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

CLASS: MTECH **SEMESTER : I**
BRANCH: BIOTECH **SESSION : MO/18**

SUBJECT: BE503 ADVANCED REACTION ENGINEERING

TIME: 3 HRS. **FULL MARKS: 50**

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)	Explain homogeneous and heterogeneous catalysis with suitable examples.	[5]
Q.1(b)	Analyse the behavior of non- catalytic and catalytic reactions using activation energy diagram	[5]
Q.2(a)	Analyse in detail the prime factors of catalyst design.	[5]
Q.2(b)	What are the major differences between the concept of catalyst inhibitors and catalyst poisons?	[5]
Q.3(a)	Explain in detail surface kinetics and pore diffusion mechanism in a catalytic reaction.	[5]
Q.3(b)	While being shown a chemical engineering laboratory you stopped to view a reactor used to obtain kinetic data. It consists of a 5 cm ID glass column packed with a 30 cm height of active catalyst. Is this a differential or an integral reactor? Justify your answer.	[5]
Q.4(a)	Discuss with complete analysis of interfacial straight mass transfer in a heterogeneous reaction.	[5]
Q.4(b)	Consider a porous catalyst bathed by a reactant A. Discuss analysing the rate of reaction A for the particle as a whole.	[5]
Q.5(a)	Discuss the strategies to minimise mass transfer negative effects.	[5]
Q.5(b)	Discuss activity and selectivity of bio catalysts.	[5]

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