15-05-2026 FE SEM-II ELECTRICAL (NEP-2020) EES QP CODE: 10094139

(2 Hours) **Total Marks: 60**

NB: (1) Question **No. 1** is **compulsory**
(2) **Answer** any **THREE** questions out of the remaining **FIVE** questions.
(3) Assume suitable data if **necessary** and **justify** them
(4) **Figure** to the **right** indicates **marks**

1		Solve Any **Five**	**15**
	(a)	Explain the techniques used for the measurement in electrical energy systems.	**03**
	(b)	Enlist the advantages and disadvantages of Thermal power plant.	**03**
	(c)	Enlist the types of conductors used in transmission system.	**03**
	(d)	Explain the importance of battery management system.	**03**
	(e)	Explain the different industrial loads used in power system along with suitable applications.	**03**
	(f)	Explain the various types of battery storage systems.	**03**
2	(a)	Explain the term electric heating and welding in detail.	**06**
	(b)	Explain Lithium-Ion battery with charging and Discharging characteristic	**05**
	(c)	Describe the function of substations within a power grid and explain how they facilitate the transition between different voltage levels.	**04**
3	(a)	A transmission line delivers 200 kW at a receiving end voltage of 11 kV to a load at 0.6 power factor lagging. The line impedance is 1+j2Ω. Calculate the current in the line, the sending end voltage (Vs) and the power transmitted (Assume single-phase system).	**05**
	(b)	Explain Moving Iron type of instruments with detail diagram	**05**
	(c)	Define unit and explain with example how to calculate number of units consumed for residential load.	**05**
4	(a)	Discuss the Hydroelectric power plant with block diagram**.**	**05**
	(b)	Describe the terms peak load and base load plant.	**05**
	(c)	A single-phase AC circuit is supplied with 230 V and draws a current of 5 A. A wattmeter connected in the circuit shows a power consumption of 1.0 kW. Calculate the apparent power, the reactive power and the power factor of the circuit.	**05**

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5 (a) A domestic consumer uses 215 units of electricity in a month. The LT domestic tariff is as follows: **05**

Slab (Units)	Rate per Unit (₹)
0 – 100	₹4.00
101 – 200	₹5.50
201 – 500	₹8.00

In addition, fixed charge = ₹75/month, and electricity duty = 12% of energy charges. Calculate the total electricity bill.

(b) Compare single circuit and double circuit of 3 phase line**.** **10**

6 (a) Explain the various types of Battery storage along with suitable applications. **05**

(b) Explain the structure of power system with the diagram showing different voltage levels. **10**

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