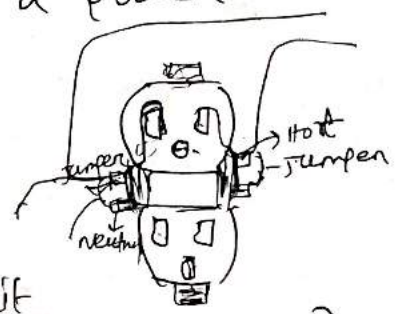


Estimation

- ① * What type of earthing is used by transmission lines Strip earthing
- ② * What is the dimension of the copper strip used for the strip earthing 25mm x 4mm
- ③ * Leakage current must not be more than 1/5000 of maximum supply current.
- ④ * 0.914 m of working space around main switchboard according to I.E rule 51
- ⑤ * Insulation resistance corrected at 25°C if it is measured to be different
- ⑥ * maximum distance between two successive cleats is 0.6m
- ⑦ * All equipment used in power wiring shall be of iron clad.
- ⑧ * maximum length of flexible conduit in motor installation is less than 1.25 m
- ⑨ * wooden poles can be used upto 60 m
- ⑩ * # - type of poles used for 130 KV
- ⑪ * Steel rail poles of height 13 meter are used for transmission purpose of 33KV
- ⑫ * PVC cable does not require bedding
- ⑬ * Dielectric constant of impregnated paper insulation is 3.5
- ⑭ * Rule F3 → Deal with supply to X-rays and high frequency installation

- ⑮ * Section 39 in IE rule deals with
'theft of energy'
- ⑯ * Silk and cotton cables are used for
low voltage
- ⑰ * XLPE cables can withstand a maximum
voltage of 130°C
- ⑱ * semiconductor fuses → very fast operation.
- ⑲ * underground service lines used for distance
more than 25 m
- ⑳ * Specification of GI earth plate is
60 cm × 60 cm × 6 mm
- ㉑ * 10 kg salt and 10 kg charcoal is needed
for GI pipe earthing
- ㉒ * Ballast resistance and choke are connected
in series
- ㉓ * 7500 hr normal life of fluorescent lamp
- ㉔ * 7/0.915 mm cable of copper conductor is used
for a 10 HP 500V DC motor.
- ㉕ * Two separate and distinct connection required
for motor frame as per IE rule 61
- ㉖ * 10 mm → Sealing b/n two conductor if
working voltage is 11 KV

- (27) * Angle betⁿ pole and stay is 30°
- (28) * 0.9 → multiplication factor used for determination of maximum current carrying capacity of 11 kV line
- (29) * Height of "roof pole" should be less than 3m
- (30) * low tension 3 1/2 core cable used for underground service connections.
- (31) High voltage equipment insulation resistance is 1 MΩ
- (32) Frequency variation allowed 3%
- (33) I.E rule section 44 ?
ans → penalty for interference with meter
- (34) Branch circuit must not feed more than 10 points.
- (35) How many outlets are permitted in a power circuit
ans → 2 point



- (36) maximum load permitted in a power circuit
3000 watt
- (37) value of earthing resistance of large power system
0.5 ohm
- (38) Earthing resistance of small sub-station 2 ohm
- (39) Earthing resistance of medium substation 1 ohm
- (40) maximum load permitted in a lighting circuit 800 watt
- (41) Diameter of GI pipe through which the earth wires need to be taken out 13 mm

* The declared voltage should not vary more than 5% in case of low or medium voltage or more than 12½% in the case of high or extra high voltage.

* Supplier shall examine, test and regulate all meters and error should not exceed 3%.

* The neutral conductor of a three phase four wire (3 ϕ , 4 wire) system shall be earthed by not less than two separate and distinct points with the earth, both at the generating station and at the substation.

* All pole type sub-station are constructed and maintain in accordance with rule 69.

* If the normal working voltage exceed 11KV, the testing voltage shall be normal voltage (working) plus 10,000 volt.

* If the normal working voltage exceed 10000 volt but does not exceed 11KV, the testing voltage shall be double the normal working voltage.

* All conductors of overhead lines shall have a breaking strength of not less than 317.5 kg.

* Ground clearance for service line erected across a street line → * low and medium voltage → 19ft (5.7m)
* high voltage line (20ft / 6.09m)

* Ground clearance for service line erected along a street line → * low and medium voltage (18 ft)
* high voltage line (19 ft)

* clearance betⁿ conductors and trolley wire :

- * low and medium voltage \rightarrow 4 ft
- * High voltage up to 11 kV \rightarrow 6 ft
- * above 11 kV \rightarrow 8 ft.
- * extra high voltage \rightarrow 10 ft.

clearance from buildings of low and medium voltage lines and service lines :

- * vertical clearance of 8 feet from the highest point.
- * When the line passes adjacent to the building, a horizontal clearance of 4 feet from a nearest point.

clearance from building of high and extra high voltage line

- * vertical clearance
up to 33 kV \rightarrow 12 ft
for extra high voltage line 12 ft plus 1 foot for every additional 33 kV

* horizontal clearance

up to 11 kV \rightarrow 4 ft
above 11 kV \rightarrow 6 ft

up to 33 kV
for extra high voltage line 6 ft plus 1 foot for every additional 33 kV.

* Earth resistance of tower foot is 10 ohm.

* For earthing use

- > copper wire \rightarrow 14 SWG
- > Aluminium wire \rightarrow 8 SWG

* A wire placed at the top of a transmission line Ground wire.

* The conductor by means of which the body of an equipment is connected to the earth is known as Earth continuity conductor.

* concealed conduit wiring is preferred for workshop lighting.

* Supplier fuse is connected just after the energy meter.

* In a 3-pin plug \rightarrow Two pins are of the same size but the third one is thicker and larger.

* Copper conductors are generally used for transmission line because it has longer life and high conductivity

* What is the minimum permissible size of the earth continuity conductor?

Ans → copper → 3 mm^2

GI/steel → 6 mm^2

* rocky area → strip earthing

* small installation → pipe earthing

* sandy soil → rod earthing.

* What should be the minimum depth of trench from the ground level for cables carrying a voltage b/w 33 kV and

11 kV → 0.9 m

* under ground HV cables (22 kV to 33 kV)
→ 1.05 m (trench depth)

* under ground LV cables :
→ 0.75 m (trench depth)

* cable at road crossing → 1 m

* High skill labourer is required in conduit wiring.

* Resistivity of earth sharply increases when moisture fall below 10%.

* methods of measuring earth resistance

- > Focor point method
- > 3 point method
- > 2 point method.

of neutral is half the phase conductor.

* 1ϕ → Neutral and live wire are of same size.

* Acid and alkali stored area → TRS wiring should be

* The acceptable value of ground resistance ^{used} to domestic → 1 ohm

* flexible wire is not used for cement factory (due to high temp, they can melt)

* The another name of neutral earthing is system earthing

* Neutral earthing → solid grounding
resistance grounding
reactance grounding

- * The cheapest system of internal wiring is cleat
- * Highly skilled labour is required in both conduit and casing capping wiring

* Which of the following types of wiring is preferred for workshop lighting?

concealed conduit wiring

* Non-metallic conduit used in internal wiring are generally made of PVC wood

* PVC conduit can be buried in plaster, lime, concrete

* ~~PVC cable can be~~

* PVC conduit can be joined by welding, threading

* solvent cement

* PVC cable are usually used for Internal wiring and workshop

* A fuse is provided in an electric circuit for safe guarding the installation against heavy current

* Accⁿ to the fuse law, the current carrying capacity varies as (diameter)^{1.5}

$$I = K(d)^{3/2}$$

↳ diameter

$$(4)^{3/2} = (4)^{1/2} \times (4)^1 = (2) \times 4 = 8$$

* Rating of fuse expressed in amp.

* protection by fuse is generally not used beyond 250A

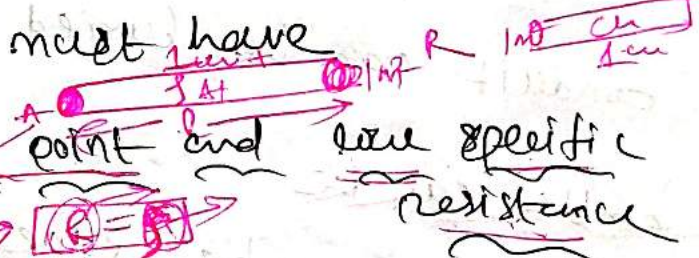
* The fuse blows off by melting

* A fuse is always connected in series with the circuit (phase wire)

* A fuse is normally a current limiting device

* A fuse material must have low melting point and low specific resistance


$R = \frac{\rho l}{A}$



* material best suited for manufacturing of fuse wire is silver

* The insulation on a current carrying conductor is provided to prevent

leakage current



* The thickness of insulation provided on the conductor depends upon voltage rating

* The insulation resistance of complete installation should not be less than 0.5 MΩ

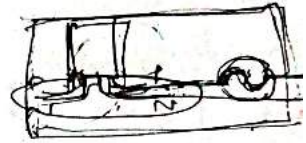
* Earth potential taken to be zero

street lighting are all connected in



(a) series (b) parallel (c) series-parallel (d) non-ferrous
refer, box connection has 4 terminals

(a) 2 (b) 4 (c) 6 (d) 8



which is provided in domestic wiring
(a) after energy meter (b) before energy meter
(c) before distribution board (d) after main switch

point is operated from two places with
two intermediate switches ~~(a)~~ two one-way switches

two two-way switches (d) Any of the above

is employed for protection against

(a) lighting ~~(b)~~ short circuit

(d) All of these

is miniature circuit breaker

device that provide definite protection
installation and sophisticated equipment

over current and short circuit

of the earth should be low

are made of galvanized stranded steel

(10) * The earth wire should be good conductor of electricity and mechanically strong.

(11) * It is fatal to touch a live wire as
~~(a) It will cause flow of current through human body~~

- (b) It may cause burns to the skin
- (c) Damage to heart
- (d) Damage nerve system

(12) * An electrical installation is earthed for

- (a) safety to personnel
 - (b) fire protection
 - (c) protection against electric shock
- ~~(d) All of these~~

(13) * An aerial fuse is connected in service connection for safety of consumer installation

(14) * Acc'n to NE code neutral wire is of black colour

(15) * Loop in system of wiring is generally employed in domestic wiring

(16) * Third pin in a 3-pin plug is provided so as to provide an earth connection

(17) Earth resistance should be appx. zero.

As per to BIS rule, the resistance of the earth electrode should be measured in Dry weather.

(18) Standard domestic ac supply voltage in india is 240V.

(19) The direct lighting scheme is most efficient but is liable to cause glare and hard shadows.

(20) The lamp that can't sustain much voltage fluctuation is Incandescent lamp.

(21) Halogen lamps are useful for the illumination of.
(a) airport (b) parks and larger garden
(c) playing field (d) all of the above

(22) The minimum height of ceiling fan from the floor should be
(a) 1.5m (b) 2.0m (c) 2.5m (d) 3.0m

(23) The minimum height of lamp from GL should be
(a) 1.25m (b) 1.5m (c) 2.0m (d) 2.5m

(24) Switchboard are to be fixed at the height of
(a) 1.5m (b) 2.5m (c) 4m (d) 4.5m

(25) The insulation resistance test is performed on power line with megger.

* Step voltage \rightarrow The potential difference b/w two points on the earth's surface separated by a distance of 1 m

* Two general principle usually employed in the design of street lighting installation:

(a) Diffusion principle

(b) specular reflection principle

* In general there should be a minimum clearance of 2.5 meter betⁿ the luminaries and the floor

* In the case of tungsten lamps the ratio of spacing to height should be 0.6.

* During pipe earthing the ratio of cement concrete is 1:4:8