion is true, but Reason is false. B). Assertion is false, but Reason is true.

C). Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion.

D). Both Assertion and Reason are true, but Reason is not the correct explanation of the Assertion.

Correct Answer: D

Q.18 Which of the following equations is correct according to the given parallel circuit?



Ans A). $I = I_R / I_L$ B). $I = I_R + I_L$ C). $E = E_R + E_L$ D). $E = E_R / E_L$

Correct Answer: B

Q.19 The no-load primary input current lags the primary voltage by an angle _____.

Ans A). $\phi = 135°$ B). $\phi < 90°$ C). $\phi = 175°$ D). $\phi = 90°$

Correct Answer: B

Q.20 Select the correct pair of type of industrial heating and the way in which the heating is obtained.

Ans A). Resistance heating : Heating through dielectric losses

B). Infrared heating : Heating through heavy current in a highly resistive element

C). Induction heating : Heating through eddy currents

D). Dielectric heating : Heating through electromagnetic radiation

Correct Answer: C

Q.21 **What is the power consumption, in watts, of a ¼ HP motor, according to the provided information?**

Ans A). 186 watts B). 373 watts C). 932.85 watts D). 745.7 watts

Correct Answer: A

Q.22 **Match the Following:**
Function: Devices:
1. Producing Electron beam A. Trigger circuit
2. Deflected beam appear B. Fluorescent screen.
3. Synchronising the deflection of electron beam C. Electron gun
4. Generate different type of wave D. Function generator.

Ans A). 1-A, 2-B, 3-C, 4-D B). 1-C, 2-A, 3-D, 4-B C). 1- C, 2- B, 3- A, 4-D D). 1-B, 2-C, 3-D, 4-A

Correct Answer: C

Q.23 **Under what conditions does an alternator exhibit a zero-voltage regulation?**

Ans A). At a certain leading power factor B). At lower leading power factors C). At unity power factor D). At lagging power factor

Correct Answer: A

Q.24 Which of the given options best describes the truthfulness of the following statements with reference to mechanical draught and natural draught in a thermal power plant?

P: Mechanical draught is independent of atmospheric temperature.
Q: In case of natural draught, the chimney height is more.

Ans A). P: True, Q: False B). P: True, Q: True C). P: False, Q: True D). P: False, Q: False

Correct Answer: B

Q.25 Select the option that is true regarding the following two statements labelled Assertion (A) and Reason (R).

(A): Open tenders are invited by public advertisement.

(R): Any contractor who is willing to undertake the work and who has the requisite finance and equipment to complete the work satisfactorily is allowed to submit the offer.

Ans A). Statement A is true and statement B is false.

B). Statements A and R are true, but R is not the correct explanation of A.

C). Statements A and R are true and R is the correct explanation of A.

D). Statements A and R both are false.

Correct Answer: C

Q.26 **Choose the correct pair of bridge with its application:**

Ans A). Wheatstone bridge: Very low resistance B). Loss of charge method: High Q-coil C). Kelvin double bridge: high resistance
D). Corey Foster's bridge: Medium resistance

Correct Answer: D

Q.27 Which of the following is the correct classification of distribution systems according to the nature of the current?

Ans A). AC and DC distribution systems B). Overhead and underground systems

C). Radial, ring mains and interconnected systems D). Open and insulated conductor systems

Correct Answer: A

Q.28 **Which statement is incorrect for Tender?**

Ans A). Price and quality are the components in Tender. B). Find out the best price. C). Large scope.
D). Doesn't Response for request for tender.

Correct Answer: D

Q.29 Select the option that is true regarding the following two statements labelled Assertion (A) and Reason (R).

(A): In a synchronous generator phasor diagram, the armature current (Ia) is in phase with the excitation voltage (E_f), and the excitation voltage leads to the terminal voltage (V_t).

(R): When a synchronous generator operates in generating mode, the armature current is in phase with the excitation voltage, and the excitation voltage leads to the terminal voltage.

Ans A). A is true, but R is false. B). A is false, but R is true.

C). Both A and R are true and R is the correct explanation of A.

D). Both A and R are true, but R is not the correct explanation of A.

Correct Answer: C

Q.30 In a resistance start motor, the pull-out torque is about 2.5 times the full load torque at about _____ of synchronous speed.

Ans A). 100% B). 50% C). 25% D). 75%

Correct Answer: D

Q.31 In an indirect arc furnace, the heat is transmitted from the arc to the top layer of the charge by _____ and it operates at a power factor of _____.

Ans A). convection; 0.85 lagging B). conduction; 0.8 leading C). radiation; 0.7 leading

D). radiation; 0.85 lagging

Correct Answer: D

Q.32 Which of the following is a correct pair of LC oscillators?

Ans A). Wien bridge oscillator and Phase-shift oscillator

B). Colpitts oscillator and Hartley oscillator C). Crystal oscillator and Phase-shift oscillator

D). Wien bridge oscillator and Colpitts oscillator

Correct Answer: B

Q.33 Match the different types of lamps with their relative luminous efficiencies.

(i) Sodium vapour lamp	(a) medium
(ii) Fluorescent lamp	(b) very high
(iii) Tungsten filament lamp	(c) low
(iv) Carbon filament lamp	(d) high

Ans A). (i)-(b), (ii)-(a), (iii)-(d), (iv)-(c) B). (i)-(b), (ii)-(d), (iii)-(a), (iv)-(c)

C). (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a) D). (i)-(d), (ii)-(c), (iii)-(b), (iv)-(a)

Correct Answer: B

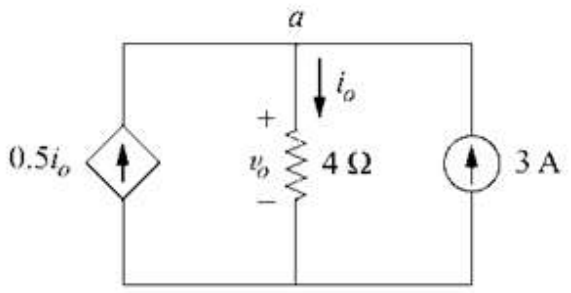
Q.34 In a network with multiple resistors, if the delta-star transformation is applied, what is the equivalent delta resistance for a star-connected set of resistors R1=6 Ω, R2=10 Ω, and R3=15Ω?

Ans A). R12 = 40 Ω, R13 = 20 Ω, R23 = 50 Ω B). R12 = 20 Ω, R13 = 30 Ω, R23 = 50 Ω C). R12 = 30 Ω, R13 = 20 Ω, R23 = 40 Ω

D). R12 = 50 Ω, R13 = 30 Ω, R23 = 40 Ω

Correct Answer: B

Q.35 Find the voltage 'v_o' in the following circuit.



Ans A). 16 V B). 20 V C). 12 V D). 24 V **Correct Answer: D**

Q.36 A 240-V DC shunt motor has an armature resistance of 0.25 Ω and runs at 1000 RPM, taking an armature current of 40 A. It is desired to reduce to speed to 800 RPM. If the armature current remains the same, find the additional resistance to be connected in series with the armature circuit.

Ans A). 1.25 Ω B). 1.75 Ω C). 1.15 Ω D). 1.65 Ω **Correct Answer: C**

Q.37 Which of the following is a passive electronic component?

Ans A). Transistor B). Operational amplifier C). Capacitor D). Photo diode **Correct Answer: C**

Q.38 Which of the given options best describes the truthfulness of the following statements with reference to the properties of the magnetic circuits?

P: Permeance is the opposition offered to the magnetic flux by the magnetic path.

Q: Magnetic lines of force cannot pass through air.

Ans A). Both P and Q are true B). P is true, but Q is false C). P is false, but Q is true D). Both P and Q are false **Correct Answer: D**

Q.39 Select the option that is true regarding the following two statements labelled Assertion (A) and Reason (R).

(A): Synchronous motors can be used to improve the voltage regulation of the transmission lines.

(R): Synchronous motors are well suited where constant speed is required.

Ans A). Statement A is true, but statement R is false. B). Both statements A and R are false. C). Statements A and R are true and R is the correct explanation of A. D). Statements A and R are true, but R is not the correct explanation of A. **Correct Answer: D**

Q.40 Calculate the power dissipated in the Zener diode in following circuit.

Ans A). 0.22 W B). 0.44 W C). 0.66 W D). 0.88 W **Correct Answer: C**

Q.41 The coils of a DC motor starter are wound with wire of Manganin because of the _____ temperature coefficient of resistance and _____ thermoelectric EMF, respectively.

Ans A). high, high B). high, low C). low, low D). low, high **Correct Answer: C**

Q.42 In ring main distribution system, each distribution transformer is fed with _____ feeder / feeders.

Ans A). three B). four C). two D). only one **Correct Answer: C**

Q.43 **Which of the following statements about the torque vs. armature current (Ta-Ia) characteristic of DC series motors is correct?**

Ans A). In DC series motors, torque varies inversely with armature current after magnetic saturation.

B). After magnetic saturation, the Ta-Ia curve becomes a parabola.

C). The Ta-Ia curve is a parabola for smaller values of armature current before magnetic saturation.

D). The shaft torque (Tsh) is greater than armature torque (Ta) due to stray losses.

Correct Answer: C

Q.44 In a 3-wire DC system, in order to maintain voltages on the two sides of the neutral equal to each other, a/an _____ is used.

Ans A). booster B). amplifier C). balancer set D). diverter **Correct Answer: C**

Q.45 Which of the following statements is INCORRECT?

Ans A). Commercial installations are cheaper and easier to maintain.

B). Commercial properties typically require a three-phase electrical supply to meet higher power demands.

C). Commercial electrical systems operate at higher voltage levels.

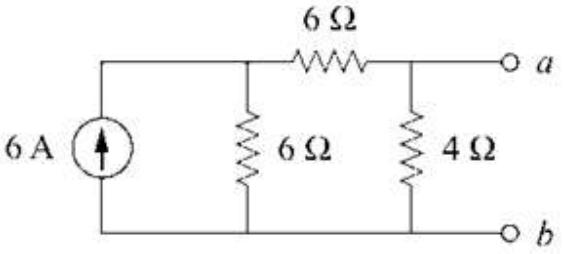
D). Commercial setups often utilise conduit-based wiring methods for easier maintenance.

Correct Answer: A

Q.46 **Match the Following:**
Terms:
1. Norton's Theorem
2. Thevenin's Theorem
3. Delta-Star Transformation
4. Maximum Power Transfer Theorem
Definitions:
a) Simplifies a network to an equivalent circuit consisting of a current source and a parallel resistance.
b) Simplifies a network to an equivalent circuit consisting of a voltage source and a series resistance.
c) Converts a delta-connected set of resistors to an equivalent star-connected configuration.
d) Determines the condition for maximum power transfer to a load resistor in a circuit.

Ans A). 1-a, 2-b, 3-c, 4-d B). 1-b, 2-a, 3-d, 4-c C). 1-d, 2-c, 3-b, 4-a D). 1-c, 2-d, 3-a, 4-b **Correct Answer: A**

Q.47 Find the Norton's equivalent of the following circuit.



Ans A). $I_N = 3\ A, R_N = 3\ \Omega$ B). $I_N = 6\ A, R_N = 12\ \Omega$ C). $I_N = 6\ A, R_N = 3\ \Omega$

D). $I_N = 3\ A, R_N = 12\ \Omega$ **Correct Answer: A**

Q.48 **What component, integral to electrostatics, is designed to accumulate and discharge electrical energy by utilizing the electric field between two conductive plates?**

Ans A). Capacitors B). Inductors C). Transformers D). Resistors **Correct Answer: C**

Q.49 Which of the following is NOT a valid disadvantage of shaded-pole type single-phase induction motor?

Ans A). High losses B). Low starting torque C). Low power factor D). High cost **Correct Answer: D**

Q.50 **What is the term used to describe the combination of a transmission line's resistance, inductance, and capacitance, influencing the voltage drop along the line and its ability to transfer power efficiently?**

Ans A). Line Configuration B). Line Losses C). Voltage Level D). Line Impedance

Correct Answer: D

Q.51 **Match the following terms with their correct formula in the context of work (W), power(P), and (E)energy:**
Terms: Definitions:
1. Electrical Energy Formula a) V*I watts
2. Electrical Power formula b) I^2 R*t
3. Basic Units of Electrical Energy c) Joule
4. Basic units of Electrical Power d) Joule/Sec

Ans A). 1-b, 2-a, 3-c, 4-d B). 1-d, 2-b, 3-c, 4-a C). 1-c, 2-a, 3-d, 4-b D). 1-b, 2-d, 3-a, 4-c

Correct Answer: A

Q.52 Two long parallel conductors, each one carrying current 100 A, flowing in the same direction, are separated by 1 cm in air. Find the force per metre length of the conductor.

Ans A). 2.0 N/m attractive force B). 0.2 N/m repulsive force C). 2.0 N/m repulsive force

D). 0.2 N/m attractive force

Correct Answer: D

Q.53 How do electrical connections differ in wiring diagrams compared to schematic diagrams?

An A).
s Wiring diagrams emphasise the flow of the system and power output, while schematic diagrams show the connections between devices.

B).
Wiring diagrams represent the logical working of a circuit, while schematic diagrams focus on the actual wiring connections.

C).
Wiring diagrams use abstract symbols for connections, while schematic diagrams represent the physical wiring.

D).
Wiring diagrams use lines to represent the wiring, while schematic diagrams use simplified shapes for connections.

Correct Answer: D

Q.54 **Explore the characteristics of outdoor cables and their suitability for different conditions. Assess the following statements and determine their correctness.**
Statements:
I. Outdoor cables are designed to be buried underground and can withstand exposure to harsh elements.
II. Underground Burial Cables, with water-blocking fillers or polymer gel, ensure long-term resistance to water infiltration into the core.

Ans A). Both Statements I and II together are correct B). Both Statements I and II together are incorrect C). Statement I alone is correct

D). Statements II alone is correct

Correct Answer: B

Q.55 Which of the following statements is INCORRECT for the superposition theorem?

Ans A). It is applicable to linear circuits. B). It is applicable to bilateral circuits.

C). It is applicable if the circuit involves nonlinear elements such as diodes

D). It is used to find voltages and currents.

Correct Answer: C

Q.56 Which of the following statements are correct?

P: Biomass energy or fuel cannot be stored and distributed.

Q: The emissions from biomass energy generation can potentially pollute the environment.

R: Biomass power plants that use pyrolysis are more efficient than direct combustion power plants.

Ans A). Only statements P and R are correct. B). Only statements Q and R are correct.

C). Statements P, Q and R – all are correct. D). Only statements P and Q are correct. **Correct Answer: B**

Q.57 Determine the total charge transferred over the time interval of $0 \leq t \leq 10$ s, when the current is given as $i(t) = 0.5\,t$ A.

Ans A). 50 C B). 25 C C). 5 C D). 10 C **Correct Answer: B**

Q.58 Which of the following pairs correctly defines the term in definition?

Ans A). Resultant Vector: The angular separation between two sinusoidal waveforms with the same frequency.

B). Vector Subtraction: A single vector that represents the sum or difference of two or more vectors.

C). Phase Difference: The representation of the complex amplitude and phase angle of a sinusoidal waveform or time-varying quantity.

D). Phasor Subtraction: The process of finding the vector difference between two phasors in a phasor diagram. **Correct Answer: D**

Q.59 An overhead transmission line is supported by supports at equal levels. Assuming the weight per unit length and tension in the conductor constant, if the length of the conductor span is _____, then the sag will decrease by 25%.

Ans A). increased by 25% B). reduced by 50% C). reduced by 25% D). increased by 50%

Correct Answer: B

Q.60 Which of the following application of CRO is incorrect?

Ans A). Measure the voltage, current, frequency, inductance, admittance, resistance and power factor.

B). Monitor the signal properties as well as characteristics C). Generate the different type of electrical signals D). Control the analog signals

Correct Answer: C

Q.61 What will be the main consideration in quotation of any electrical installation?

Ans A). Designing of component B). Quality of component C). Type of bid D). Pricing of component **Correct Answer: D**

Q.62 A single-stack, eight-phase, multipole stepper motor has six rotor teeth. The phases are excited one at a time. Determine the number of steps per revolution.

Ans A). 48 B). 40 C). 32 D). 24 **Correct Answer: D**

Q.63 With reference to the shaded pole induction motor, state true/false for the following statements.

P: The shaded pole motor rotates in only one direction.

Q: In the shaded pole motor, the copper ring acts as a secondary winding for the motor.

Ans A). Statements P and Q both are true. B). Statement P is false and statement Q is true.

C). Statement P is true and statement Q is false. D). Statements P and Q both are false.

Correct Answer: A

Q.64 In a series RL circuit, the phase difference between the voltage and current will ____.

Ans A). always be 90° B). be between 90° and 180° C). always be 0° D). be between 0° and 90°

Correct Answer: D

Q.65 Which of the following is the most important factor governing the selection of an electric motor in electives among the following options?

Ans A). Appearance of the motor

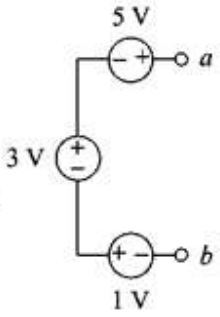
B). Maintenance cost of the motor

C). Torque-speed characteristics of the motor

D). Ambient temperature of the place where the motor is mounted

Correct Answer: C

Q.66 Find the voltage 'V_{ab}' between terminals 'a' and 'b' in the following figure.



Ans A). 9 V B). 1 V C). 3 V D). 7 V

Correct Answer: A

Q.67 Which statement accurately describes the working principle of single-phase motors?

Ans A). Single-phase motors do not require any auxiliary influence for initial movement of the rotor

B). The magnetic field produced by a single-phase motor "pulsates" between 2 motor poles, requiring an initial force for rotor movement.

C). Single-phase motors produce a true rotating magnetic field with 120 degrees of phase separation.

D). The stationary rotor in a single-phase motor experiences a continuous and smooth rotating magnetic field.

Correct Answer: B

Q.68 The magnetic force per unit length between two parallel current carrying conductors is _____.

Ans A). directly proportional to the distance between the conductors

B). inversely proportional to the current flowing through the conductors

C). directly proportional to the square of the distance between the conductors

D). inversely proportional to the distance between the conductors

Correct Answer: D

Q.69 What is the significance of Rule 29 in the Indian Electricity Rules, 2005, regarding electrical installations?

Ans A). It defines the safety measures for the installation, protection, and maintenance of electrical systems.

B). It specifies the requirements for planning electrical circuits.

C). It details the guidelines for the Bureau of Indian Standards related to electrical engineering.?

D). It outlines the regulations for estimating and costing in electrical projects.

Correct Answer: A

Q.70 Which of the following is NOT a diamagnetic material?

Ans A). Bismuth B). Lead C). Silicon D). Iron

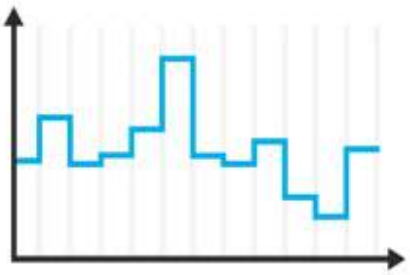
Correct Answer: D

Q.71 In a complex electrical network, applying Norton's Theorem involves finding the Norton current and Norton equivalent resistance. What is the Norton equivalent resistance for a network with resistances R1=8Ω and R2=12Ω in parallel?

Ans A). 20 Ω B). 2.4 Ω C). 12.6 Ω D). 4.8 Ω

Correct Answer: D

Q.72 What type of electrical signal is shown in the given figure?



Ans A). Sinusoidal Signal B). Pulse Signal C). Digital Signal D). Analog Signal

Correct Answer: C

Q.73 **Choose the correct pair of transformer type with correct application?**

Ans A). Power transformer: Lanes for domestic purposes B). Instrument Transformer: Measuring voltage, current

C). Protection Transformer: Generation stations D). Distribution Transformer: Component protection.

Correct Answer: B

Q.74 **What is the mathematical representation of solid angle (ω) in terms of area (A) and radius (r)?**

Ans A). $\omega=r/A^2$ B). $\omega=A/r^2$ C). $\omega=A\,r^2/2$ D). $\omega=A/r$

Correct Answer: B

Q.75 In a Cathode Ray Tube (CRT) used for frequency comparison, how are the electrons deflected to compare frequencies?

Ans A). Both on the horizontal and vertical axes.

B). Along the vertical axis, but not on the horizontal axis.

C). Along the horizontal axis, but not on the vertical axis.

D). Alternating between the horizontal and the vertical axes.

Correct Answer: C

Q.76 Which of the following is NOT a valid advantage of capacitor-start capacitor-run motor?

Ans A). High efficiency B). High starting torque C). High power factor D). Low cost

Correct Answer: D

Q.77 In an AC current carrying conductor, the skin effect _____ with the increase in diameter of the conductor and _____ with the increase in frequency.

Ans A). decreases, increases B). increases, decreases C). increases, increases

D). decreases, decreases

Correct Answer: C

Q.78 Which of the given options best describes the truthfulness of the following statements?

P: Within the solenoid, the field lines are in the form of parallel straight lines.

Q: The field within the solenoid is uniform.

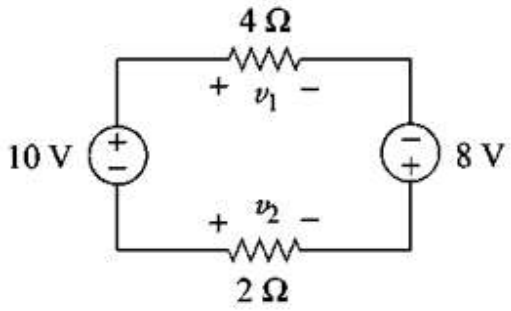
R: Both ends of the solenoid act as magnetic north poles.

Ans A). Only statements P and Q are correct B). Only statements P and R are correct

C). Statements P, Q and R – all are correct D). Only statements Q and R are correct

Correct Answer: A

Q.79 Find the voltage 'v_1' in the following circuit.



Ans A). 12 V B). 6 V C). −6 V D). −12 V

Correct Answer: A

Q.80 The frequency of the sinusoidal voltage expressed as $v(t) = 50 \sin 80\pi t$ is _____.

Ans A). 60 Hz B). 40 Hz C). 80 Hz D). 20 Hz

Correct Answer: B

Q.81 Which of the following is a VALID disadvantage of single bus bar system?

Ans A). High fault current B). High maintenance C). Complex operation D). High cost

Correct Answer: A

Q.82 A 12-pole alternator running at a speed of 600 rpm will produce a frequency of _____.

Ans A). 60 Hz B). 30 Hz C). 50 Hz D). 40 Hz

Correct Answer: A

Q.83 If the maximum demand on the plant is equal to the plant capacity, then the reserve capacity of the plant will be _____.

Ans A). zero B). twice the maximum demand C). half of the maximum demand D). same as the maximum demand

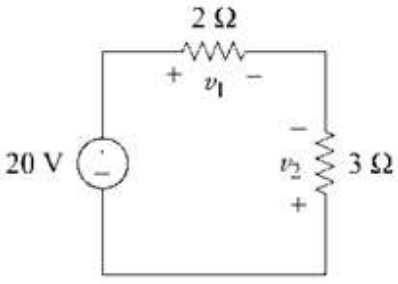
Correct Answer: A

Q.84 Determine the energy stored by a 2 H inductor, when the current flowing through it is 4 A.

Ans A). 16 J B). 32 J C). 4 J D). 8 J

Correct Answer: A

Q.85 Find the voltage 'v_1' in the following circuit.



Ans A). 12 V B). − 12 V C). − 8 V D). 8 V

Correct Answer: D

Q.86 Which of the following oscillators is generally considered a fixed frequency oscillator?

Ans A). Phase-shift oscillator B). Hartley oscillator C). Crystal oscillator D). Wien-bridge oscillator

Correct Answer: C

Q.87 In a cathode-ray tube, the focusing anode is positioned between the _____.

Ans A). pre-accelerating anode and accelerating anode B). control grid and pre-accelerating anode

C). accelerating anode and vertical deflection plates D). horizontal and vertical deflection plates

Correct Answer: A

Q.88 **What type of component in an electrical circuit has to be used to deliver power or process electrical signals?**

Ans A). Unilateral component B). Linear component C). Passive component D). Active component

Correct Answer: D

Q.89 **What is the primary difference between Avalanche breakdown and Zener breakdown in a p-n junction diode?**

Ans A). Avalanche breakdown is a controlled version of Zener breakdown.

B). Avalanche breakdown is irreversible, while Zener breakdown is reversible.

C). Zener breakdown is irreversible, while Avalanche breakdown is reversible D). Both breakdowns occur due to the rapid collision of electrons

Correct Answer: B

Q.90 A potential barrier of 0.7 V exists across a PN-junction. Calculate the intensity of the electric fiend in the depletion region, if the width of the depletion region is (3.5×10^{-7}) m.

Ans A). (0.2×10^{6}) V/m B). (0.2×10^{4}) V/m C). (2×10^{6}) V/m D). (2×10^{4}) V/m

Correct Answer: C

Q.91 In a parallel RL circuit, the inductive susceptance is given by _____.

Ans A). $B = 2\omega L$ B). $B = \frac{1}{\omega L}$ C). $B = \omega L$ D). $B = \frac{L}{\omega}$

Correct Answer: B

Q.92 With reference to the methods of determination of voltage regulation of smooth cylindrical rotor type alternators, which of the following methods is known as zero-power factor method?

Ans A). Potier method B). Synchronous impedance method C). Direct loading method

D). Ampere-turn method

Correct Answer: A

Q.93 For a series RLC circuit, at resonance the _____.

Ans A). impedance is maximum B). current is maximum C). current is minimum

D). power factor is zero

Correct Answer: B

Q.94 **Assertion (A): Fixed charges in power generation remain constant regardless of the plant's capacity or operation.**
Reason (R): Semi-fixed charges are dependent on the installed capacity of the plant and include costs like interest, depreciation, taxes, and insurance premiums.

Ans A). Assertion is false, but Reason is true. B). Assertion is true, but Reason is false.

C). Both Assertion and Reason are true, but Reason is not the correct explanation of the Assertion

D). Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion.

Correct Answer: C

Q.95 The impedance of a series RL circuit is 130 Ω. If the inductive reactance (X_L) in the circuit is 50 Ω, find the value of the resistance.

Ans A). 120 Ω B). 180 Ω C). 80 Ω D). 90 Ω

Correct Answer: A

Q.96 **Which of the following statements is correct regarding the classification of transmission and distribution lines?**

Ans A). Transmission lines carry electricity over long distances at high voltages, while distribution lines deliver electricity to end-users at lower voltages

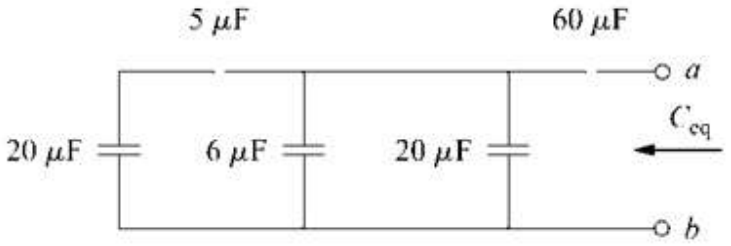
B). Both transmission and distribution lines operate at identical voltages, differing only in the type of conductor material used.

C). Transmission lines and distribution lines serve the same purpose and are interchangeable in the electrical grid.

D). Transmission lines are designed for short-distance electricity transfer, while distribution lines are specialized for long-distance power transmission.

Correct Answer: A

Q.97 Find the equivalent capacitance 'C_{eq}' in the following circuit.



Ans A). 20 μF B). 35 μF C). 30 μF D). 25 μF **Correct Answer: A**

Q.98 Which of the following is called the mechanical characteristic of a DC motor?

Ans A). Speed vs. Armature current characteristic B). Torque vs. Armature current characteristic

C). Speed vs. Torque characteristic D). Armature voltage vs. Armature current characteristic

Correct Answer: C

Q.99 A synchronous motor is said to be over-excited when:

Ans A). back EMF is less than the applied voltage

B). back EMF is greater than the applied voltage C). back EMF is zero

D). back EMF is equal to the applied voltage **Correct Answer: B**

Q.100 With reference to DC arc welding, which of the following statements is INCORRECT?

Ans A). The arc is stable. B). It is costlier than AC arc welding.

C). It cannot be used for nonferrous metals. D). The operation is noisy. **Correct Answer: C**