

MIZORAM PUBLIC SERVICE COMMISSION
DEPARTMENTAL EXAMINATION FOR JUNIOR GRADE OF M.E.S. (AE/SDO)
UNDER POWER & ELECTRICITY DEPARTMENT, GOVERNMENT OF MIZORAM.
(JULY-2025)

ENGINEERING PAPER – I
Common Paper for all Engineers in Electrical Wing under P&E Cadre

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. Overall length of Galvanised Steel Tabular pole SP-35 in SOR 2023 is-
(a) 9 meters (b) 9.5 meters
(c) 9.25 meters (d) 7.5 meters
2. As per General Condition of execution and maintenance of Deposit Work, duration of Annual Operation and maintenance charge to be included in the estimate is-
(a) 6 months (b) 2 years
(c) 1 year (d) 5 years
3. What type of conductor is normally used for 132kV line in Mizoram?
(a) Rabbit Conductor (b) Panther Conductor
(c) Raccoon Conductor (d) Weasel Conductor
4. What is the tensile strength of porcelain Disc insulator normally used in 33kV line?
(a) 45KN (b) 90KN
(c) 70KN (d) 120KN
5. The Name of the instrument used for measuring insulation resistance of power distribution line is-
(a) Meggar (b) Multi meter
(c) Earth Tester (d) Synchronoscope
6. The minimum vertical clearance from building for High Voltage (up to 33kV) bare conductor is-
(a) 3.5 meters (b) 3.0 meters
(c) 3.7 meters (d) 3.75 meters
7. The full form of NERPC
(a) North Eastern Regional Power Committee
(b) North Eastern Regional Power Circle
(c) North Eastern Regional Power Center
(d) North Eastern Regional Procurement Committee

8. The person who has been granted a licence to undertake trading in electricity under section 12 of Electricity Act 2003 is named as-
- (a) Trader
 - (b) Consumer
 - (c) Franchiser
 - (d) Electricity Trader
9. A power plant set up by any person to generate electricity primarily for his own use and includes a power plant set up by any co-operative society or association of persons for generating electricity primarily for use of members of such cooperative society or association as per Electricity Act 2003 is called-
- (a) Captive Generating Station
 - (b) Captive Generating Plant
 - (c) Captive Power Plant
 - (d) Captive Power Station
10. Percentage calculation formula of Deviation in a time block for buyer as per CEA Deviation Settlement Mechanism is-
- (a) $\text{Deviation (\%)} = 100 \times (\text{Actual drawal} - \text{Scheduled drawal}) / \text{Scheduled Drawal}$
 - (c) $\text{Deviation (\%)} = 100 \times (\text{Scheduled drawal} - \text{Actual drawal}) / \text{Scheduled Drawal}$
 - (d) $\text{Deviation (\%)} = 100 \times (\text{Actual drawal} - \text{Scheduled drawal}) / \text{Actual Drawal}$
 - (e) $\text{Deviation (\%)} = 100 \times (\text{Scheduled drawal} - \text{Actual drawal}) / \text{Actual Drawal}$
11. The name of the seller those generating station based on other than wind or solar or hybrid of wind-solar resources as described in CEA (Deviation Settlement Mechanism and Related Matters) Regulations, 2014 is known as-
- (a) General Seller
 - (b) Hydro Electric Seller
 - (c) Conventional Seller
 - (d) Ancillary Seller
12. The Regional Load Despatch Center who Control Mizoram is-
- (a) MSLDC
 - (b) ERLDC
 - (c) ASLDC
 - (d) NERLDC
13. As described in The Electricity Act 2003, the licensee authorised to operate and maintain a distribution system for supplying electricity to the consumers in his area of supply is called-
- (a) Distribution licensee
 - (b) DISCOM
 - (c) Distributor
 - (d) SLDC
14. Which one of the following conductors is Steel Re-enforced.
- (a) Ant Conductor
 - (b) Gnat Conductor
 - (c) Weasel Conductor
 - (d) Grasshopper Conductor
15. The minimum required breakdown voltage value for Transformer Oil at 2.5mm gap for 132kV Voltage level as per Operation and maintenance guidelines for lines & Sub-Station is-
- (a) 40 kV
 - (b) 60 kV
 - (c) 30 kV
 - (d) 50 kV
16. The purpose of CRC Spray in electrical terminal is-
- (a) For cooling purpose
 - (c) To prevent corrosion
 - (b) Strengthening insulation resistance
 - (d) For lubrication

17. The main function of Potential Transformer is-
- (a) Reduce high voltage to measurable value
 - (b) Detect Oil leakage
 - (c) Divert Surge current
 - (d) Breaking the circuit
18. Who is responsible for Right of Way issue in any type of electrical works executed under Deposit-III?
- (a) The estimate approving authority
 - (b) The authority who procured materials
 - (c) Paying authority
 - (d) Interested party. The person who deposited the Deposit-III
19. What is the normal validity period of estimate from the date of approval for making necessary payment to the Department as per General condition for execution and maintenance of Deposit works?
- (a) 6 months
 - (b) 12 months
 - (c) 3 months
 - (d) 9 months
20. Which one of the following work is not included in annual operation and maintenance of Deposited Works as per General condition for execution and maintenance of Deposit works.
- (a) Annual painting
 - (b) Replacement of GOAB Switch
 - (c) Jungle cutting
 - (d) Topping up of Transformer oil.
21. What is the interval of periodical inspection and testing to be carried out by the electrical Inspectorate or by the Department if the party/consumer carry out annual Operation and maintenance by himself.
- (a) Annually
 - (b) Two years
 - (c) Five years
 - (d) 10 years
22. The minimum operating safety distance for live line upto 33kV as per safety manual issued by P&E Department is-
- (a) Two feet
 - (b) Five feet
 - (c) Three Feet
 - (d) Four Feet
23. The main purpose of temporary earthing of power conductor during working at power line is-
- (a) Safety for the worker
 - (b) Protection of Transformers
 - (c) Protection of equipment
 - (d) Leakage current detection
24. What is the standard ruling span for 11kV line to be adopted for preparation of DPR in case actual survey is not carry out as per SOR 2023?
- (a) 100 meters
 - (b) 180 meters
 - (c) 250 meters
 - (d) 120 meters
25. What is the preferable distance between two earth pit of DT Sub-Station as per SOR 2023?
- (a) 4 meter
 - (b) 3 meters
 - (c) 6.5 meter
 - (d) 5 meters
26. The nominal period between two consecutive meter reading dates is called-
- (a) Billing Cycle
 - (b) Demand period
 - (c) Nominal Period
 - (d) One Year.

27. JERC Supply Code declared that the area with population more than 1 lakhs city as defined in the latest Census of India is-
- (a) Class -II City
 - (b) Class -I Town
 - (c) Class I City
 - (d) Class-II Town
28. The level of voltage classified as Extra High Voltage as described by JERC Supply Code Regulation is-
- (a) Voltage exceeds 220 kV
 - (b) Voltage exceeds 66 kV
 - (c) Voltage exceeds 132kV
 - (d) Voltage exceeds 33kV
29. The amount chargeable for the billing cycle/billing period based upon sanctioned load/contracted load in kW is called-
- (a) Contracted charges
 - (b) Fixed Charges
 - (c) Contracted load
 - (d) Connected load
30. The load in kW (kilo Watt) or kVA (kilo Volt Ampere), agreed to be supplied by the licensee and indicated in the agreement executed between the licensee and the consumer is known as-
- (a) Contracted load
 - (b) Demand Load
 - (c) Connected load
 - (d) Peak load
31. A charge levied on the consumer based on the quantity of electricity (units in kWh or kVAh as per tariff) supplied
- (a) Fixed Charge
 - (b) Minimum charge
 - (c) Energy Charge
 - (d) Surcharge
32. The highest load measured in average kVA or kW at the point of supply of a consumer during any consecutive period of 30 (thirty) minutes during the billing period is known as
- (a) Peak Load
 - (b) Connected load
 - (c) Sanctioned load
 - (d) Maximum Demand
33. The permissible limit of voltage in High Tension as per JERC Supply Code is-
- (a) Plus or minus 6%
 - (b) Plus or minus 9%
 - (c) Plus or minus 10%
 - (d) Plus or minus 5%
34. The higher contracted load permissible as per JERC Supply code for Single Phase LT Domestic Consumer is-
- (a) 5 kW
 - (b) 6 kW
 - (c) 10 kW
 - (d) 8 kW
35. Any system for the conveyance of electricity by means of a main Transmission Line from the territory of one State to another State
- (a) Inter State Transmission System
 - (b) State Transmission system
 - (c) Indian Transmission
 - (d) Intra-State transmission system
36. That period in a day when the electrical power demand is lowest as described by JERC Grid Code is-
- (a) Scheduled Period
 - (b) Isolation period
 - (c) Lean Period
 - (d) Off Peak period

37. The condition of a generating station which is loaded but is not running at its declared availability is called as-
- (a) Off Peak load
 - (b) Part Load
 - (c) Partial load
 - (d) Plant load
38. The Generating Station having Black Start capability is called-
- (a) Starter
 - (b) Black Starter
 - (c) Self Sufficient station
 - (d) Black Start Station
39. The product of voltage and alternating current measured in unit of volt-amperes is called-
- (a) Apparent Power
 - (b) Real Power
 - (c) Active Power
 - (d) Reactive Power
40. What is the latest name of Electricity Regulatory commission for the State of Mizoram?
- (a) Mizoram State Electricity Regulatory Commission
 - (b) Mizoram Electricity Regulatory Commission
 - (c) Joint Electricity Regulatory Commission
 - (d) Electricity Regulatory Commission for Mizoram
41. The non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Commission is called-
- (a) Consumer
 - (b) Investor
 - (c) Generator
 - (d) Open Acces
42. A shutdown of a part of the system resulting in failure of power supply, either from external connections or from the healthy part of the system.
- (a) Partial Shutdown
 - (b) Direct Shutdwon
 - (c) Emergency shutdown
 - (d) Half Shutdown
43. In a Guranteed Standard, Power Restore time in the case of normal fuse-off calls, fuses at the distribution transformer or at the consumer premises from receiving the complaint in Class-I Cities is-
- (a) One day
 - (b) 6 Hours
 - (c) 4 Hours
 - (d) 10 hours
44. In a Guaranteed Standard, the Licensee shall restore supply in the case of distribution transformer failures by replacement of transformer in Class-I Cities & Urban Areas
- (a) Within One day
 - (b) Within 48 Hours
 - (c) Within 12 Hours
 - (d) Within 3 days
45. In a Guaranteed Standard, the Licensee shall inspect and check the correctness of the meter in Rural Areas
- (a) Within One week
 - (b) Within 4 Days
 - (c) Within 10 Day
 - (d) Within 15 days
46. In an Overall Standard of performance, the percentage of distribution transformers replaced within the time limits should be-
- (a) 90%
 - (b) 95%
 - (c) 85%
 - (d) 70%

47. In an Overall Standard of performance, the percentage Licensee shall achieve the standards of performance in release of new connection is-
- (a) 93% (b) 99%
(c) 95% (d) 90%
48. Aggregate load of manufacturer's rated capacities of all energy consuming devices or apparatus in the consumer's premises is called-
- (a) Contracted load (b) Demand Load
(c) Connected load (d) Peak load
49. A point at which the consumer's installation and/or apparatus are connected to distribution licensee's distribution system is called-
- (a) Connected point (b) Distribution point
(c) Connection (d) Network point
50. The Voltage level of Low Tension is-
- (a) 5000V (b) 33kV
(c) 11kV (d) 240V

SECTION- B (Conventional Type) (50 Marks)

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

Marks for each question is indicated against it.

1. Define what is 'Renewable Rich State' as describe in CEA (Deviation Settlement Mechanism and Related Matters) Regulations, 2014. (4)
2. Write short notes on maintenance schedule to be followed in maintenance of 33kV and 11kV line. What are the major components to be checked for preventive maintenance of lines before monsoon season. (3+3= 6)
3. Calculate the Load security to be deposited by the consumer with the help of parameter given below: (5)
- (a) Applicable Tariff
- | | |
|-----------------------|-------------------------|
| Monthly fixed charge | : Rs 90/contracted load |
| Monthly energy charge | : Rs 11.1 for all Unit |
- (b) Load factor : 30%
- (c) Contracted load of consumer : 5kW
- (d) Contracted load is same as Connected load
4. What are the safety equipment and tools to be used for the lineman? Write down the importance of those equipment to protect the lineman. (5)

5. Answer the following questions with the help of SOR 2023 analysis given:

- (i) Calculate the total weight requirement of M.S. Channel 75 x 40 x 6mm for 3 locations of double Pole of 11kV line. (2)
- (ii) Calculate the total amount (in Rs) to purchase M.S Flat Iron 40mm x 6mm for 4 locations of double Pole of 11kV line. (3)

Given SOR Analysis:

Providing and erection of 4 nos. of MS Channel Iron 75 mm X 40 mm X 6 mm (7.14Kg per metre) double pole crossarm for three wire 11 kV overhead line conductors (triangular formation) complete with through bolts and nuts for clamping to the poles including drilling of holes for insulator pins/fitting bolts, nuts and washers etc and painting with primer and finished paint as required (for SP-29) as directed by the engineer in charge.					
Sl. No.	Description	Unit	Rate/Unit	Qty.	Amount
Materials					
1138	M.S. Channel 75 x 40 x 6 mm	kg	114	44.61	5,085.62
1141	M.S. Flat Iron 40mm x 6 mm	kg	114	6.32	720.76
1321	M.S. Nut & Bolt 16 x 155 mm full thread conforming to IS : 1364-2 (1992) or any amendments up to date.	kg	162	3.67	594.86
1320	M.S. Nut & Bolt 16 x 75 mm full thread conforming to IS : 1364-2 (1992) or any amendments up to date.	kg	162	2.34	378.43
1329	Aluminium Paint	Lit	187	0.20	37.40
1331	Red Oxide Paint	Lit	138	0.20	27.60

6. Write the procedure for change of consumer Name as per JERC Supply Code. (5)

7. Write notes on procedure for temporary supply as per JERC Supply Code regulation. (5)

8. Explain the following: (3×2=6)

(a) Captive Power Plant

(b) Peak Period

(c) Force outage

9. Calculate the following power system interruption index for a particular interruption data given below:

(a) Calculate SAIFI Hint: $SAIFI = \frac{\sum_{i=1}^n (A_i \times N_i)}{N_t}$ (3)

(b) Calculate SAIDI Hint: $SAIDI = \frac{\sum_{i=1}^n (B_i \times N_i)}{N_t}$ (3)

(c) Calculate MAIFI Hint: $MAIFI = \frac{\sum_{i=1}^n (C_i \times N_i)}{N_t}$ (3)

Given Data :

Power Interruption data for a particular area during one month is given below:

Name of 11kV Feeder (i)	N _i	C _i	A _i	B _i
Feeder X	350	5	8	3hr 20min 40sec
Feeder Y	250	6	5	2hr 30min 25sec
Feeder Z	150	8	4	0hr 50min 50sec

Where,

A_i = Total number of sustained interruptions (each longer than 5 minutes) on i^{th} feeder for the month

B_i = Total duration of all sustained interruptions (each longer than 5 minutes) on i^{th} feeder for the month

C_i = Total number of momentary interruptions (each less than or equal to 5 minutes) on i^{th} feeder for the month

N_i = No of consumer in i^{th} feeder affected due to each interruption

N_t = Total No. of consumer at 11kV in licensee's supply area

n = Number of 11kV feeders in licensee's supply area (excluding agricultural feeders)

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