

Marking Scheme of Model Test Paper

Class 9th

Subject:- Power

Sr No	Answer	Marks
1	<p>Types of Earthing</p> <p>(a) Strip earthing: In this type of earthing galvanized iron strip of 25mm × 4mm or copper strip of 25mm × 1.6mm are laid in horizontal trenches of minimum depth of 0.5 meter and covered with charcoal and salt.</p> <p>(b) Rod earthing: In this type of earthing system 12.5 mm diameter of solid rod of copper or 16 mm diameter of solid rod of galvanised iron are fitted vertically into the earth not less than 2.5 meter on earth surface.</p> <p>(c) Pipe earthing: It is cheaper and the best form of earthing. In this type of earthing a hollow pipe of 38 mm diameter and 2.5 meterlong GI is placed underground and covered with charcoal and salt.</p> <p>(d) Plate earthing: In this type of earthing system, a plate of either copper with dimensions 60cm×60cm×3.18mm or galvanised iron (GI) of dimensions 60cm×60cm×6.35mm is buried vertical in the earth pit which should not be less than 3 metre from the surface of ground</p> <p style="text-align: center;">or</p> <p>One of the major objectives of earthing is to ensure safety of persons during leakage fault conditions. Earthing creates the path of least resistance from machine to the earth so that the fault current dissipates quickly. It allows the lightning electrical energy to be safely dissipated thereby minimising the danger caused by the lightning. Earthing is the key to safety, i.e., protection of personnel, equipment, wiring, machines and instruments. Another advantage of earthing is in communication tower where it is used to reduce electromagnetic interference.</p> <p>Both type of earthing processes can be used. But plate earthing is preferred in small buildings and pipe earthing is used for multistorey buildings as well as electrical sub-station. All metallic parts of electric machines must be earthed for safety of equipment.</p> <p>Earth Resistance</p> <p>1. Earth resistance depends on the following factors:</p> <ol style="list-style-type: none"> (a) Type of earth soil (b) Temperature of earth (c) Humidity on earth (d) Minerals on earth (e) Length of electrode (f) Distance between two electrodes 	5

	(g) Number of electrodes	
2	<p>The various tools and equipment used by an electrical or electronic technician while working with electrical circuits are as explained below:</p> <p>(a) Screw driver:</p> <p>(b) Ratchet:</p> <p>(c) Spanner:</p> <p>(d) Wrench:</p> <p>(e) Wire cutter and plier:</p> <p>(f) Tester:</p> <p>(g) Hammer:</p> <p>(h) Ladder:</p> <p>(i) Utility knife:</p> <p>(j) Soldering or desoldering iron:</p> <p>(k) Soldering or desoldering station:</p> <p>(l) Voltmeter:</p> <p>(m) Ammeter:</p> <p>(n) Multimeter:</p> <p style="text-align: center;">Or</p> <p>Voltmeters</p> <p>(i) A voltmeter is always connected across the device or in parallel.</p> <p>(ii) A voltmeter has a very high internal resistance, so as to not draw a large current from the circuit</p> <p>Multimeter: It is used to measure various electrical quantities like resistance, voltage and current, etc.</p>	5
3	<p>Disadvantages of PVC casing capping wiring</p> <p>Explain</p> <ol style="list-style-type: none"> 1. Costly 2. Not suitable for weather with high humidity 3. High risk of fire <p>Or</p> <p>Advantages of conduit wiring</p> <ol style="list-style-type: none"> 1. Safe 2. Appearance is better 3. No risk of fire 4. No risk of damage to cable insulation 5. Immune to humidity, smoke, steam, etc. 6. No risk of shock 7. Long lasting 	5

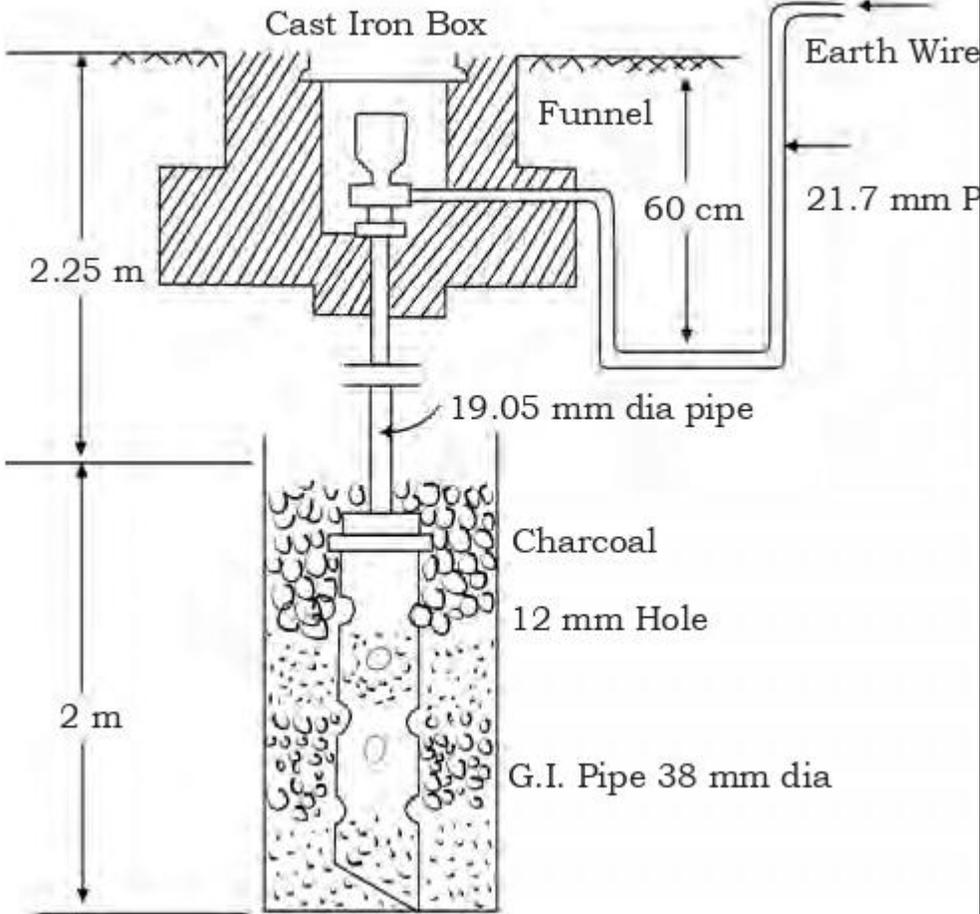
4	 <p>The diagram illustrates a pipe earthing system. At the top, a Cast Iron Box contains a Funnel. A 19.05 mm diameter pipe extends from the box down to a 2 m long G.I. Pipe (38 mm diameter). The G.I. pipe is filled with Charcoal and has a 12 mm diameter hole. An Earth Wire (21.7 mm P) is connected to the top of the G.I. pipe. The distance from the top of the Cast Iron Box to the top of the G.I. pipe is 2.25 m. The distance from the top of the G.I. pipe to the bottom of the pipe is 2 m. The distance from the top of the G.I. pipe to the top of the Earth Wire is 60 cm.</p>	3
5	<p>Earthing means connection of non-current carrying parts (metallic parts) of electrical apparatus to the earth to discharge electrical energy without any danger. Electrical earthing is important to</p> <ol style="list-style-type: none"> 1. save human life from the danger of shock from leaking current. 2. maintain the line voltage constant. 3. protect large machines and buildings from atmosphere lighting. 4. avoid the risk of accident in an electrical substation and other installation. 	3
6	<p>The following tools are commonly used</p> <ol style="list-style-type: none"> (a) Combination pliers: (b) Adjustable wrench: (c) Pipe wrench: (d) Measuring tape: (e) Hammer: (f) Ratchet with drill bit (hand drill): 	

Fig. 1.29 Pipe earthing

7	<p>It is the most common type of age old watt-hour meter. It consists of a rotating aluminum disc mounted on a spindle between two electromagnets. Speed of rotation of disc is proportional to the power and this power is integrated by the use of counter mechanism and gear trains. It comprises two silicon steel laminated electromagnets, i.e., series and shunt magnets</p>	
8	<p>(a) Switch: (b) One-way switch: (c) Two-way switch: (d) Intermediate switch: (e) Holder: (f) Socket outlet or plug:</p> <p style="text-align: center;">Or</p> <p>Precautions</p> <ol style="list-style-type: none"> 1. Phase is always controlled by the switch. 2. The part of the wire without insulation should not be open. 3. Twisted wire fitted in the holder should be put in such a way that the two wires do not touch each other. 4. Carefully remove the insulation part such that the wire does not cut. 5. Do not touch any naked electrical wire unless you are sure that there is no current in the wire 	3
9	<p>Consumer Meters</p> <p>The consumer meter shall be installed by the licensee either at consumer premises or outside the consumer premises:</p> <p>(a) Provided that where the licensee installs the meter outside the premises of the consumer, the licensee shall provide real-time display unit at the consumer premises for information to indicate the electricity consumed by the consumer.</p> <p>(b) Provided further that for the billing purpose, reading of consumer meter and not the display unit shall be taken into account.</p> <p style="text-align: center;">Or</p> <p>It is an advanced metering technology involving placing intelligent meters to read, process and provide feedback to customers. It measures energy consumption, remotely switches the supply to customers and remotely control the maximum electricity consumption. Smart metering system uses the advanced metering infrastructure system technology for better performance. This system is capable of communicating in both directions. It can transmit data to the utilities like energy consumption, parameter values, alarms, etc.,</p>	3
10	<p>Points to be earthed(Any four)</p> <ol style="list-style-type: none"> 1. Earth pin of 3 pin and 5 pin plug and socket 2. All metal parts of the electrical machine, e.g., motor, heater geyser and mixer 3. Metallic frame of electrical machines 4. The neutral conductor of 3-phase 4-wire system 5. Pole, tower, armouring of cable 6. Stray wire of overhead lines 	2

11	<p>The following tools are commonly used for (Any four) tools are</p> <p>(a) Combination pliers:</p> <p>(b) Adjustable wrench:</p> <p>(c) Pipe wrench:</p> <p>(d) Measuring tape:</p> <p>(e) Hammer:</p> <p>(f) Ratchet with drill bit (hand drill):</p>	
12	<p>The consumer meter shall be installed by the licensee either at consumer premises or outside the consumer premises:</p> <p>(a) Provided that where the licensee installs the meter outside the premises of the consumer, the licensee shall provide real-time display unit at the consumer premises for information to indicate the electricity consumed by the consumer.</p> <p>(b) Provided further that for the billing purpose, reading of consumer meter and not the display unit shall be taken into account.</p>	2
13	<p>One must note here that a self-employed person may not be an entrepreneur if she/he does not have these qualities. An entrepreneur should be willing to take a calculated risk and is always open to new ideas to make his/her business grow. A person who has does not take risks, is not open to new ideas and is running the business only to earn a steady source of income is not an entrepreneur.</p>	2
14	<p>a) Copper: It is a good conductor of electricity. It is used in wiring material in cables. Its resistance is low and used for conduction of electricity at high, medium and low voltage</p> <p>(b) Aluminium: It is light weight in comparison to copper. Aluminium is cheaper than copper and is therefore mostly used in electrical wiring and cable making.</p> <p>Or</p> <p>Aluminium: Its colour is silvery-white and it is soft</p>	2
15	<p>Conservation and management of water are essential for the survival of mankind, plants and animals. This can be achieved by adopting the following methods:</p> <ol style="list-style-type: none"> 1. Growing vegetation in the catchment areas, which will hold water in the soil and allow it to percolate into deeper layers and contribute to formation of ground water. 2. Constructing dams and reservoirs to regulate supply of water to the fields, as well as to enable generation of hydroelectricity. 3. Sewage should be treated and only the clear water should be released into the rivers. 4. Industrial wastes (effluents) should be treated to prevent chemical and thermal pollution of fresh water. <p>Or</p> <p>Conservation and management of water are essential for the survival of</p>	2

	<p>mankind, plants and animals. This can be achieved by adopting the following methods:</p> <ol style="list-style-type: none"> 1. Growing vegetation in the catchment areas, which will hold water in the soil and allow it to percolate into deeper layers and contribute to formation of ground water. 2. Constructing dams and reservoirs to regulate supply of water to the fields, as well as to enable generation of hydroelectricity. 3. Sewage should be treated and only the clear water should be released into the rivers. 4. Industrial wastes (effluents) should be treated to prevent chemical and thermal pollution of fresh water. 	
16	B	1
17	C	1
18	A	1
19	B	1
20	A	1
21	A,B,C	1
22	A,C,D	1
23	D	1
24	B	1
25	FALSE	1
26	TRUE	1
27	ELECTROMECHANICAL	1
28	SIM CARD	1
29	JOINING THE WIRES	1
30	NEON	1