

**Board of Departmental Examination, HP**

**Departmental Examination**

**Session November, 2023**

**Paper-A : Rules, Regulations, Procedures & Acts for Engineering Officers  
(Electrical) of HPSEB Ltd.**

**Time Allowed 3 Hours**

**Max. Marks 100**

**Notes:-**

- 1) Attempt Five questions; Maximum **three** from Part A or B.
- 2) Indicate the same question numbers & its part(s) in the answers.
- 3) Quote relevant rule(s) in support of answer where necessary.
- 4) Marks are shown/indicated against each question.
- 5) Only **Bare Acts/Rules**, Notifications and Approved **Reference Books** are allowed.

**PART-A :-**

- Q:No.1 : a) Explain provisions of FRSR-General rule for extension of Temporary post of an GS/employee under Suspension. **...10 Marks**
- b) Describe Joining Time pay under CCS (JT) Rules, 1979. **... 5 Marks**
- c) Write down procedure for securing second Medical opinion under CCS (Leave) Rules, 1972. **...5 Marks**
- Q: No.2 a) What are the conditions subject to which service qualifies and from which date the pension becomes payable. **...10 Marks**
- b) Describe duty(s) of a Controlling Officer before signing or countersigning a Travelling Allowance bill. **...10 Marks**
- Q:No. 3 a) How do you regulate payment of subsistence allowance in each cases e.g **initial grant, first review, retrospective revision** and further review. **...15 Marks**
- b) Explain provision under CCS (Conduct) Rules 1964 regarding consumption of intoxicating drinks and drugs. **...5 Marks**
- Q:No.4 a) Write down criterion for determining Home Town LTC and LTC to Home Town outside India. **...10 Marks**
- b) State date/period up to which interest is to be allowed in r/o an employee found absconding under Provident Fund Rules. **..5 Marks**

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- c) Explain about the amount of reimbursement in Treatment of Cancer, Renal failure/Kidney Transplant as provided in HP Govt. Medical Reimbursement policy. **...5 Marks**

Q:No.5 Define the following:-

1. Foreign Service
2. Substantive pay.
3. Disciplinary Authority.
4. Transfer.

**.. 5X4=20 Marks**

### **PART-B**

- Q.No.6 a) What is record? Explain record management, efficient record management & evaluation of record. **...10 Marks**
- b) Define "Partial Disablement" as per workmen's Compensation Act 1923. **..5 Marks**
- c) Describe "Caution Notices" under HPSEB Ltd. Safety Code. **...5 Marks**

- Q.No.7 a) State the procedure laid down for publication of preliminary Notification and mention power of Officers under Land Acquisition Act, 1894. **...10 Marks**
- b) What agreements are contracts? Who is competent to contract? Illustrate "Sound Mind" for the purpose of contracting. **...10 Marks**

- Q.No.8 a) Narrate the processes & procedures prescribed for incorporation of a Company under Companies Act, 2013. **...15 Marks**
- b) Mention in short on Disconnection of the electricity supply temporarily or permanently with punishment and fines. **...5 Marks**

- Q.No.9 a) What are the objectives of Forest Conservation Act,1980 and list out atleast three restrictions where State Authorities cannot make laws. **...12 Marks**
- b) How many Watts are equal to 1 (One) unit? **...3 Marks**
- c) Define Dust & Fume under Factory Act 1948. **...3 Marks**
- d) Define "Circuit" . **...2 Marks**

- Q.No.10 : Describe in detail about appointments of an Arbitrator and Conciliator. **...20 Marks**

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**PAPER - B**

**Time Allowed : 3 hours  
(PART-1)**

**(100 Marks)**

**Consumers / Company accounts and accounting procedures  
For Engineering Officers (Electrical) (Books allowed)**

**Solve any five questions.**

*Session : Nov, 2023*

1. **Explain briefly the following - (4x5 Marks)**
  - (i) When the work order is to be issued and what care should be taken while issuing work order?
  - (ii) What is 'Security Deposit'? What are the criteria for recovery of security deposit through cash or Bank Guarantee?
  - (iii) Administrative approval and Expenditure Sanction
  - (iv) Grants -in- aids
  
2. **Distinguish between - (4x 5 Marks)**
  - (i) Measurement book and stock measurement book
  - (ii) Capital works and revenue works
  - (iii) Service lines and Distribution lines / system
  - (iv) Infrastructure Development Charges and Service line charges
  
3. **(A) What is the procedure followed in dealing the cases related to the disposal of unserviceable, obsolete and surplus stores?**

(10 Marks)

**(B) What is the principle for allocation of expenditure between Capital and Revenue?**

(10 Marks)
  
4. **What is 'Budget'? How the budget data is prepared? Also explain in brief Supplementary Budget? (20 Marks)**
  
5. **What is special category load? What is Standard Supply voltage for special category loads? Under what circumstances consumer can avail power at lower voltage than standard supply voltage for special category loads? What are the constraints to be taken care while releasing special category load in a feeder? (20 Marks)**
  
6. **What are the matters which require financial concurrence? Which officers / officials have been designated in HPSEBL to grant financial concurrence?**

(20 Marks)
  
7. **What is an 'Assessing Officer' and 'Authorized Officer' in HPSEBL in accordance with the provisions of Electricity Act, 2003? What is unauthorized use of electricity and who is authorized by HPSEBL to take action in case of unauthorized use of electricity? What is the relaxation notified by the HPSEBL for unauthorized use of electricity to its consumers?**

(20 Marks)

Electrical Engineering Basics  
For Engineering Officers (Electrical)

(No Books Allowed)

Question number one is compulsory. Answer any four from remaining.

A. Choose the correct answer of following: - (20x1 = 20 Marks)

1. When the speed at which a conductor is moved through a magnetic field is increased, the induced voltage –
  - (A) increases
  - (B) decreases
  - (C) remains the same
  - (D) reduced to zero
2. In Aluminum conductor, steel core is provided to –
  - (A) compensate the skin effect
  - (B) neutralize the skin effect
  - (C) reduce line inductance
  - (D) increase tensile strength
  - (E) All of the above
3. Pin type of insulators are not generally used for voltages beyond –
  - (A) 1KV
  - (B) 11KV
  - (C) 22KV
  - (D) 33KV
4. Which of the following is usually not the generating voltage –
  - (A) 6.6KV
  - (B) 8.8KV
  - (C) 11KV
  - (D) 13.2KV
5. A 3-Phase, 4-wire system is commonly used on -
  - (A) primary transmission
  - (B) secondary transmission
  - (C) primary distribution
  - (D) secondary distribution
6. If the cross-sectional area of a magnetic field increases, but the flux remains the same, the flux density
  - (A) increases
  - (B) decreases
  - (C) remains the same
  - (D) doubles
7. What is the flux density when the flux is  $5.5 \mu\text{Wb}$  and the cross-sectional area is  $6 \times 10^{-3} \text{ m}^2$ ?
  - (A)  $91.7 \mu\text{T}$

- (B) 917  $\mu$ T
  - (C) 91 T
  - (D) 9.7 T
8. To produce an 800 Hz sine wave, a four-pole generator must be operated at-
- (A) 200 rps
  - (B) 400 rps
  - (C) 800 rps
  - (D) 1,600 rps
9. The turns ratio required to match an 80  $\Omega$  source to a 320  $\Omega$  load is
- (A) 80
  - (B) 20
  - (C) 4
  - (D) 2
10. The current drawn by the line due to corona losses is -
- (A) Non-sinusoidal
  - (B) Sinusoidal
  - (C) Triangular
  - (D) Square
11. Laminated core in electrical machines are used to reduce -
- (A) Copper loss
  - (B) Eddy current loss
  - (C) Hysteresis loss
  - (D) All of the above
12. Relative permeability of vacuum is -
- (A) 1
  - (B) 1 H / M
  - (C)  $4 \times 10^{-7}$
  - (D) 1/4
13. When both the inductance and resistance of a coil are doubled, the value of -
- (A) Time constant remains unchanged
  - (B) Initial rate of rise current is doubled
  - (C) Final steady current is doubled
  - (D) Time constant is halved
14. An ideal transformer will have maximum efficiency at a load such that -
- (A) Copper loss is equal to iron loss
  - (B) Copper loss greater than iron loss
  - (C) Copper loss is less than iron loss
  - (D) None of the above
15. Part of the transformer which is most subject to damage from overheating is -
- (A) Iron core
  - (B) Copper winding
  - (C) Winding insulation
  - (D) Frame of transformer

16. The thickness of lamination used in a transformer is usually –
- 0.4 mm to 0.5mm
  - 0.9 mm to 1.2 mm
  - 4mm to 5 mm
  - 9 mm to 11 mm
17. When a 1.6kOhm resistor and a 120Ohm resistor are connected in parallel , the total resistance will be –
- Greater than 1.6 K Ohm
  - Greater than 120Ohm and less than 1.6 k Ohm
  - Less than 120Ohm but greater than 100Ohm
  - Less than 100 Ohm
18. Which of the following is primarily responsible for converting input data into meaningful output information –
- RAM
  - CPU
  - Storage device
  - Input and output devices
19. In MS-Excel the formula, which symbol specifies the fixed columns or rows ?
- \$
  - \*
  - %
  - ;
20. Which of the following computer language is written in binary form –
- Java
  - C
  - Pascal
  - Machine language
- B. 1. What factors determine the capacity of hydro power plant? (3 Marks)
2. How we calculate the hydro power plant approximate capacity from its discharge and head? Suppose Bhuri Singh power house in Chamba have water inflow of 2.5 cubic meter per second and its head is 15 meter, what capacity (in KW) hydro power plant should be installed. (5+5 =10 Marks)
3. What are different types of Turbines used in Hydro electric Plants? Explain in brief the selection criteria of turbine to Hydro generating plant. (2+5= 7 Marks)
- C. 1. What is full load current carrying capacity in Amps of following transformers on LV side? (3x2 =6 marks)
- 11/0.4kV, 250 KVA
  - 33/11kV, 10MVA
  - 132/33kV, 25 MVA

2. What is current (Amp) and power (MVA) carrying capacity upto which following conductors can transmit power at 11kV in Hamirpur Kangra area.

(3x3 =9 Marks)

- a) ACSR 50 mm<sup>2</sup> Rabbit conductor
- b) ACSR 100mm<sup>2</sup> Dog conductor
- c) ACSR 200 mm<sup>2</sup> Panther conductor

3) How multiplying factor of a CT/PT metering equipment is calculated? If in an electricity connection CT/PT have specification as 100/5 A, 33kV/110V and energy meter have specifications as 20/5A, 11kV/110V, what will be the multiplying factor of metering unit?  
(5 Marks)

- D.
- 1) What are different types of earthing and what are the advantages of earthing?
  - 2) What are different types of circuit breakers used in LT distribution system? what is ELCB and how it works ?
  - 3) How many types of Protection relays are there based on the Characteristic
  - 4) What is the difference between Electrical earthing and Electrical grounding?
  - 5) What are uses of Ground Fault Circuit Interrupter? (4x5= 20 Marks)

E. Explain following in brief - (4x5= 20 Marks)

1. Critical disruptive Voltage
2. Various losses that occur in a Transformer
3. SAIDI and SAIFI in distribution system
4. What is the difference between count, counta, and countblank?
5. Graphics processing unit.

F. Explain following in brief - (4x5= 20 Marks)

- 1) What is OLTC in transformers? How it works?
- 2) Differential protection in power transformers.
- 3) Fleming hand rules.
- 4) 11kV RMU, FPI and autorecloser uses.
- 5) Skin and proximity effect