**18EE406**

**Hall Ticket Number:**

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| |  | | --- | | **II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | | |
| **August, 2021** | **Electrical & Electronics Engineering** | | |
| **Fourth Semester** | **Power Systems -1** | | |
| **Time:** Three Hours | | **Maximum:** 50 Marks | |
| ***Answer question 1 compulsory.*** | | | **(10X1 = 10Marks)** |
| ***Answer one question from each unit.*** | | | **(4X10=40Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | Define diversity factor. | CO1 | L1 | 1M |
|  | b) | Define plant use factor. | CO1 | L1 | 1M |
|  | c) | Write different types of tariff. | CO1 | L1 | 1M |
|  | d) | Give the formula for power available in wind. | CO2 | L1 | 1M |
|  | e) | Draw V-I characteristics of P-V cell. | CO2 | L1 | 1M |
|  | f) | What is skin effect? | CO2 | L1 | 1M |
|  | g) | What is a bundle conductor? | CO3 | L1 | 1M |
|  | h) | What is GMR? | CO3 | L1 | 1M |
|  | i) | List the four parameter by which the performance of transmission line are governed. | CO3 | L1 | 1M |
|  | j) | What is the reason for sag in the transmission line. | CO4 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Explain the term Load factor, Load curve and write its features. | CO1 | L2 | 5M |
|  | b) | A three phase, 50 Hz, 3300 V, star connected induction motor develops 250HP, the power factor being 0.707 lagging and the efficiency 0.86. Three capacitors in delta are connected across the supply terminals and power factor is raised to 0.9 lagging. Calculate:  i) The kVAR rating of the capacitor bank and  ii) The capacitance of each unit. | CO1 | L3 | 5M |
|  |  | **(OR)** |  |  |  |
| 3 | a) | A proposed station has the following load cycle:  Time in hours: 6-8 8-11 11-16 16-19 19-22 22-24 24-6 Load in MW: 20 40 50 35 70 40 20  Draw the load curve and select suitable generator units from 10,000, 20,000,  25,000, 30,000 kVA. Prepare the operation schedule for the selected machines  and determine the load factor from the curve. | CO1 | L3 | 5M |
|  | b) | |  | | --- | | What is Load curve. Explain the significance of Load ve. | | CO1 | L2 | 5M |
| **Unit-II** | | | | | |
| 4 | a) | Explain Hydro Electric power plants using a neat sketch. | CO2 | L2 | 5M |
|  | b) | Mention the merits and demerits of solar power generation in bulk and explain  with respect to live examples. | CO2 | L3 | 5M |
| **(OR)** | | | | | |
| 5 | a) | With the help of a block diagram, explain the working of a wind energy  conversion system. | CO2 | L2 | 6M |
|  | b) | Enlighten upon the various components and their operation in a hydroelectric  power plant for energy production. | CO2 | L2 | 4M |
| **Unit-III** | | | | | |
| 6 | a) | A 3 phase 80km long Transmission line has its conductors of 1cm diameter  spaced at the corners of the equilateral triangle of 100cm side. Find the  inductance per phase of the system. | CO3 | L3 | 4M |
|  | b) | What is transposition of lines? Comment on its necessity in the system. | CO3 | L3 | 6M |
| **(OR)** | | | | | |
| 7 | a) | State Skin Effect and Ferranti Effect. | CO3 | L2 | 6M |
|  | b) | Derive the ABCD Constants for medium length lines using nominal π method  draw its phasor diagram. | CO3 | L2 | 4M |
| **Unit-IV** | | | | | |
| 8 | a) | Explain corona and derive the equation for disruptive critical voltage and visual critical voltage. | CO4 | L2 | 5M |
|  | b) | Derive the equation for Sag in transmission lines, when the support is at equal  and unequal heights. | CO4 | L2 | 5M |
| **(OR)** | | | | | |
| 9 | a) | Explain different types of insulators used for transmission and distribution. | CO4 | L2 | 5M |
|  | b) | Comment on the effect of wind and ice loading on transmission line with respect to change in sag calculation. | CO4 | L2 | 5M |
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