

Dr. Babasaheb Ambedkar Technological University, Lonere
Summer examinations May 2015
B tech Course in Electrical Engineering
Subject: Power System I
Semester: IV
Time: 3 hours

Date: 12/05/2015

Max Marks: 70

Instruction to student:

1. Question No.1 is compulsory and carries 10 marks whereas Question No. 2 to Question No.7 carries 12 marks each.
2. Attempt any five Questions from Question No. 2 to Question No.7.
3. Illustrate your answers with neat sketches, diagrams etc. wherever necessary.
4. Necessary data is given in the respective questions. If such data is not given, it means that the knowledge of that part is a part of examination.
5. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

Q.1 Select an appropriate option for each of the following. (10)

I) Corona loss can be reduced by the use of hollow conductors because

- (a) the current density is reduced (b) the eddy current in the conductor is eliminated
(c) for a given cross-section, the radius of the conductor is increased (d) of better ventilation in the conductor

II) Bundled conductors are employed to

- (a) reduce the short circuit current (b) improve system stability
(c) decreases system stability (d) increase the short circuit current

III) When bundle conductors are used in place of single conductors, the effective inductance and capacitance will respectively

- (a) increase and decrease (b) decrease and increase
(c) decrease and remain unaffected (d) remain unaffected and increase

IV) In a string of suspension insulators, the voltage distribution across the different units of a string could be made uniform by the use of a grading ring, because it

- (a) forms capacitances with link-pins to carry the charging current from link pins
(b) forms capacitances which help to cancel the charging current from link pins
(c) increases the capacitances of lower insulator units to cause equal voltage drop
(d) decreases the capacitances of upper insulators units to cause equal voltage drop

V) "Expanded ACSR" are conductors composed of

- (a) larger diameter individual strands for a given cross-section of the aluminum strands
(b) larger diameter of a central steel strands for a given overall diameter of the conductor
(c) larger diameter of the aluminum strands only for a given overall diameter of the conductor
(d) a filter between the inner steel and the outer aluminum strands to increase the overall diameter of the conductor

VI) For a 500 Hz frequency excitation, a 50 km long power line will be modeled as

- (a) short line (b) medium line
(c) long line (d) data insufficient decision

VII) Bundled conductors are employed to

- (a) reduce the short circuit current (b) improve system stability
(c) decreases system stability (d) increase the short circuit current

VIII) The main criterion for selection of the size of a distribution for a radial distribution system is

- (a) voltage drop (b) corona loss
(c) temperature rise (d) capital cost

IX) Corona losses are minimized when

- (a) conductors size is reduced (b) smooth conductor is reduced
(c) sharp points are provided in the line hardware (d) current density in conductors is reduced

X) Whenever the conductors are dead-ended of there is a change in the direction of transmission line, the insulator. used are of the

- (a) pin type (b) suspension type
(c) strain type (d) shackle type

Q.2) Attempt the following.

(12)

a) Explain the functions of following

- i) Dam
- ii) Spillways
- iii) surge tank
- iv) Draft tube

b) Derive the expression for flux linkage **inside** and **outside** the conductor

Q.3) Attempt any three of the following.

(12)

a) Discuss the advantage and disadvantage of Thermal power plant

b) Discuss the advantage and disadvantage of corona

c) what is skin effect. How does it influence resistance, inductance and capacitance of a conductor

d) A substation supplies power by 4 feeders to consumers. Feeder no.1 supplies 6 consumers whose individual's daily max demands are 70 KW, 90 KW, 20 KW, 50 KW, 10 KW and 5 KW while the max demand on the feeder is 250 KW. Feeder no.2 supplies 4 consumers whose individuals daily max demands are 60 KW, 40 KW, 75 KW, 15 KW while the max demand on the feeder is 160 KW. Feeder no.3 & 4 have daily max demand 200 KW and 275 KW respectively while the max demand on station is 575 KW. Determine the diversity factors for feeder no.1 and feeder no.2 and for the all 4 feeders together.

Q.4) Attempt the following

(12)

a) Derive the expression for the capacitance per phase for a 3 phase overhead transmission line when

(8)

- i) conductors are symmetrically placed.
- ii) conductors are unsymmetrically placed.

b) what is Sag in transmission line.

(4)

Q.5) Attempt any three the following.

(12)

a) Draw the schematic dia. of modern nuclear power plant and explain the operation of nuclear reactor.

b) What is effect of unsymmetrical spacing of conductors in 3 phase transmission line.

c) Define- i) load duration curve ii) load factor iii) Diversity Factor

d) Three conductors A, B and C of 3 phase line are arranged in a horizontal plane 6 m apart. The diameter of each conductor 1.24 cm. find capacitance of each conductor to neutral per 100 km of the line.

Q.6) Attempt the following

(12)

a) show how regulation and transmission efficiency are determined for medium line using

(8)

- i) nominal T method
- ii) nominal π method

b) Explain Per Unit Method (p.u.)

(4)

Q.7) Attempt any three the following.

(12)

a) What is String efficiency and derive the expression for it

b) What is Ferranti effect

c) Factors affecting Corona.

d) Discuss the types of insulator

- i) pin type insulator
- ii) suspension type insulator

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

(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
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 *****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE Summer Examination – 2023 Course: B. Tech. Branch : Electrical Engg. Semester : 4th Subject Code & Name: Power System, BTEEC402 Max Marks: 60 Date: 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)	Draw the schematic diagram of Thermal power plant and explain function of its main component.	L2/CO1	6
B)	Explain the major equipments used in electrical substation of power plant.	L2/CO1	6
C)	Draw the schematic diagram of Nuclear power plant and Explain function of it's main component.	L2/CO1	6
Q.2	Solve Any Two of the following.		12
A)	Write a short note on transposition of power lines.	L2/CO2	6
B)	Explain the concept of self GMD for evaluating inductance of transmission lines.	L2/CO2	6
C)	Write a short note on Skin Effect, Ferranti Effect, Proximity Effect.	L2/CO2	6
Q.3	Solve Any Two of the following.		12
A)	Explain various types of conductor.	L1/CO3	6
B)	Discuss the advantage and disadvantages of (i) Pin-type insulators (ii) Suspension type insulators.	L2/CO3	6
C)	Why are insulators used with overhead lines? Discuss the desirable properties of insulators.	L2/CO3	6
Q.4	Solve Any Two of the following.		12
A)	Discuss the terms voltage regulation as applied to transmission line.	L2/CO4	6
B)	Explain different types of medium transmission line.	L2/CO4	6
C)	Explain the classification of lines based on their length of transmission.	L2/CO4	6

Q. 5	Solve Any Two of the following.		12
A)	Write short notes on the following:(i) Distribution Transformers (ii) D.C. distribution.	L2/C05	6
B)	What are the design consideration of distribution system? Explain.	L2/C05	6
C)	What are the advantages and disadvantages of d.c. transmission over a.c. transmission.	L2/C05	6
	*** End ***		

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