

DEPARTMENTAL EXAMINATION  
NOVEMBER 2019

DEPARTMENTAL TEST FOR TECHNICAL OFFICERS - FIRST PAPER  
(With books)

ANSWER KEY

1. Choose the correct answer:

1 x 20 = 20

- |                                                                                 |                                                                |
|---------------------------------------------------------------------------------|----------------------------------------------------------------|
| i) Code of Tech. Instructions/Page 16.                                          | c) voltage and specific gravity                                |
| ii) TNE Supply Code/Page 139.                                                   | c) 5 MVA                                                       |
| iii) Code of Tech. Instructions/Page 17.                                        | a) hydrometer                                                  |
| iv) TNE Supply Code/Page 141.11 (v)(2)<br><i>Chapter</i>                        | c) <del>(a)</del> <del>(b)</del> Both Domestic and Agriculture |
| v) Code of Tech. Instructions/Page 216/Para 5.10.                               | b) series                                                      |
| vi) TNE Supply Code/Page 143/4(v).                                              | d) 1.5%                                                        |
| vii) Code of Tech. Instructions/Page 60.                                        | a) year                                                        |
| viii) TNE Supply Code /Page 154/Para.19<br>Electricity Act,2003/Page 57/Para126 | c) Section 126                                                 |
| ix) TNE Grid Code /Page 54/ 4(iii)                                              | b) > 50.5 Hz                                                   |
| x) TNE Grid code / Page 25/ 8(xviii)                                            | a) 230 kV                                                      |
| xi) TNE Grid Code /Page 14/Para 7.                                              | a) PGCIL                                                       |
| xii) TNE Distribution Code/Page 209/ 34(7).                                     | c) zero                                                        |
| xiii) The TN Transparency in Tender rules<br>2000/Page15/ Para.20.1.b.          | b) 30 days                                                     |
| xiv) TNE Distribution Code/Page 234/21.                                         | c) Restriction and Control.                                    |
| xv) TNE Grid Code/Page 40/ 17(d)(v)                                             | a) Restricted Earth Fault.                                     |
| xvi) TNE Distribution Standards of<br>Performance/Page 8/Para 9.                | c) Commercial to agriculture                                   |
| xvii) The TN Transparency in Tender rules<br>2000/Page 9/ Para.14.1.            | a) not exceeding 1%                                            |
| xviii) TNE Distribution Code/Page 210/ 35(5).                                   | a) True                                                        |
| xix) Code of Tech. Instructions/Page 319/Para<br>9.02.01.                       | c) both (a) and (b)                                            |
| xx) TNE Distribution Code/Page 201/ 27(4).                                      | b) False                                                       |

2. Choose the correct answer:

1 x 20 = 20

- |                                                                            |                                             |
|----------------------------------------------------------------------------|---------------------------------------------|
| i) Code of Tech. Instructions/Page 392/Para 13.03.01.                      | b) 18 feet                                  |
| ii) TNE Supply Code/Page 167/C(1) Electricity Act, 2003/Page 65/137        | d) Punishment for receiving stolen property |
| iii) Code of Tech. Instructions/Page 401/Para 13.11.02.                    | b) 40°                                      |
| iv) TNE Distribution Code/Page 196/2.                                      | c) TNE Grid Code                            |
| v) Code of Tech. Instructions/Page 410/Para 14.02.04.                      | a) 1.2 metre                                |
| vi) TNE Distribution Code/Page 209 /35(1).                                 | a) before availing service connection       |
| vii) The Tamil Nadu Transparency in Tender rules 2000/Page 7/ Para.8.      | c) both (a) and (b)                         |
| viii) TNE Distribution Code/Page 187 / z - cc.                             | a) 650V to 33 kV                            |
| ix) TNE Grid Code/Page 5/ 52.                                              | c) Regional Energy Account                  |
| x) TNE Distribution Code/Page 208 /31(2).                                  | b) Three                                    |
| xi) TNE Grid Code/Page 51/ 5(h) & Electricity Act, 2003/Page 71            | a) Section 161                              |
| xii) TNE Supply Code/Page 149/9(2).                                        | c) Revised Test Report                      |
| xiii) The Tamil Nadu Transparency in Tender rules 2000/Page 11/ Para.14.6. | a) liquidated damages                       |
| xiv) SLDC is in                                                            | c) Chennai                                  |
| xv) TNE Grid Code/Page 45 / 3(xii)                                         | a) <del>49.0-50.5 Hz</del> 49.85 - 50.05 Hz |
| xvi) TNE Distribution Code/Page 211/ 40.                                   | d) Energy Conservation Act, 2001            |
| xvii) Tender Regulations, 1991/Page 31/Para 28.1.                          | d) Board Level Tender Committee             |
| xviii) TNE Distribution Standards of Performance/Page 5/ 3(table 1).       | b) 60 days                                  |
| xix) TNE Grid Code/Page 50 /e(viii)                                        | c) SLDC                                     |
| xx) TNE Supply Code/Page 145/6(3).                                         | c) New                                      |

3. i) TNEB Manual Vol.I /Page 327/Para 513: (4)

The approval or sanction to an estimate for any public work other than unusual repairs will, unless such work has been commenced, cease to operate after the period shown in the table below from the date on which the sanction was accorded.

Sl.No	Amount of estimate	Period of currency
1.	Annual repairs estimates	Financial year
2.	Estimates upto Rs.10,000/-	One year
3.	Estimates upto Rs.1 lakh	Two years
4.	Above Rs.1 lakh to Rs.3 lakh.	Three years
5.	Above Rs.3 lakh.	Period to be fixed by Govt. at the time they are sanctioned.

If the work has not been commenced within the period of currency of sanction, the estimate should be regarded as lapsed and any outlay incurred thereon should be regularized by renewal of sanction or a fresh estimate.

3. ii) Code of Technical Instructions/Page 130/Para 4.03.01: (4)

- a) Spring operated mechanism
- b) Compressed air mechanism
- c) Hydraulic operating mechanism
- d) Solenoid closing mechanism

3. iii) Tender Regulations 1991/Page 25/Para 21.2: (5)

The tender shall be rejected if it is

- a) not in the prescribed form.
- b) Not accompanied by the required Earnest Money Deposit (EMD) or proof of Permanent Deposit or proof of exemption.
- c) Not properly signed by the tenderer.
- d) From any blacklisted firm or contractor.
- e) Received after the expiry of the due date and time.
- f) Received by telex or telegram.
- g) Not accompanied by an undertaking/agreement where EMD/security deposit is to be exempted.
- h) Not in conformity with Board's technical specifications.
- i) From an approved tenderer whose Permanent Earnest Money Deposit is not adequate for the particular tender.

**(Any five are sufficient for 5 marks)**

3. iv) TNE Grid Code/Page 2&3/Para 2 -6 & 26: (2)

**Automatic Voltage Regulator (AVR):**

A continuously acting automatic excitation control system to control the voltage of a Generating Unit measured at the generator terminals.

**Data Acquisition System (DAS):**

A device provided to record the sequence of operation in time, of the relays / equipments / system parameters at a location.

3. v) Code of Technical Instructions/Page 294/Para.7.03 (b): (3)  
 a) Register of relay settings  
 b) Register of relay operations  
 c) Register of peak loads on current transformers.
3. vi) Tamil Nadu Transparency in Tender Rules 2000/Page 9/ Para 14.3: (2)  
 The tender documents shall require that as a guarantee of the tenderer's performance of the contract, a security deposit be taken from the successful tenderer subject to the conditions that -  
 (a) the amount of the deposit not exceeding five per cent of the value of the orders placed and  
 (b) the deposit being in the form of demand draft or bankers' cheque or specified small savings instruments or where the procuring entity deems fit, irrevocable bank guarantee in a prescribed form.
4. i) TNE Distribution Standards of Performance/Page 7/ Para 7: (3)  
 1. Shifting of meter - 25 days  
 2. Shifting of LT lines - 60 days  
 3. Shifting of Transformer structures - 90 days
4. ii) Code of Technical Instructions/Page 59/Para.3.03.04: (2)  
 1. Plain breather  
 2. Silica gel breather
4. iii) Tamil Nadu Transparency in Tender Act 1998/Page 6/ Para 9: (4)  
**Functions of Tender Inviting Authority**  
 (1) The Tender Inviting Authority shall invite tenders in the form of a notice containing such particulars as may be prescribed.  
 (2) The Tender Inviting Authority shall communicate the notice inviting tenders to the Bulletin Officers according to the value of the procurement and within such time as may be prescribed, so as to publish the same in the appropriate Tender Bulletin.  
 (3) The Tender Inviting Authority shall also publish the notice inviting tenders in Indian Trade Journal and in daily newspapers having wide circulation depending upon the value of the procurement prescribed.  
 (4) The Tender Inviting Authority shall supply the schedule of rates and tender documents in such manner and in such places as may be prescribed to every intending tenderer who has applied for such document.

4. iv) TNEB Manual Vol.I/Page 306/Para 489 & 490: (4)
- a. **Administrative approval:** The administrative approval is, in effect, an order to execute a certain specified work at a stated cost.
- b. **Technical sanction:** For each individual work to be carried out after obtaining administrative approval, a detailed estimate must be prepared for the technical sanction of authority competent in the Electricity Board. This sanction is known as the technical sanction and must be obtained before the execution of the work is commenced.

4. v) TNE Supply Code/Page 139/Ch.2/Para 3: (2)
- Supply of electricity available to the consumer is of the following categories:-
- a. Single-phase 2 wire 240 volts between phase and neutral for supply to a total connected load not exceeding 4000 watts (including power loads).
- b. Three-phase 4 wire 415 volts between phases and 240 volts between phase and neutral for supply to a total connected load exceeding 4000 watts but not exceeding a demand of 112 KW.
- c. Three-phase 3 wire, 11,000 volts and above between phases for power installation exceeding a demand of 112 KW, the minimum demand however being 63 KVA.
- d. The consumer shall avail supply at 33 kV and above when the demand is 5 MVA and above.

**(Any two are sufficient for two marks)**

4. vi) TNE Distribution Code/Page 189/CH.2(5): (5)
- The functions of Commission as set out in the Act and rules made there under and in particular, to,-
- (i) determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk, and retail as the case may be within the State;
- (ii) introduce non-discriminatory open access as per the provisions contained in the Act and in phases. Where open access has been provided to a category of consumer, the Commission shall determine the wheeling charges and surcharge thereon;
- (iii) regulate electricity purchase and procurement process of distribution licensees including the price at which the electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;
- (iv) facilitate intra state transmission and wheeling of electricity;

(v) specify and enforce standards with respect to quality, continuity and reliability of service by Licensees.

5. i) Code of Technical Instructions/Page 228&229/ Para.6.01.07: (5)
- a) Supply voltage, frequency and temperature of the area with the rating plate.
  - b) Ensure no hardware or tools are left inside the rack assembly. This may cause short circuit and breakdown.
  - c) Ensure proper ventilation.
  - d) Ensure electrical and mechanical connections are done correctly and tightly.
  - e) Ensure correct size of fuse is used.

5. ii) Tamil Nadu Transparency in Tender Rules 2000/Page 7/ Para 10: (5)
- The Notice Inviting Tenders shall contain the following details, namely:-
- (a) The name and address of the procuring entity and the designation and address of the Tender Inviting Authority;
  - (b) Name of the scheme, project or programme for which the procurement is to be effected;
  - (c) The date upto which and places from where the tender documents can be obtained;
  - (d) The amount of earnest money deposit payable;
  - (e) The last date and time for receipt of tenders;
  - (f) The date, time and place for opening of tenders received; and
  - (g) Any other information the Tender Inviting Authority considers relevant.

**(Any five are sufficient for 5 marks)**

5. iii) Electricity Act, 2003 / Page 64 & 65/ Section 136: (3)
- (1) Whoever, dishonestly --
- (a) cuts or removes or takes away or transfers any electric line, material or meter from a tower, pole, any other installation or place of installation or any other place, or site where it may be rightfully or lawfully stored, deposited, kept, stocked, situated or located including during transportation, without the consent of the licensee or the owner, as the case may be, whether or not the act is done for profit or gain; or
  - (b) stores, possesses or otherwise keeps in his premises, custody or control, any electric line, material or meter without the consent of the owner, whether or not the act is committed for profit or gain; or
  - (c) loads, carries, or moves from one place to another any electric line, material or meter without the consent of its

owner, whether or not the act is done for profit or gain, is said to have committed an offence of theft of electric lines and materials, and shall be punishable with imprisonment for a term which may extend to three years or with fine or with both.

5. iv) TNE Grid Code/Page 5(44), 6(61) & 6(55) : (3)

**i) Maximum Continuous Rating (MCR):**

The normal rated full load MW output capacity of a generating unit, which can be sustained on a continuous basis at specified conditions.

**ii) Supervisory Control and Data Acquisition (SCADA):**

'SCADA' means Supervisory Control and Data Acquisition System that acquire data from remote locations over communication links and process it at centralized control location for monitoring, supervision, control as well as decision support.

**iii) Single Line Diagram (SLD):**

Diagrams which are a schematic representation of the HV / EHV apparatus and the connections to all external circuits at a Connection Point incorporating its numbering nomenclature and labeling.

5. v) TNEB Manual Vol.II/Page 9/Item No.17: (4)

- a. Assistant Executive Engineer – Rs.50,000/-
- b. Executive Engineer – Rs.3 lakh.
- c. Superintending Engineer – Rs.10 lakh.
- d. Chief Engineer – Full powers.

6. i) TNE Supply Code/Pages 141/2(i), 143/4(i)&(ii)(a), 150/11(1)&(2): (8)

**a. Excess Demand Charge:**

Whenever the consumer exceeds the sanctioned demand, excess demand charge shall be:

(i) In the case of HT supply, the maximum demand charges for any month shall be based on the KVA demand recorded in that month at the point of supply or such percentage of sanctioned demand as may be declared by the Commission from time to time whichever is higher. The exceeded demand shall alone be charged at double the normal rate.

**b. Belated Payment Surcharge (BPSC) :**

(i) All bills are to be paid in the case of HT consumers, within the due date specified in the bill and in the case of LT consumers, within the due date and notice period specified in the consumer meter card.

(ii) Where any HT consumer neglects to pay any bill by the

due date, he shall be liable to pay belated payment surcharge from the day following the due date for payment. Where any LT consumer (except services relating to Public lighting and water supply and other services belonging to Local Bodies) neglects to pay any bill by the last day of the notice period, he shall be liable to pay belated payment surcharge from the day following the last day of the notice period.

**c. Billing in services where there is no meter:**

(1) Where supply to the consumer is given without a meter and no theft of energy or violation is suspected, the quantity of electricity supplied during the period when the meter was not installed, shall be assessed as below:

(2) The quantity of electricity, supplied during the period in question shall be determined by taking the average of the electricity supplied during the preceding four months in respect of both High Tension service connections and Low Tension service connections provided that the conditions in regard to use of electricity during the said four months were

not different from those which prevailed during the period in question.

**d. Clerical errors in billing:**

In the event of any clerical errors or mistakes in the amount levied, demanded or charged by the Licensee, the Licensee will have the right to demand an additional amount in case of undercharging and the consumer will have the right to get refund of the excess amount in the case of overcharging.

6. ii) Code of Technical Instructions/Page 188/Para 4.09.07 : (3)

- a) Number of short circuit interruptions
- b) switching frequency and service conditions
- c) number of years of service

6. iii) Tamil Nadu Transparency in Tender Act 1998/Page 8/Para 14: (3)

The Government may at any time, with a view to ensuring transparency in tender process, require any authority,-

(a) to produce records relating to invitation and acceptance of tenders;

(b) to furnish the tender document, estimate, statement, accounts or statistics relating to such tenders; and

(c) to furnish any report.

6. iv) TNE Grid Code/Page 24/Para 8 -xii -a & b: (5)

**Power Supply to Sub-Station Auxiliaries :**

(a) AC supply :

Two HT supplies shall be arranged from independent sources.



One of the two HT supplies shall be standby to the other. In addition, a Diesel Generating set of suitable capacity shall also be provided.

**(b) DC Supply:** (Applicable to new sub-stations) There shall be two sets of 220V batteries, each equipped with its own charger for substations of 230 kV and above. Each battery shall be of adequate capacity to meet the sub-station requirements. The batteries shall operate in parallel and one being standby to the other. Facility for changing the duty of the batteries from main to standby and vice versa shall be made. There shall be two sets of 50V batteries (one being standby to the other) for PLCC System. For sub-stations of 110 KV and below, one set of battery each may be provided.

6. v) Tamil Nadu Transparency in Tenders Rules 2000/Page 4/ Para 2f: (1)  
"Earnest Money Deposit" means the amount required to be remitted by a tenderer along with his tender indicating his willingness to implement the contract.
7. i) TNE Distribution Code/Page 204/12(ii): (1)  
The requirement of land for establishment of 33kV indoor sub-station shall not exceed 1520 sq.m.
7. ii) TNE Distribution Standards of Performance/Page 11/ Para 15: (2)  
The voltage complaints shall be attended to within 48 hours if no system upgradation is required.  
Wherever system upgradation is required to improve the status, it shall be attended to within 180 days.
7. iii) TNEB Manual Vol.II/Page 4/Item No.6: (4)  
a. Assistant Executive Engineer – Rs.10,000/- upto 25 kW/LT only for a period of six months.  
b. Executive Engineer – Rs.1 lakh upto 130 HP or 97 kW/LT only for a period of one year.  
c. Superintending Engineer – Rs.2 lakh for three years upto 0.75 MVA.  
d. Chief Engineer – Rs.20 lakh upto 2 MVA.
7. iv) Code of Tech. Instructions/Page 68/Para 3.04: (5)  
a)Diverter switch oil tank  
b)Diverter switch  
c)Transition resistors  
d)Tap selector  
e)Drive Mechanism

7. v) Tamil Nadu Transparency in Tender Act 1998/Page 7/Para 10.5: (2)

In case where two or more tenderers quoted the same price, the Tender Accepting Authority shall split the procurement among such tenderers taking into consideration the experience and credentials of such tenderers. Where such splitting is not possible or could not be done equally, he shall record reasons for the same.

7. vi) Tamil Nadu Transparency in Tender Rules 2000/Page 9/ Para 13.2: (4)

Unbiased technical specifications shall be prepared by observing the following safeguards, namely:-

(a) use of brand names and catalogue numbers shall be avoided and where it becomes unavoidable, along with the brand name the expression "or equivalent" shall be added;

(b) wherever possible the appropriate Indian Standards with the number shall be incorporated;

(c) in the case of construction tenders, detailed estimates shall be prepared by the competent technical authorities based on the schedule of rates and standard data as revised from time to time provided that for large and prestigious projects, the Government shall permit any procuring entity to engage a qualified private architect or consultant to prepare the design and estimates; and

(d) in case alternative designs or materials are permitted, the conditions for their acceptability and the method of their evaluation shall be clearly stated.

7. vii) Tender Regulations 1991/Page 13/Para 8: (2)

**Single tender:**

If the competent authority is of the opinion that the materials are required for immediate use of the Board and that resorting to Open or Limited tender will cause undue delay, he may, after recording the reasons, resort to single tender system.

Also for the purchase of proprietary items and spares, only single tender system is resorted to.

8. i) Safety Manual /Page 15/Para 16.14:

(5)

ஒரு மின்பாதை அல்லது கம்பத்தில், 66 கிலோ வோல்ட்டு அழுத்தமுள்ள கடத்தியின் (conductor) பக்கத்தில் 6 அடி தூரத்துக்குக் குறைந்தும், 110 கிலோ வோல்ட்டு கடத்தியின் பக்கத்தில் 9 அடிக்குக் குறைந்தும் இருந்தால், அப் பாதையிலோ கம்பத்திலோ வேலை செய்யக்கூடாது. இரு மின் சுற்றுப் பாதைகளில் (double circuit lines) ஒரு சுற்றில் மின் இயக்க முள்ளபோது, மற்ற மின் இயக்கமில்லாத சுற்றில் வேலை செய்யலாம். ஆனால், வேலை செய்வோர் மின் இயங்கும் சுற்றுக்குப் பின்வரும் தூரங்களுக்குக் குறைவாக நெருங்கமுடியாமல் இருக்க வேண்டும்.

மின்பாதையின் அழுத்தம் கிலோ வோல்ட்	தூரம் அடி அங்குலம்	
11 } 22 }	8	6
33	9	0
66	9	9
110	10	9

8. ii) Tender Regulations 1991/Page 13&14/Para 10.3:

(5)

The tender document should include

- standard specification setting out the technical requirements and commercial terms.
- In the absence of standard specification, a complete specification of the work to be executed, the materials to be used or the supply of materials to be made.
- The schedule of quantities of various items of work to be executed or supply of materials to be made.
- A complete set of drawings showing the general dimension of the proposed work or materials and
- A set of conditions of the contract.

8. iii) TNE Grid Code/Page 32/Para 6.6:

(5)

**Metering and Communication**

- The user shall provide meters for accounting and audit purposes as per the standards specified by Authority under Section 73(e) of the Act.
- The agency who has to provide, operate and maintain the metering arrangements at various locations will be stipulated by the STU in the connection agreement.
- STU shall be responsible to formulate the metering procedure and implement it with other Users.

iv) The user shall be required to provide the voice and data communication facilities as decided by SLDC.

v) The user shall make arrangements for integration of the controls and telemetering features of his system into the Automatic Generation Control, Special Protection System, Energy Management Systems and SCADA system of the STU / SLDC.

8. iv) Code of Tech. Instructions/Page 400/Para 13.09.03: (3)

a) All HT metering points.

b) On the HT side of all distribution transformers of capacity 50 kVA and above.

c) At junction of overhead HT lines and long cables when the cable length exceeds 150 feet.

8. v) TNE Distribution Standards of Performance/Page 4/ Ch.2(3): (2)

a) frequent power failure

b) fuse of calls,

c) voltage fluctuations.

**(any 2 are sufficient for 2 marks)**