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BEE405A



# Fourth Semester B.E./B.Tech. Degree Examination, June/July 2025
## Electrical Power Generation and Economics

Time: 3 hrs. Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.*
*2. M : Marks , L: Bloom's level , C: Course outcomes.*

| | | Module – 1 | M | L | C |
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| Q.1 | a. | Explain the factors to be considered for the selection of site for hydro electric power plant. | 06 | L2 | CO1 |
| | b. | Explain the classification of hydro power plants. | 06 | L2 | CO1 |
| | c. | With a neat schematic diagram, explain the essential elements of hydroelectric power plant. | 08 | L2 | CO1 |
| | | **OR** | | | |
| Q.2 | a. | What are differences between Impulse turbine and Reaction turbine? | 06 | L2 | CO1 |
| | b. | Discuss the utility of hydrograph, flow duration curve and mass curve for the hydro power plant. | 06 | L2 | CO1 |
| | c. | Explain the governing mechanism of hydraulic Impulse turbine and reaction turbine with neat sketches. | 08 | L2 | CO1 |
| | | **Module – 2** | | | |
| Q.3 | a. | Explain the function of air preheater, super heater and economizer in thermal plant. | 06 | L2 | CO2 |
| | b. | What are the advantages and disadvantages of steam power plant? | 06 | L1 | CO2 |
| | c. | With a neat sketch, explain fluidized bed combustion. | 08 | L2 | CO2 |
| | | **OR** | | | |
| Q.4 | a. | Explain with a neat sketch the closed cycle gas turbine power plants. | 06 | L2 | CO2 |
| | b. | Discuss the application of diesel power plant. | 06 | L2 | CO2 |
| | c. | Discuss the following in diesel power plant :<br>i) Fuel Supply System ii) Air Intake System<br>iii) Lubricating System iv) Engine Starting System | 08 | L2 | CO2 |
| | | **Module – 3** | | | |
| Q.5 | a. | Explain the advantages and disadvantages of Nuclear Power Plant. | 06 | L2 | CO3 |
| | b. | Give the various classification of nuclear reactor and explain any one. | 06 | L1 | CO3 |
| | c. | Draw the schematic diagram of a Nuclear Power Station and discuss its operation. | 08 | L2 | CO3 |

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| | | **OR** | | | |
| Q.6 | a. | Discuss the disposal of nuclear waste in nuclear power station. | 06 | L2 | CO3 |
| | b. | Explain the following with respect to nuclear power plant:<br>(i) Moderator (ii) Control rods (iii) Reflector | 06 | L2 | CO3 |
| | c. | Discuss the factor to be considered for selecting site for nuclear power plant. | 08 | L2 | CO3 |
| | | **Module – 4** | | | |
| Q.7 | a. | What is Substation? Discuss the main components of substation. | 08 | L2 | CO4 |
| | b. | Discuss the classification of substation. | 06 | L2 | CO4 |
| | c. | Discuss the factors to be considered for site selection of substation. | 06 | L2 | CO4 |
| | | **OR** | | | |
| Q.8 | a. | With a neat sketch, explain the grounding system through earthing transformer. | 06 | L2 | CO4 |
| | b. | A 230 V, 3$\phi$, 50 Hz, 200 Km transmission has a capacitance to earth of 0.01 mF/Km per phase. Calculate the inductance and KVA rating of Peterson coil used for earthing the above system. | 06 | L3 | CO4 |
| | c. | Explain double bus without sectionalisation with neat diagram and advantages. | 08 | L2 | CO4 |
| | | **Module – 5** | | | |
| Q.9 | a. | Explain the following terms as applied to power station:<br>i) Average Load<br>ii) Maximum Load<br>iii) Diversity Factor<br>iv) Plant Use Factor | 08 | L2 | CO5 |
| | b. | Explain Two Part tariff and Power Factor tariff. | 06 | L2 | CO5 |
| | c. | Discuss the various methods of Power Factor Improvement. | 06 | L2 | CO5 |
| | | **OR** | | | |
| Q.10 | a. | Explain any two methods of determination of depreciation. | 06 | L2 | CO5 |
| | b. | Explain the factors affecting tariff. | 06 | L2 | CO5 |
| | c. | A generating station has 3×50 MW units. The station output is $876\times10^6$ KWH per annum. The maximum demand is 120 MW. Calculate<br>i) Average Load on Station<br>ii) Annual Load Factor<br>iii) Annual Capacity Factor<br>iv) Utilization Factor | 08 | L3 | CO5 |

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