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HKKJR LJDKJ GOVERNMENT OF INDIA
JSY EA=AKY; MINISTRY OF RAILWAYS

OBJECTIVE QUESTION BANK FOR GENERAL SERVICE

TARGET GROUP: General Services Maintenance Staff

CAMTECH/ E/ 13-14/QB-GS/ 1.0

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Maharajpur, GWALIOR - 474 005

*OBJECTIVE QUESTION BANK
FOR
GENERAL SERVICES*

QUALITY POLICY

"To develop safe, modern and cost effective Railway Technology complying with Statutory and Regulatory requirements, through excellence in Research, Designs and Standards and Continual improvements in Quality Management System to cater to growing demand of passenger and freight traffic on the railways".

FOREWORD

CAMTECH has prepared a question bank on electrical general service with a view to update the knowledge of staff and help them in their day to day working. This book covers questions on electrical general services..

The question bank will be helpful for improving and judging knowledge of staff of electrical general services about the various aspects and assets/equipment of electrical general services.

I hope that this question bank shall be useful for electrical general services maintenance staff and training centers.

CAMTECH, Gwalior
Date: 01.01.2014

A.R.Tupe
Executive Director

PREFACE

CAMTECH has prepared this Question Bank on electrical general services which includes the objective type questions with their answers. This question bank covers various technical aspects of electrical general services. It includes questions on topics like general Electrical Engineering, Transformer, Earthing, DG set, Induction motor, & other terms related to electrical general services. The Question Bank of electrical general services will update the knowledge of staff and help them in their day to day working.

It is clarified that this question bank does not supersede any existing provisions laid down by RDSO or Railway Board. The question bank is for guidance only and it is not a statutory document.

I am thankful to all field personnel who have helped us in preparing this question bank.

Technological up-gradation & learning is a continuous process. Hence feel free to write to us for any addition or modification in this question bank. We shall highly appreciate your contribution in this regard.

CAMTECH, Gwalior
Date: 31.12.2013

Peeyoosh Gupta
Jt. Director Electrical

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ISSUE OF CORRECTION SLIPS

The correction slips to be issued in future for this handbook will be numbered as follows :

CAMTECH/E/13-14/QB-GS/C.S. # XX date-----

Where “XX” is the serial number of the concerned correction slip (starting from 01 onwards).

CORRECTION SLIPS ISSUED

[illegible]

GENERAL ELECTRICAL ENGINEERING

For the protection of single-phase 1.5 kW motor, a MCB of rating should be provided

- (a) 10 A
- (b) 16 A
- (c) 32 A
- (d) 63 A

The low power factor results in

- (a) Increased losses
- (b) Decreased losses
- (c) No effect on losses
- (d) Better generating efficiency

Low power factor

- Aids the voltage regulation
- Increase the voltage regulation
- Decrease the voltage regulation
- None of the above

The power factor of the AC supply can be improved by using

- (a) Synchronous generator
- (b) Universal motor
- (c) Synchronous condenser
- (d) SCR

A distribution line of 440 V is classified as

- (a) LV
- (b) MV
- (c) HV
- (d) EHV

Which of the following is not used as a overhead conductor

- (a) ACSR
- (b) Weasel
- (b) PILCA
- (d) Zebra

Which of the following reduces the power factor

- (a) Motor on no load
- (b) Tube lights
- (c) Fans
- (d) All of the above

Under high voltage test cable shall withstand an AC voltage of

- (a) 1.5 kV
- (b) 3 kV
- (c) 5.2 kV
- (d) 7.2 kV

Under high voltage test cable shall withstand a DC voltage of

- (a) 1.5 kV
- (b) 3 kV
- (c) 5.2 kV
- (d) 7.2 kV

Under water immersion test cable is immersed in a water bath at

- (a) 40 deg C
- (b) 50 deg C
- (c) 60 deg C
- (d) 70 deg C

For water immersion test, cable is immersed in hot water at specified temperature, after 24 hrs the voltage applied between conductor and water for five minutes is

- (a) 3 kV (b) 4 kV
(c) 5 kV (d) 6 kV

12. Unit of energy is

- a) Kilo volt hours b) Kilo watt hours c) Kilo watt

13. As per Ohm's law

- a) $V = IR$ b) $V = I/R$ c) $R = V \times I$

14. Unit of resistance is

- a) Ampere b) Volts c) Ohm

In three phase 415 volts 50 Hz supply, the phase to phase voltage is

- a) 220 Volts b) 415 volts c) 440 volts

In three phase 415 volts 50 Hz supply, the phase to neutral voltage is

- a) 220 volts b) 230 volts c) 440 volts

In 4 sq. mm PVC wire, 4 sq. mm stand for

Thickness of wire

Length of wire

The area of thickness of wire

The instrument to measure the light is called

- a) Tong tester b) Lux meter c) Micro meter

10 hours use of 500 watt lamp will consume the energy

- a) 10 units b) 20 units c) 5 units

No. of poles in MCB/TPN is

- a) 2 poles b) 4 poles c) 3 poles

A.C. is converted into D.C. by

- a) Dynamo b) Motor.
c) Transformer d) Rectifier

Farad is a unit of

- a) Flux b) Capacitance
c) Mutual inductance d) Resistance of a conductor

A kilowatt-hour is a unit of

- a) Energy b) Electrical potential
c) Power d) Electric current

An electric lamp is marked 100 watt. It is working on 200 Volts. The current through the lamp is given as

- 0.5 Amp.
- 0.2 Amp.
- 5.0 Amp.
- 1.0 Amp.

Before carrying out O/H maintenance following is due

Transformer is switched off

DG set is switched off

HT panel is switched off

Respective O/H feeder is switched off or earthed

In house wiring the red wire indicates the

- (a) Phase
- (b) Neutral
- (c) Earth wire
- (d) Dead wire.

In house wiring the black wire indicates the

- (a) Phase
- (b) Neutral
- (c) Earth wire
- (d) Dead wire

In house wiring the green wire indicates the

- (a) Phase
- (b) Neutral
- (c) Earth wire
- (d) Dead wire.

In 4 wire electric circuit, the black conductor is used for

- (a) Phase
- (b) Neutral
- (c) Earth wire
- (d) Armour

In cabling system the earth is connected with conductor having colour

- (a) Red
- (b) blue
- (c) yellow
- (d) Armour

Unit of current is

- (a) Watt
- (b) Ampere
- (c) Volt
- (d) ohm

Heater element is made up of

- (a) Tin
- (b) Nichrome
- (c) Silver
- (d) Any above

Filament of incandescent lamp is made of

- (a) Tin
- (b) Nichrome
- (c) Tungsten
- (d) Silver

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

n insulator should have

- (a) High resistance
- (b) High conductance
- (c) High conductivity
- (d) All of the above

Which of the following is used to make electric connections

- (a) Solder
- (b) PG clamp
- (c) Thimbles
- (d) All above

Instrument used for measuring the speed of rotating machines/ appliances is

- (a) Lux meter
- (b) Tachometer
- (c) Micrometer
- (d) None above

Instrument used for measuring the thickness of wire/strip is

- (a) Lux meter
- (b) Tachometer
- (c) Micrometer
- (d) None above

Instrument used for measuring the voltage across a circuit is

- (a) Ammeter
- (b) voltmeter
- (c) Thermometer
- (d) None above

Instrument used for measuring the current is

- (a) Ammeter
- (b) voltmeter
- (c) Thermometer
- (d) None above

Instrument used for measuring the temperature is

- (a) Ammeter
- (b) voltmeter
- (c) Thermometer
- (d) None above

Illumination level is measured in terms of

- (a) Lux
- (b) Volt
- (c) Ampere
- (d) Ohm

Insulating resistance is measured by using

- (a) Multimeter
- (b) Megger
- (c) Voltmeter
- (d) Hydrometer

Which of the following is used for rectification of AC supply

- (a) Diodes
- (b) Transistors
- (c) Capacitor
- (d) Resistors

Which preparation should be done starting a new wiring

- Prepare a wiring diagram
- Prepare for shock treatment
- Both a & b
- None of the above

- 45 In wiring circuit the fuse will be placed on
- (a) Phase (b) Neutral
 - (c) Earth (d) Any of the above

Which of the following tests should be done before connecting a wiring to the main line

- (a) IR test (b) Continuity test
 - (c) Polarity test (d) Any above
- 47 Which of the following is a common wiring fault
- (a) Short circuit (b) Open circuit
 - (c) Fuse blown (d) All above
- 48 Wattage rating range of electric kettle is
- (a) 50-500 W (b) 350-1000 W
 - (c) 1000-1500 W (d) 1200-1600 W
- 49 Device used for auto off an electric iron is
- (a) Thermostat switch (b) Overload relay
 - (c) Time delay switch (d) Any of the above
- 50 Can you repair an immersion rod
- (a) No (b) Yes
 - (c) It depend on condition (d) None above.
- 51 A wire gauge is used to measure diameter of
- (a) Wire (b) cable
 - (c) OH conductor (d) Any above
- 52 To improve the power factor, capacitors are connected in the circuit as
- (a) Parallel path (b) Series path
 - (c) Any of a & b (d) None of the above

To switch ON or switch OFF the supply in accordance with day light, following is used

- (a) Light dependent resistor (b) Light emitting diode
- (c) Any of a & b (d) None of the above

In order to draw more current from the electric source

Resistors are connected in parallel

Resistors are connected in series

Resistors are connected in series and parallel

None of the above.

If a 60 W and 100 W lamps in series and are connected to a source of supply, which lamp will give more light

- (a) 100 W (b) 60 W
(c) Both will give same light (d) None of the bulb will glow.

56 Power is defined as

- (a) Capacity of doing work (b) Rate of doing work
(c) Product of force and distance (d) Energy dissipated by load.

57 Unit of electric power is

- (a) Kilowatt (b) watt
(c) Kilowatt hour (d) watt hour

The internal resistance of battery is increased by

- Increase in no. of cells
Decrease in no. of cells
None of the above

A generators converts

- Mechanical energy into light
Electrical energy to mechanical energy
Mechanical energy to electrical energy
None of the above

Power factor of AC circuit is equal to

- (a) Tan of phase angle (b) Sine of phase angle
(c) Cosine of phase angle (d) None of the above

61 Resistance of open circuit is equal to

- (a) Zero (b) Infinity
(c) Less than 1 ohm (d) None above

62 Laminated core is used to reduce

- (a) Hysteresis loss (b) Eddy current loss
(c) Copper loss (d) iron loss

63 Which of the following is not a non conventional energy source

- (a) Solar (b) Bio gas
(c) Wind (d) Electricity

64 Solar energy is used for

- (a) Lighting (b) Cooking
(c) Battery charging (d) All above

- 65 Solar and wind hybrid system is
 (a) Becoming popular (b) Not possible
 (c) Conventional energy source (d) None of the above
- 66 Bio gas depends on
 (a) Electrical energy (b) Waste products
 (c) Both a and b (d) None of the above
- 67 Which of the following is not a constituent of a solar lighting system
 (a) Photo voltaic cell (b) Back up batteries
 (c) Charger (d) Earth wire.
- 68 Which of the following is not a type of fuse
 (a) HRC (b) Rewirable
 (c) Ceramic (d) None above.
- 69 Which of the following is not a type of generating station?
 (a) Thermal (b) Nuclear
 (c) Hydro (d) Atmospheric
- 70 Which of the following is not a part of overhead distribution line
 (a) Conductor (b) Insulator
 (c) Cross arms (d) Thimbles
- 71 Type of insulator not used in a 3 phase, 440 V overhead distribution line
 (a) Pin (b) Shackle
 (c) Disc (d) None above
- Instrument connected in the circuit with the ammeter (in panel) to facilitate the measurement of current is
 (a) Current transformer (b) Potential transformer
 (c) Excitation transformer (d) None of the above
- 73 Capacitor opposes
 (a) Instantaneous change of voltage (b) Instantaneous change of current
 (c) Instantaneous change in resistance (d) None of the above
- Inductor opposes
 Instantaneous change of voltage
 Instantaneous change of current
 Instantaneous change in resistance
 None of the above
- Current is
 (a) Rate of flow of charge (b) Gradual change in resistance
 (c) Linear change in capacitance (d) None of the above.

- 76 When resistances are connected in parallel, the equivalent resistance
(a) Decreases (b) Increases
(c) No change (d) May increase or decrease
- 77 When resistances are connected in series, the equivalent resistance
(a) Decreases (b) Increases
(c) No change (d) May increase or decrease
- 78 Diode allows the flow of the current
(a) In one direction (b) In both the directions
(c) Flow of current not allowed (d) None of the above.
- 79 When capacitances are connected in parallel, the equivalent capacitance
(a) Decreases (b) Increases
(c) no change (d) May increase or decrease
- 80 When capacitances are connected in series, the equivalent capacitance
(a) Decreases (b) Increases
(c) No change (d) May increase or decrease

Two lamps of 60 W and one of 100 W are connected in series to a supply 220 V, the current flowing in the circuit will be

- (a) 1A (b) 2A
(c) 3A (d) 4A

A 2 x 40 W box type fitting glows for 10 hrs in a day, units consumed per day will be

- (a) 0.72 (b) 0.04
(c) 0.8 (d) 1

A 2 x 40 W box type fitting glows for 10 hrs in a day, electric charges for the month of June @ Rs. 3/- per unit will be Rs.

- (a) 18 (b) 3.60
(c) 72 (d) 90

- 84 One ordinary ceiling fan works for 12 hrs in a day, units consumed per day will be
(a) 0.72 (b) 0.04
(c) 0.8 (d) 1

One ordinary ceiling fan works for 12 hrs in a day, electric charges per day @ Rs. 2/- per unit will be

- (a) 0.72 (b) 1.44
(c) 0.8 (d) 1

One 20 inch desert cooler (150 W) works for 8 hrs per day, units consumed per day will be

- (a) 1.2 (b) 1.8
(c) 2.1 (d) 2.4

One 20 inch desert cooler (150 W) works for 8 hrs per day, electric charges for the month of July @ Rs. 3/- per unit will be

- (a) 111.6 (b) 110.2
(c) 90 (d) 115.3

A geyser of 25 ltrs., 1500 W remains ON for 2 hrs per day, units consumed for 6 months will be

- (a) 540 (b) 480
(c) 620 (d) 700

89 One 60 w lamp and 2 fans works for 10 hrs per day, units consumed per day will be

- (a) 1.8 (b) 2.1
(c) 1.7 (d) 3

90 A 10 hp pump works for 10 hrs per day, monthly consumption will be

- (a) 223.8 (b) 2.23
(c) 22.38 (d) 2238

A grinder in a factory, equipped with 1.5 hp motor, works for 6 hrs per day, the units consumed per day will be

- (a) 5.490 (b) 6.714
(c) 2388 (d) 1940

Internal resistance of a cell is 0.1 ohm and 10 cells are connected in series to form a battery supplying a current of 1 A, the power lost in the battery is

- (a) 0.5 W (b) 1 W
(c) 5 W (d) 50 W

93 The resistance of human body lies between

- (a) 100-200 ohm (b) 5 K ohm-50 K ohm
(c) 1 M ohm-10 M ohm (d) 100 k ohm-500 K ohm

94 Instrument used to measure electric energy consumption is

- (a) Galvanometer (b) Potentiometer
(c) Energy meter (d) None of the above

95 Which of the following keeps the poles straight

- (a) Stay rod (b) Cross arm
(c) Conductor (d) Insulator

- 96 Inside the geyser there is a
 (a) Filament (b) Immersion rod
 (c) Any of a & b (d) None of the above
- 97 Which of the following is used for concealed wiring in a house
 (a) PVC conduit (b) GI pipe
 (c) Spun concrete pipe (d) Any of the above.
- 98 The size of copper wire used for point wiring in sq mm is
 (a) 1.5 (b) 2.5
 (c) 4 (d) 10
- 99 The size of copper wire used for sub main in sq mm is
 (a) 1.5 (b) 2.5
 (c) 4 (d) 10
- 100 The size of Aluminium wire used for point wiring in sq mm is
 (a) 1.5 (b) 2.5
 (c) 4 (d) 10
- 101 The combined Earth resistance of 33kV/11 kV receiving station should not exceed
 (a) 1 ohm (b) 2 ohms
 (c) 10 ohms (d) 20 ohms
- 102 The combined earth resistance of 11 kV/415 V Sub-station should not exceed
 (a) 0.5 ohm (b) 2 ohms
 (c) 10 ohms (d) 20 ohms

The integration time employed by supply authorities for recording M.D. for a 33 kV/415 V, 10 MVA Sub-station is –

- (a) 5 minutes (b) 15 minutes
 (c) 45 minutes (d) 60 minutes
- 104 While designing a sub-station anticipated future loads in the next ... years are taken
 (a) 1 year (b) 2 years
 (c) 20 years (d) 5-7 years
- 105 As per the present Tariff the minimum power factor of sub-station should be
 (a) 0.8 (b) 0.85
 (c) 0.90 (d) 0.95

The minimum clearance of lowest conductor from the ground of 33 kV lines, across the load.

- (a) 3 M (b) 4 M
 (c) 6.1 M (d) 14 M

The minimum clearance of lowest conductor from the ground of 33 kV lines, along a street.

- | | |
|-----------|-----------|
| (a) 5.8 M | (c) 3.0 M |
| (b) 4.0 M | (d) 14 M |

The minimum vertical clearance from 11 kV line to any part of building.

- | | |
|-----------|-----------|
| (a) 2.0 M | (b) 10.M |
| (c) 3.7 M | (d) 6.0 M |

The minimum Horizontal clearance of 11 kV lines from any buildings.

- | | |
|-----------|-----------|
| (a) 1.2 M | (b) 3.7 M |
| (c) 6.1 M | (d) 10 M |

110. The Visible, Audible, Partial discharge at the surface of conductor at high voltage is called –

- | | |
|-----------------|-------------------|
| (a) Skin affect | (b) Corona |
| (c) Creep | (d) None of these |

For maintaining power supply quantity the frequency variation of power supply are restricted to

- | | |
|-----------------|----------------|
| (a) $\pm 1 \%$ | (b) $\pm 3 \%$ |
| (c) $\pm 0.5\%$ | (d) $\pm 10\%$ |

The 3 phase voltage unbalance in supply should not exceed

- | | |
|-----------------|---------|
| (a) 2.5.% to 5% | (b) 20% |
| (c) 25% | (d) 10% |

For maintaining power supply quality the rate of change of frequency should not exceed.

- | | |
|--------------|----------------|
| (a) 5Hz/Sec. | (b) 10 Hz/Sec |
| (c) 1HZ/Sec | (d) 3 Hz/ Sec. |

In Thermal Power plants the generator used are

- AC 3 Ø, Induction Generators.
- AC 3 Ø, Synchronous Generators.
- D.C. Shunt Generators.
- AC 1 Ø Synchronous Generators.

The highest system voltage of normal 33 kV System for the purpose of design of equipments is

- | | |
|------------|------------|
| (a) 30 kV. | (b) 36 kV. |
| (c) 33 kV. | (d) 66 kV. |

The Rod gap on the L.V.side of 11 kV/415, 250 kVA Transformer is

- | | |
|-------------|--|
| (a) 300 mm. | (b) 100 mm. |
| (c) 50 mm. | (d) Rod gap L.A. is not provided for LV side of Transformer. |

The rated voltage of L.A. for 11 kV/415V Transformer Protection is

- (a) 11 kV.
- (b) 12 kV.
- (c) 9 kV.
- (d) 24 kV.

For medium sized 11 kV/415 v, 500 kVA Transformer sub-station, the type of L.A. used are

- (a) Station type.
- (b) Line type.
- (c) Distribution type.
- (d) None of these.

The line type L.A. used for our 11 kV and 33 kV Sub-station are having a standard normal discharge current (Peak).

- (a) 5 KA.
- (b) 10 KA.
- (c) 1.5 KA.
- (d) 2.5 KA.

The span of supports for 11 kV over head lines should not exceed.

- (a) 100 m.
- (b) 65 m.
- (c) 30 m.
- (d) 27 m.

The testing of relays should be performed at a interval of

- (a) 6 months
- (b) 12 months
- (c) 18 months
- (d) 24 months

122. If any live conductor in the circuit is entangled with tree branch _____ operates.

- (a) EFR
- (b) OVR
- (c) OLR
- (d) Thermal relay

_____ relay operates if there is a heavy increase in load current.

- (a) EFR
- (b) OVR
- (c) OLR
- (d) Thermal relay

_____ relay indicates the temperature rise of a transformer.

- (a) EFR
- (b) OVR
- (c) OLR
- (d) Thermal relay

If the relay setting of 60/5 CT is at 3.75, then the tripping will be at

- (a) 60 Amp.
- (b) 45 Amp.
- (c) 30 Amp.

The normal SPG of electrolyte of lead acid battery should be

- (a) 1.160 (b) 1.180 (c) 1.220 (d) 1.240

The terminal voltage of a fully charged lead acid cell is

- (a) 1.8 V (b) 2.0 V (c) 2.2 V (d) 2.4 V

☐ $\bar{A}$ ☐ $\bar{A}$ ☐ $\bar{A}$ ☐ $\bar{A}$

he terminal voltage of a lead acid cell should not fall below

- (a) 1.6 V (b) 1.8 V (c) 2.0 V (d) 2.2 V

The normal charging rate of 120 AH lead acid battery set is

- (a) 4 A (b) 8 A (c) 12 A (d) 16 A

The ratio of distil water and acid used to prepare new electrolyte for lead acid cell is

- (a) 1 : 1 (b) 2 : 1 (c) 3 : 1 (d) 4 : 1

Following law is applicable in the working of lead acid cell

Faradays law of self induction.

Faradays law of mutual induction

Faradays law of electrolysis.

Newton's law of motion.

The capacity of storage battery is expressed as

No. of recharges it can take

Time for which it can be used

No. of cells it contain

Ampere hour it can deliver.

Sedimentation in lead acid cell occurs due to

Overcharging at high rate.

Slow charging at low rate.

Over discharge at low rate.

Non-utilization for long periods.

Even when not in use, a lead acid battery should be recharged once in

- (a) Six week (b) Six days
(c) Three months (d) Six months.

First step to be carried out before starting work starting work on faulty portion of overhead line is to

Earth the line on both the ends of the portion

Obtain the permit to work

Bring ladder or crane

Climb on the pole immediately

Before starting the work on faulty circuit it should be ensured that

- The faulty portion has been isolated from the power supply
- The worker is strong enough to climb the pole
- The cable is not deep enough to dig
- None of the above.

The electric overhead line on which work is to be carried out should be necessarily earthed on both the ends to

- Dispense the charge stored between the conductors due to capacitive effect
- To bring the line at zero potential
- Both a & b
- None of the above

One can protect himself from electric shock while working on live circuit by wearing gloves of good

- Conducting material
- Insulating material
- Semiconductor material
- Any of the above.

Which of the following are principal safety precautions

- Don't touch live wire or equipment with bare hands
- Before switching on supply, see no one is working in the line
- Use rubber gloves and meeting.
- All of the above.

Which of the following is most effective method of artificial respiration

- Mouth to mouth air pumping method
- To use bicycle air pump
- Both a & b
- None of the above

Which material is recommended as fire extinguisher in electrical cases

- Carbon tetra chloride
- Carbon dioxide
- Sulphur hexafluoride
- Any of the above

Which of the following is to be necessarily kept in a electric substation

- First aid box
- Stretcher
- Earthing rod
- All of the above

The warning board to be provided, on the switch of the line on which work is going on

- Man working
- Danger
- Keep away
- None of the above

Staff competent to work on overhead line of MV should be

- Unskilled
- Semi skilled
- Highly skilled
- Any of the above

Which of the following is a renewable source of energy?

- a) coal
- b) oil
- c) Natural gas
- d) Solar

The law of conservation of energy states that energy

- can be created and destroyed
- is destroyed in the process of burning
- cannot be converted from one
- is neither destroyed nor created form to another

Absolute pressure is

- Gauge Pressure
- Atmospheric Pressure
- Gauge pressure + Atmospheric Pressure
- Gauge Pressure – Atmospheric Pressure

100 kCals expressed as kilojoules would be

- a) 418.7 kJ
- b) 4.187 Joules
- c) 4.187 kJ
- d) 41.87 kJ

When heat flows from one place to another by means of a liquid or gas, it is being transferred by

- a) radiation
- b) conduction
- c) sublimation
- d) convection

150. How many watts are in a hp?

- a) 700
- b) 725
- c) 740
- d) 746

The characteristic of an electrical circuit that forces current to flow is

- a) watts
- b) amps
- c) ohms
- d) volts

Voltage and resistance in an electrical circuit are related by Ohm's law and determine

- a) resistance
- b) voltage
- c) the type of circuit
- d) current

The characteristic of an electrical circuit that opposes current flow is

- a) resistance b) voltage c) friction d) power

154. The instrument used to measure RPM is

- a) Fyrite b) Pyrometer
c) Ultrasonic flow meter d) Stroboscope

Which of the following terms does not refer to specific energy consumption

- a) Kwh/ton b) kcal/kL c) kJ/kg d) kg

156. Which of the following will not motivate the employees for energy conservation ?

- a) Incentive b) Recognition c) Reward d) Threatening

The heat input required for generating 'one' kilo watt-hour of electrical output is called as ____.

- a) Efficiency b) Heat Rate c) Calorific Value d) Heat value

158. Which of the voltage is not available for Indian distribution system?

- a) 33 kV b) 11 kV c) 280 V d) 433 V

159. The power loss in transmission/distribution line depends on ____.

- a) Current in the line b) Resistance of the line c) Length of the line d) All

If distribution of power is raised from 11 kV to 66 kV, the voltage drop would lower by

- a) 6 times b) 1/6 times c) 36 times d) 1/36 times

161. If the distribution voltage is raised from 11 kV to 33 kV, the line loss would be:

- a) Less by 1/9 b) More by 9 times c) No change d) None of the above

The maximum demand of an industry, if trivector motor records 3600 KVA for 15 minutes and 3000 kVA for next 15 minutes over a recording cycle of 30 minutes is_____.

- a) 3600 kVA b) 3000 kVA c) 3300 kVA d) 600 kVA

Presenting the load demand of a consumer against time of the day is known as____.

- a) Time Curve b) Load curve c) Demand curve d) Energy curve

The vector sum of active power and reactive power required is ____.

- a) Apparent Power b) Power Factor c) Load Factor d) Maximum Demand

Power factor is the ratio of ____ and apparent power.

- a) Active power b) Reactive power c) Load Factor d) Maximum Demand

The kVAr rating required for improving the power factor of a load operating at 500 kW and 0.85 power factor to 0.95 is _____.

- a) 145 kVAr b) 500 kVAr c) 50 kVAr d) 100 kVAr

The rating of the capacitor at motor terminals should not be greater than ____ .
 magnetizing kVAr of the motor at full load
 magnetizing kVAr of the motor at no load
 magnetizing kVAr of the motor at half load
 magnetizing kVAr of the motor at 75% load

The percentage reduction in distribution losses when tail end power factor raised from 0.8 to 0.95 is ____.

- a) 29% b) 15.8% c) 71% d) 84%

If voltage applied to a 415 V rated capacitors drops by 10%, its VAR output drops by ____.

- a) 23% b) 87% c) 19% d) 10%

The ratio between the number of turns on the primary to the turns on the secondary of a transformer is known as:

- a) turns ratio b) efficiency
 c) winding factor d) power factor

The ratio of overall maximum demand of the plant to the sum of individual maximum demand of various equipments is ____.

- a) load factor b) diversity Factor
 c) demand Factor d) maximum demand

Core losses in transformer are caused by ____.

- a) Hysteresis loss b) Eddy current loss c) both a & b d) None

The load losses in transformer vary according to ____.

- a) Loading of transformer b) Square of loading of transformer
 c) Cube of loading of transformer d) None

The total losses in a transformer operating at 50% load with designed no load and load losses at 2 kW and 20 kW respectively are ____.

- a) 7 kW b) 12 kW c) 4.5 kW d) 22 kW

The total amount of harmonics present in the system is expressed using ____.

- a) Total Harmonic Factor b) Total Harmonic Ratio
 c) Total Harmonic Distortion d) Crest Factor

The 5th and 7th harmonic in a 50 Hz power environment will have:

- voltage and current distortions with 55 Hz & 57 Hz
 voltage and current distortions with 500 Hz & 700 Hz
 voltage and current distortions with 250 Hz & 350 Hz
 no voltage and current distortion at all

The type of energy possessed by the charged capacitor is

- a) Kinetic energy b) Electrostatic c) Potential d) Magnetic

The energy stored in the bonds of atoms and molecules is called

- a) Kinetic energy
- b) Chemical energy
- c) Potential energy
- d) Magnetic energy

Active power consumption of motive drives can be determined by using one of the following relations.

- a) $\sqrt{3} \times V \times I$
- b) $\sqrt{3} \times V^2 \times I \times \cos \phi$
- c) $\sqrt{3} \times V \times I^2 \times \cos \phi$
- d) $\sqrt{3} \times V \times I \times \cos \phi$

The grade of energy can be classified as low, high, extra ordinary. In case of electrical energy it would fall under ____ category. **(EM/EA)**

- a) low grade
- b) extra ordinary grade
- c) high grade
- d) none of the above

The portion of apparent power that doesn't do any work is termed as

- a) Apparent power
- b) Active power
- c) Reactive Power
- d) None of the above

Power factor (PF) is the ratio of **(EM/EA)**

- a) Apparent power & Active power
- b) Active power & Reactive power
- c) Active Power & Apparent power
- d) Apparent power & Reactive power

183. kVA is also called as

- a) reactive power
- b) apparent power
- c) active power
- d) captive power

The energy consumed by a 50 kW motor loaded at 40 kW over a period of 4 hours is

- a. 50 kWh
- b) 160 kWh
- c) 40 kWh
- d) 2000 kWh

The ratio of maximum demand to the connected load is termed as

- a) Load factor
- b) Demand factor
- c) Contract demand
- d) none of the above

A single phase induction motor is drawing 10 amps at 230 volts. If the operating power factor of the motor is 0.9, then the power drawn by the motor is

- a) 2.3 kW
- b) 3.58 kW
- c) 2.07 kW
- d) 2.70 kW

The quantity of heat required to raise the temperature of 1 gram of water by 1 °C is termed as

- a) Specific heat
- b) Heat capacity
- c) One Calorie
- d) Sensible heat

Nameplate kW or HP rating of a motor indicates

- a) input kW to the motor
- b) output kW of the motor
- c) minimum input kW to the motor
- d) maximum input kW to the motor

The quantity of heat required to change 1 kg of the substance from liquid to vapor state without change of temperature is termed as

- a) Latent heat of fusion
- b) Latent heat of vaporization
- c) Heat capacity
- d) Sensible heat

The latent heat of condensation of 1 kg of steam at 100 °C to form water at 100 °C, it gives out the heat of

- a) 580 kCal
- b) 540 kCal
- c) 620 kCal
- d) 2260 kCal

The specific heat of ____ is very high compared to other common substances listed below.

- a) Lead
- b) Mercury
- c) Water
- d) Alcohol

The property of viscosity of liquid fuels:

- decreases with decreasing temperature
- increases with increasing temperature
- decreases with increasing temperature
- increases with decreasing temperature

The quantity of heat Q, supplied to a substance to increase its temperature depends upon the following.

- a) sensible heat added
- b) latent heat of fusion
- c) specific heat of the substance
- d) heat capacity

194. Unit of specific heat in SI system is_____.

- a) joule /kg °C
- b) kg/cm²
- c) kcal/m³
- d) kcal/cm²

The change by which any substance is converted from a gaseous state to liquid state is termed as -----

- a) condensation
- b) Evaporation
- c) Fusion
- d) Phase change

The method of producing power by utilizing steam generated for process in the boiler is termed as -----

- a) Extraction
- b) Cogeneration
- c) Both a & b
- d) Neither a nor b

TRANSFORMERS

The BDV of transformer oil should be

- (a) 20 kV
- (b) 30 kV
- (c) 40 kV
- (d) 50 kV

The colour of moisten silica gel is

- (a) Pink
- (b) Blue
- (c) Yellow
- (d) Green

The material filled in breather of transformer is

- (a) Silica gel
- (b) Sulphuric acid
- (c) SF₆
- (d) Mineral oil

The protective device to indicate the internal fault in a transformer is

- (a) Thermal relay
- (b) Bucholz relay
- (c) OVR
- (d) EFR

The minimum allowable BDV for transformer oil should stand for

- (a) 15 sec
- (b) 30 sec
- (c) 45 sec
- (d) 60 sec

While testing transformer oil the gap between electrodes is kept at a distance of

- (a) 1 mm
- (b) 2 mm
- (c) 3 mm
- (d) 4 mm

7 Core of a transformer is made up of

- (a) Aluminium
- (b) Carbon
- (c) Lead
- (d) Silicon steel.

Which of the following is not the function of a transformer oil

- Cooling of primary coils
- Cooling of secondary coils.
- Providing additional insulation.
- Providing inductive coupling.

For a transformer, the condition for maximum efficiency is

- Hysteresis loss = eddy current loss
- Core loss = hysteresis loss
- Copper loss = Iron loss
- Total loss = 2/3 copper loss.

Transformer oil shall be free from

- (a) Odour
- (b) Gases
- (c) Temperature
- (d) Moisture.

The power factor in a transformer

Is always unity

Is always leading

Is always lagging

Depends on power factor of load.

The short circuit test of a transformer gives

Copper loss at full load

Copper loss at half load

Iron loss at any load

Sum of iron loss and copper load.

The open circuit test of transformer determines

Iron loss

Copper loss at full load

Copper loss at half load

Total losses.

The type of oil, which is suitable as transformer oil is

(a) Crude oil

(b) Organic oil

(c) Mineral oil

(d) Animal oil.

15 A step up transformer increases

(a) Power

(b) Current

(c) Voltage

(d) Frequency.

16 Which test is conducted on all transformers in a manufacturing concern

(a) Routine test

(b) Type test

(c) Special test

(d) All above

17 The colour of fresh dielectric oil for a transformer

(a) Pale yellow

(b) Dark brown

(c) White to grey

(d) Colourless

18 The ratio of kW to kVA is known as

(a) Voltage regulation

(b) power factor

(c) Transformation ratio

(d) None above

19 Core lifting of a transformer is done after a period of

(a) 3 yrs.

(b) 4 yrs.

(c) 5 yrs.

(d) 6 yrs.

20 The purpose of conservator tank in a transformer is to

(a) Monitor the oil level

(b) Top up the oil level

(c) Both a & b above

(d) None of the above.

Transformers placed in a room enclosed from all the four sides, the minimum spacing between the walls and the transformer should be

- (a) 0.5 m
- (b) 0.75 m
- (c) 1 m
- (d) 1.25 m

For indoor installation the minimum clearance between the highest point of the conservator tank to the ceiling of the transformer room should be

- (a) 0.25 m
- (b) 0.5 m
- (c) 0.75 m
- (d) 1 m

At an atmospheric temperature of 45 deg C and keeping in view the working condition, the winding temperature of the transformer should not exceed

- (a) 80 deg C
- (b) 95 deg C
- (c) 110 deg C
- (d) 130 deg C

Which of the following does not change in a transformer?

- a. Current
- b. Voltage
- c. Frequency
- d. All of the above

In a transformer the energy is conveyed from primary to secondary

- a. through cooling coil
- b. through air
- c. by the flux
- d. none of the above

A transformer core is laminated to

- a. reduce hysteresis loss
- b. reduce eddy current losses
- c. reduce copper losses
- d. reduce all above losses

The path of a magnetic flux in a transformer should have

- a. high resistance
- b. high reluctance
- c. low resistance
- d. low reluctance

No-load test on a transformer is carried out to determine

- a. copper loss
- b. magnetizing current
- c. magnetizing current and loss
- d. efficiency of the transformer

The dielectric strength of transformer oil is expected to be

- a. 1 kV
- b. 33 kV
- c. 100 kV
- d. 330 kV

The efficiency of a transformer will be maximum when

- a. copper losses = hysteresis losses
- b. hysteresis losses = eddy current losses
- c. eddy current losses = copper losses
- d. copper losses = iron losses

No-load current in a transformer

- a. lags behind the voltage by about 75°
- b. leads the voltage by about 75°
- c. lags behind the voltage by about 15°
- d. leads the voltage by about 15°

The purpose of providing an iron core in a transformer is to

- a. provide support to windings
- b. reduce hysteresis loss
- c. decrease the reluctance of the magnetic path
- d. reduce eddy current losses

Which of the following is not a part of transformer installation?

- a. Conservator
- b. Breather
- c. Buchholz relay
- d. Exciter

While conducting short – circuit test on a transformer the following side is short-circuited

- a. High voltage side
- b. Low voltage side
- c. Primary side
- d. Secondary side

In the transformer following winding has got more cross-section area

- a. low voltage winding
- b. High voltage winding
- c. primary winding
- d. secondary winding

A transformer transforms

- a. voltage
- b. current
- c. power
- d. frequency

A transformer cannot raise or lower the voltage of a D.C. supply because

- a. there is no need to change the D.C. voltage
- b. a D.C. circuit has more losses
- c. Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero
- d. none of the above

Primary winding of a transformer

- a. is always a low voltage winding
- b. is always a high voltage winding
- c. could either be a low or high voltage winding
- d. none of the above

Which winding in a transformer has more number of turns?

- a. Low voltage winding
- b. High voltage winding
- c. Primary winding
- d. Secondary winding

Efficiency of a power transformer is of the order of

- a. 100 percent
- b. 98 percent
- c. 50 percent
- d. 25 percent

A common method of cooling a power transformer is

- a. natural air cooling
- b. air blast cooling
- c. oil cooling
- d. any of the above

In a transformer routine efficiency depends upon

- a. supply frequency
- b. load current
- c. power factor of load
- d. both (b) and (c)

The maximum efficiency of a distribution transformer is

- a. at no load
- b. at 50% full load
- c. at 80% full load
- d. at full load

Transformer breathes in when

- a. load on it increases
- b. load on it decreases
- c. load remains constant
- d. none of the above

No-load current of a transformer has

- a. has high magnitude and low power factor
- b. has high magnitude and high power factor
- c. has small magnitude and high power factor
- d. has small magnitude and low power factor

Spacers are provided between adjacent coils

- a. to provide free passage to the cooling oil
- b. to insulate the coils from each other
- c. both (a) and (b)
- d. none of the above

In a transformer the tappings are generally provided on

- a. primary side
- b. secondary side
- c. low voltage side
- d. high voltage side

The chemical used in breather for transformer should have the quality of

- a. ionizing air
- b. absorbing moisture
- c. cleaning the transformer oil
- d. cooling the transformer oil

The chemical used in breather is

- a. asbestos fibre
- b. silica sand
- c. sodium chloride
- d. silica gel

The transformer ratings are usually expressed in terms of

- a. Volts
- b. amperes
- c. kW
- d. kVA

Material used for construction of transformer core is usually

- a. Wood
- b. copper
- c. Aluminium
- d. silicon steel

The thickness of lamination used in a transformer is usually

- a. 0.4mm to 0.5 mm
- b. 4 mm to 5 mm
- c. 14mm to 15mm
- d. 25mm to 40 mm

The function of conservator in a transformer is

- a. to protect against internal fault
- b. to reduce copper as well as core losses
- c. to cool the transformer oil
- d. to take care of the expansion and contraction of transformer oil due to variation of temperature of surroundings

December, 2013

A Buchholz relay can be installed on

- a. auto-transformers
- b. air-cooled transformers
- c. welding transformers
- d. oil cooled transformers

Buchholz's relay gives warning and protection against

- a. electrical fault inside the transformer itself
- b. electrical fault outside the transformer in outgoing feeder
- c. for both outside and inside faults
- d. none of the above

The transformer laminations are insulated from each other by

- a. mica strip
- b. thin coat of varnish
- c. paper
- d. any of the above

During open circuit test of a transformer

- a. primary is supplied rated voltage
- b. primary is supplied full-load current
- c. primary is supplied current at reduced voltage
- d. primary is supplied rated kVA

Open circuit test on transformers is conducted to determine

- a. hysteresis losses
- b. copper losses
- c. core losses
- d. eddy current losses

Short circuit test on transformers is conducted to determine

- a. hysteresis losses
- b. copper losses
- c. core losses
- d. eddy current losses

The function of breather in a transformer is

- a. to provide oxygen inside reduced load
- b. to cool the coils during reduced load
- c. to cool the transformer oil
- d. to arrest flow of moisture when outside air enters the transformer

The secondary winding of which of the following transformers is always kept closed?

- a. Step-up transformer
- b. Step-down transformer
- c. Potential transformer
- d. Current transformer

For a transformer, operating at constant load current, maximum efficiency will occur at

- a. 0.8 leading power factor
- b. 0.8 lagging power factor
- c. zero power factor
- d. unity power factor

Which of the following protection is normally not provided on small distribution transformers?

- a. Over-fluxing protection
- b. Buchholz relay
- c. Over-current protection
- d. All of the above

Which of the following acts as a protection against high voltage surges due to lightning and switching?

- a. Horn gaps
- b. Thermal overload relays
- c. Breather
- d. Conservator

Which of the following parts of a transformer is visible from outside?

- a. Bushings
- b. Core
- c. Primary winding
- d. Secondary winding

The noise produced by a transformer is termed as

- a. zoom
- b. hum
- c. Ringing
- d. buzz

Which of the following loss in a transformer is zero even at full load?

- a. core loss
- b. friction loss
- c. eddy current loss
- d. hysteresis loss

If a transformer is continuously operated the maximum temperature rise will occur in

- a. Core
- b. windings
- c. Tank
- d. any of the above

An open-circuit test on a transformer is conducted primarily to measure

- a. Insulation Resistance
- b. Copper loss
- c. Core loss
- d. Total loss

A no-load test is performed on a transformer to determine

- a. Core loss
- b. Copper loss
- c. Efficiency
- d. Magnetising current and loss

EARTHING

1. The code of practice for earthing is governed by

- (a) IS: 3043 (b) IS: 4340 (c) IS: 4340 (d) IS: 4430

The length of pipe electrode used for earthing should not be less than

- (a) 3.5 m (b) 4 m (c) 4.5 m (d) 5 m

As per IS, the earthing electrode shall not be within a distance of _____ mtrs from any building being earthed.

- (a) 0.5 m (b) 1 m (c) 1.5 m (d) 2 m

Maximum permissible earth resistance at large power stations is

- (a) 0.5 ohm (b) 1 ohm (c) 2 ohms (d) 8 ohms

Maximum permissible earth resistance at major power stations is

- (a) 0.5 ohm (b) 1 ohm (c) 2 ohms (d) 8 ohms

Maximum permissible earth resistance at small power stations is

- (a) 0.5 ohm (b) 1 ohm (c) 2 ohms (d) 8 ohms

Maximum permissible earth resistance for buildings is

- (a) 0.5 ohm (b) 1 ohm (c) 2 ohms (d) 8 ohms

Earth continuity inside an installation i.e. from plate earth to any point in installation should be

- (a) 0.5 ohm (b) 1 ohm (c) 2 ohms (d) 8 ohms

9 The plate electrode of copper used for earthing should be with minimum size of

- (a) 50cm x 50cm x 3.15mm (b) 50cm x 50cm x 6.3mm
(c) 60cm x 60cm x 3.15mm (d) 60cm x 60cm x 6.3mm

10 The plate electrode of GI or steel used for earthing should be with minimum size of

- (a) 50cm x 50cm x 3.15mm (b) 50cm x 50cm x 6.3mm
(c) 60cm x 60cm x 3.15mm (d) 60cm x 60cm x 6.3mm

11 In pipe earthing, the minimum internal diameter for GI pipe should be

- (a) 30 mm (b) 40 mm (c) 50 mm (d) 60 mm

12 In pipe earthing, the minimum internal diameter for cast iron pipe should be

- (a) 80 mm (b) 90 mm (c) 100 mm (d) 60 mm

13 Copper strip electrodes used for earthing should not be less than

- (a) 22.5 mm x 1.60 mm (b) 20 mm x 2.5 mm
(c) 25 x 1.60 mm (d) 25 mm x 2.5 mm

14 GI or Steel strip electrodes used for earthing should not be less than

- | | |
|-----------------|------------------|
| (a) 25 mm x 4mm | (b) 20 mm x 3 mm |
| (c) 25mm x 3mm | (d) 20mm x 4mm |

Earthing arrangement for HT installations, substations and generating stations should be inspected at an interval of

- | | | | |
|--------------|--------------|--------------|---------------|
| (a) 3 months | (b) 6 months | (c) 9 months | (c) 12 months |
|--------------|--------------|--------------|---------------|

Earthing arrangement for low voltage installations such as service builings, public buildings should be inspected at an interval of

- | | | | |
|--------------|--------------|--------------|---------------|
| (a) 3 months | (b) 6 months | (c) 9 months | (c) 12 months |
|--------------|--------------|--------------|---------------|

17 Earthing arrangement for residential buildings should be inspected at an interval of

- | | | | |
|--------------|--------------|--------------|---------------|
| (a) 3 months | (b) 6 months | (c) 9 months | (c) 12 months |
|--------------|--------------|--------------|---------------|

Earthing arrangement for medium voltage installations should be inspected at an interval of

- | | | | |
|--------------|--------------|--------------|---------------|
| (a) 3 months | (b) 6 months | (c) 9 months | (c) 12 months |
|--------------|--------------|--------------|---------------|

LIGHTING & ILLUMINATION

- The illumination level at A class stations should be
 (a) 20 lux (b) 30 lux (c) 40 lux (d) 50 lux
2. The illumination level at B class stations should be
 (a) 20 lux (b) 30 lux (c) 40 lux (d) 50 lux
3. The illumination level at C class stations should be
 (a) 20 lux (b) 30 lux (c) 40 lux (d) 50 lux
4. Recommended no. of light points in type I (DR) quarter is
 (a) 5 (b) 6 (c) 7 (d) 8
5. Recommended no. of light points in type II quarter is
 (a) 5 (b) 6 (c) 7 (d) 8
6. Recommended no. of light points in type III quarter is
 (a) 5 (b) 6 (c) 7 (d) 8
7. Recommended no. of light points in type IV quarter is
 (a) 8 (b) 9 (c) 10 (d) 11
8. Recommended no. of light points in type IV spl. quarter is
 (a) 11 (b) 12 (c) 13 (d) 14
9. Recommended no. of fan points in type I quarter is
 (a) 2 (b) 3 (c) 4 (d) 5
10. Recommended no. of fan points in type II quarter is
 (a) 2 (b) 3 (c) 4 (d) 5
11. Recommended no. of fan points in type III quarter is
 (a) 2 (b) 3 (c) 4 (d) 5
12. Recommended no. of fan points in type IV quarter is
 (a) 2 (b) 3 (c) 4 (d) 5
13. Recommended no. of fan points in type IV spl. quarter is
 (a) 2 (b) 3 (c) 4 (d) 5
14. Recommended connected load for type I (DR) quarter is
 (a) 1.36 kW (b) 3.48 kW (c) 4.17 kW (d) 6.85 kW

Which of the following lamps is the cheapest for the same wattage?

- a. Fluorescent tube
- b. mercury vapour lamp
- c. GLS lamp
- d. sodium vapour lamp

Which of the following is not the standard rating of GLS lamps?

- a. 100 W
- b. 75 W
- c. 40 W
- d. 15 W

The colour of sodium vapour discharge lamp is

- a. red
- b. pink
- c. yellow
- d. bluish green

A reflector is provided to

- a. protect the lamp
- b. provide better illumination
- c. avoid glare
- d. do all of the above

The purpose of coating the fluorescent tube from inside with white powder is

- a. to improve its life
- b. to improve the appearance
- c. to change the colour of light emitted to white
- d. to increase the light radiations due to secondary emissions

In the fluorescent tube circuit the function of choke is primarily to

- a. reduce the flicker
- b. minimize the starting surge
- c. initiate the arc and stabilize it
- d. reduce the starting current

The function of capacitor across the supply to the fluorescent tube is primarily to

- a. stabilize the arc
- b. reduce the starting current
- c. improve the supply power factor
- d. reduce the noise

Most affected parameter of a filament lamp due to voltage change is

- a. wattage
- b. life
- c. luminous efficiency
- d. light output

In electric discharge lamps for stabilizing the arc

a reactive choke is connected in series with the supply

a condenser is connected in parallel to the supply

a condenser is connected in series to the supply

a variable resistor is connected in the circuit

For precision work the illumination level required is of the order of

- a. 500– 1000 lumens/m²
- b. 200– 400 lumens/m²
- c. 50 –100 lumens/ m²
- d. 10 –25 lumens/ m²

For normal reading the illumination level required is around

- a. 20 –40 lumens/ m²
- b. 60 – 100 lumens/ m²
- c. 200 – 300 lumens/ m²
- d. 400 – 500 lumens/ m²

In electric discharge lamps light is produced by

- a. cathode ray emission
- b. ionization in a gas or vapour
- c. heating effect of current
- d. magnetic effect of current

A substance which change its electrical resistance when illuminated by light is called.....

- a. photoelectric
- b. photovoltaic
- c. photoconductive
- d. none of the above

In case of ... power factor is the highest.

- a. GLS lamps
- b. mercury arc lamps
- c. tube lights
- d. sodium vapour lamps

A mercury vapour lamp gives ... light.

- a. white
- b. pink
- c. yellow
- d. greenish blue

Sometimes the wheels of rotating machinery, under the influence of fluorescent lamps appear to be stationary. This is due to the

- a. low power factor
- b. stroboscopic effect
- c. fluctuations
- d. luminescence effect

The flicker effect of fluorescent lamps is more pronounced at

- a. lower frequencies
- b. higher frequencies
- c. lower voltages
- d. higher voltages

Which gas can be filled in GLS lamp?

- a. oxygen
- b. carbon di-oxide
- c. xenon
- d. any inert gas

The gas filled in vacuum filament lamps is

- a. nitrogen
- b. argon
- c. air
- d. none

The vapour discharge tube used for domestic lighting has

- a. no filament
- b. one filament
- c. two filament
- d. three filament

Stroboscopic effect due to use of discharge lamps in workshops results in moving machinery appearing

- a. stationary
- b. stationary running slow
- c. stationary running in reverse direction
- d. all of the above

Glare is reduced by

- a. using diffusers
- b. increasing the height of the lamp
- c. using reflectors to cut-off the light at certain angle
- d. all of the above

Which of the following is present inside the fluorescent tube?

- | | |
|-------------------|------------------------------|
| a. argon and neon | b. argon and CO ₂ |
| c. mercury vapour | d. helium and oxygen |

When an electric bulb is broken it produces bang; this is due to

- | | |
|---|--------------------------------|
| a. vacuum inside the bulb | b. pressure of air in the bulb |
| c. pressure inside is equal to that outside | d. none of the above |

5. D.G. SET

- 1 If a DG set fails to start, the probable cause may be
 - (a) Dirty clogged air cleaner
 - (b) Fuel tank empty
 - (c) Nozzle niddle jammed
 - (d) All of the above
- 2 If a DG set starts but stop after some time, the probable cause may be
 - (a) Air in fuel
 - (b) Fuel line choke
 - (c) Fuel filter choked
 - (d) All of the above
- 3 If a DG set is not gaining full speed, the probable cause may be
 - (a) Fuel tank empty
 - (b) Governor spring broken
 - (c) Fuel filter dirty
 - (d) All of the above
- 4 If a DG set misses during operation, the probable cause may be
 - (a) Air in fuel line
 - (b) Nozzle damaged
 - (c) Water mixed with fuel
 - (d) All of the above
- 5 If a DG set lacks power, the probable cause may be
 - (a) Pump may inject insufficient quantity of fuel
 - (b) Poor quality of fuel
 - (c) Dirty cooling system
 - (d) All of the above
- 6 If a DG set gives excessive smoke at no load, the probable cause may be
 - (a) Dirty clogged air cleaner
 - (b) choked fuel injection hole
 - (c) Faulty fuel pump
 - (d) All of the above
- 7 If a DG set excessive smoke at full load, the probable cause may be
 - (a) One or more cylinder not working
 - (b) Poor quality of oil
 - (c) Nozzle jammed
 - (d) All of the above
- 8 If a DG set gives out blue smoke, the probable cause may be
 - (a) Worn out liner on piston
 - (b) Wrong graded lubricating oil
 - (c) Engine used after a long time
 - (d) All of the above
- 9 If a DG set gives white smoke, the probable cause may be
 - (a) Water mixed with fuel
 - (b) Engine used after a long time
 - (c) Worn out liner piston
 - (d) All of the above
- 10 If a DG set overheats, the probable cause may be
 - (a) high exhaust back pressure
 - (b) Engine overloaded
 - (c) Damaged main or connecting bearings
 - (d) All of the above
- 11 If a DG set consumes excessive fuel, the probable cause may be
 - (a) Injector adjustment disturbed
 - (b) External/internal fuel leakage
 - (c) Incorrect value of fuel timing
 - (d) All of the above

- 12 If the alternator of DG set overheats, the probable cause may be
(a) Improper ventilation (b) Misalignment
(c) Overloading of machine (d) All of the above
- 13 If the armature of DG set overheats, the probable cause may be
(a) Overloading (b) Internal short circuit
(c) Both a & b (d) None of the above
- 14 The maximum rated speed for 125 kVA Cummins make DG set is
(a) 1500 rpm (b) 1800 rpm (c) 2100 rpm (d) 2500 rpm
- 15 The oil temperature gauge of a DG set should normally read between
(a) 82-116 deg C (b) 90-125 deg C (c) 100-140 deg (d) 122-148 deg C
- During warming up, the load should be applied gradually on a DG set until the oil temperature reaches
(a) 40 deg C (b) 60 deg C (c) 80 deg C (d) 100 deg C
- 17 The water temperature of DG set in operation should normally range between
(a) 60-80 deg C (b) 74-91 deg C (c) 88-98 deg C (d) 95-110 deg C
- The pH value of the coolant in the radiator of a DG set should be maintained between
(a) 6.5 to 8.5 (b) 8.5 to 10.5 (c) 10.5 to 12.5 (d) 12.5 to 14.5
- 19 The diesel engine should not be operated if the pH value in the radiator is less than
(a) 6.5 (b) 8.5 (c) 10.5 (d) 12.5
- 20 Primary filters in the fuel system of the DG set should be cleaned at every
(a) 150 hrs (b) 200 hrs (c) 250 hrs (d) 300 hrs
- 21 Primary filters in the fuel system of the DG set should be replaced at every
(a) 500 hrs (b) 800 hrs (c) 1000 hrs (d) 1500 hrs
- The secondary fuel filter of a DG set should be replaced when the fuel pressure gauge is below
(a) 10 psi (b) 12 psi (c) 15 psi (d) 20 psi
- 23 The exciter in a DG set is
(a) Shunt motor (b) Compound generator
(c) Either of a or b (d) None of the above.

The compression ratio in diesel engines is in the range of:

- a) 10:1 to 15:1 b) 14:1 to 25:1 c) 5:1 to 10:1 d) 1:2 to 3:1

Which of the following is the last step in diesel engine operation?

- a) Induction stroke b) Compression stroke c) Ignition stroke d) Exhaust stroke

The power requirement of the DG set is determined by:

- a) base load b) Maximum load c) Partial load d) Zero load

Present specific fuel consumption value of DG sets in industries is about _____. a)

- 220 g/kWh b) 100 g/kWh c) 160 g/kWh d) 50 g/kWh

The efficiency of diesel generating set falls in the region of:

- a) 35 – 45% b) 50 – 60% c) 65 – 70% d) Above 80%

Auxiliary power consumption of DG set at full load in its operating capacity is about _____. a)

- 1 - 2% b) 5 – 6% c) 10 - 12% d) Above 15%

The rating required for a DG set with 500 kW connected load and with diversity factor of 1.5, 80% loading and 0.8 power factor is _____

- a) 520 kVA b) 600 kVA c) 625 kVA d) 500 kVA

The starting current value of DG set should not exceed ___% of full load capacity of DG set.

- a) 100 b) 200 c) 150 d) 300

The maximum permissible percentage unbalance in phase loads on DG sets is _____

- a) 5% b) 15% c) 10% d) 1%

The permissible percentage overload on DG sets for 1 hour in every 12 hours of operation is _____

- a) 5% b) 15% c) 10% d) 1%

Designed power factor of a DG set is generally at:

- a) 1.0 b) 0.8 c) 0.9 d) 1.1

Lower power factor of a DG set demands _____

- a) Lower excitation currents b) Higher excitation currents
c) No change in excitation currents d) None of the above

6. PUMPS

- 1 If pump delivers no liquid, then probable cause is

(a) Lack of prime	(b) Gas or air in liquid
(c) Bent shaft	(d) Moisture in lubricating oil
- 2 If pump discharge pressure is low, then probable cause is

(a) Lack of prime	(b) Gas or air in liquid
(c) Bent shaft	(d) Moisture in lubricating oil
- 3 If there is excessive vibration in pump, then probable cause is

(a) Lack of prime	(b) Gas or air in liquid
(c) Bent shaft	(d) Moisture in lubricating oil
- 4 If the bearing of pump overheats, then probable cause is

(a) Lack of prime	(b) Gas or air in liquid
(c) Bent shaft	(d) Moisture in lubricating oil
- 5 If pump overloads the driver, then probable cause is

(a) Packing too tight	(b) Suction line not filled with liquid
(c) Gas or liquid in air	(d) None of the above
- 6 Which of the following is not a criteria of pump selection

(a) Type of duty required	(b) Details of head
(c) Duration of availability of power supply	(d) The look of pump.

HS Pump works with suction head.

- | | |
|---------------------|------------------------|
| (a) 15-20 feet head | (b) 21-40 feet head |
| (c) 41-80 feet head | (d) None of the above. |

VS Pump works with total head

- | | |
|-------------------------|-----------------------|
| (a) Upto 46 Mtrs. head. | (b) 46-70 Mtrs. head |
| (c) 70-100 Mtrs. Head | (d) None of the above |

Motor of the VS pump is located

- | | |
|----------------------------|----------------------------|
| (a) Above the ground level | (b) Below the ground level |
| (c) Deep in the bore | (d) None of the above |

Line shaft of the VS pump is lubricated

- | | |
|-----------------------|-----------------------|
| (a) Spindle oil | (b) Diesel oil |
| (c) Lub oil SAE-40/30 | (d) None of the above |

11. Priming is required for

- | | | |
|-------------|-------------|----------------------|
| (a) HS Pump | (b) VS Pump | (c) Submersible Pump |
|-------------|-------------|----------------------|

RPM of submersible pump set is

- (a) 440 (b) 1440 (c) 380 (d) 2800

Which pump is most suitable for deep & titled bore

- (a) HS Pump (b) VS Pump (c) Submersible (d) Jet pump
None of above.

Redevelopment of bore is done

- For smooth operation of pump
- For taking good yield for bore
- To maintain long life of bore
- To avoid the frequent failure of the pump
- All of above.

Capacity of pump set is selected on the ground of

- Yield, Static-water-level, Working-water-level.
- Location of bore
- Type of starter provided
- Quantity of water to be used.

Pump fails mostly due to

- Less working
- Excessive working
- Incorrect operation
- Failure of pump

Pump set motor burns due to

- Single phasing
- Reverse phasing
- Over loading for a shorter period
- None of above.

For a 10 HP pump set which type of starter is suitable

- (a) DOL (b) Start Delta (c) Auto Transformer
None of the above

A 5 HP pump set draws current on full load

- (a) 5 A (b) 10 A (c) 7.5 A (d) 6 A

Ammeter is provided in control panel of pump set to measure the

- (a) Voltage (b) Frequency (c) Power Factor (d) Current

No. of contractors provided in star-delta starter

- (a) 1 (b) 2 (c) 3 (d) 4

Pump Guard functions to protect the submersible pump set against

- Single Phasing
- Reverse Phasing
- Over Loading
- Dry Running
- All of above.

Automation of pump set is done to

- To limit the working of pumps
- To avoid the working of water
- To save the electrical energy
- To reduce the man power
- All of the above.

Centralized control of pumps means

- Operation of pump from individual pump houses
- Operation of all pumps from a single location
- None of the above

The functional head due to flow of water in the pipe line----- length of piping system.

- (a) Inversely proportional to
- (b) Directly proportional to
- (c) Constant and independent of
- (d) None of the above.

The functional head due to flow of water in the pipe line----- Diameter of pipe.

- Inversely proportional to
- Directly proportional to
- Constant and independent of
- None of the above.

The functional head due to flow of water in pip line is directly proportional to---- of water.

- Velocity
- (Square root of) Velocity
- 1 / Velocity
- Velocity²

The average of velocity of water in the suction pipe --- the delivery pipe.

- | | | | | |
|-------------------|-----------|-----------|-----------|-----------|
| $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ |
| less than in | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ |
| more than in | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ |
| same as in | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ |
| one of the above. | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ | $\bar{A}$ |

Theoretically the maximum suction head for ordinary centrifugal pumps should not exceed.

- (a) 20 feet
- (b) 34 feet
- (c) 10 feet
- (d) 5 feet.

For vertical shaft pump and submersible pumps the suction head is always.

- (a) Positive (b) Negative (c) Zero (d) None of the above.

The motor of vertical shaft, 75 HP rating pump is.

- (a) Force air cooled (b) Natural air cooled
(c) Water cooled. (d) None of the above.

The specific speed of pump (in RPM) is the speed at which the impeller would run to give discharge of --- against head of ----

- 1 GPM, 1 Foot
1 GPH, 1 Foot
1 GPM, 34 feet
1 GPH, 34 feet

The specific speed of pump is directly proportional to ---- where 'Q' is rate of discharge in GPH.

- (a) (Square root) Q (b) Q
(c) Q^2 (d) None of the above.

The specific speed of pump is directly proportional to --- where 'N' is speed of pump in RPM.

- (a) Square root (N) (b) N
(c) N^2 (d) None of the above.

Positive displacement pumps are generally less efficient than centrifugal pumps. State whether the statement is true or false

- (a) True (b) False

Installing larger diameter pipe in pumping system results in reduction in-----

- a) static head b) frictional head c) both a and b d) neither a nor b

Generally water pipe lines are designed with water velocity of

- a) < 1 m/s b) up to 2.0 m/s c) > 2 m/s d) None of the above

What is the impact on flow and pressure when the impeller of a pump is trimmed?

- a) Flow decreases with increased pressure b) Both flow and pressure increases
c) Both pressure and flow decreases d) None of the above

For high flow requirement, pumps are generally operated in

- a) parallel b) series c) any of the above d) none of the above

“In case of throttling operation, the pump has to overcome additional pressure in order to deliver the reduced flow”. Please indicate whether this statement is

- (a) True (b) False

Friction losses in a pumping system is-----

- a) proportional to $1/Q$ b) proportional to $1/Q^2$
c) proportional to $1/Q^3$ d) proportional to $1/Q^4$

For large capacity centrifugal pumps, design efficiencies are in the range of

- a) around 70% b) around 85% c) around 95% d) any of above

The moving part in centrifugal pump is -----

- a) impeller b) diffuser c) both a & b d) neither a nor b

The most efficient method of flow control in a pumping system is-----

- a) Throttling the flow b) Speed control c) Impeller trimming d) None

In case of increased suction lift from open wells, the delivery flow rate-----

- a) increases b) decreases c) remains same d) none of the above

Pump efficiency generally increases with specific speed. State whether the statement is True or False.

- (a) True (b) False

Throttling the delivery valve of a pump results in increased ____.

- a) head b) power c) both (a) and (b) d) either (a) or (b)

The operating point in a pumping system is identified by

Point of intersection of system curve and efficiency curve

Point of intersection of pump curve and theoretical power curve

Point of intersection of pump curve and system curve

Ä □ Ä □

Ä □

Ä □

cannot be decided by pump characteristic curves

The intersection point of the pump curve and the system curve is called-----

- a) Pump efficiency b) Best efficiency point
c) System efficiency d) None of the above

If the speed of a centrifugal pump is doubled, its power consumption increases by----- times.

- a) two b) four c) eight d) no change

51. Installation of Variable frequency drives (VFD) allows the motor to be operated with ____.

- a) lower start-up current
- b) higher start-up current
- c) constant current
- d) none of the above

In case of centrifugal pumps, impeller diameter changes are generally limited to reducing the diameter to about ____ of maximum size.

- a) 75%
- b) 50%
- c) 25%
- d) None of the above

If the delivery valve of the pump is throttled such that it delivers 30% of the rated flow, one of the best options for improved energy efficiency would be

- a) Trimming of the impeller
- b) Replacing the motor
- c) Replacing the impeller with a smaller size impeller
- d) None of the above

54. Small by-pass lines are installed some times to ____.

- a) control flow rate
- b) control pump delivery head
- c) prevent pump running at zero flow
- d) reduce pump power consumption

TRACK CROSSINGS

The minimum height above rail level of the lowest portion of any conductor of 11 kV to 66 kV overhead lines crossing (including guard wire) the railway track should be

- (a) 14.1 m (b) 14.6 m (c) 15.4 m (d) 17.9 m

The minimum height above rail level of the lowest portion of any conductor of 66 kV to 132 kV overheads lines crossing the railway track should be

- (a) 14.1 m (b) 14.6 m (c) 15.4 m (d) 17.9 m

- 3 The minimum depth of underground cable track crossing (through) pipe should be

- (a) 1 m (b) 1.5 m (c) 2 m (d) 2.5 m

- 4 The Electrical Inspector at zonal railway is

- (a) CEE (b) Dy. CEE (c) DRM (Elect.) (d) CESE.

The regulations for electrical line crossing on railway track is not applicable to

- Crossing of railway track laid underground/ inside tube and tunnels
- 1500 V DC traction system
- 25 kV, 50 Hz traction systems
- All of the above

In special cases the reduction in specified clearance of electrical crossing on railway track can be permitted by

- (a) Electrical Inspector (b) Astd. Electrical Inspector
(c) DRM (d) ADRM

In view of electrical lines crossing on railway tracks the materials used should comply with Indian Standards specifications but where these are not available, which of the following should be followed

- British standard specifications
- US standard specifications
- Russian standard specifications
- France standard specifications

Electrical crossings on railway tracks should be inspected by the owner at a interval not exceeding

- (a) 3 months (b) 6 months (c) 9 months (d) 12 months

If at instance of railways any electrical crossing on railway track is to be shifted or modified the cost will be borne by____ (shifting not foreseen at the time of agreement)

- (a) Owner (b) Railways (c) Both (d) Either a or b

In case of defects and failures in electrical crossing on railway tracks, owner has to send a detailed report to all the authorities mentioned in the regulations, within _____ hrs of the first report

- (a) 12 (b) 24 (c) 36 (d) 48

Angle of overhead electrical line crossing to railway track shall be

- Right angle
Acute angle
Obtuse angle
Angle does not matter.

In special cases the maximum permitted deviation in angle of OH electrical line crossing to railway track shall be

- (a) 10 deg (b) 20 deg (c) 30 deg (d) 45 deg

The minimum distance of structures (for electrical line crossing) from the centre of nearest railway track shall be equal to the height of the structure in meters plus

- (a) 3 m (b) 6 m (c) 9 m (d) 12 m

14 The span of the OH electrical line crossing the railway track is restricted to

- (a) 100 m (b) 200 m (c) 300 m (d) 400 m

The minimum height above rail level of the lowest portion of any conductor of 132kV to 220kV overhead lines crossing (including guard wire) the railway track should be

- (a) 14.1 m (b) 14.6 m (c) 15.4 m (d) 17.9 m

The minimum height above rail level of the lowest portion of any conductor of 220kV to 400kV overhead lines crossing (including guard wire) the railway track should be

- (a) 14.1 m (b) 4.6 m (c) 15.4 m (d) 17.9 m

In special circumstances if the railway crane has to work under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 33 kV lines should be

- (a) 1.5 m (b) 2 m (c) 2.25 m (d) 2.5 m

In special circumstances if the railway crane has to work under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 66 kV lines should be

- (a) 1.5 m (b) 2 m (c) 2.25 m (d) 2.5 m

In special circumstances if the railway crane has to work under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 110kV lines should be

- (a) 1.5 m (b) 2 m (c) 2.25 m (d) 2.5 m

In special circumstances if the railway crane has to work under the under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 132kV lines should be

- (a) 1.5 m (b) 2 m (c) 2.25 m (d) 2.5 m

In special circumstances if the railway crane has to work under the under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 220kV lines should be

- (a) 2.25m (b) 2.5 m (c) 3.5 m (d) 6.0 m

In special circumstances if the railway crane has to work under the under the overhead electrical line crossing, the minimum clearance between the highest point of the jib and the lowest conductor of the 400kV lines should be

- (a) 2.25m (b) 2.5m (c) 3.5 (d) 6.0 m

In sections where tracks are not to be electrified in future, lines upto 11 kV overhead crossing are permitted with clearance between lowest conductor of the line and railway track

- (a) 9 m (b) 10.95 m (c) 11.05 m (d) 12.1 m

The factor of safety of each string of insulator used for overhead electrical crossing on railway track should not be less than

- (a) 1 (b) 2 (c) 3 (d) 4

The minimum height between any guard wire and a live conductor of electrical crossing on railway track shall not be less than

- (a) 1 m (b) 1.5 m (c) 2 m (d) 2.5 m

Each structure on either side of the railway track, supporting the span of overhead electrical line crossing should be provided with _____ no. of independent earths

- (a) 1 (b) 2 (c) 3 (d) 4

The maximum permissible earth resistance on either side of the electrical overhead line crossing (on railway track) is

- (a) 5 ohm (b) 8 ohm (c) 10 ohm (d) 12 ohm

The owner of the overhead electric line crossing on railway tracks, is required to inspect and test the earth on hot dry day at an interval of

- (a) 3 months (b) 6 months (c) 9 months (d) 12 months

Which of the following should be displayed on the marker at each end of the underground cable crossing on railway track

- (a) No. of cables (b) Size of cable
(c) Make of cables (d) All of the above

Which of the following data is to be provided by the owner, while proposing for overhead electrical line crossing on railway track

Temperature data provided

Name of supervisor from owner's side

Life of crossing

None of the above.

The final authority to grant the approval for proposed electrical line crossing on railway track

(a) Electrical Inspector

(b) DRM

(c) DRM (Elect.)

(d) ADRM

INDIAN ELECTRICITY RULES

- 1 The maximum variation allowed in voltage of LV & MV AC supply is
 (a) $\pm 2\%$ (b) $\pm 3\%$ (c) $\pm 4\%$ (d) $\pm 5\%$
- 2 The maximum variation allowed in voltage of HV & EHV AC supply is
 (a) $\pm 8.5\%$ (b) $\pm 10.5\%$ (c) $\pm 12.5\%$ (d) $\pm 14.5\%$
- 3 The maximum variation allowed in frequency of AC supply is
 (a) $\pm 2\%$ (b) $\pm 3\%$ (c) $\pm 4\%$ (d) $\pm 5\%$

Clearance of the lowest conductor (across the street) from the ground for LT and MT lines should be

- (a) 17 ft. (b) 18 ft. (c) 19 ft. (d) 20 ft.

Clearance of the lowest conductor (across the street) from the ground for HT lines should be

- (a) 17 ft. (b) 18 ft. (c) 19 ft. (d) 20 ft.

Clearance of the lowest conductor (along the street) from the ground for LT and MT lines should be

- (a) 17 ft. (b) 18 ft. (c) 19 ft. (d) 20 ft.

Clearance of the lowest conductor (along the street) from the ground for HT lines should be

- (a) 17 ft. (b) 18 ft. (c) 19 ft. (d) 20 ft.

Clearance of the lowest conductor vertical above the building for LT and MT lines should be

- (a) 4 ft. (b) 6 ft. (c) 8 ft. (d) 12 ft.

- 9 Clearance of the lowest conductor vertical above the building for HT lines should be
 (a) 4 ft. (b) 6 ft. (c) 8 ft. (d) 12 ft.

Clearance of the conductor Horizontal from the building for LT and MT lines should be

- (a) 4 ft. (b) 6 ft. (c) 8 ft. (d) 12 ft.

- 11 Clearance of the conductor Horizontal from the building for HT lines should be
 (a) 4 ft. (b) 6 ft. (c) 8 ft. (d) 12 ft.

The on line vertical spacing between the conductors for 400/230 V, 150 ft. span lines should be

- (a) 1'3" (b) 1'6" (c) 2' (d) 2'6"

The on line vertical spacing between the conductors for 400/230 V, 150-250 ft. span lines should be

- (a) 1'3" (b) 1'6" (c) 2' (d) 2'6"

- 14 The on line vertical spacing between the conductors for 11 kV lines should be

- (a) 1'3" (b) 1'6" (c) 2' (d) 2'6"

The on line horizontal spacing between the conductors for 400/230 V, 150 ft. span lines should be

- (a) 1'3" (b) 1'6" (c) 2' (d) 2'6"

The on line horizontal spacing between the conductors for 400/230 V, 150-250 ft. span lines should be

- (a) 1'3" (b) 1'6" (c) 2' (d) 2'6"

- 17 The on line horizontal spacing between the conductors for 11 kV lines should be

- (a) 1'3" (b) 1'6" (c) 2'6" (d) 3'9"

The clearance between the conductor and pole for 400/230 V, 150 ft span lines, should be

- (a) 6" (b) 9" (c) 12" (d) 1'3"

The clearance between the conductor and pole for 400/230 V, 150-250 ft span lines, should be

- (a) 6" (b) 9" (c) 12" (d) 1'3"

- 20 The clearance between the conductor and pole for 11 kV lines, should be

- (a) 6" (b) 9" (c) 12" (d) 1'3"

POLICY

Provision of rebate by state electricity authority is applicable if the power factor is kept above

- (a) 0.9 (b) 0.92 (c) 0.95 (d) 0.98

Penalty is imposed by state electricity authority if the power factor is below

- (a) 0.9 (b) 0.92 (c) 0.95 (d) 0.98

Electric energy charges from the railway employees residing in railway colonies are at

- Flat rate
- Fixed rate
- Average consumption
- The rate that of local supply authority

Electric energy charges from the staff/ teachers of Kendriya Vidhyalaya residing in railway colonies is at

- Flat rate
- Fixed rate
- Average consumption
- The rate applicable to railway employees

Electric energy charges from the social welfare organizations such as railway institute, community halls, clubs, etc. is at

- Flat rate
- Fixed rate
- Average consumption
- The rate applicable to railway employee subject to maximum limit of consumption.

Electric energy charges from the religious buildings (electric supply fed by railway) such as temples. Mosque etc is at

- Flat rate
- Fixed rate
- Average consumption
- The rate that of local supply authority

Per day charges from officers on duty (entitled to 1st class AC travel) for occupation of air conditioned accommodation on railway rest house is Rs.

- (a) 3 (b) 5 (c) 6 (d) 7

Per day charges from officers on leave (entitled to 1st class AC travel) for occupation of air conditioned accommodation on railway rest house is prescribed room rent plus Rs.

- (a) 3 (b) 5 (c) 6 (d) 7

Per day charges from officers on duty (entitled to 1st class AC travel) for occupation of air conditioned accommodation on railway rest house during winter season is Rs.

- (a) 3 (b) 5 (c) 6 (d) No charges

The firms dealing with coin operated person weighing machines has to deposit security money equivalent to

- One month electric charges
- Two month electric charges
- Three month electric charges
- No charges.

The private parties applying for electric connection from railways has to deposit security money equivalent to

- One month electric charges
- Two month electric charges
- Three month electric charges
- No charges.

As per Railway Board recommendations, following are to be connected with DG set supply

- Vacuum testing plants
- Water coolers on platforms
- Hospital with operation theatre
- All of the above.

As per Railway Board recommendations, the stations/ halts should be electrified, where the electric supply is available within

- (a) 1 km
- (b) 1.5 km
- (c) 2 km
- (d) 2.5 km

14 The porters rest centres are treated as

- (a) Service building
- (b) Private building
- (c) Passenger amenity
- (d) None of the above

As per Indian Electricity Act, penalty against unauthorised electricity connection is

- Imprisonment up to 3 yrs and fine up to Rs. 1000/-
- Imprisonment up to 2 yrs and fine up to Rs. 1000/-
- Imprisonment up to 3 yrs and fine up to Rs. 1500/-
- Imprisonment up to 2 yrs and fine up to Rs. 1500/-

Number of geysers that can be provided in officer's flat (on special request)

- (a) 1
- (b) 2
- (c) 3
- (d) 4

17 Number of geysers that can be provided in the GM's bungalow is

- (a) 1
- (b) 2
- (c) 3
- (d) 4

The railway stations at zonal headquarters and state capitals are classified as of category

- (a) A
- (b) B
- (c) C
- (d) D

The railway stations at divisional headquarters and district headquarters are classified as of category

- (a) A (b) B
(c) C (d) D

As per Railway Board recommendations, the light fittings for platform on category A and B stations are

- (a) 1 x 36 W FL tube (b) 2 x 36 W HPSV
(c) 1 x 70 W HPSV (d) 2 x 36 W HPSV

As per Railway Board recommendations, the light fittings for platform on category C stations are

- (a) 1 x 36 W FL tube (b) 2 x 36 W HPSV
(c) 1 x 70 W HPSV (d) 2 x 36 W HPSV

As per Railway Board recommendations, the light fittings for ASM office, SM office, enquiry and PRS on category A and B stations are

- (a) 2 x 36 W mirror optic FL tube (b) 4 x 36 W mirror optic FL tube
(c) 2 x 36 W box type FL tube (d) 4 x 36 W box type FL tube

As per Railway Boards recommendations, the light fittings in station approach and car parks are

- (a) 1 x 70 W HPSV (b) 2 x 70 W HPSV
(c) 1 x 40 W Box type (d) 2 x 40 W box type

As per Railway Board recommendations, on platform having width of 9-6 m, fannage should be provided in

- (a) 1 row (b) 2 rows (c) 3 rows (d) 4 rows

As per Railway Board recommendations, on platform having width more than 9 m, fannage should be provided in

- (a) 1 row (b) 2 rows (c) 3 rows (d) 4 rows

As per Railway Board recommendations, the sweep of fans provided on platforms should be

- (a) 800 mm (b) 1200 mm (c) 1500 mm (d) 1800 mm

As per Railway Board recommendations, the sweep of fans provided in offices, waiting hall etc. should be

- (a) 800 mm (b) 1200 mm (c) 1500 mm (d) 1800 mm

As per Railway Board recommendations, the sweep of fans provided in retiring rooms on each bed should be

- (a) 800 mm (b) 1200 mm (c) 1500 mm (d) 1800 mm

At stations where neither electrical supervisor nor engineering supervisor is headquartered, the upkeep of pumps in water supply system is under

- (a) S & T supervisor (b) Station Master (c) Gangman (d) Pointsman

State Electricity Board charges Electricity Duty against selling electricity to railways amounting Rs.

- (a) 10,000/- (b) 50,000/- (c) 75,000/- (d) No charges

Railway Board has recommended that locations where HPSV lamps affect the colour light signalling should be replaced by

Mercury Vapour Lamps

FL tube fittings

Any of A & B

No such recommendation has been made.

The maintenance of water coolers donated by private parties is to be done by

The donating party

Railways

On contract

Any of the above.

The electrical energy consumption on water coolers donated by private parties are to be borne by

The donating party

Railways

SEB

Through collection from public

The Railway Board has recommended to provide water coolers at stations with _____ passengers (inward & outward) per day

- (a) 500 (b) 1000 (c) 1500 (d) 2000

ELECTRICAL UNITS: EQUIVALENTS & FORMULAE

One HP =

- (a) 756 watts (b) 746 watts (c) 860 watts (d) 856 watts

Torque in ft. lbs. =

- (a) $HP \times 33000 / (RPM \times 2)$ (b) $HP \times 2 / (RPM \times 33000)$
 (c) $HP \times RPM / (2 \times 33000)$ (d) $RPM \times 2 / (HP \times 33000)$

3. Current =

- (a) Watts/Volts (b) Volts/Watts
 (c) Kilowatt/Volts (d) Kilovolt/watt

Motor output in HP=

- (a) $KW \text{ input} \times \text{efficiency} / 0.746$ (b) $KW \text{ input} \times 0.746 / \text{efficiency}$
 (c) $\text{Efficiency} \times 0.746 / KW \text{ input}$ (d) $0.746 / (KW \text{ input} \times \text{efficiency})$

5. kVA equal to

- (a) $1000 \times \text{Amps} / \text{volts}$ (b) $\text{volts} \times \text{Amps} \times 1000$
 (c) $\text{Volts} \times 1000 / \text{Amps}$ (d) $\text{Amps} \times \text{volts} / 1000$

6. Power factor =

- (a) True Power/Apparent power (b) Apparent power/True power
 (c) Average power/True power (d) Apparent power/Average power

True power in three-phase circuit in Kilowatt is

- (a) $1.414 \times \text{volts} \times \text{amperes} \times \text{pf} / 1000$ (b) $1.73 \times \text{volts} \times \text{amperes} \times \text{pf} / 1000$
 (c) $\text{Volts} \times \text{Amperes} \times \text{pf} / 1000$ (d) $\text{Volts} \times \text{Amperes} \times 1000 / \text{pf}$

Amperes drawn by single-phase motor are equal to

- (a) $\text{Efficiency} \times \text{Volts} \times \text{pf} / (HP \times 746)$ (b) $\text{Efficiency} \times \text{pf} / (\text{volt} \times HP \times 746)$
 (c) $HP \times 746 / (\text{Efficiency} \times \text{volts} \times \text{pf})$ (d) $HP \times 746 \times \text{volts} / (\text{Efficiency} \times \text{pf})$

Amperes drawn by three phase motor are equal to

- (a) $\text{Efficiency} \times \text{Volts} \times \text{pf} / (HP \times 746)$ (b) $\text{Efficiency} \times \text{pf} / (\text{volt} \times HP \times 746)$
 (c) $HP \times 746 / (\text{Efficiency} \times \text{volts} \times \text{pf} \times 1.73)$ (d) $HP \times 746 \times \text{volts} / (\text{Efficiency} \times \text{pf})$

One Kilowatt =

- (a) 1.314 HP (b) 13.41 HP (c) 134.1 HP (d) 1341 HP

11. One Kilowatt =

- (a) 1360 Metric HP (b) 136 Metric HP
 (c) 13.60 Metric HP (d) 1.360 Metric HP

12. One Kwh =

- (a) 34.13 BTU (b) 44.13 BTU
 (c) 3.413 BTU (d) 4.413 BTU

One Kwh =

- (a) 1000 calories (b) 860 calories (c) 740 calories (d) 970 calories

One BTU =

- (a) 0.2520 calories (b) 2.520 calories (c) 25.20 calories (d) 252.0 calories

One Calorie =

- (a) 39.68 BTU (b) 4.968 BTU (c) 49.68 BTU (d) 3.968 BTU

One foot pound =

- (a) 0.1383 M Kg (b) 1.383 M Kg (c) 13.83 M Kg (d) 138.3 M Kg

One BTU =

- (a) 0.1076 M Kg (b) 1.076 M Kg (c) 10.76 M Kg (d) 107.6 M Kg

One Kilowatt =

- (a) 202 M Kg/sec (b) 102 M Kg /sec (c) 20.2 M Kg/sec (d) 10.2 M Kg/sec

One Electrical Unit =

- (a) 1 Kwh (b) 1 Kw (c) 1 kVA (d) Watt

Power factor =

- (a) R/Z (b) Z/R (c) V/I (d) I/V

The current rating of PVC insulated and PVC sheathed four core , armoured aluminium cable of size 120 sq mm (laid direct in ground) is approximately

- (a) 80 amps (b) 185 amps (c) 290 amps (d) 320 amps

The current rating of PVC insulated and PVC sheathed four core , armoured aluminium cable of size 70 sq mm (laid in duct) is approximately

- (a) 115 amps (b) 210 amps (c) 290 amps (d) 350 amps

The current rating of PVC insulated and PVC sheathed four core , armoured aluminium cable of size 50 sq mm (laid in air) is approximately

- (a) 65 amps (b) 105 amps (c) 200 amps (d) 250 amps

The current rating of PVC insulated and PVC sheathed four core , armoured aluminium cable of size 35 sq mm (laid direct in ground) is approximately

- (a) 92 amps (b) 160 amps (c) 200 amps (d) 250 amps

The current rating of PVC insulated and PVC sheathed four core , armoured aluminium cable of size 25 sq mm (laid direct in ground) is approximately

- (a) 55 amps (b) 76 amps (c) 90 amps (d) 150 amp

INDUCTION MOTOR

Which of the following component is usually fabricated out of silicon steel ?

- a. Bearings
- b. Shaft
- c. Stator core
- d. None of the above

The frame of an induction motor is usually made of

- a. Silicon steel
- b. cast iron
- c. aluminium
- d. bronze

The shaft of an induction motor is made of

- a. high speed steel
- b. stainless steel
- c. carbon steel
- d. cast iron

In squirrel cage induction motors, the rotor slots are usually given slight skew in order to

- a. reduce windage losses
- b. reduce eddy currents
- c. reduce accumulation of dirt and dust
- d. reduce magnetic hum

In case the air gap in an induction motor is increased

- a. the magnetizing current of the rotor will decrease
- b. the power factor will decrease
- c. speed of motor will increase
- d. the windage losses will increase

In N_s is the synchronous speed and s the slip, then actual running speed of an induction motor will be

- a. N_s
- b. $s.N_s$
- c. $(1-s)N_s$
- d. $(N_s-1)s$

Slip rings are usually made of

- a. copper
- b. carbon
- c. phosphor bronze
- d. aluminium

The efficiency of an induction motor can be expected to be nearly

- a. 60 to 90%
- b. 80 to 90%
- c. 95 to 98%
- d. 99%

The number of slip rings on a squirrel-cage induction motor is usually

- a. low
- b. negligible
- c. same as full-load torque
- d. slightly more than full-load torque

Star-delta starting of motors is not possible in case of

- a. single phase motors
- b. variable speed motors
- c. low horse power motors
- d. high speed motors

An induction motor with 1000 r.p.m. speed will have

- a. 8 poles
- b. 6 poles
- c. 4 poles
- d. 2 poles

The crawling in the induction motor is caused by

- a. low voltage supply
- b. high loads
- c. harmonics developed in the motor
- d. improper design of machine
- e. none of the above

It is advisable to avoid line starting of induction motor and use starter because

- a. motor take five to seven time its full load current
- b. it will pick up very high speed and may go out of step
- c. it will run in reverse direction
- d. starting torque is very high

Rotor rheostat control method of speed control is used for

- a. squirrel-cage induction motors only
- b. slip ring induction motors only
- c. both (a) and (b)
- d. none of the above

If any two phases for an induction motor are interchanged

- a. the motor will run in reverse direction
- b. the motor will run at reduced speed
- c. the motor will not run
- d. the motor will burn

An induction motor is

- a. self-starting with zero torque
- b. self starting with high torque
- c. self starting with low torque
- d. non self starting

In three-phase squirrel-cage induction motors

- a. rotor conductor ends are short-circuited through slip rings
- b. rotor conductors are short-circuited through end rings
- c. rotor conductors are kept open
- d. rotor conductors are connected to insulation

In a three-phase induction motor, the number of poles in the rotor winding is always

- a. zero
- b. more than the number of poles in stator
- c. less than number of poles in stator
- d. equal to number of poles in stator

DOL starting of induction motors is usually restricted to

- a. low horsepower motors
- b. variable speed motors
- c. high horsepower motors
- d. high speed motors

The power factor of an induction motor under no-load conditions will be closer to

- a. 0.2 lagging
- b. 0.2 leading
- c. 0.5 leading
- d. unity

Size of a high speed motor as compared to low speed motor for the same H.P. will be

- a. bigger
- b. smaller
- c. same
- d. any of the above

Slip ring motor is recommended where

- a. speed control is required
- b. frequent starting, stopping and reversing is required
- c. high starting torque is needed
- d. all above features are required

Which type of bearing is provided in small induction motors to support the rotor shaft

- a. ball bearings
- b. cast iron bearings
- c. bush bearings
- d. non of the above

Lubricant used for ball bearing is usually

- a. graphite
- b. grease
- c. mineral oil
- d. molasses

If the rotor circuit of a squirrel cage induction motor is open, the rotor will

- a. run at very high speed
- b. run at very low speed
- c. make noise
- d. not run

The advantage of a slip-ring induction motor over a squirrel cage induction motor is that

- a. it has higher efficiency
- b. it has higher power factor
- c. it can be started with help of rotor stater
- d. non of the above

A 3-phase slip-ring induction motor is always started with

- a. a starting winding
- b. squirrel cage winding
- c. no external resistance in rotor circuit
- d. full external resistance in rotor circuit

The synchronous speed of a 3- phase induction motor is given by the formula

- a. $N_s = 120f/P$
- b. $N_s = 120P/f$
- c. $N_s = 120 fP$
- d. $N_s = f P/120$

If single-phasing occurs on the running position in an induction motor, the motor will

- a. fail to carry load
- b. produce peculiar noise
- c. draw unbalanced and excessive currents
- d. not start

A pump induction motor is switched on to a supply 25 percent lower than its rated voltage. The pump runs; eventually

- a. the pump will get heated and consequently get damaged
- b. the pup will stall after sometimes
- c. the pump will continue to run at lower speed without damage

If there is an open circuit in the rotor of a squirrel cage induction motor

- a. rotor will overheat
- b. line fuses will blow
- c. motor will be noisy
- d. motor will not start

The principle of operation of a 3-phase induction motor is most similar to that of

- a. transformer with a shorted secondary
- b. synchronous motor
- c. capacitor start induction run motor
- d. repulsion start motor induction motor

The A.C. motor which would be best suited to drive a centrifugal pump for discharging a variable quantity of water against a fixed head is the

- a. repulsion motor
- b. synchronous motor
- c. squirrel cage
- d. slip ring induction motor

Two of the power supply terminals to a 3-phase induction motor get inter-changed during reconnection after maintenance of the motor. When put back into service, the motor will

- a. get heated up and damaged
- b. rotate in the same direction as it was prior to maintenance
- c. fail to rotate
- d. rotate in the reverse direction to that prior to maintenance
- e. none of the above

The frame of an induction motor is made of

- a. carbon
- b. closed grained cast iron
- c. aluminium
- d. stainless steel

Slip rings for induction motors are made of

- a. phosphor bronze
- b. aluminium
- c. carbon
- d. cobalt steel

The shaft, on which the rotor of an induction motor is mounted is made of

- a. high speed steel
- b. chrome vanadium steel
- c. cast-iron
- d. mild steel
- e. aluminium

Which of the following type of bearing is generally used to support the rotor of an induction motor

- a. Ball bearing
- b. Needle bearing
- c. Plummer block
- d. Bush bearing

Under which method of starting an induction motor is expected to take largest starting current?

- a. star-delta starting
- b. auto-transformer starting
- c. direct on line starting
- d. stator rotor starting

The direction of rotation of a 3-phase induction motor can be reversed by

- a. interchanging any two phases
- b. supplying low voltage
- c. reducing load
- d. reducing frequency

The number of slip rings on a squirrel cage induction motor is

- a. four
- b. three
- c. two
- d. none

The starting torque of the slip ring induction motor can be increased by

- a. adding resistance to the stator
- b. adding resistance to the rotor
- c. adding resistance to stator as well as the rotor
- d. none of the above

If the rotor is open in a squirrel cage motor, it

- a. will run at very high speed
- b. will run at very slow speed
- c. will not run
- d. will make noise

The value of average flux density in air gap in an induction motor, should be small

- a. to achieve good efficiency
- b. to get poor power factor
- c. to get good power factor
- d. for minimum cost

An induction motor has a rated speed of 720 r.p.m. How many poles has its rotating magnetic field?

- a. 8 poles
- b. 6 poles
- c. 4 poles
- d. 2 poles

During starting if an induction motor hums, the probable cause could be

- a. open circuit
- b. unequal phase resistance
- c. inter-turn short circuit on rotor
- d. any of the above

The probable reason for an induction motor running too hot could be

- a. low voltage
- b. uneven air gap
- c. clogged ventilating ducts
- d. any of the above

In case single phasing occurs in delta connected motor

- a. one phase will be seriously over-loaded and two others will be slightly overloaded
- b. two phases will be seriously over-loaded and there will be no current in the third phase
- c. there will be no current in one phases
- d. there will be no current in two phases

Synchronous speed is defined as

- a. the speed of a synchronous motor
- b. the natural speed at which a magnetic field rotates
- c. the speed of the rotor of an induction motor
- d. the speed of an induction motor at no load

The speed of three phase cage-rotor induction motor depends on

- a. number of poles only
- b. input voltage
- c. frequency of supply only
- d. number of poles and frequency of supply
- e. none of the above

The two important parts of a 3-phase induction motor are

- a. rotor and armature
- b. rotor and stator
- c. slip ring and brushes
- d. stator and field

Phase advancers are used with induction motors to

- a. reduce noise
- b. reduce vibrations
- c. reduce copper losses
- d. improve power factor

CABLES

1. The insulating material for a cable should have

- a. low cost
- b. high dielectric strength
- c. high mechanical strength
- d. all of the above

Which of the following protects a cable against mechanical injury

- a. bedding
- b. sheath
- c. armouring
- d. none of the above

Which of the following insulation is used in cables?

- a. Varnished cambric
- b. rubber
- c. paper
- d. any of the above

Empire tape is

- a. varnished cambric
- b. vulcanized rubber
- c. impregnated paper
- d. none of the above

The thickness of the layer of insulation on the conductor, in cables, depends upon

- a. bedding
- b. sheath
- c. armouring
- d. none of the above

The bedding on a cable consists of

- a. Hessian cloth
- b. jute
- c. any of the above
- d. none of the above

The insulating material for cables should

- a. be acid proof
- b. be non-inflammable
- c. be non-hygroscopic
- d. have all above properties

8. In a cable immediately above metallic sheath..... is provided

- a. earthing connection
- b. bedding
- c. armouring
- d. none of the above

In case of three core flexible cable the colour of the neutral is

- a. blue
- b. black
- c. brown
- d. none of the above

Low tension cables are generally used upto

- a. 200 V
- b. 500 V
- c. 700 V
- d. 1000 V

PVC stands for

- a. polyvinyl chloride
- b. post varnish conductor
- c. pressed and varnished cloth
- d. positive voltage conductor
- all above parameters

12 In the cables, the location of fault is usually found out by comparing

- a. the resistance of the conductor
- b. the inductance of conductors
- c. the capacitances of insulated conductors
- d. all above parameters

The material for armouring on cable is usually

- a. steel tape
- b. galvanized steel wire
- c. any of the above
- d. none of the above

In the cables, sheaths are used to

- a. prevent the moisture from entering the cable
- b. provide enough strength
- c. provide proper insulation
- d. none of the above

Underground cables are laid at sufficient depth

- a. to minimize temperature stresses
- b. to avoid being unearthed easily due to removal of soil
- c. to minimize the effect of shocks and vibrations due to passing vehicles, etc.
- d. for all of the above reasons

The advantage of cable over overhead transmission lines is

- a. easy maintenance
- b. low cost
- c. can be used in congested areas
- d. can be used in high voltage circuits

The insulating material should have

- a. low permittivity
- b. high resistivity
- c. high dielectric strength
- d. all of the above

The disadvantage with paper as insulating material is

- a. it is hygroscopic
- b. it has high capacitance
- c. it is an organic material
- d. none of the above

ANSWER SHEET

1. GENERAL

1 - b	2 - a	3 - b	4 - c	5 - b	6 - c
7 - d	8 - b	9 - d	10 - c	11 - d	12 - b
13 - a	14 - c	15 - b	16 - b	17 - c	18 - b
19 - c	20 - b	21 - d	22 - b	23 - a	24 - a
25 - d	26 - a	27 - b	28 - c	29 - b	30 - d
31 - b	32 - b	33 - c	34 - a	35 - d	36 - b
37 - c	38 - b	39 - a	40 - c	41 - a	42 - b
43 - a	44 - a	45 - a	46 - a	47 - d	48 - b
49 - a	50 - a	51 - a	52 - a	53 - a	54 - a
55 - b	56 - b	57 - c	58 - a	59 - c	60 - c
61 - b	62 - b	63 - d	64 - d	65 - a	66 - b
67 - d	68 - c	69 - d	70 - d	71 - c	72 - a
73 - a	74 - b	75 - a	76 - a	77 - b	78 - a
79 - b	80 - a	81 - a	82 - c	83 - c	84 - a
85 - b	86 - a	87 - a	88 - a	89 - a	90 - d
91 - b	92 - b	93 - d	94 - c	95 - a	96 - b
97 - a	98 - a	99 - b	100 - c	101 - a	102 - b
103 - b	104 - d	105 - c	106 - c	107 - a	108 - c
109 - b	110 - b	111 - b	112 - a	113 - c	114 - b
115 - b	116 - d	117 - c	118 - b	119 - a	120 - c
121 - b	122 - a	123 - c	124 - d	125 - b	126 - c
127 - c	128 - b	129 - c	130 - d	131 - c	132 - d
133 - a	134 - a	135 - b	136 - a	137 - c	138 - b
139 - d	140 - a	141 - b	142 - d	143 - a	144 - c
145 - d	146 - d	147 - c	148 - a	149 - d	150 - d
151 - d	152 - d	153 - a	154 - d	155 - d	156 - d
157 - b	158 - c	159 - d	160 - b	161 - a	162 - c
163 - b	164 - a	165 - a	166 - a	167 - b	168 - a
169 - c	170 - c	171 - b	172 - c	173 - b	174 - a
175 - c	176 - c	177 - b	178 - b	179 - d	180 - c
181 - c	182 - c	183 - b	184 - b	185 - b	186 - c
187 - c	188 - b	189 - b	190 - b	191 - c	192 - c
193 - c	194 - a	195 - a	196 - b		

2. TRANSFORMERS

1-b	2-b	3-a	4-b	5-d	6-d	7-d	8-d	9-c	10-d
11-d	12-a	13-a	14-c	15-c	16-a	17-d	18-b	19-c	20-c
21-d	22-b	23-b	24-c	25-c	26-b	27-d	28-c	29-b	30-d
31-a	32-c	33-d	34-b	35-a	36-c	37-c	38-c	39-b	40-b
41-c	42-d	43-b	44-b	45-d	46-a	47-c	48-b	49-d	50-b
51-d	52-a	53-d	54-d	55-a	56-b	57-a	58-c	59-d	60-d
61-d	62-d	63-b	64-a	65-a	66-b	67-b	68-b	69-c	70-d

EARTHING

1-a	2-b	3-c	4-a	5-b	6-c	7-d	8-b	9-c	10-d
11-b	12-c	13-c	14-a	15-d	16-b	17-b	18-d		

LIGHTING AND ILLUMINATION

1-d	2-b	3-a	4-b	5-b	6-d	7-c	8-c	9-a	10-a
11-b	12-c	13-d	14-a	15-b	16-c	17-d	18-c	19-d	20-d
21-b	22-c	23-b	24-b	25-c	26-a	27-b	28-c	29-b	30-c
31-d	32-d	33-c	34-c	35-b	36-a	37-a	38-b	39-b	40-c
41-a	42-d	43-b	44-a	45-d	46-d	47-c	48-d	49-d	50-c
51-a									

D.G. SET

1-d	2-d	3-d	4-d	5-a	6-d	7-d	8-d	9-a	10-d
11-d	12-d	13-c	14-c	15-a	16-b	17-b	18-b	19-b	20-c
21-b	22-b	23-a	24-b	25-d	26-b	27-c	28-a	29-a	30-a
31-b	32-c	33-c	34-b	35-b	36-d	37-a	38-c	39-b	40-d
41-b	42-	43-b							

PUMP

1-a	2-b	3-c	4-d	5-a	6-d	7-b	8-b	9-a	10-c
11-a	12-b	13-d	14-b	15-a	16-b	17-a	18-b	19-c	20-d
21-c	22-a	23-d	24-b	25-b	26-a	27-d	28-a	29-b	30-a
31-c	32-a	33-a	34-b	35-b	36-b	37-b	38-c	39-a	40-a
41-b	42-b	43-a	44-b	45-b	46-a	47-c	48-c	49-b	50-c
51-a	52-a	53-c	54-c						

7.. TRACK CROSSING

1-a	2-b	3-a	4-a	5-d	6-a	7-a	8-d	9-b	10-d
11-a	12-c	13-b	14-c	15-c	16-d	17-a	18-b	19-c	20-d
21-c	22-d	23-b	24-b	25-b	26-b	27-c	28-d	29-a	30-a
31-b									

INDIAN ELECTRICITY RULES

1-d	2-c	3-b	4-c	5-d	6-b	7-c	8-c	9-d	10-a
11-b	12-b	13-c	14-c	15-a	16-b	17-d	18-a	19-b	20-c

POLICY

1-c	2-a	3-d	4-d	5-d	6-d	7-c	8-c	9-d	10-a
11-c	12-d	13-a	14-a	15-a	16-a	17-b	18-a	19-b	20-c
21-a	22-a	23-a	24-a	25-b	26-d	27-c	28-b	29-b	30-d
31-c	32-b	33-b	34-b						

ELECTRICAL UNITS: EQUIVALENTS & FORMULAE

1-b	2-a	3-a	4-a	5-d	6-a	7-b	8-c	9-c	10-a
11-d	12-c	13-b	14-a	15-d	16-a	17-d	18-b	19-a	20-a
21-b	22-a	23-b	24-a	25-b					

INDUCTION MOTOR

1-c	2-b	3-c	4-d	5-b	6-c	7-c	8-b	9-d	10-a
11-a	12-b	13-c	14-a	15-b	16-a	17-c	18-b	19-d	20-a
21-a	22-b	23-d	24-a	25-b	26-d	27-c	28-d	29-a	30-d
31-a	32-d	33-a	34-d	35-d	36-b	37-a	38-d	39-a	40-c
41-a	42-d	43-b	44-c	45-c	46-a	47-d	48-d	49-a	50-b
51-d	52-b	53-d							

CABLES

1-d	2-c	3-d	4-a	5-c	6-c	7-d	8-b	9-a	10-d
11-a	12-c	13-c	14-a	15-c	16-c	17-d	18-a		

REFERENCES

Referred Question bank of South Central Railway, Secunderabad.

Referred Question bank of West Central Railway, Jabalpur.

Referred book on Electrical Engineering containing objective type questions by R. K. Rajput.

Referred book of BEE website.

OUR OBJECTIVE

upgrade maintenance technologies and methodologies and achieve improvement in productivity, performance of all Railway assets and manpower which inter-alia would cover reliability, availability, utilisation and efficiency.

If you have any suggestions and any specific Comments please write to us.

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