

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Eight Semester – Regular) Examinations, April– 2024

BPECH8020 – Petroleum Refinery Engineering

(Chemical)



Time: 3 hrs

Maximum: 70 Marks

The figures in the right hand margin indicate marks.**PART – A: (Multiple Choice Questions)****(1 x 10 = 10 Marks)**Q.1. Answer **ALL** questions

		[CO#]	[PO#]
a.	Which of the following is desirable in petrol (gasoline) but undesirable in kerosene?	CO1	PO1
	(i) Paraffin		
	(ii) Mercaptans		
	(iii) Aromatics		
	(iv) Naphthenic acid		
b.	In case of liquid petrofuels, momentary combustion is observed at its	CO2	PO2
	(i) Flash point		
	(ii) Preheating temperature		
	(iii) Flame temperature		
	(iv) Fire point		
c.	In catalytic cracking, the	CO1	PO1
	(i) Gasoline obtained has a very low octane number		
	(ii) Pressure & temperature is very high		
	(iii) Gasoline obtained has very high aromatic content		
	(iv) Gasoline obtained has very high amount of gum forming compound		
d.	Pressure & temperature maintained in catalytic cracking is about	CO1	PO2
	(i) 2 atm & 500°C		
	(ii) 10 atm & 500°C		
	(iii) 30 atm & 200°C		
	(iv) 50 atm & 750°C		
e.	The main aim of cracking is to produce	CO2	PO1
	(i) Gasoline		
	(ii) Lube oil		
	(iii) Petrolatum		
	(iv) Coke		
f.	Mercaptans are low boiling	CO2	PO2
	(i) Sulphur compounds		
	(ii) Oxygen compound		
	(iii) Nitrogen compounds		
	(iv) Organometallic compounds		
g.	Clay treatment is generally employed for	CO2	PO1
	(i) The removal of olefins and diolefins from cracked gases/liquid stream		
	(ii) The improvement of color and odor		
	(iii) The oxidation stability of lube base stock		
	(iv) All of the above		
h.	Pressure & temperature maintained in catalytic cracking is about	CO3	PO1
	(i) 2 atm & 500°C		
	(ii) 10 atm & 500°C		
	(iii) 30 atm & 200°C		
	(iv) 50 atm & 750°C		
i.	Which of the following petroleum products has maximum flash point?	CO3	PO1
	(i) Naphtha		
	(ii) Kerosene		
	(iii) HSD oil		
	(iv) Furnace oil		
j.	Which of the following hydrocarbons has maximum octane number?	CO4	PO1
	(i) Benzene		
	(ii) Cyclohexane		
	(iii) Hexane		
	(iv) Iso-hexane		

PART – B: (Short Answer Questions)**(2 x 10 = 20 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. What is the elemental composition of crude oil?	CO1	PO1
b. What is API? What is the work of API members?	CO1	PO2
c. State two points against the carbide theory.	CO2	PO2
d. What is knocking? Give an example of anti-knocking agent.	CO1	PO3
e. What is MEK? Define its proportion maintained in solvent Dewaxing process.	CO3	PO2
f. Mention the Requisite conditions of good dewaxing solvents.	CO2	PO1
g. How Propane Dewaxing process is advantage over MEK Process?	CO3	PO1
h. In the Edeleanu process which solvent is used and why	CO3	PO2
i. How wax is separated by Chilling and pressing methods. Why this process is	CO4	PO1
j. Why Additives are required.	CO4	PO3

PART – C: (Long Answer Questions)**(10 x 4 = 40 Marks)**Answer ALL questions

	Marks	[CO#]	[PO#]
3. a. Discuss in detail about Petroleum crude mentioning elaborately about its composition, constituent and classification based on nature of hydrocarbon.	6	CO1	PO1
b. Discuss about the general properties of Paraffin, unsaturates and Aromatics.	4	CO1	PO2
(OR)			
c. Discuss about Indian scenario of petroleum industry highlighting reserve and deposit.	6	CO1	PO2
d. Describe the theories for the origin and formation of crude petroleum in the earth crust. Justify with chemical reaction.	4	CO1	PO1
4. a. Why pre-treatment is essential before refining the crude petroleum? Discuss about all pre-treatment process in detail.	10	CO2	PO2
(OR)			
c. Articulate about the single stage, Double stage and three stage distillation units for processing of crude oil mentioning a clear flow sheet about the process.	10	CO2	PO3
5. a. Discuss about Copper Chloride process for sweetening of gasoline with mentioning reactions.	6	CO3	PO2
b. What is Doctors solution? How Sulphur shall be removed by this methods.	4	CO3	PO3
(OR)			
c.. How furfural extraction is carried out for upgrading the Lube oil.	6	CO3	PO2
d. Discuss about Deasphalting Process for removal of Asphalt.	4	CO3	PO3
6. a. Discuss in detail about reaction associated in thermal cracking Operations.	6	CO4	PO1
b. Analyse the process involved in Alkylation process for converting i-paraffin to further larger Iso-paraffin.	4	CO4	PO3
(OR)			
c. What is cracking mentioning about its types and necessity? Elaborate about catalytic cracking, feed, catalyst, reactions and commercial processes involved in this.	10	CO4	PO3

--- End of Paper ---