

MIZORAM PUBLIC SERVICE COMMISSION
DEPARTMENTAL EXAMINATION FOR JUNIOR ENGINEER
UNDER POWER & ELECTRICITY DEPARTMENT,
GOVERNMENT OF MIZORAM.
(JULY-2025)

ELECTRICAL ENGINEERING

Time Allowed : 3 hours

FM : 100 PM : 40

SECTION - A (Multiple Choice questions) (50 Marks)

All questions carry equal mark of 1 each. Attempt all questions.

*This Section should be answered only on the **OMR Response Sheet** provided.*

1. A transformer core is laminated to-
 - (a) reduce hysteresis loss
 - (b) reduce eddy current losses
 - (c) reduce copper losses
 - (d) reduce all above losses
2. Which of the following does not change in a transformer?
 - (a) Current
 - (b) Voltage
 - (c) Frequency
 - (d) All of the above
3. 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
4. Transformer ratings are expressed in terms of-
 - (a) kVA
 - (b) kW
 - (c) kVAr
 - (d) kWh
5. The chemical used in breather is-
 - (a) asbestos fiber
 - (b) silica sand
 - (c) sodium chloride
 - (d) silica gel
6. The objective of earthing or grounding is-
 - (a) to provide a low resistance path to the ground
 - (b) to provide a high resistance path to the ground
 - (c) to provide flow of positive, negative and zero sequence currents
 - (d) none of the above

7. Generally grounding is provided for-
 - (a) only for the safety of the equipment
 - (b) only for the safety of the operating personnel
 - (c) both (a) and (b)
 - (d) none of the above
8. Earth wire or ground wire is made of-
 - (a) Copper
 - (b) Aluminium
 - (c) Iron
 - (d) Galvanised Steel
9. Which element of hydroelectric power plant prevents the penstock from water hammer phenomenon?
 - (a) Valves and Gates
 - (b) Draft tubes
 - (c) Spillway
 - (d) Surge Tank
10. Trash racks are located-
 - (a) near tailrace
 - (b) at the entrance of turbine
 - (c) inside penstock
 - (d) intake
11. Pelton turbines are used for-
 - (a) medium head applications
 - (b) low head applications
 - (c) in steam power plants
 - (d) for high head applications
12. The capacity of battery is expressed in terms of-
 - (a) Ampere
 - (b) Volt-hour
 - (c) Ampere-hour
 - (d) Volt-Ampere hour
13. Cells are connected in series in order to-
 - (a) increase the voltage rating
 - (b) increase the current rating
 - (c) increase life of the cell
 - (d) None of the above
14. During charging, the specific gravity of the electrolyte of a Lead Acid Battery-
 - (a) decrease
 - (b) increase
 - (c) remain same
 - (d) None of the above
15. Which conductor is commonly used as a neutral conductor in LT distribution line?
 - (a) Weasel
 - (b) Gnat
 - (c) Ant
 - (d) Grasshopper
16. In aluminium conductors, steel core is provided to-
 - (a) compensate for skin effect
 - (b) neutralise proximity effect
 - (c) reduce line inductance
 - (d) increase the tensile strength
17. Pin type insulators are generally not used for voltages beyond-
 - (a) 1.1 kV
 - (b) 11 kV
 - (c) 22 kV
 - (d) 33 kV

- 18.** Which of the following distribution systems is more reliable?
- (a) Radial system
 - (b) Tree system
 - (c) Ring main system
 - (d) All are equally reliable
- 19.** The voltage of the single phase supply to residential consumers is-
- (a) 110 V
 - (b) 210 V
 - (c) 230 V
 - (d) 400 V
- 20.** The corona is considerably affected by which of the following?
- (a) Size of the conductor
 - (b) Shape of the conductor
 - (c) Surface condition of the conductor
 - (d) All of the above
- 21.** The power factor of industrial loads is generally-
- (a) unity
 - (b) lagging
 - (c) leading
 - (d) zero
- 22.** In the Electricity Act, 2003, there are _____ Sections.
- (a) 203
 - (b) 190
 - (c) 185
 - (d) 196
- 23.** In a tap changing transformer, the tappings are provided on-
- (a) primary winding
 - (b) secondary winding
 - (c) high voltage winding
 - (d) any of the above
- 24.** Which of the following materials is not used for transmission and distribution of electrical power?
- (a) Copper
 - (b) Aluminium
 - (c) Steel
 - (d) Tungsten
- 25.** Silicon steel used in laminations mainly reduces-
- (a) hysteresis loss
 - (b) eddy current losses
 - (c) copper losses
 - (d) all of the above
- 26.** Ammeter is used for measuring-
- (a) Voltage
 - (b) Current
 - (c) Resistance
 - (d) None of the above
- 27.** Hertz is SI unit of-
- (a) Current
 - (b) Voltage
 - (c) Frequency
 - (d) Power
- 28.** As per JERC(M&M) Electricity Supply Code Regulation 2013, any of the following documents or its attested copies, shall not be considered as acceptable proof of identity for individual in respect to application of new service connection-
- (a) Electoral identity card
 - (b) Driving Licence
 - (c) Land Settlement Certificate (LSC)
 - (d) Ration Card

29. As per JERC(M&M) Electricity Supply Code Regulation 2013, Supply of LT Single Phase category shall be upto a contracted load of _____ kW.
- (a) 10 (b) 6
(c) 8 (d) 4
30. Temporary connection shall be granted for a maximum period of _____ at a time.
- (a) 30 days (b) 3 months
(c) 6 months (d) 45 days
31. Four resistors each of 3 ohm are connected in series, the equivalent resistance of the system will be-
- (a) $4/3$ Ohm (b) 12 Ohm
(c) 6 Ohm (d) $3/4$ Ohm
32. Five capacitors each of 5 μF are connected in series, the equivalent capacitance of the system will be-
- (a) 5 μF (b) 25 μF
(c) 10 μF (d) 1 μF
33. A SWG is used to measure-
- (a) length of the wire (b) Cross sectional area of the wire
(c) Diameter of the wire (d) Insulation of the wire
34. Which of the following device is used to measure power in A.C. circuits?
- (a) Ammeter (b) Wattmeter
(c) Voltmeter (d) Ohmmeter
35. An ammeter is connected in _____ with the circuit element whose current we wish to measure.
- (a) series (b) parallel
(c) series or Parallel (d) None of the above
36. A CRO is used to measure-
- (a) Voltage (b) Frequency
(c) Phase (d) All of the above
37. A Voltmeter is connected in _____ with the circuit component across which Potential difference is to be measured.
- (a) series (b) parallel
(c) series or Parallel (d) None of the above
38. AT&C Loss stands for-
- (a) Aggregate Transmission & Consumption Loss
(b) Aggregate Technical & Commercial Loss
(c) Average Technical & Consumption Loss
(d) Actual Technical & Control Loss
39. The SI unit of Magnetic Flux is-
- (a) Hertz (b) Weber
(c) Ampere (d) Candela

- 40.** As per P&E Department SOR 2025, planting depth of SP-29 is-
- (a) 1 m (b) 1.5 m
(c) 1.8 m (d) 2.0 m
- 41.** As per P&E Department SOR 2025, standard span of 11kV line is-
- (a) 120 m (b) 100 m
(c) 140 m (d) 80 m
- 42.** How many Consumer Category are there in the prevailing Tariff?
- (a) 6 (b) 8
(c) 10 (d) 12
- 43.** The overall average per unit subsidized tariff in the prevailing Tariff is-
- (a) Rs. 7.82 (b) Rs. 8.10
(c) Rs. 7.10 (d) Rs. 6.82
- 44.** As per P&E Department SOR 2025, the least capacity of Distribution transformer is-
- (a) 16 kVA (b) 63kVA
(c) 10 kVA (d) 25 kVA
- 45.** Meggar is an instrument used for-
- (a) measuring current (b) measuring voltage
(c) measuring power (d) testing insulation
- 46.** Distribution transformers are usually designed to have maximum efficiency-
- (a) at 50% of full load (b) at 75% of full load
(c) near full load (d) near no load
- 47.** The All day (energy) efficiency is the term related to-
- (a) Power Transformer (b) Distribution transformer
(c) Current transformer (d) Voltage transformer
- 48.** Iron loss in the transformer can be determined by-
- (a) Short Circuit Test (b) Open Circuit Test
(c) Both a) and b) (d) None of the above
- 49.** In a LT 3-ph, 5 wire system, the 5th wire is used for-
- (a) Earthing (b) Spare
(c) Street light (d) Communication
- 50.** Highest system voltage in Mizoram is-
- (a) 220kV (b) 132kV
(c) 66kV (d) None of the above

Section - B (50 Marks)

*This Section should be answered only on the **Answer Sheet** provided.*

Marks for each question is indicated against it.

1. List out the major materials and its quantity required for - (6)
 - (a) Construction of 1x25 kVA, 11/0.433 Pole Mounted Distribution Transformer with Street Light Metering unit.

OR

 - (b) Construction of 1 Km, 3-Phase 11kV line using Weasel Conductor assuming line span of 120 Mtrs.
2. What is the importance of earthing in electrical installation ? Explain with suitable diagram the method of pipe earthing in a Distribution Sub-Station. (2+4=6)
3. What are the clearance requirement as per CEA (Measures relating to Safety and Electric Supply) Regulation, 2010 for: (5×1=5)
 - (a) Minimum clearance above ground for lines of Voltage exceeding 650V but not exceeding 33kV across the street?
 - (b) Minimum clearance above ground for lines of Voltage exceeding 650V but not exceeding 33kV along any street?
 - (c) Minimum clearance between 11kV line and 33kV line crossing each other?
 - (d) The Horizontal Clearance between nearest conductor and any part of the building for line of voltages not exceeding 650 V?
 - (e) Minimum clearance above ground for lines of Voltage not exceeding 650V across the street.
4. Write short notes on *any four (4)*: (4×2=8)

(a) Penstock	(b) Insulator
(c) Buchholz Relay	(d) Uses of transformer oil
(e) Breather in a Transformer	(f) Battery charger
5. Write the full form of the following: (5×1=5)

(a) MzERC	(b) HTLS conductor
(c) Mizoram SLDC	(d) ABC
(e) RDSS	
6. Write short notes on *any four (4)* : (4×2=8)

(a) Power Factor	(b) Contracted Load
(c) Transformation Loss	(d) Net Meter
(e) KJ category	(f) Pro-rata billing

7. Answer *any three (3)* of the following:

(3×4=12)

- (a) Write down the classification of consumers into various tariff categories as per P&ED Tariff Order for FY 2025-26.
- (b) What are the Classification of Supply Voltages on the basis of contracted load as per Clause 3.2 of the JERC(M&M) Electricity Supply Code Regulation 2013?
- (c) Write down the list of information to be included in the Energy bill of a consumer as per JERC(M&M) Electricity Supply Code Regulation 2013.
- (d) What are losses in Electrical Power Distribution System ? How do you reduce AT&C losses?

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