



RRB ALP 2025 CBT 2

Assistant Loco Pilot · CEN 01/2025 · CBT 2 · Electrician Trade · Part B (Electrician) · Question Paper

English

All 2 Shifts (Sets) · Part B (Electrician) Section · Official Answer Key

About this Compilation

This booklet contains all 2 shift papers of the RRB ALP 2025 CBT 2 (Electrician) examination in English (Part B (Electrician) section only), with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear section by section in the order of the paper, numbered 1 onward.
- Diagram and wide-table questions appear at full width at the end of their section.
- The correct answer is highlighted in green with a tick.

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Index — All Sets (click to open)

Set 1

28 Jul 2026

9:30 AM - 12:00 PM

Set 2

28 Jul 2026

2:30 PM - 5:00 PM

Part B (Electrician)

75 Questions • Answer Key

Q1 Part B (Electrician)

Which of the following best describes the function of an intermediate switch in a staircase lighting circuit?

- A. Controls two separate lights from one point
- B. Allows light control from three or more locations ✓
- C. Permits light control from only one location
- D. Used only for temporary bell circuits

Q2 Part B (Electrician)

Why are circuit breakers used at both the sending and receiving ends of a transmission line?

- A. To increase the power factor of the line
- B. To balance the electrical load evenly
- C. To measure line current accurately
- D. To isolate faulty sections during emergencies ✓

Q3 Part B (Electrician)

An industrial plant wants to replace its current lighting system to reduce energy costs while maintaining the same light output. Which factor should be prioritized when selecting new lamps for maximum efficiency and cost-effectiveness?

- A. Choosing lamps that produce a cooler color temperature
- B. Selecting lamps with a higher lumens per watt rating ✓
- C. Choosing lamps with the same physical size
- D. Selecting lamps with a longer warm-up time

Q4 Part B (Electrician)

A technician in a workshop misreads the third band of a resistor as Orange instead of its actual color, Yellow. If the first two bands are Red and Violet, what is the calculation error caused by this mistake?

- A. The value is calculated as 2.7 k Ω instead of 27 k Ω
- B. The value is calculated as 270 Ω instead of 2.7 k Ω
- C. The value is calculated as 27 k Ω instead of 270 k Ω ✓
- D. The value is calculated as 270 k Ω instead of 2.7 M Ω

Q5 Part B (Electrician)

During maintenance of a high-voltage AC power substation feeder, which operating sequence ensures safe isolation of load current while using an isolator and a circuit breaker?

- A. Close the earthing switch before opening the energized feeder circuit
- B. Operate the isolator first, followed by opening of the circuit breaker
- C. Operate the isolator and circuit breaker under loaded conditions simultaneously
- D. Open the circuit breaker first, followed by operation of the isolator ✓

Q6 Part B (Electrician)

Which material can undergo large deformation and return to its original shape?

- A. Glass
- B. Rubber ✓
- C. Clay
- D. Chalk

Q7 Part B (Electrician)

A DC generator uses wave winding with 16 coils and 4 poles. What will be the number of parallel paths?

- A. There will be sixteen parallel paths equal to the number of coils.
- B. There will be two parallel paths regardless of coil and pole number. ✓
- C. There will be four parallel paths equal to the number of poles.
- D. The number of parallel paths depends on the number of turns in a coil.

Q8 Part B (Electrician)

When selecting insulated screwdrivers for use in electrical maintenance, which specification should be prioritized to ensure safe operation in high-voltage environments?

- A. The handle length appropriate for accessing electrical equipment safely.
- B. The maximum torque that can be applied without blade deformation.
- C. The tool's rated voltage insulation capacity. ✓
- D. The wear resistance of the screwdriver tip during repeated use.



Q9 Part B (Electrician)

Why is backup power supply important for the continuous functioning of a smart meter during outages?

- A. It provides electricity to the house during outage
- B. It reduces power consumption of appliances
- C. It ensures meter records and transmits data even without main power ✓
- D. It increases meter reading speed

Q10 Part B (Electrician)

Why must an underground cable be protected with bedding, armouring, and serving layers?

- A. To increase the electrical conductivity
- B. To improve the insulation of the cable
- C. To improve the mechanical protection of cable ✓
- D. To reduce the conductor area and thus resistance

Q11 Part B (Electrician)

In the context of DC machines, why is the commutator essential for proper functioning?

- A. It reverses current direction in the coil. ✓
- B. It supplies voltage to the field winding.
- C. It controls the speed of rotation.
- D. It increases field winding strength.

Q12 Part B (Electrician)

Which method evaluates compliance with IEE regulations for earthing systems in a newly installed industrial facility?

- A. Performing visual inspection of all earthing conductors
- B. Conducting an earth loop impedance test and verifying earth electrode resistance ✓
- C. Checking wire color codes and connection labels
- D. Reviewing installation records and certification documents

Q13 Part B (Electrician)

What is the main function of a penstock in hydel power generation?

- A. To store water for later use
- B. To regulate the voltage produced by the generator
- C. To carry water to the turbines through open or closed conduits ✓
- D. To store electrical energy generated by the turbine

Q14 Part B (Electrician)

During charging using the constant potential method, what happens to the charging current as the battery approaches full charge?

- A. The charging current decreases gradually ✓
- B. The charging current increases steadily
- C. The charging current fluctuates randomly
- D. The charging current stays constant

Q15 Part B (Electrician)

In a double layer winding, an AC machine has 54 slots and 6 poles. Find the pole pitch in terms of slots.

- A. 9 slots ✓
- B. 8 slots
- C. 6 slots
- D. 7 slots

Q16 Part B (Electrician)

A silicon crystal is doped with phosphorus impurity. After doping, which of the following statement correctly describes the charge carriers?

- A. Phosphorus contributes one hole per atom to the crystal
- B. Both electrons and holes exist in equal numbers
- C. Electrons are majority carriers and holes are minority carriers ✓
- D. Holes are majority carriers and electrons are minority carriers

Q17 Part B (Electrician)

Which statement best describes the significance of derating factors when calculating current ratings for cables installed in conduits?

- A. Derating factors are used for cable length calculation only
- B. Derating factors increase cable current ratings for safety
- C. Derating factors only depend on cable colour
- D. Derating factors adjust current ratings due to installation conditions ✓



Q18 Part B (Electrician)

Why is preventive maintenance carried out on AC motors in industrial applications?

- A. To reduce bearing wear losses
- B. To change winding polarity
- C. To avoid unexpected motor failure ✓
- D. To reduce initial set up cost

Q19 Part B (Electrician)

Which component is essential for converting electrical energy into heat in an electric iron?

- A. Heating element ✓
- B. Plug
- C. Thermostat
- D. Outer casing

Q20 Part B (Electrician)

What is the name of the side opposite to the 90° angle in a right-angled triangle?

- A. Perpendicular
- B. Hypotenuse ✓
- C. Adjacent side
- D. Base

Q21 Part B (Electrician)

A 6-pole alternator generates 50 Hz frequency. Its rotor speed is:

- A. 1000 RPM ✓
- B. 1500 RPM
- C. 500 RPM
- D. 750 RPM

Q22 Part B (Electrician)

Which type of instrument is NOT used for measuring alternating current in a circuit?

- A. Moving coil instrument ✓
- B. Hot wire instrument
- C. Moving iron instrument
- D. Electrostatic instrument

Q23 Part B (Electrician)

The external characteristic of a DC generator shows relation between _____.

- A. EMF and speed
- B. Terminal voltage and load current ✓
- C. Torque and speed
- D. Flux and current

Q24 Part B (Electrician)

A voltage stabilizer disconnects the output circuit when the input voltage becomes:

- A. Normal only
- B. Slightly fluctuating only
- C. Very low or very high ✓
- D. Exactly equal to rated voltage

Q25 Part B (Electrician)

Why is cutting fluid used during metal drilling operations?

- A. To cool and lubricate the cutting area ✓
- B. To hold the workpiece in position
- C. To sharpen the tip of the drill bit
- D. To provide power to the machine spindle

Q26 Part B (Electrician)

In a DC machine, which quantity is directly proportional to the torque produced for a given armature current?

- A. The frequency
- B. The voltage
- C. The resistance
- D. The magnetic flux ✓

Q27 Part B (Electrician)

Which type of cell can be recharged by sending an electric current in the reverse direction compared to discharge mode?

- A. Secondary cell ✓
- B. Fuel cell
- C. Primary cell
- D. Dry cell



Q28 Part B (Electrician)

Calculate the diversity factor for a distribution network having 3 loads with 350 kW, 100 kW and 250 kW as their maximum demands. The maximum simultaneous demand for the network is recorded as 400 kW.

A. 1.20

B. 1.75 ✓

C. 1.43

D. 1.00

Q29 Part B (Electrician)

Which procedure should be followed to safely resume operations after a power failure in an industrial environment?

A. Wait for a fixed period and resume operations using normal procedures

B. Turn on all machines immediately after power returns

C. Check electrical wiring and restore production after maintenance approval

D. Inspect all machines for safe status before restarting operations ✓

Q30 Part B (Electrician)

What is the function of a single-phase transformer?

A. To store electrical energy

B. To change the output power level

C. To change the level of AC voltage ✓

D. To convert AC into DC

Q31 Part B (Electrician)

In a universal motor, field winding and armature are connected in:

A. Star Arrangement

B. Parallel Arrangement

C. Series Arrangement ✓

D. Delta Arrangement

Q32 Part B (Electrician)

Which of the following is a disadvantage associated with incandescent lamps used in illumination?

A. Cool operation compared to other lamp types

B. High energy consumption compared to other lamp types ✓

C. Long lifespan compared to other lamp types

D. Low replacement frequency compared to other lamp types

Q33 Part B (Electrician)

A technician tests a PN junction diode with an ohmmeter. The meter shows a very low resistance in both the forward and reverse directions. What does this indicate?

A. The diode is open circuited

B. The diode is functioning properly

C. The diode has high forward resistance

D. The diode is short circuited ✓

Q34 Part B (Electrician)

When operating a portable fire extinguisher in an industrial setting, what is the correct sequence of actions to effectively control a small electrical fire?

A. Pull the pin, aim at the base, squeeze the handle, sweep side to side ✓

B. Squeeze the handle, sweep at the top, pull the pin, aim upward

C. Aim at the flames, squeeze the handle, pull the pin, sweep randomly

D. Sweep at the flames, pull the pin, squeeze the handle, aim at the smoke

Q35 Part B (Electrician)

Which term describes the total magnetic field lines passing through a specific cross-sectional area in a magnetic circuit?

A. Magnetic reluctance

B. Magnetic flux ✓

C. Magnetomotive force

D. Magnetic field strength

Q36 Part B (Electrician)

Which practice helps produce a strong soldered joint in electrical wiring?

A. Applying solder directly to a cold joint

B. Moving the joint while the solder cools

C. Using excess solder to cover an unclean surface

D. Heating both the wire and terminal before applying solder ✓



Q37 Part B (Electrician)

When extending the voltage range of a moving coil voltmeter, which component is essential and how should it be connected?

- A. A variable resistor connected across the supply
- B. A high-value resistor connected in series with the meter ✓
- C. A low-value resistor connected in parallel with the meter
- D. A fuse connected in parallel with the meter

Q38 Part B (Electrician)

What is the safety guideline for using a high rate discharge tester on a battery?

- A. It can be used on charged batteries for any amount of time.
- B. It can be used on any battery for any duration.
- C. It should be used only on charged batteries and for less than ten seconds. ✓
- D. It should be used only on discharged batteries for short time.

Q39 Part B (Electrician)

In a detailed engineering drawing of electrical components for a control panel, which symbol would correctly represent a single pole single throw (SPST) switch, considering the need for clarity in circuit tracing?

- A. A push-button contact that automatically returns to its original position after release
- B. A pair of parallel contacts enclosed within a coil-operated switching device
- C. A rectangle with a diagonal line from corner to corner
- D. Two terminal dots connected by a movable contact that can open or close a single circuit path ✓

Q40 Part B (Electrician)

When interpreting an electrical circuit diagram, what does the symbol of a series of alternating long and short parallel lines typically represent?

- A. A lamp
- B. A capacitor
- C. A switch
- D. A battery ✓

Q41 Part B (Electrician)

Which of the following describes the function of an Earth Leakage Circuit Breaker (ELCB) in an electrical earthing system?

- A. It acts as a fuse during overcurrent conditions only.
- B. It monitors the voltage difference between neutral and earth.
- C. It disconnects the circuit when leakage current to earth exceeds a safe limit. ✓
- D. It limits the voltage supplied to electrical equipment.

Q42 Part B (Electrician)

In industrial power and control circuits, what is the function of a Normally Open (NO) push button during normal operating conditions?

- A. To complete the control circuit only during button actuation ✓
- B. To provide automatic overload protection during fault conditions
- C. To interrupt the control circuit only during button actuation
- D. To maintain continuous current flow without operator actuation

Q43 Part B (Electrician)

In a Zener diode voltage regulator circuit, the Zener diode operates in:

- A. Active region
- B. Reverse breakdown region ✓
- C. Forward bias region
- D. Zero bias

Q44 Part B (Electrician)

An electrician has to make a joint in an overhead bare conductor. The joint must not open under conductor tension. Which jointing method is most suitable?

- A. Simple twist joint with insulation tape
- B. Rat-tail joint covered with PVC sleeve
- C. Britannia joint with proper binding and soldering ✓
- D. Soldered lap joint without binding wire



Q45 Part B (Electrician)

A wooden plank 6 m long is cut into equal pieces of length $\frac{3}{4}$ m each. Find the number of complete pieces obtained.

- A. 7
- B. 8
- C. 6
- D. 9

Q46 Part B (Electrician)

A trainee measures the time period of an AC waveform on an oscilloscope as 2 ms. What is the frequency of the waveform?

- A. 500 Hz
- B. 50 Hz
- C. 1000 Hz
- D. 100 Hz

Q47 Part B (Electrician)

If a student is asked to represent a cylindrical object using free hand geometrical drawing, which combination of techniques will yield the most realistic result?

- A. Outline two parallel lines joined by smooth ellipses at both ends
- B. Combine rectangles and triangles for the main body
- C. Use several curved lines in various directions
- D. Draw two circles joined by straight lines for the sides

Q48 Part B (Electrician)

Which theorem is used along with trigonometry for solving right-angled triangle problems?

- A. Bernoulli theorem
- B. Pythagoras theorem
- C. Pascal's theorem
- D. Archimedes principle

Q49 Part B (Electrician)

Which among the following components ensures that the Uninterruptible Power Supply (UPS) can supply power to the equipment when the main supply fails?

- A. Battery
- B. Transformer
- C. Rectifier
- D. Inverter

Q50 Part B (Electrician)

In a three-phase alternator, the armature winding is placed on the:

- A. Stator
- B. Bearing
- C. Rotor
- D. Shaft

Q51 Part B (Electrician)

Which of the following electronic components is classified as a passive component?

- A. Diode
- B. Resistor
- C. Transistor
- D. Op-amp

Q52 Part B (Electrician)

In a distributed stator winding of an AC machine, what is the effect of increasing the number of slots per pole per phase on the generated emf waveform?

- A. emf waveform lags the current by 90 degrees
- B. emf waveform lags the torque
- C. emf magnitude increases
- D. emf waveform quality improves

Q53 Part B (Electrician)

What is the cause of circulating current flow in DC series generators, during parallel operation?

- A. Difference in generated EMF
- B. Difference in resistance
- C. Difference in load type
- D. Difference in speed

Q54 Part B (Electrician)

Which approach is most effective when representing the size of a cylindrical feature in a dimensioned sketch for manufacturing?

- A. Omitting the size and relying on scale measurements
- B. Marking the length without specifying diameter
- C. Indicating only the radius in the sketch
- D. Indicating the diameter with a leader line and symbol



Q55 Part B (Electrician)

A shop has a lighting load of 600W and a power socket load of 800W. If the diversity factor is 1.25, what is the maximum demand?

- A. 1020 W
- B. 1250 W
- C. 1400 W
- D. 1120 W

**Q56 Part B (Electrician)**

Identify which relay type is used to provide backup protection when the primary distance relay fails in a transmission system.

- A. Overcurrent relay
- B. Thermal relay
- C. Impedance relay
- D. Pilot relay

**Q57 Part B (Electrician)**

In a Variable Frequency Drive controlled induction motor, why is it essential to maintain a constant volts-to-hertz (V/Hz) ratio throughout the speed control range?

- A. To reduce supply frequency to zero
- B. To maintain constant magnetic flux
- C. To increase rotor resistance continuously
- D. To improve bearing lubrication condition

**Q58 Part B (Electrician)**

How does the capacitive reactance of a capacitor change if the frequency of the AC supply connected to it is doubled?

- A. It increases to four times its original value
- B. It decreases to half of its original value
- C. It increases to double its original value
- D. It remains completely unchanged

**Q59 Part B (Electrician)**

If an overhead pole is leaning just after installation, what should be checked first?

- A. Type of pole material used
- B. Color of the installed pole
- C. Weather conditions during installation
- D. Stability and compaction of the surrounding soil

**Q60 Part B (Electrician)**

Why is the Buchholz relay regarded as a sensitive protective device in oil-immersed transformers?

- A. It increases transformer efficiency automatically
- B. It responds to small internal faults at an early stage
- C. It controls transformer voltage ratio
- D. It prevents magnetic saturation

**Q61 Part B (Electrician)**

External resistance is connected to the rotor circuit of a 3-Phase slip ring induction motor to:

- A. Stop magnetic rotation
- B. Reduce supply voltage
- C. Increase starting torque
- D. Increase core losses

**Q62 Part B (Electrician)**

Which primary function do cable thimbles used in electrical panel wiring serve during terminal connection?

- A. They provide mechanical mounting support for terminal blocks
- B. They increase the continuous current carrying capability of conductors
- C. They prevent stranded conductor wires from fraying at terminal ends
- D. They regulate the operating voltage level of electrical circuits

**Q63 Part B (Electrician)**

Which characteristic makes the separately excited DC generator different from the self-excited DC generator?

- A. The method of field excitation
- B. The armature winding resistance
- C. The number of poles
- D. The speed of rotation

**Q64 Part B (Electrician)**

Which factors will be affected by changing field excitation of alternators operating in parallel?

- A. Power factor and reactive power output
- B. Rotor speed and generated frequency
- C. Armature resistance and copper losses
- D. Mechanical torque and shaft rotation



Q65 Part B (Electrician)

In an industrial facility, a sudden power failure occurs while critical machinery is operating. Which is the most effective first response to ensure worker safety and minimize equipment damage?

- A. Restart affected machinery quickly once electrical power becomes available
- B. Wait for power restoration and monitor equipment conditions from a distance
- C. Initiate emergency shutdown procedures according to the facility protocol ✓
- D. Evacuate the building immediately, ignoring shutdown protocols

Q66 Part B (Electrician)

What is the purpose of using a Variable Frequency Drive (VFD) in AC motor applications?

- A. Prevent motor overheating at low speeds.
- B. Eliminate harmonic distortion
- C. Provide high starting current
- D. Control AC motor speed ✓

Q67 Part B (Electrician)

To minimize the loading effect, which of the following voltmeters is used to measure the voltage across a resistor in a high-impedance circuit?

- A. A voltmeter with internal resistance equal to the resistor
- B. A voltmeter with very low internal resistance compared to the resistor
- C. A voltmeter with internal resistance slightly lower than the resistor
- D. A voltmeter with internal resistance much higher than the resistor being measured ✓

Q68 Part B (Electrician)

Which component is bypassed when an EV is charged using a supercharger?

- A. On-board rectifier ✓
- B. Alternator
- C. Transformer
- D. Inverter

Q69 Part B (Electrician)

Which condition is necessary for satisfactory load sharing in parallel transformers?

- A. Equal active power rating
- B. Equal tank size only
- C. Equal resistance to Impedance ratio
- D. Equal impedance percentage ✓

Q70 Part B (Electrician)

Which design characteristic in impulse turbines ensures that the pressure remains constant as steam passes over the moving blades?

- A. All expansion occurs in stationary nozzles ✓
- B. Expansion is divided between nozzles and blades
- C. Expansion occurs in moving blades
- D. Variable pressure over moving blades

Q71 Part B (Electrician)

While testing a logic gate IC on a workshop breadboard, a trainee observes that the output becomes HIGH when any input is switched to logic HIGH. Which logic gate is being verified?

- A. NAND gate
- B. AND gate
- C. OR gate ✓
- D. NOT gate

Q72 Part B (Electrician)

A laboratory needs to install a single-phase socket for a 2000 W heater. If the supply voltage is 250 V, which wire size should be chosen if 1.5 sq. mm wire is rated at 10 A and 2.5 sq. mm at 15 A?

- A. 1 sq. mm wire is sufficient for this load
- B. 2.5 sq. mm wire is required for this load
- C. 4 sq. mm wire is required for this load
- D. 1.5 sq. mm wire is sufficient for this load ✓



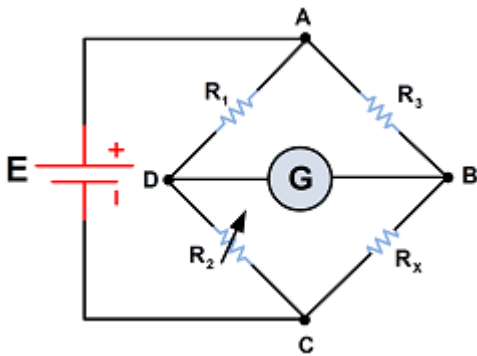
Q73 Part B (Electrician)

Which characteristic distinguishes electrical isolators from circuit breakers in high-voltage switchgear systems?

- A. Isolators lack arc-quenching mechanisms required for on-load current interruption ☒
- B. Isolators are designed to automatically reclose after protective tripping operation
- C. Isolators provide automatic voltage magnitude regulation during operation
- D. Isolators can automatically detect electrical fault currents in the system

Q74 Part B (Electrician)

A standard Wheatstone bridge is set up with $R_1 = 100\ \Omega$, $R_2 = 200\ \Omega$, and $R_3 = 150\ \Omega$. What should R_x be for the bridge to balance?



- A. $150\ \Omega$
- B. $100\ \Omega$
- C. $300\ \Omega$ ☒
- D. $200\ \Omega$

Q75 Part B (Electrician)

A three-phase load is supplied at a line voltage of 415 V and a line current of $\frac{20}{\sqrt{3}}\text{ A}$ at a power factor of 0.9. What is the real power delivered?

- A. 10,390 W
- B. 12,940 W
- C. 8,100 W
- D. 7,470 W ☒



Part B (Electrician)

75 Questions • Answer Key

Q1 Part B (Electrician)

A technician needs to estimate the total current load of a workshop circuit. The circuit has five 1.5 kW machines, each operating at 230 V. What is the approximate total current drawn by the circuit?

- A. 7.5 A
- B. 65.2 A
- C. 32.6 A
- D. 15.2 A



Q2 Part B (Electrician)

A DC shunt generator is running at a constant speed and field excitation. If the load increases causing armature current to rise, what will be the effect on the generated voltage with reason?

- A. The generated voltage remains unchanged due to constant speed.
- B. The generated voltage decreases due to increased armature reaction.
- C. The generated voltage increases due to load demand.
- D. The generated voltage increases due to improved commutation.



Q3 Part B (Electrician)

Which factor affects the level of illumination received on a working surface in an electrical installation?

- A. Quality of the electrical wiring used
- B. Distance between the light source and the surface
- C. Shape of the room where light is installed
- D. Color of the wall paint in the room



Q4 Part B (Electrician)

An alternator has 500 turns per phase and flux per pole of 0.02 Weber at 50 Hz. The generated EMF per phase is:

- A. 2220 V
- B. 1110 V
- C. 4440 V
- D. 3330 V



Q5 Part B (Electrician)

A factory is planning to upgrade its lighting system. The management wants improved energy efficiency, longer service life, and reduced maintenance costs. Based on these needs, which lamp type should they select for optimal overall benefits?

- A. Incandescent lamp
- B. LED lamp
- C. Fluorescent lamp
- D. Halogen lamp



Q6 Part B (Electrician)

A technician is setting up electrical equipment in a workshop with high humidity and metallic flooring. Which earthing practice is critical to ensure both equipment safety and human protection in this scenario?

- A. Connecting all equipment to the neutral wire only
- B. Placing all equipment on wooden platforms
- C. Using only the building's metal structure as earth
- D. Installing a dedicated earth electrode for each major equipment



Q7 Part B (Electrician)

In a workshop, a student observes that metals conduct electricity easily. Which atomic property is responsible for this behavior?

- A. Protons in the nucleus
- B. Free electrons in the outermost shell
- C. Electrons in the innermost shell
- D. Neutrons in the nucleus



Q8 Part B (Electrician)

Which feature is used in energy meters to detect and alert about the unauthorized opening of the meter cover?

- A. Tamper detection switch
- B. Extra fuse
- C. Reinforced lock
- D. Integrated relay



Q9 Part B (Electrician)

Which feature of an ammeter is required to reduce voltage drop across it during measurement of circuit current?

- A. Low resistance coil** ✓
- B. High rated current
- C. Large physical size
- D. High resistance coil

Q10 Part B (Electrician)

In an EV charging system, what type of current is supplied to the battery after passing through the rectifier?

- A. High-Frequency Current
- B. Pulsating Current
- C. Alternating Current (AC)
- D. Direct Current (DC)** ✓

Q11 Part B (Electrician)

Which terminal of a Silicon Controlled Rectifier (SCR) must receive a positive pulse to switch it from the forward blocking state to conduction when controlling a DC load?

- A. Anode
- B. Base
- C. Gate** ✓
- D. Cathode

Q12 Part B (Electrician)

What is a key benefit of implementing BIS standards for industrial occupational health in terms of employee training and hazard awareness?

- A. It increases the number of safety training sessions
- B. It ensures employees receive uniform safety training modules** ✓
- C. It reduces equipment maintenance requirements
- D. It assigns training based on employee working hours

Q13 Part B (Electrician)

Which of the following is the application of primary cells?

- A. Large power transformers
- B. Heavy industrial motors
- C. Electronic products** ✓
- D. Electric power transmission

Q14 Part B (Electrician)

Which feature makes a dry cell suitable for portable electronic devices?

- A. It requires special mounting brackets
- B. It can operate in any position without leaking electrolyte** ✓
- C. It must be kept upright to function
- D. It is less portable than other types

Q15 Part B (Electrician)

Which is the correct sequence of functional blocks in the block diagram of the working of a basic Uninterruptible Power Supply (UPS) system?

- A. Battery, Inverter, Rectifier, Load, AC supply
- B. AC supply, Rectifier, Battery, Inverter, Load** ✓
- C. Load, Battery, Inverter, AC supply, Rectifier
- D. Rectifier, Load, Inverter, Battery, AC supply

Q16 Part B (Electrician)

Which method is most effective for identifying chemical hazards in a manufacturing unit during a routine workplace safety inspection?

- A. Monitoring workplace noise levels and PPE compliance
- B. Examining chemical labels and Safety Data Sheets (SDS)** ✓
- C. Inspecting machine guards and emergency stops
- D. Reviewing housekeeping practices in the work area

Q17 Part B (Electrician)

An on-delay timer relay is set to 10 seconds. Its normally open (NO) timed contact controls a load. If the timer coil is energized continuously, what will happen?

- A. The normally open contact will close after 10 seconds and energize the load.** ✓
- B. The normally open contact will close immediately and energize the load.
- C. The normally open contact will close after 20 seconds and energize the load.
- D. The normally open contact will remain open indefinitely and prevent load energization.



Q18 Part B (Electrician)

Which material is most commonly used for manufacturing DIN rails used in industrial power distribution and control panel assemblies?

- A. Cold-rolled carbon steel with zinc surface plating** ✓
- B. Copper with electrolytic finishing for enclosure mounting systems
- C. Stainless steel with corrosion-resistant treatment for universal applications
- D. Aluminum with anodized coating for standard DIN rail fabrication

Q19 Part B (Electrician)

A transformer has no-load secondary voltage of 220 V and full-load secondary voltage of 200 V. Find the percentage voltage regulation.

- A. 12%
- B. 5%
- C. 10%** ✓
- D. 8%

Q20 Part B (Electrician)

While testing a diode circuit, an ITI trainee connects the positive terminal of a DC power supply to the cathode and the negative terminal to the anode of the diode. Which bias condition is this?

- A. Zero bias
- B. Avalanche bias
- C. Reverse bias** ✓
- D. Forward bias

Q21 Part B (Electrician)

What is meant by an unbalanced load in a three-phase electrical system?

- A. Equal load currents in all three phases
- B. Identical resistive loads in all three phases
- C. Equal phase voltages with identical loads
- D. Unequal load currents in the three phases** ✓

Q22 Part B (Electrician)

How many P-N junctions are present in a standard bipolar junction transistor (BJT)?

- A. Exactly 1 P-N junction
- B. Exactly 4 P-N junctions
- C. Exactly 3 P-N junctions
- D. Exactly 2 P-N junctions** ✓

Q23 Part B (Electrician)

Assuming others parameter remains constant, if the frequency of supply voltage of a transformer increases, the induced EMF will:

- A. Become zero
- B. Increase** ✓
- C. Decrease
- D. Remain unchanged

Q24 Part B (Electrician)

Which of the following must be (mandatorily) displayed at every substation, as per IE rules compliance?

- A. Fire extinguisher location on map
- B. Transformer voltage ratings
- C. Access pass list for staff
- D. Warning sign boards indicating danger** ✓

Q25 Part B (Electrician)

If two distribution feeders have the same maximum demand but different load factors, what does the difference in load factor indicate?

- A. The feeder with the lower load factor has higher maximum demand.
- B. The feeder with higher load factor has shorter periods of peak usage only.
- C. The feeder with higher load factor uses less energy overall.
- D. The feeder with the higher load factor has more consistent use of its maximum capacity.** ✓

Q26 Part B (Electrician)

Which of the following quantities is measured in kilograms?

- A. Mass** ✓
- B. Energy
- C. Pressure
- D. Force

Q27 Part B (Electrician)

Before connecting a three-phase motor, which instrument is used to check the order of the supply phases?

- A. Phase sequence meter** ✓
- B. Three-phase energy meter
- C. AC voltmeter
- D. Three-phase Wattmeter



Q28 Part B (Electrician)

In a tidal power generation system, what is the primary function of sluice gates during energy production?

- A. They prevent sediment from entering the power generation chamber.
- B. They increase the speed of water passing turbines for higher output.
- C. They store generated electricity during low tide for later use.
- D. They are responsible for the flow of water through the barrage. ✓

Q29 Part B (Electrician)

When analyzing an engineering drawing for a lighting circuit, how would you identify the symbol for an incandescent lamp among other common components?

- A. A square with an arrow through it
- B. A rectangle with two lines inside it
- C. A circle with a cross inside it ✓
- D. A triangle with a horizontal line below it

Q30 Part B (Electrician)

In a contactor-based motor control circuit, which component is responsible for interrupting the circuit during excessive current conditions?

- A. Thermal overload relay ✓
- B. Buchholz relay
- C. Rotor resistance unit
- D. Impedance relay

Q31 Part B (Electrician)

In an NPN transistor circuit, the collector current stops increasing even when the base current is increased further. In which region is the transistor operating?

- A. Reverse bias region
- B. Saturation region ✓
- C. Active region
- D. Cut-off region

Q32 Part B (Electrician)

Which of the following statements best describes the relationship between voltage and current in a purely resistive single-phase AC circuit?

- A. Current is in phase with voltage ✓
- B. Current is opposite in phase to voltage
- C. Current leads voltage by 90°
- D. Current lags voltage by 90°

Q33 Part B (Electrician)

Which factor must remain constant to ensure that generated voltage in a DC machine depends only on the speed?

- A. Load current
- B. Number of conductors
- C. Field flux ✓
- D. Armature resistance

Q34 Part B (Electrician)

A large electrical fire breaks out in an industrial workshop where energized machinery is running. As the supervisor, which is the safest and most effective way to extinguish the fire?

- A. Use a foam fire extinguisher directly on the energized equipment
- B. Use a water fire extinguisher to cool the machinery and suppress the flames
- C. Use a CO₂ extinguisher after isolating the electrical power supply ✓
- D. Use a dry powder extinguisher and leave the power supply on

Q35 Part B (Electrician)

Two transformer secondary voltages are 120 V and 80 V. If connected in series aiding, the total voltage is:

- A. 200 V ✓
- B. 40 V
- C. 120 V
- D. 80 V



Q36 Part B (Electrician)

Which formula is used to calculate the perimeter of a rectangle having length l and breadth b ?

- A. $l \times b$
- B. $l + b + h$
- C. πr^2
- D. $2(l + b)$ ✓

Q37 Part B (Electrician)

Which scenario would result in a lower diversity factor in a distribution network?

- A. Some consumers have peak load in the morning, others at night.
- B. Consumers have peak load at different times during the day.
- C. All consumers have peak loads at the same time. ✓
- D. Consumers have random, uncoordinated peak load times.

Q38 Part B (Electrician)

Which parameter of an induction motor remains almost constant from no-load to full-load operation?

- A. Rotor copper loss
- B. Motor operating speed ✓
- C. Starting current value
- D. Stator winding temperature

Q39 Part B (Electrician)

In a three-phase system with RYB phase sequence, phase Y reaches its maximum value:

- A. After phase B reaches its peak value
- B. After phase R reaches its peak value ✓
- C. Before phase R reaches its peak value
- D. Along with phase B peak value

Q40 Part B (Electrician)

What is the primary use of a hand file in metalworking operations?

- A. To cut wooden pieces for fitting work
- B. To smoothen and shape metal surfaces efficiently ✓
- C. To measure angles on sheet metal precisely
- D. To join two metal parts together

Q41 Part B (Electrician)

What is the function of an exciter in a wind power plant?

- A. To provide the necessary excitation to the coil to generate voltage ✓
- B. To convert mechanical energy to electrical energy directly
- C. To measure wind speed for power regulation
- D. To control the speed of the wind turbine rotor

Q42 Part B (Electrician)

What happens to the depletion region of a PN junction diode during forward bias?

- A. It narrows ✓
- B. It becomes open circuit
- C. It widens
- D. It remains unchanged

Q43 Part B (Electrician)

A 20 m workshop circuit carries a 16 A load, and minimizing voltage drop is the top priority. Which copper cable size is the best choice?

- A. 1.0 sq mm copper cable
- B. 4.0 sq mm copper cable ✓
- C. 2.5 sq mm copper cable
- D. 1.5 sq mm copper cable

Q44 Part B (Electrician)

If the mass of a body increases while its volume remains unchanged, what happens to its density?

- A. Becomes zero
- B. Increases ✓
- C. Remains same
- D. Decreases

Q45 Part B (Electrician)

Which statement about voltage in a delta-connected three-phase circuit is correct?

- A. Line voltage is less than phase voltage
- B. Line voltage is zero
- C. Line voltage is double the phase voltage
- D. Line voltage equals phase voltage ✓



Q46 Part B (Electrician)

Which process involves depositing a thin layer of one metal onto the surface of another metal using electrolysis?

A. Electroplating



B. Annealing

C. Tempering

D. Galvanizing

Q47 Part B (Electrician)

A generating station has a total connected load of 9500 kW. If the demand factor is 0.65, what is the station's maximum demand?

A. 6175 kW



B. 14615 kW

C. 6500 kW

D. 9500 kW

Q48 Part B (Electrician)

A factory manager is updating the workplace safety procedures and must select an appropriate safety standard to minimize electrical hazards. Which action best demonstrates effective application of the concept of standards in industrial occupational safety and health?

A. Implementing recognized electrical safety guidelines issued by an accredited organization.



B. Selecting safety requirements according to commonly followed workplace practices.

C. Developing separate safety rules independently for each production department.

D. Relying on individual judgment when addressing electrical safety concerns.

Q49 Part B (Electrician)

What is self-induced electromagnetic force (emf) in an electrical circuit?

A. An emf induced in the coil due to a battery connected to the coil

B. An emf induced in the coil by some external circuit voltage

C. An emf induced in one coil due to the current change of nearby coil

D. An emf produced in a coil due to rate of change of current flowing through itself

**Q50 Part B (Electrician)**

A worker completes one job in 5 hours. Estimate the total time required for the same worker to complete 8 similar jobs.

A. 35 hours

B. 30 hours

C. 40 hours



D. 45 hours

Q51 Part B (Electrician)

In a distributed winding of AC machines, the coils are connected in _____.

A. Random order only

B. Dummy slots only

C. Proper phase sequence



D. Reverse polarity only

Q52 Part B (Electrician)

If the direction of current in a DC motor armature is reversed while keeping the magnetic field unchanged, what happens to the rotation?

A. The speed of rotation increases

B. The direction of rotation remains the same

C. The motor stops rotating

D. The direction of rotation reverses

**Q53 Part B (Electrician)**

In an AC variable frequency drive, the maximum frequency setting determines the:

A. Maximum braking torque of the drive

B. Highest attainable running speed of motor



C. Minimum output frequency supplied to drive

D. Maximum permissible operating temperature

Q54 Part B (Electrician)

An industrial facility uses a three-phase system and plans to upgrade wiring. According to IE rules, what is the maximum allowable voltage drop from supply point to load?

A. Voltage drop should not exceed 10 percent of the nominal voltage

B. Voltage drop should not exceed 5 percent of the nominal voltage



C. Voltage drop should not exceed 2 percent of the nominal voltage

D. Voltage drop should not exceed 20 volts from supply point to load



Q55 Part B (Electrician)

Which feature of a smart energy meter enables remote disconnection and reconnection of electrical service without physical site visit?

- A. Wireless communication module
- B. Integrated relay switch ✓
- C. Tamper detection circuit
- D. High speed data transfer

Q56 Part B (Electrician)

According to IEE regulations, what is the purpose of earthing an electrical installation?

- A. To increase the efficiency of the electrical circuit
- B. To ensure safety by preventing electric shocks ✓
- C. To improve voltage regulation in distribution lines
- D. To limit electromagnetic interference in circuits

Q57 Part B (Electrician)

If the load on a DC motor suddenly increases, what initially happens to the back emf?

- A. Back emf reaches its maximum
- B. Back emf decreases temporarily ✓
- C. Back emf remains unchanged
- D. Back emf increases immediately

Q58 Part B (Electrician)

Which characteristic of DC drive systems makes them suitable for elevator and lift control applications?

- A. Less maintenance
- B. Low operational cost
- C. Precise speed control ✓
- D. Light weight construction

Q59 Part B (Electrician)

What causes excessive brush sparking during single-phase AC operation of a universal motor affecting the commutation process?

- A. Mechanical vibration and bearing friction effects only
- B. Low magnetic flux and reduced field strength
- C. Armature reaction and inductive reactance effects ✓
- D. High insulation resistance and winding leakage only

Q60 Part B (Electrician)

In an NPN transistor switch, the load and external wiring are verified as normal. The base drive is present, but the load remains OFF and the collector-emitter voltage V_{CE} remains nearly equal to the supply voltage V_{CC} . What is the most likely transistor fault?

- A. The load has become short-circuited
- B. The transistor is operating in saturation region
- C. The collector-emitter path has failed short-circuit
- D. The collector-emitter path has failed open-circuit ✓

Q61 Part B (Electrician)

When installing a grommet in a sheet metal panel for control wiring, which installation requirement ensures protection of conductor insulation from mechanical abrasion at the panel opening?

- A. The grommet must remain loosely fitted to permit unrestricted movement inside the panel opening
- B. The grommet must be mechanically tightened using threaded fastening tools at the panel opening
- C. The grommet must be adhesively bonded to provide permanent fixation at the panel opening
- D. The grommet must fit snugly to completely cover the sharp metal edges of the panel opening ✓

Q62 Part B (Electrician)

A single insulator string must withstand a phase-to-earth voltage of 220 kV. Each disc insulator is rated for 11 kV. Considering a safety factor of 2, what is the minimum number of discs required?

- A. 30 discs
- B. 25 discs
- C. 20 discs
- D. 40 discs ✓

Q63 Part B (Electrician)

Which type of alternator is best suited for high-speed operation due to its mechanically strong rotor construction?

- A. Split phase alternator
- B. Salient pole alternator
- C. Repulsion type alternator
- D. Cylindrical rotor alternator ✓



Q64 Part B (Electrician)

Which type of switch is used to control a single-phase lighting circuit from only one location in residential electrical wiring systems?

- A. Double Pole Double Throw (DPDT) switch
- B. Single Pole Double Throw (SPDT) switch
- C. Single Pole Single Throw (SPST) switch ✓
- D. Double Pole Single Throw (DPST) switch

Q65 Part B (Electrician)

Which method is used to achieve damping in moving iron instruments?

- A. Spring friction damping is applied to the pointer
- B. Liquid damping is used with an oil-filled chamber
- C. Eddy current damping is achieved with a magnet
- D. Air friction damping is provided using an air chamber ✓

Q66 Part B (Electrician)

The V-curve of a synchronous machine shows the relation between:

- A. Power and efficiency
- B. Speed and torque
- C. Armature current and field current ✓
- D. Voltage and frequency

Q67 Part B (Electrician)

An industrial facility requires a wiring layout to minimize voltage drop over long distances. What should the electrician adjust in the layout?

- A. Select smaller gauge conductors
- B. Increase insulation thickness while keeping the same conductor size
- C. Use thinner conductors with longer cable routes
- D. Increase the conductor size and minimize cable length ✓

Q68 Part B (Electrician)

Which statement illustrates how the torque of a DC machine changes if the armature current is doubled while the flux per pole remains constant?

- A. The torque will become four times the flux.
- B. The torque will double. ✓
- C. The torque will remain unchanged.
- D. The torque will be half times flux.

Q69 Part B (Electrician)

A DIAC used in a triggering circuit starts conducting only after which condition is met?

- A. Supply frequency increases
- B. Forward resistance becomes infinite
- C. Holding current becomes zero
- D. Breakover voltage is reached ✓

Q70 Part B (Electrician)

When constructing a regular hexagon using only a compass and straightedge, which method ensures accurate equal sides and correct angles without measurement errors?

- A. Draw a circle and mark six random points on the circumference, then connect them sequentially in order.
- B. Draw a circle and divide it into six equal parts by estimating angles at the center of the circle.
- C. Draw a circle and connect alternate points without ensuring equal spacing around the circumference.
- D. Draw a circle and step off equal arcs using compass radius around the circumference, then join points in order. ✓

Q71 Part B (Electrician)

A student needs to transfer several equal measurements along a straight line on a drawing. Which method will help maintain consistency and accuracy throughout the process?

- A. Measure each interval with a scale and mark with a pencil
- B. Reset the divider for each interval before marking
- C. Draw multiple lines freehand at estimated equal distances
- D. Set the divider once and step it repeatedly along the line ✓

Q72 Part B (Electrician)

What is the purpose of using earth connection in domestic electrical appliances?

- A. To prevent wire overheating
- B. To improve voltage stability
- C. To provide a safe path for fault current ✓
- D. To increase appliance efficiency



Q73 Part B (Electrician)

An engineer is required to draw a small hole of 15 mm diameter accurately on a machine component drawing. Which instrument would provide the most precise result for this task?

- A. Pivot joint compass
- B. Spring bow compass** ✓
- C. Protractor
- D. Set square

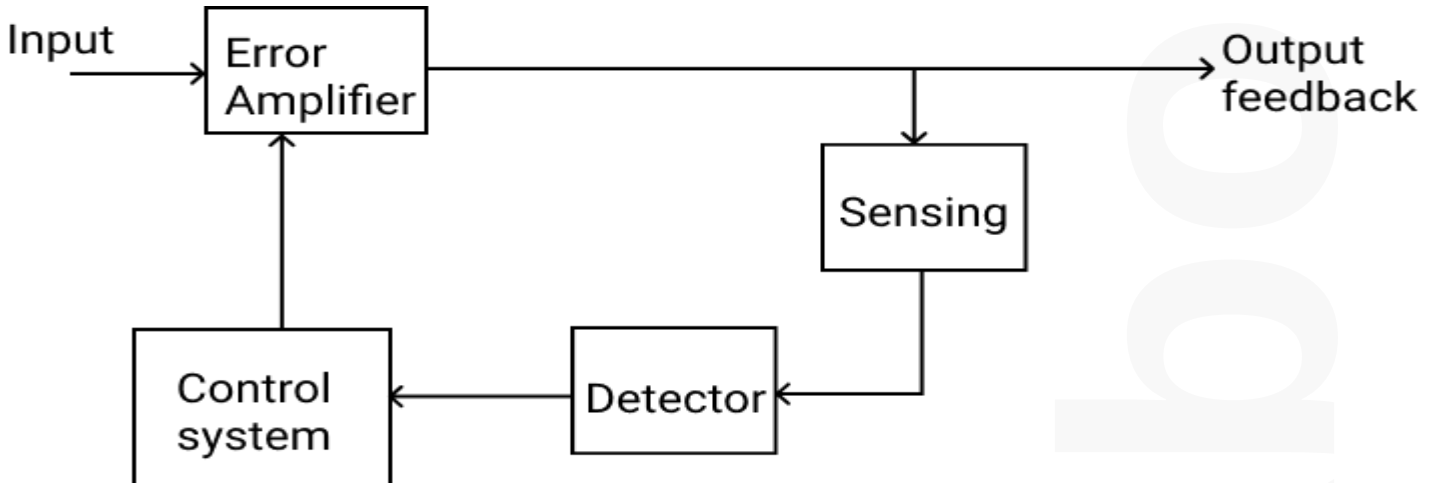
Q74 Part B (Electrician)

How is the efficiency of a DC generator determined?

- A. The total losses in the generator
- B. The ratio of output power to input power** ✓
- C. The electrical losses only
- D. The speed of the generator's rotation

Q75 Part B (Electrician)

In the block diagram of a voltage stabilizer, which unit senses voltage variation?



- A. Control circuit unit
- B. Sensing unit** ✓
- C. Detector unit
- D. Input unit

