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PRESIDENCYUNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION – JULY 2024

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| **Semester: II** | **Date: 05.07.2024** |
| **Course Code: EEE2008** | **Time: 09.30am to 12.30pm** |
| **Course Name: Electrical Power Generation Transmission and Distribution** | **Max Marks: 100** |
| **Program: B. Tech EEE** | **Weightage: 50** |

**Instructions:**

1. *Readallquestionscarefullyandansweraccordingly.*
2. *Questionpaperconsistsof3parts.*
3. *Scientificandnon-programmablecalculatorare permitted.*
4. *DonotwriteanyinformationonthequestionpaperotherthanRoll Number.*

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| **PART A** | | | |
| **ANSWER ANY 4 QUESTIONS 4Q X 5M=20M** | | | |
| 1 | List out the various applications of Solar Energy. | (CO 1) | [Knowledge] |
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| 2 | Describe the need of for Renewable Energy. | (CO 1) | [Knowledge] |
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| 3 | Define the following terms;   1. Irradiance. 2. Solar Panel. 3. Photovoltaic (PV) Cell. 4. Solar Array. 5. Solar Photovoltaic System | (CO 2) | [Knowledge] |
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| 4 | List out the advantages and disadvantages of wind energy. | (CO 3) | [Knowledge] |
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| 5 | Identify and List Key aspects and objectives of integrated energy system modeling. | (CO 4) | [Knowledge] |
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| 6 | Define the term Integrated Energy Systems and list all the components associated it with. | (CO 5) | [Knowledge] |
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| **PART B** | | | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | | | |
| 7 | A hydro-electric power station simply involves the conversion of hydraulic energy into electrical energy, yet it embraces many arrangements for proper working and efficiency. Draw the Schematic arrangement of Medium Head Hydro Electric Power Plant and list all the parts. | (CO 1) | | [Comprehension] | |
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| 8 | A power generation plant mainly consists of alternator runs with help of steam turbine. The steam is obtained from reactor via heat exchanger. The heavy elements of nuclear fission are Uranium/Thorium is carried out within a special device called a nuclear reactor. A huge amount of energy can be generated because of nuclear fission. The fission of 1 Kg Uranium generates heat energy which is equal to the energy generated through 4500 tons of high-grade coal. With neat schematic diagram explain the constructional details of the above described power plant. | (CO 1) | | [Comprehension] | |
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| 9 | The curve showing the variation of load on the power station with respect to (w.r.t) time is known as a load curve. The load on a power station is never constant; it varies from time to time. These load variations during the whole day (i.e., 24 hours) are recorded half-hourly or hourly and are plotted against time on the graph. Explain the importance of Load Curve, also construct the load curve and load duration curve for the given data sets.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Time (Hours) | 0—6 | 6—10 | 10—12 | 12—16 | 16—20 | 20—24 | | Load (MW) | 60 | 0 | 150 | 80 | 90 | 70 | | (CO 2) | | [Comprehension] | |
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| 10 | The rate at which electrical energy is supplied to a consumer is known as tariff. Although tariff should include the total cost of producing and supplying electrical energy plus the profit, yet it cannot be the same for all types of consumers. It is because the cost of producing electrical energy depends to a considerable extent upon the magnitude of electrical energy consumed by the user and his load conditions. Summarize the important objectives of Tariff. | (CO 2) | | [Comprehension] | |
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| 11 | The overhead line conductors should be supported on the poles or towers in such a way that currents from conductors do not flow to earth through supports i.e., line conductors must be properly insulated from supports. A string of suspension insulators consists of a number of porcelain discs connected in series through metallic links, show with relevant notation and expression how to compute the potential distribution over a string of suspension insulators. | (CO 3) | | [Comprehension] | |
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| 12 | The electrical energy produced at the generating station is conveyed to the consumers through a network of transmission and distribution systems. The part of power system which distributes electric power for local use is known as distribution system. In general, the distribution system is the electrical system between the sub-station fed by the transmission system and the consumer’s meters. It generally consists of feeders, distributors and the service mains. List out and explain in brief the various requirements of distribution. | (CO 5) | | [Comprehension] | |
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| 13 | The cable generally comprises of the conductor, insulation material, bedding, beading/ armoring, and outer sheath etc. Although, the armoring and outer sheath takes care of the physical safety of cable, adequate care has to be taken by cable manufacturers during manufacturing of the cable. With neat diagram explain the construction details of 3 core underground cable | (CO 5) | | [Comprehension] | |
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| **PART C** | | | | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 15M=30M** | | | | | | |
| 14 | A single phase overhead transmission line delivers 1100 kW at 33 kV at 0·8 p.f. lagging. The total resistance and inductive reactance of the line are 10 Ω and 15 Ω respectively. Determine: (i) sending end voltage (ii) sending end power factor and (iii) transmission efficiency, also draw the necessary circuit diagram and phasor diagram for the given problem statement. | | (CO 3) | | [Application] | |
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| 15 | Two wires of 1-phase transmission line are separated by 3 mt. the radius of each conductor is 0.02 mt. Identify the unknown parameters that could be found from the given data and compute the same. | | (CO 3) | | [Application] | |
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| 16 | Two towers of height 40 m and 30 m respectively support a transmission line conductor at water crossing. The horizontal distance between the towers is 300 m. If the tension in the conductor is 1590 kg, find the clearance of the conductor at a point mid-way between the supports. Weight of conductor is 0•8 kg/m. Bases of the towers can be considered to be at the water level. | | (CO 4) | | [Application] | |
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