

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

<b>CLASS:</b>	M. TECH	<b>SEMESTER :</b> I
<b>BRANCH:</b>	MECHANICAL ENGINEERING	<b>SESSION :</b> MO/22
<b>TIME:</b>	03 HOURS	<b>FULL MARKS:</b> 50

**SUBJECT: ME549 ENERGY SIMULATION AND MODELLING**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

- Q.1(a) Outline the various types of computer based tools for energy planning [CO1, IO(Intermediate Order), PO2-3.] [5]
- Q.1(b) Outline the various factors national and rural energy planning. [CO1, IO(Intermediate Order) PO2-3.] [5]
- Q.2(a) Explain the Types and Characteristics of **INPUT-OUTPUT (I-O)** models. [CO2, HO(Higher Order) PO2-3.] [5]
- Q.2(b) Formulate the IO transaction tables for banking [CO2, HO(Higher Order) PO2-3.] [5]
- Q.3(a) Discuss the Linear and non-linear optimization models [CO3, LO(Lower order) PO2-3.] [5]
- Q.3(b) Discuss the advantage and limitation of optimization models [CO3, LO(Lower order) PO2-3.] [5]
- Q.4(a) Specify the various advantage and limitations of process analysis models [CO4, HO(Higher Order) PO2-3.] [5]
- Q.4(b) Specify the various consideration in process analysis models for industrial [CO4, HO(Higher Order) PO2-3.] [5]
- Q.5(a) Analyze the causal loop diagram with suitable block diagram [CO5, IO(Intermediate Order) PO2-3.] [5]
- Q.5(b) Explain the dynamic behavior of energy systems [CO5, IO(Intermediate Order) PO2-3.] [5]

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