Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2023-24
POWER SYSTEM - I

TIME: 3 HRS   **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   Attempt *all* questions in brief.

Qno.	Question	Marks	CO
a.	Differentiate between renewable and non renewable energy?	2	1
b.	What is a diversity factor?	2	1
c.	What is skin effect?	2	2
d.	Is corona more in AC or DC?	2	2
e.	What do you mean by sag template?	2	3
f.	Define the term sag?	2	3
g.	What do you mean by self GMD & mutual GMD?	2	4
h.	Write the main causes of insulation failure?	2	4
i.	Discuss the underground cable losses?	2	5
j.	Differentiate between overhead lines and underground cables?	2	5

SECTION B

2.   Attempt any *three* of the following:

Qno.	Question	Marks	CO
a.	What are the equipments used in sub- station? Discuss them?	10	1
b.	State & prove Kelvin's law for size of conductor for transmission line. Discuss its limitations.	10	2
c.	Write a short note on the factors that affect sag.	10	3
d.	A double circuit single phase line have conductor a_1 & a_2 which carry the current in one direction .Conductor b_1 & b_2 carry the current in return direction. The diameter of each conductor is 25 mm. Calculate the inductance of the line per km if D_1=1mt & D_2=2mt.	10	4
e.	Discuss different types of insulating materials used in power system?	10	5

SECTION C

3.   Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	A generating station has the following daily load cycle :	10	1

Time (Hours)	0 —6	6 —10	10 —12	12 —16	16 —20	20 —24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find

(i) maximum demand   (ii) units generated per day
(iii) average load   (iv) load factor.

Qno.	Question	Marks	CO
b.	Give the layout of thermal power plant and explain its components in details?	10	1

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4. **Attempt any *one* part of the following:**

Qno.	Question	Marks	CO
a.	Classify different types of supply system and compare the volume of conductor DC two wire system and 3-φ 3-wire system?	10	2
b.	Analyze the performance of medium transmission line (T model). Draw phasor diagram and derive relation for ABCD parameters.	10	2

5. **Attempt any *one* part of the following:**

Qno.	Question	Marks	CO
a.	An insulator string consists of three units, each having a safe working voltage of 15 kV. The ratio of self-capacitance to shunt capacitance of each unit is 8: 1. Find the maximum safe working voltage of the string. Also find the string efficiency.	10	3
b.	Discuss different methods of improving string efficiency?	10	3

6. **Attempt any *one* part of the following:**

Qno.	Question	Marks	CO
a.	Explain Catenary method for finding the sag in a transmission line?	10	4
b.	Explain rigorous method for long transmission line?	10	4

7. **Attempt any *one* part of the following:**

Qno.	Question	Marks	CO
a.	Discuss the inter-sheath grading of cables. What are practical difficulties in the grading of cables?	10	5
b.	Find the most economical diameter of a single core cable to be used on 66 KV, 3-phase system. If the peak permissible stress is not to exceed 50 KV/m. Also find overall diameter.	10	5