

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER • 2014****Subject Code: 150801****Date: 28-11-2014****Subject Name: Electrical Power Engineering****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Draw and explain the schematic arrangement of nuclear power plant. Also explain the function of : **07**
- i) Moderator
 - ii) Fuel rods
 - iii) Control rods
- (b)** Define tariff and explain in detail : **07**
- i) Two-part tariff
 - ii) Power factor tariff
 - iii) Three –part tariff
- Q.2 (a)** Each line of a 3-phase system is suspended by a string of 3 similar insulators. If the voltage across the line unit is 17.5KV, Calculate the line to neutral voltage. Assume that the shunt capacitance between each insulator and earth is $1/8^{\text{th}}$ of the capacitance of the insulator itself. Also find the string efficiency. **07**
- (b)** i) Advantages of per unit system **05**
ii) Explain critical disruptive voltage **02**
- OR**
- (b)** Draw and explain typical line diagram of A.C power supply scheme. **07**
- Q.3 (a)** Explain string efficiency and methods of improving it. **07**
- (b)** An overhead 3-phase transmission line delivers 5000w at 22KV at 0.8pf lagging .The resistance and reactance of each conductor is 4Ω and 6Ω respectively. Determine (1) sending end voltage (2) percentage regulation (3) transmission line efficiency. **07**
- OR**
- Q.3 (a)** Derive the ABCD parameter for Nominal Π medium transmission line. **07**
- (b)** Explain corona with advantages and disadvantages of it. Also define : **07**
- i) Critical disruptive corona voltage.
 - ii) Visual corona voltage.
- Q.4 (a)** Write a note on Tap changing transformer(ON load) **07**
- (b)** Stat and explain different type of tariff **07**
- OR**
- Q.4 (a)** Explain FACTS devices **07**
- (b)** A transmission line has a span of 100m between level supports. The conductor has cross section area of 5cm^2 . The tension in the conductor is 2500kg. If specify gravity of conductor material is 9.98m/cm^3 and wind pressure is 1.2kg/m. Calculate sag and vertical sag. **07**

- Q.5 (a)** State and explain different methods to improve power factor. **07**
(b) What is Corona? Explain its advantages and disadvantages. Also state factors affecting it. **07**

OR

- Q.5 (a)** Derive an expression for the inductance of three phase line with conductor having equilateral spacing. **07**
(b) Explain the bus impedance matrix method for analysis of unsymmetrical shunt faults. **07**
