Q.P. Code: 18EE0210 **R18**

**Reg. No:** | | | | | | | | | | |

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

(AUTONOMOUS)

**B.Tech III Year I Semester Regular Examinations Feb-2021**

**POWER SYSTEMS - I**

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

**PART-A**

(Answer all the Questions **5 x 2 = 10** Marks)

| | | | |
|---|---|---|---|
| 1 | a | Discuss the disadvantages of nuclear power plant. | **2M** |
| | b | Write different types of tariff methods. | **2M** |
| | c | Describe the voltage regulation in transmission line. | **2M** |
| | d | What is puncture and flash over in insulators? | **2M** |
| | e | What is a cable? What types of insulating materials are used in cables? | **2M** |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

| | | |
|---|---|---|
| 2 | Explain the function of the following in thermal power plant and explain the principle of operation of each. (i)economizer (ii)Electrostatic precipitator (iii)condenser (iv)super heater (v) cooling tower | **10M** |

**OR**

| | | |
|---|---|---|
| 3 | Draw a neat schematic diagram of a hydroelectric plant and explain the functions of various components. | **10M** |

**UNIT-II**

| | | |
|---|---|---|
| 4 | Explain principle of operation and working of Wind Power Plant. | **10M** |

**OR**

| | | |
|---|---|---|
| 5 | Explain the principle of operation and working of Tidal Power Plant with neat schematic diagram. | **10M** |

**UNIT-III**

| | | |
|---|---|---|
| 6 | Derive equivalent mathematical expression for voltage regulation of a short transmission line with the help of phasor diagram. | **10M** |

**OR**

| | | |
|---|---|---|
| 7 | A single-phase overhead transmission line delivers 1100kW at 33kV at 0.8 p.f. lagging. The total resistance and inductive reactance of the line are 10 ohm and 15 ohm respectively. Determine (i) Sending end Voltage (ii) Transmission Efficiency | **10M** |

## UNIT-IV

8 (a) Derive the expression for sag and tension when the supports are at unequal heights. 5M

(b) An overhead transmission line at a river crossing is s upported from two towers at heights of 40m and 90 m above water level. The horizontal distance between the towers being 400m.If the allowable tension is 2000kg, find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/m. 5M

**OR**

9 (a) Derive the expression for sag for equal supports. 5M

(b) Each conductor of a three phase over headline is suspended from a cross arm of a steel tower by a string of 4 suspension insulators. The voltage across the second unit is 14.2kv and across the third 20kv. Find the voltage between the conductors and the string efficiency. 5M

## UNIT-V

10 Explain the construction of underground cables. 10M

**OR**

11 (a) Distinguish between Underground cables and overhead lines. 5M

(b) Explain the pressure cables with a neat sketch. 5M

***END***