DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Summer 2024

Course: B. Tech. **Semester : IV**

Branch: Electrical Engineering / Electrical Engineering (Electronics and Power)/ Electrical & Electronics Engg. / Electrical & Power Engineering.

Subject Code & Name: BTEEC402 POWER SYSTEM

Max Marks: 60 **Date: 14/06/2024** **Duration: 3 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		12
A)	Describe the working principle of hydroelectric power Plant. Highlight their advantages, disadvantages, and environmental impacts.	CO1	6
B)	With neat diagram explain in detail thermal power plants.	CO3	6
C)	Explain in detail Nuclear power plant with neat block diagram of main parts.	CO4	6
Q.2	**Solve Any Two of the following.**		12
A)	Derive the expression for Flux linkages due to a single current carrying conductor.	CO2	6
B)	Explain skin and proximity effect in detail.	CO2	6
C)	Describe in detail the phenomenon of corona Effect in transmission lines.	CO3	6
Q. 3	**Solve Any Two of the following.**		12
A)	Explain types of Conductor used in transmission line, explain each type in detail.	CO1	6
B)	Explain String Efficiency with mathematical expression.	CO4	6
C)	Explain types of Insulators used in transmission line, explain with diagram.	CO4	6
Q.4	**Solve Any Two of the following.**		12
A)	Write performance equation of long transmission line.	CO2	6
B)	Derive ABCD parameters of medium transmission line (T and π nominal network).	CO3	6
C)	A 3-phase, 50-Hz overhead transmission line 100 km long has the following constants : Resistance/km/phase = 0.1 Ω Inductive reactance/km/phase = 0·2 Ω	CO1	6

Capacitive susceptance/km/phase = 0·04 × 10− 4 Siemen
Determine (i) the sending end current (ii) sending end voltage (iii) sending end power factor and (iv) transmission efficiency when supplying a balanced load of 10,000 kW at 66 kV, p.f. 0·8 lagging. Use nominal T method.

Q. 5 Solve Any Two of the following. 12

A) Explain classification of distribution system of power system in detail. CO2 6

B) Distinguish between overhead distributions systems versus underground distribution system. CO4 6

C) What are the deferent method to obtain 3 wire DC system in distribution system? Explain with diagram. CO3 6

*** End ***

POWER SYSTEMS

NEW SYLLABUS QUE PAPER

2021- 2022

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
Regular End Semester Examination – Summer 2022

Course: B. Tech. Branch : Electrical Engg. & Allied Branches **Semester :** IV

Subject Code & Name: (BTEEC402) POWER SYSTEM

Max Marks: 60 **Date: 18/08/2022** **Duration: 3.45 Hr.**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Draw the schematic diagram of Thermal power plant and explain function of its main component.	(Remember)	6
B)	Explain the major equipments used in electrical substation of power plant.	(Understand)	6
C)	Draw the schematic diagram of Nuclear power plant and explain function of its main component.	(Remember)	6
Q.2	**Solve Any Two of the following.**		
A)	Write a short note on transposition of power lines.	(Remember)	6
B)	Explain the concept of self GMD for evaluating inductance of transmission lines.	(Understand)	6
C)	Write a short note on Skin Effect, Ferranti Effect, Proximity Effect.	(Remember)	6
Q. 3	**Solve Any Two of the following.**		
A)	Discuss the advantages and disadvantages of (i) pin-type insulators (ii) suspension type insulators.		6
B)	Why are insulators used with overhead lines? Discuss the desirable properties of insulators.	(Application)	6
C)	Discuss the various conductor materials used for overhead lines.	(Remember)	6
Q.4	**Solve Any Two of the following.**		
A)	Discuss the terms voltage regulation as applied to transmission line	(Application)	6
B)	Explain the classification of lines based on their length of transmission.	(Remember)	6
C)	Deduce an expression for voltage regulation of a short transmission line, giving the vector diagram.	(Analysis)	6
Q. 5	**Solve Any Two of the following.**		
A)	Write short notes on the following : (i) Distribution transformers (ii) 3-wire d.c. distribution	(Remember)	6
B)	What are the design considerations of distribution system? Explain.	(Understand)	6
C)	What are the advantages and disadvantages of d.c. transmission over a.c. transmission?	(Remember)	6

*** End ***

OLD SYLLABUS

QUE PAPERS

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Winter Examination – Nov - 2019

Branch: Electrical Engineering **Sem.:- IV**

Subject with Subject Code:- Power System I (BTEEC402) **Marks: 60**

Date:- 26/11/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

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(Marks)

Q.1. Attempt the following questions

a) Enlist and explain different sources of electrical energy **(4)**

b) A consumer has following connected load:
10 lamps each of 60W
2 heaters each of 100W
Maximum demand 1500W
On the average he uses 8 lamps for 5 hours per day, each heater 3 hours per day. Find i) average load , ii) monthly energy consumption, iii) load factor **(4)**

c) Enlist and explain different types of turbines and their selection **(4)**

Q.2. Attempt the following questions

a) Explain the role of excitation system, transformer, control panel, metering and other control equipment in power system. **(6)**

b) Derive an expression for loop inductance of a single phase line **(6)**

Q.3. Attempt the following questions

a) Derive the expression for capacitance of three phase line with symmetrical spacing **(6)**

b) Explain the effect of earth on three phase transmission line parameter **(6)**

P.T.O.

Q.4. **Attempt the following questions**

a) Explain the terms skin effect, Ferranti effect and proximity effect. **(6)**

b) Derive an expression for string efficiency. Also explain various methods to improve string efficiency. **(6)**

Q.5. **Attempt the following questions**

a) Give classification and representation of transmission lines. **(6)**

b) A single phase line transmits 1000kW at 10kV At a p.f. of 0.85 lagging. It has total loop resistance of 2 ohm and inductive reactance of 3 ohm. Determine (i) voltage regulation, (ii) transmission efficiency. **(6)**

Q.6. **Attempt the following questions**

a) Explain the phenomenon of corona. With various factors effecting on corona enlist its disadvantages **(6)**

b) The towers of height 30m and 90m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 500m. if the tension in the conductor is 1600kg, find the minimum clearance of the conductor and water, and clearance midway between the supports. Weight of conductor is 1.5 kg/m. Bases of the towers can be considered to be water level. **(6)**

Paper End

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Semester Examination – May - 2019

Branch:-Electrical Engineering **Sem.:- I**

Subject with Subject Code:- POWER SYSTEM-I (BTEEC402) **Marks: 60**

Date:- 14/05/2019 **Time:- 3 Hr.**

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Q.1. **(Marks :60)**

a) Explain the working of thermal power plant with neat diagram **(4)**

b) Explain the typical layout for a storage type hydro power plant **(4)**

c) Explain the different types of sources for energy generation **(4)**

Q.2.a) Explain the electrical equipment's used in typical 11KV indoor Sub-station **(6)**

b) The arrangement of conductors of a single phase transmission line is shown in figure 1, wherein the forward circuit is composed of three solid wires of 2.5mm and return circuit of 2 wires of 5mm, placed Symmetrically with respect to forward circuit find Inductance of the line?

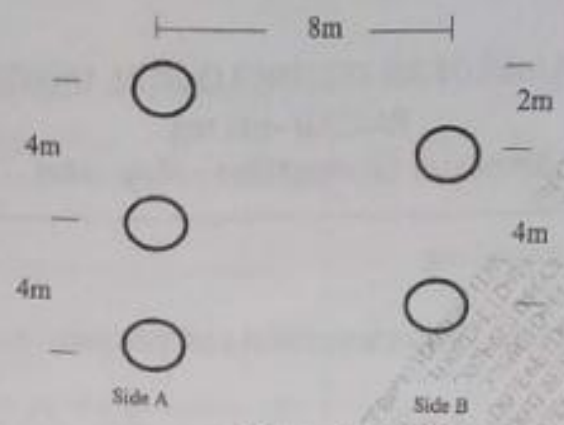

Figure 1

Q3) a) Find the capacitance of three phase line with equilateral spacing (6)

b) Explain the effect of earth on transmission line parameter (6)

Q4) a) Explain the types of Insulators for overhead lines? (4)

b) Explain string efficiency? Enlist the methods to improve string efficiency ? (4)

c) Explain the terms Skin effect and Proximity effect (4)

Q5) a) Find the generalized constants for Nominal-T method for medium transmission line along with Phasor diagram ? (4)

b) A 3 –phase ,50 Hz over head line is 100Kms long and has following constants :-
Resistance/km/phase
Inductance reactance/phase
Capacitive susectance : $0.04 * 10^{-4}$ Siemen
Determine the sending and receiving end current ? (8)
(Use Nominal T method)

Q6)

a) Explain the calculation of sag of transmission line for unequal levels? The tower height are 30m and 90m respectively supports a transmission line at water crossing. The horizontal distance is 500m. If the tension is 1600 Kg? Find the clearance of conductor and water. (7)

b) What are the factors affecting corona effect? Enlist the advantages of corona? (5)

END