(2)

Sr. DEE/TRD/S

QUESTION BANK FOR SELECTION TO JE-II/TRD

ABBREVIATIONS

1.	RE	: Railway Electrification
2.	R.O.R	: Rate Of Return
3.	GTKM	: Gross Ton Kilo Meters
4.	OHE	: Over Head Equipment
5.	LOP	: Lay Out Plan
6.	CSD	: Cross Sectioning Drawing
7.	SED	: Structure Erection Drawing
8.	AED	: As Erected Drawing
9.	FBM	: Foundation Bending Moment
10.	FP	: Feeding Post
11.	SP	: Sectioning and Paralleling post
12.	SSP	: Sub Sectioning and Paralleling post
13.	RSJ	: Rolled Steel Joist
14.	BFB	: Broad Flange Beam
15.	TTC	: Two/Three Track Cantilever
16.	TPC	: Traction Power Control.
17.	PRV	: Pressure Relief Valve
18.	DGA	: Dissolved Gas Analysis
19.	OTI	: Oil Temperature Indicator
20.	WTI	: Winding Temperature Indicator
21.	OIP Bushings	: Oil Impregnated Paper Condenser core
22.	OLTC	: On Load Tap Changer
23.	AVO	: Amperes-Voltage-Ohms (meter)
24.	CTD	: Capacitor Tripping Device
25.	SF-6	: Sulphur Hexa Fluoride
26.	OCR	: Over Current Relay
27.	WPC	: Wrong Phase Coupling
28.	NCT	: Neutral Current Transformer
29.	UPS	: Uninterrupted Power Supply
30.	VDU	: Video Display Unit
31.	SCADA	: Supervisory Control And Data Acquisition System
32.	RTU	: Remote Terminal Unit
33.	FEP	: Front End Processor
34.	PSU	: Power Supply Unit
35.	MODEM	: Modulator Demodulator Unit

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FILL IN THE BLANKS (OHE)

(Fill the blanks with appropriate answer)

1. Cess level is the vertical distance between top of foundation and _____.
2. Dwarf mast anchors are used on _____.
3. To prevent accumulation of water around mast and thereby to prevent corrosion _____ are provided.
4. The height of contact wire for unregulated OHE designed for areas with temperature range of 4^0 to 65^0 is _____.
5. The minimum height of Contact wire at level crossing is _____
6. The minimum height of Contact wire at Electric Loco Inspection bits is _____
7. The permitted Contact wire gradient on Sidings is _____
8. The relative gradient of Contact wire on sidings in two adjacent spans should not exceed _____
9. Height of termination of regulated OHE is _____ from rail level
10. On tangent track the Catenary stagger for masts supporting single cantilever is _____
11. On Curved track, the Contact wire stagger should not exceed _____
12. At un insulated Overlaps the between intermediate supports two contact wires run parallel to each other at a distance of _____
13. The size of 'G' Jumper is _____ copper for conventional OHE
14. The size of Inspan Jumper/ C Jumper (Continuity Jumper) is _____
15. The length of 'G' Jumpers used in Uninsulated overlaps should be _____
16. In regulated OHE, the tension in OHE is maintained constant at _____

17. For obligatory structure for overlap type turnout the separation between main and turnout OHE shall be between _____ and _____

18. When tracks are slewed for maintenance _____ will get adjusted which may sometime results in panto entanglement

19. For Winch type regulating equipment the length of S.S.Rope is _____

20. For Unmodified 3 pulley type regulating equipment the length of S.S Rope is _____

21. For modified 3 pulley type regulating equipment the length of S.S Rope is _____

22. In a winch type regulating equipment for normal tension length OHE the total weight provided at the BWA at each end is _____

23. The size of copper contact wire is _____

24. _____ size droppers are used for supporting contact wire from catenary

25. In modified three pulley regulating equipment the distance between centers of movable pulley and adjacent fixed pulley is called _____

26. In modified three pulley regulating equipment the distance between bottom of counter weight and top of muff is called _____

27. _____ is used for lubrication of SS ropes.

28. The thickness of new contact wire is _____.

29. The condemning thickness of contact wire is _____.

30. The periodicity of annual checking of single CLs is _____.

31. The POH of ATD are done once in _____ years.

32. The electrical connection across a rail joint is called _____.

33. Bond between two rails of adjacent tracks near L.C gate is called _____.

34. The standard implantation on normal tangent track is _____.

35. The implantation of portals, structures crossing more than two cantilevers, should be less than _____.

36. The implantation of masts on platforms shall not be less than _____.

37. The maximum span for tramway equipment is _____.

38. The minimum height of contact wire at level crossing is _____.

39. The distance of height gauge from rail level at LC should be more than _____.

MULTIPLE CHOICE QUESTIONS (OHE)
(CHOOSE THE CORRECT ANSWER)

1. The size of stay tube is _____

a) 40 (J.D)/ 49 mm (O.D)
b) 30/48 mm
c) 28.4/33.7 mm
d) None of the above

2. The size of standard Bracket tube is _____

a) 28,4 mm/33.7 mm
b) 40/49 mm
c) 30/38 mm
d) None of the above

3. The size of Register arm tube is _____

a) 30/38 mm
b) 40/49 mm
c) 10/20 mm
d) 28.4/33.7 mm

4. BFB steady arm is _____

a) 20x10 mm
b) 32x31 mm
c) 10x5 mm
c) None of the above

5. minimum vertical clearance between live parts and earthed structure or moving loads for long duration is _____

a) 250 mm
b) 200mm
c) 320 mm
d) 270 mm

6. Minimum vertical distance between any live parts of OHE and parts of earthed structure or moving loads for short duration is _____

a) 320 mm
b) 220 mm
c) 200 mm
d) 270 mm

7. Minimum lateral clearance between any live parts of OHE and parts of earthed structure or moving loads for long duration is _____

a) 270 mm
b) 200 mm
c) 270 mm
d) 320 mm

8. Minimum lateral clearance between any live parts of OHE and parts of earthed structure or moving loads for short duration is _____

a) 220 mm
b) 270 mm
c) 320 mm
d) 200 mm

9. Minimum working clearance between live parts of OHE and earthed structure or different elementary structure where men are required to work is _____

a) 5 meters
b) 10 Meters
c) 1 Meters
d) 2 Meters

10. Wind pressure for design of mast is expressed as _____

a) Kg-m
b) Kg/m
c) Kg/m^2
d) Kgs

11. The maximum span adopted for regulated OHE is _____

a) 48 m
b) 63 m
c) 18 m
d) 72 m

12. The maximum span adopted for Unregulated OHE is _____

a) 18 m
b) 67 m
c) 22.5 m
d) 48 m

13. The difference between two consecutive spans should not exceed _____

a) 18 m
b) 22.5 m
c) 4.5 m
d) 9.0 m

14. Span length are chosen normally in multiples of _____

a) 9 m
b) 4.5 m
c) 18 m
d) 13.5 m

15. K - 200 is a _____

a) Portal
b) Fabricated mast
c) TTC
d) Concrete mast

16. _____ type portal are used to cover 8 track (30-40 spans)

a) 'N' type
b) 'R' type
c) 'O' type
d) 'P' type

17. _____ type portals are used to cover 6 tracks (20-30 m)

a) 'N' type
b) 'R' type
c) 'O' type
d) 'P' type

18. The size RSJ used in OHE is _____

(a) 6"x6" (152mm x 152mm)
(b)8"x6" (200mm x 152mm)
(c) 450 mm x 450 mm
(d)None of the above

19. _____ type portals are used to cover 4 tracks (10 m–20 m span)

a) 'N' type
b) 'O' type
c) 'R' type
d) None of the above

20. In consolidated and hard coils when he soil bearing pressure is more than 10,000 kg/m^2 _____ type of foundation are used

a) Pure gravity
b) Side bearing
c) Side gravity
c) None of the above

21. In unconsolidated filled up soils when the bearing pressure of soil is less than 10,000 kgf/m^2 _____ type of foundations are used.

a) Pure gravity
b) Side gravity
c) Side bearing
c) None of the above

22. The height of contact wire at the support for regulated OHE with 10 cms pre sag is _____ .

a) 4.92 m
b) 5.60 m
c) 5.75 m
c) 4.80 m

23. The permitted contact wire gradient on main line is _____ .

a) 3 mm/m
b) 10 mm/m
c) 1.5 mm/m
c) None of the above

24. The relative gradient of contact wire main line in two adjacent spans should not exceed _____ .

a) 5 mm/m
b) 1.5 mm/m
c) 10 mm/m
c) 3 mm/m

25. The height of termination of unregulated OHE from RL is _____ .

a) 6.95 m
b) 5.0 m
c) 5.5 m
c) 4.8 m

26. The distance between the catenary and contact wire at support is termed as _____ .

a) Encumbrance
b) Versine
c) Stagger
c) Setting distance

27. The displacement of contact wire with respect to pantograph axis is called _____ .

a) Stagger
b) Versine
c) Encumbrance
c) Setting distance

28. On tangent track the contact wire stagger is _____ .

a) 350 mm
b) 300 mm
c) 0
c) 200 mm

29. The distance between two contact wires in insulated overlap is _____ .

a) 500 mm
b) 200 mm
c) 50 mm
c) 300 mm

30. The standard encumbrance (axial distance between catenary and contact wire at support) on single cantilever location is _____ .

a) 1.40 m
b) 0.30 m
c) 0.75 m
c) 0.90 m

31. At turnouts the encumbrance of main line OHE is 0.90m. The encumbrance of turnout OHE is maintained at _____ .

a) 0.30 m
b) 10.90 m
c) 1.4 m
c) None of the above.

32. _____ is a device used on OHE for insulating two adjacent elementary sections, while providing continuous path for pantograph.

a) Isolator
b) Section Insulator
c) Interruptor
c) None of the above.

33. The stagger at section insulator should not exceed .

a) 100 m
b) 300 m
c) 500 m
c) 200 m

34. 'G' Jumpers are used at _____ .

a) Insulated overlap
b) Inspan
c) Uninsulated overlap
d) None of the above

35. _____ Jumper are used for equalizing potential between OOR and IROHE at Insulated overlaps.

a) 'C' Jumper
b) 'G' Jumper
c) 'F' Jumper
d) None of the above

36. The standard Turnout arrangement on main tracks employed are

a) Overlap type
b) Cross type
c) Knuckle type
d) None of the above

37. In a Overlap type turnout, at obligatory location, the contact wire of turnout is kept _____ along the main track

a) 2 Cms
b) 5 Cms
c) 0 Cms
d) 10 Cms

38. In a Overlap type or turnout the minimum desirable length of zone where the pantograph contacts with OHE should be _____

a) 9 m
b) 5 m
c) 48 m
d) 21.5 m

39. The Contact wire stagger may get affected (changed) in the following causes:-

a) Track Slewing
b) Depression of track due to low joints, loose packing
c) Blow off (wind pressure)
d) All the three factors given at a, b and c

40. In modified three pulley regulating equipment for normal tension length OHE, the total weight provided at the BWA at each end is _____

a) 665 Kgs
b) 400 Kgs
c) 200 Kgs
d) 330 Kgs

41. In Composite OHE the size of Alluminium Catenary is _____

a) 65 mm^2
b) 107 mm^2
c) 150 mm^2
d) 116 mm^2

42. The Conventional OHE is designed to carry a continuous current of _____

a) 600 Amps
b) 400 Amps
c) 800 Amps
d) 11200 Amps

MULTIPLE CHOICE QUESTIONS (PSI)
(CHOOSE THE CORRECT ANSWER)

1. The operation of LVIDMTL relay is a indication of _____.

   a) Overload on transformer
   b) Internal fault
   c) Earth fault on OHE
   d) Lightning surges

2. The oil temperature indicator for 21.6 MVA Traction Transformer is normally set at _____ for alarm and _____ for trip.

   a) 85°C, 95°C
   b) 45°C, 50°C
   c) 100°C, 80°C
   d) 105°C, 115°C

3. The winding temperature indicator for 21.6MVA Traction Transformer is normally set at _____ for alarm and _____ for trip.

   a) 45°C, 50°C
   b) 105°C, 115°C
   c) 100°C, 80°C
   d) 75°C, 80°C

4. Silica gel crystals when dry is _____ in colour.

   a) Pink
   b) White
   c) Blue
   d) Green

5. The test tap is provided in condenser bushing for testing of bushing for.

   a) tan-delta
   b) Capacitance
   c) both (a) & (b)
   d) to draw oil samples

6. For 132 kV/25 kV, 21.6 MVA transformer in service the permissible unit of BDV of oil is _____.

   a) 30 kV b) 40 kV c) 60 kV d) 10 kV

7. Bucholz relay is provided on the power transformers for protection of transformers against _____.

   a) Overload
   b) Internal fault
   c) Lightning surges
   d) none of these

8. Bucholz relay is a _____ relay.

   a) Electromagnetic
   b) Static
   c) Gas & oil operated
   d) none of the above

9. Bucholz relay is provided on the _____

a) Transformer b) Relay control panel in the control room
c) Transformer marshalling box d) none of the above

10. The function of PRV in a traction power transformer is

a) to reduce pressure whenever the pressure in the tank rises above a predetermined value.
b) Trips the LV & HV circuit breakers and isolate the transformer.
c) Gives visual indication to indicate abnormality.
d) All the three stated above.

11. Traction Transformers are designed for ____% overload for 15 min.

a) 100% b) 75% c) 25% d) 150%

12. The object of oil filtration of transformers is

a) remove all water b) dissolved gases c) dirt
d) All the three factors mentioned in (a), (b) & (c).

13. The insulation resistance of Traction Power Transformers is taken with _____ megger.

a) 1000 V b) 250 V c) 500 V d) 2500 V

14. The maximum value of acidity (mg KOH/gm of oil) permitted for Traction Transformer in service is _____

a) 1.0 b) 2.0 c) 0.3 d) 0.1

15. Capacitor Tripping device actuates CB tripping when _____

a) Incoming 32 Kv supply fails b) 110V DC supply fails
c) Low gas pressure d) Low air pressure

16. Inter Trip of H.V & L.V Circuit Breaker takes in case operation of the

a) Differential Relay
b) Earth fault relay
c) Bucholz relay
d) Any one of the relays mentioned at a, b and c

17. The condition of condenser type sealed OIP bushings of Traction Transformers are best monitored by measurement of _____.

a) Horn gap distance
b) Tan delta & capacitance
c) Resistance of winding
d) None of the above

18. The DC control circuit at Traction sub-station and switching stations operates at _____.

a) 72 V b) 110 V c) 24 V d) 220 V

19. The minimum height of power line of 132 kV class above rail level crossing tracks of electrified section is _____.

a) 10 M b) 5.5 M c) 14.10 M d) 14.60 M

20. Presently Traction Tariff is

a) Single part tariff based on the energy consumed
b) Two part tariff based on the RMD charges & energy consumption charges
c) Three part tariff based on the MD, Energy consumption, Reactive power
d) None of the above

FILL IN THE BLANKS (PSI)

(Fill the blanks with appropriate answer)

1. In a Traction Power Transformer whenever the pressure in the tank rises above predetermined safe limit _____ acts and reduces pressure.

2. The arc horn gap for bushing on 132 kV side for traction transformer is kept at _____.

3. The arc horn gap for bushing on 25 kV side for 21.6MVA traction transformer is kept at _____.

4. In Crompton Greaves make 132 kV SF-6 gas circuit breakers, the pressure switch is set at _____ kg/cm² for alarm.

5. In a Crompton Greaves make 132 Kv Circuit Breaker, the pressure switch is set at _____ Kg/Cm² for trip lockout.

6. In Crompton Greaves make 132 Kv Circuit Breaker, the compressor switches on if air pressure falls below _____.

7. In Crompton Greaves make 132 Kv Circuit Breaker the cut but pressure of Air Compressor is _____.

8. The Potential Transformer at the switching stations and feeding posts are for _____.

9. The capacity of fuse on 25 KV side for 10 KVA, AT is _____.

10. The capacity of fuse on 25 Kv side for 100 KVA AT is _____.

11. In open condition in isolators the isolating distance shall not be less than _____.

12. _____ used for lubricating contact parts of isolators.

13. The combined earth resistance of the earthing system (CER) of Traction Sub-Station shall not exceed _____.

14. The combined earth resistance of the earthing system (CER) of switching stations (SP & SSP) shall not exceed _____.

15. The earth resistance of AT station shall not exceed _____.

16. The earth resistance of P.F.Shelters, FOB shall not exceed _____.

17. The capacity of batteries at TSS is _____ and at switching stations are _____.

18. The BDV of Traction Transformer oil is checked with _____ test gap.

19. The polarization index is the ratio of insulation resistance at the end of 600 seconds to insulation resistance at the end of _____ seconds.

20. In gas operated circuit breaker _____ used as a medium for extinguishing of arc.

TRUE OR FALSE (PSI)

(1) The position of Taps in Traction Transformer can be changed "On Load".

(2) The condition of condenser type sealed OIP Bushings of Traction Transformer are best monitored by measurement of "Tan delta & capacitance".

(3) The Silica gel Crystals when saturated with moisture are blue in colour.

(4) Silica gel are activated by heating up to 110° C - 130° < for 8 hours.

(5) In Traction Power Transformer, the oil has to be filtered if polarization index (IR ratio of R60/R10) falls below 1.1.

(6) For a given temperature, the gas (SF-6) pressure for 'Alarm' is set above the rated gas pressure.

(7) The contact resistance between fixed and moving contacts in closed condition (in micro ohms) is a measure of healthiness of contacts.

(8) The relays MHO, OCR & WPC reset themselves immediately after operation.

(9) Specific gravity and Cell Voltage are indication of condition of battery.

(10) The Ampere hour rating of Batteries for TSS and switching stations are based on 5 hours rating.

(11) For Electrical Fires we use Soda Acid Type fire extinguishers.

(12) Power Line crossings across track of voltage upto and including 11 Kv in 25 Kv electrified section should be through U.G.Cables.

(13) The distance structure (supporting the crossing span) from centre of nearest track shall be equal to height of structure as per regulation of power line crossing.

(14) Bridging interruptors at S.P are kept normally kept open in normal feed conditions.

(15) In a single line section there will not be any paralleling interruptors.

(16) Paralleling of Up & Dn Lines are done to reduce the voltage drop in OHE.

(17) While passing the neutral section drivers are lowering the Pantographs.

(18) The Circuit Breakers (25 Kv or 132 Kv) opens of D.C supply fails.

(19) If a feeder CB Trips and goes to lock out it indicates a permanent catenary to earth fault.

(20) The minimum power factor to be maintained at TSS is 0.85.

(21) For carrying out maintenance on interruptors at SSP, FP and SP Gantry Block are required.

MATCH THE FOLLOWING (PSI)

(Choose the correct answers from Group 'B' for the questions of Group-A)

(A) Under Group 'A' names of protective relays in Traction Sub-Stations are given.
In Group 'B' Types of faults are given. Match the Type of fault and the relay which
operates for the type of fault.

	Group 'A'		**Group 'B'**
(a)	Overload on Transformers	(i)	WPC
(b)	Distance earth fault on OHE	(ii)	OCR
(c)	Bridging of different phases at the neutral section.	(iii)	Bucholz relay
(d)	Earth fault on OHE in the vicinity of feeding post.	(iv)	Mho
(e)	Short Circuit between transformer winding turns resulting in evolution of gas.	(v)	Restricted earth fault (LV).
(f)	Earth fault on 25 KV side.	(vi)	LVIDMTL
(g)	Unbalance protection (Capacitor Bank)	(vii)	Nuetral displacement relay.

(B) Under Group 'A' names of Instruments are given. Under Group 'B' Electrical Parameter/Tests are given. Match the instrument used for the tests.

	Group 'A		**Group 'B**
(a)	Ammeter	(i)	Circuit continuity
(b)	Volt Meter	(ii)	Current
©	Multimeter	(iii)	Voltage
(d)	Earth Meggar	(iv)	Winding Insulation resistance
(e)	Load Cell Tester	(v)	Battery healthiness
(f)	Insulation Tester	(vi)	Earth resistance
(g)	Micro Ohm meter	(vii)	Contact resistance of breakers

(c) Under Group 'A' Electrical Physical and Chemical para meter of Transformer Oil used in 132 Kv/25 Kv Traction Power Transformer are given. Under Group B the limiting values are given. Match the para meter with their limiting value.

	Group 'A'		Group 'B'
(a)	Acidity	(i)	40 KV (Min)
(b)	Water content	(ii)	0.3 mg KOH/gm of oil (Max)
©	Break down voltage	(iii)	0.015 (Min)
(d)	Resistivity (at 90° C)	(iv)	0.2 (Max)
(e)	Interfacial Tension	(v)	1×10^{12} Ohms-Cms (Min)
(f)	Tan delta at 90° C	(vi)	40 ppm (Max)

(D) Under Group 'A' capacity of Electrical equipments are given under Group 'B' the name of equipments are given. Match the equipments with their capacity.

	Group 'A'		Group 'B'
(a)	200/5 Amps, 30 VA	(i)	Auxiliary Transformer
(b)	25000/110 V, 100 VA	(ii)	Potential Transformer
©	10 KVA, 25 KV/230 V	(iii)	Current Transformer
(d)	2400 KVAR	(iv)	Isolator
(e)	25 KV, 800 Amps, Single pole.	(v)	Capacitor (Bank)
(f)	42 Kv, 10 KA	(vi)	Lightening Arrestor

Mathematical Calculations

(1) The current density of solid copper conductor is 4 Amps/mm^2, find its current carrying capacity.

(2) The secondary of a 500/5 Current Transformer is connected in series with Ammeter. If the current in the primary is 400 Amps find the reading of Ammeter.

(3) Find the secondary voltage of 25000 V/230 V, Auxiliary Transformer when the primary voltage is 20 Kv.

(4) A Traction Power Transformer 132 KV/25 KV draws 400 Amps at 25 Kv from OHE. Find KVA power drawn.

(5) Indicating Type Potential Transformer 25000 V/110 Volts s connected across volt meter. If the Volt meter reads 27.5 KV what is the secondary voltage of PT.

(6) In a 132 Kv/25 Kv Transformer the primary current is 100 Ams what is the current on the secondary side.

(7) Find the rated secondary current of 132 Kv/25 Kv, 20 MVA Transformer.

(8) The insulation resistance of a transformer measured with motorized meggar is 10000 Mega Ohms and 20000 Mega Ohms at the end of 10 seconds and 60 seconds respectively. Find the polarization index?

(9) A Battery rated for 10 hours duty delivers 10 Amps for 2 hours, 5 Ams for 3 hours and 1 Amps for 5hours. What is the total Ampere hour out put given by the battery.

(10) A Traction Power Transformers draws 8000 KVA power and delivers 7500 KVA as out put find the efficiency?

(11) The energy reading of Traction Energy Meter on first and last day of month is respectively 1525 and 2860 Units. The meter multiplication factor is 10. Find the energy bill? The tariff in force is given below:

(i)	Energy charges	::	Rs.4.40 Per Unit.
(ii)	Fuel cost adjustment	::	Rs.0.20 Per Unit
(iii)	Meter Rent	::	Rs.1500

Descriptive Type Questions (PSI)

(1) Draw schematic of Traction Sub-Station and name the important equipments.

(2) What are protective relays provided for transformer protection and indicate the protection offered by them.

(3) What are the relays provided for OHE protection? Indicate the function of each relay.

(4) What are the points to be checked during annual maintenance.

(a) Traction Power Transformer.
(b) SF-6/Vacuum Circuit Breakers.
(c) SF-6/Vacuum Interruptors.
(d) Current Transformer.
(e) Potential Transformer.
(f) Auxiliary Transformers.

(5) What is the periodicity of checks of gantry maintenance? What are equipment and details of checks to be done during annual maintenance.

(6) What are the important instruments to be kept in PSI depot and indicate the use of each.

(7) What are the precautions to be taken while doing maintenance on Incoming 132 KV D.P.Isolators and Bus Coupling 132 Kv DP Isolators. What are points to be checked for 132 KV D.P. Isolators.

(8) Why Capacitor Bank provided in a Traction Sub-Station? Draw a schematic of Capacitor Bank with associated equipments?

(9) What are the protective relays provided for Capacitor Bank and indicate their function.

(10) Name 10 points on the cure and maintenance of battery.

(11) What is the function of the following accessories of Transformers.

(i) Breather.
(ii) PRD (or PRV)
(iii) Bucholz relay
(iv) Arcing hours.
(v) Radiators

Descriptive Type Questions (OHE)

1. Define the following
   a. Contact wire stagger
   b. Implantation or setting distance
   c. Encumbrance
   d. Super Elevation
   e. Versine
   f. Transverse protection
   g. Longitudinal protection

2. Write briefly what you understand by
   a. Long time clearance
   b. Short time clearance
   c. Working clearance

   as applied to 25 KV OHE section what are the values.

3. What are the causes of sparking and how do you reduce sparking during current collection.

4. What are the important points to be checked in ATD of winch type to prevent SS rope failure.

5. Draw a diagram of double line section with loop lines on each line and indicate the sectioning arrangement.

6. What are the types of inspection done by lineman and supervisors in OHE and indicate the important points to be checked in the inspection.

7. How do you attend a mast (i) leaning towards track (ii) leaning away from track.

8. List out the T&P and staff required for attending
   a. SS rope wire cut
   b. Bracket tube replacement
   c. Catenary wire snapped
   d. Contact wire parted

9. What is Pre Arranged Block? What precautions you take for carrying out maintenance of Cantilevers with ladder trolley.

10. Name any 10 important essential T&P for OHE maintenance.

11. Name any 5 caution boards.

12. What are important measurements and checks to be made while carrying out maintenance of (i) Turnouts (ii) Crossovers (iii) Section Insulators.

13. What are the points to be checked during quarterly maintenance of PTFE neutral section.

14. What are the points to be checked during annual maintenance of
    a. Cantilevers
    b. ATD
    c. Isolators

15. What are important action to be taken to reduce feeder CB trippings.

16. Indicate the action to be taken if a person gets electric shock.

17. Write short notes on
    a. Imprest stores
    b. Proprietary articles
    c. Breakdown stores

18. Write short notes on
    a. Composite Insulators
    b. Long Creepage Insulators

19. Write short notes on
    a. Insulated overlaps
    b. Un-insulated overlaps
    c. Neutral Sections

20. Indicate the purpose/use of the following
    a. Raised Register Arm
    b. Bent Steady Arm
    c. Equalizing plate.
    d. 9-Tonne adjuster
    e. Splices
    f. Distance rod
    g. Anti wind clamp
    h. Stay adjuster
    i. Anti fallen rod
    j. Guide tube

TRUE OR FALSE (OHE)

1. No ODC consignment with less than 100mm clearance from the overhead contact wire are permitted in electrified section.

2. When the clearance of ODC from contact wire is between 390mm and 340mm, the ODC is to be moved with OHE supply 'OFF'.

3. When the clearance of ODC from contact wire is more than 390mm, the ODC can be moved without any restrictions.

4. OHE lineman (with TR-2 certificate) is authorized to issue permit to work.

5. OHE supervisor (with TR-3 certificate) is authorized to work on 25KV OHE and 132KV transmission line in installation, maintenance and repair.

6. PSI fitters (with TR-5 certificate) is authorized to take shut downs or take power block on 132KV/220KV installation.

7. Sectioning is provided to isolate OHE in small section for maintenance or to minimize the faulty sections during breakdowns.

8. The first loop and in adjacent main line are normally of different elementary section.

MATCH THE FOLLOWING (OHE)

(Choose the correct answers from Group-B for the questions of Group-A)

(A) Under Group 'A' names of protective jumpers are given. In Group 'B' the place where the jumpers are used is given. Match the type of jumper with in use.

	Group 'A'		Group 'B'
(a)	Inspan or "C" jumper 50sq.mm.	(i)	Insulated overlaps neutral sections.
(b)	Potential equalizer jumpers or F-jumpers 50sq.mm.	(ii)	Electrical continuity between catenary & contact wire at intervals of 400mm.
(c)	Continuity jumpers of G-jumpers	(iii)	Un-insulated overlaps, turnouts, crossovers for electrical continuity between two OHEs.

(B) In Group 'A' the type of conductor is given. In group 'B' the size of conductors are given. Match the conductor with its size.

	Group 'A		Group 'B
(a)	Copper catenary	(i)	116 sq.mm. Aluminum
(b)	Contact wire	(ii)	65 sq.mm (19/2.1)
©	'G' or continuity jumper	(iii)	Solid copper wire 5mm.
(d)	'C or in span jumper	(iv)	Solid copper wire 7mm.
(e)	'F' or potential jumper	(v)	50 sq.mm (19/1.83)
(f)	Register arm dropper	(vi)	105 sq.mm (133/1.013)
(g)	In span droppers	(vii)	50 sq.mm (19/1.83)
(h)	Anti creep wire	(viii)	107 sq.mm. Hard drawn copper
(i)	Aluminum catenary	(ix)	93 sq.mm (19/2.50)

(c) In Group 'A' the type of Insulator are used. In Group-'B' the use of insulators are given. Match type of insulator with the use.

	Group 'A'		Group 'B'
(a)	3KV disc insulator	(i)	Bracket type in cantilever
(b)	Post insulator	(ii)	Stay tube in cantilever
©	Bracket insulator	(iii)	Isolators
(d)	Stay arm insulator	(iv)	OHE termination
(e)	9-Tonne insulator	(v)	RC conductor suspension

(D) In Group 'A' the names of T&P are given. In group-'B' the use of T&P are given. Match the Tools & Plants and its use.

	Group 'A'		Group 'B'
(a)	Dynamometer	(i)	Mast deflection
(b)	Vernier calipers	(ii)	Temporary bonding during track attention
©	Plumb-bob	(iii)	Drawal of contact wire
(d)	Fibre pulleys	(iv)	Mast deflection
(e)	Rail jumpers	(v)	Tension/load measurements
(f)	Meggar	(vi)	Insulation resistance measurement.