

# C.U. SHAH UNIVERSITY

## Winter Examination-2018

**Subject Name: Electrical Power System**

**Subject Code: 4TE05EPS1**

**Branch: B.Tech (Electrical)**

**Semester: 5**

**Date: 03/12/2018**

**Time: 10:30 To 01:30**

**Marks: 70**

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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- Q-1**      **Attempt the following questions:**      **(14)**
- a)** What is the advantage of the static capacitors?      **(1)**
- (a) Low losses
  - (b) Easy installation
  - (c) Lower maintenance
  - (d) All of the above.
- b)** Active power and apparent power are respectively represented by \_\_\_\_\_.      **(1)**
- (a) KW and KVAR
  - (b) KVAR and KVA
  - (c) KVA and KVAR
  - (d) KW and KVA.
- c)** The maximum KVA demand of the consumer is \_\_\_\_\_ proportional to power factor.      **(1)**
- (a) Inversely
  - (b) Directly
  - (c) Square
  - (d) None of above.
- d)** A 3 phase 4 wire system is commonly used for      **(1)**
- (a) Primary distribution
  - (b) Secondary distribution
  - (c) Primary transmission
  - (d) Secondary transmission.
- e)** Write the function of surge tank in hydro power plant.      **(1)**
- f)** Give the function of nuclear reactor in nuclear power plant.      **(1)**
- g)** Define diversity factor.      **(1)**
- h)** Write the name of different equipment used for power factor improvement.      **(1)**
- i)** Give definition of tariff.      **(1)**
- j)** Define the term load curve.      **(1)**
- k)** What do you meant by peak load?      **(1)**
- l)** Write definition of demand factor.      **(1)**



- m) Give advantages of gas turbine power plant. (1)
- n) Write two choice of site selection of thermal power plant. (1)

**Attempt any four questions from Q-2 to Q-8**

- Q-2 Attempt all questions (14)**
- a) Draw the schematic diagram of a modern steam power station and explain its operation. (7)
- b) Explain the working of a gas turbine power plant with schematic diagram and Discuss the factors for the choice of site for a nuclear power plant. (7)
- Q-3 Attempt all questions (14)**
- a) Give comparison of ac transmission and dc transmission line. (7)
- b) What do you meant by interconnected grid system? Discuss the advantages of interconnected grid system. (7)
- Q-4 Attempt all questions (14)**
- a) Enlist various methods of determining the depreciation of equipment write short note on (i) Diminishing value method (2) Sinking fund method. (7)
- b) Describe the desirable characteristics of tariff and explain below mention tariff (i) Flat rate tariff (ii) Block rate tariff (iii) Power factor tariff. (7)
- Q-5 Attempt all questions (14)**
- a) What do you meant by string efficiency? Explain the mathematical expression of string efficiency. (7)
- b) Deduce an expression for sag in overhead transmission lines when (i) Supports are at equal levels (ii) When supports are at unequal levels. (7)
- Q-6 Attempt all questions (14)**
- a) Give three definition of power factor and explain disadvantages of low power factor. (7)
- b) Using rigorous method, derive expression for sending end voltage and current for a long transmission lines. (7)
- Q-7 Attempt all questions (14)**
- a) Each line of a 3 phase system is suspended by a string of a 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. (7)
- b) Write short note on corona effect. (7)
- Q-8 Attempt all questions (14)**
- a) Enlist various methods of neutral grounding. Write any one method of neutral grounding. (7)
- b) Draw and explain construction, various parts of underground cable. (7)

