BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATIONMO/2024)

CLASS: **B.Tech.** **SEMESTER : V**
BRANCH: **Chemical Engineering** **SESSION : MO/2024**

SUBJECT: CL321 PETROLEUM REFINERY ENGINEERING

TIME: **02 Hours** **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Illustrate Hydroskimming refinery configuration with a flow sheet	[2]	1	2
Q.1(b)	Differentiate ASTM & TBP distillation processes through set-up diagrams and characteristic graphs and explain how to predict quantity of products from the graph that can be made from a given crude oil	[3]	1	4
Q.2(a)	Examine the reason for the necessity of vacuum distillation process and outline the salient points of vacuum distillation process	[2]	2	4
Q.2(b)	Define Octane number and Cetane number and explain the experiments done to find their values and also outline their significance.	[3]	1	1,2
Q.3(a)	Outline the mathematical equation for total Gibbs free energy of a catalytic reforming system and explain the meaning of $\sum_i n_i a_{ij} = b_j$	[2]	3	2
Q.3(b)	A naphtha feed of 15,57,200 kg/day undergoes catalytic reforming and produces 87% total reformate & 1.3 % total hydrogen by weight. Let H_2S produced is 150.28 kg/day & H_2 in H_2S be 9.40 kg/day. **Estimate total reformate, total H_2, Net H_2 produced** and calculate **losses and write opinion on losses. Assume no other products are made.**	[3]	3	5
Q.4(a)	Summarize the objective and outcomes of Isomerization process and name catalysts used in it	[2]	3	2
Q.4(b)	Illustrate Platforming process with a neat flowsheet and outline salient points of a reforming process that uses non-noble catalyst.	[3]	3	2
Q.5(a)	Outline the objectives and outcomes of desalting process and name methods used for it	[2]	2	2
Q.5(b)	Analyze the functions of reboiler, reflux and column internals in an atmospheric distillation unit with a neat flow sheet of atmospheric distillation process showing various products made from it.	[3]	2	4

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