GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

BCHPE7020 – PETROLEUM REFINERY ENGINEERING

(Chemical Engineering)

Time: 3 hrs Maximum: 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) **(2 x 10 = 20 Marks)**

Q.1. Answer ***ALL*** questions [CO#] [PO#]

a. Crude petroleum consists of CO1 PO1

(i) 84 - 87 % Carbon and 11-14%Hydrogen.
(ii) 11-14 % Carbon and 84-87%Hydrogen
(iii) 54 % Carbon and 25 %Hydrogen.
(iv) 70-72 % Carbon and 5-7%Hydrogen

b. Solvent used for dewaxing of petroleum products are CO1 PO2

(i) Furfural
(ii) Propane
(iii) Hexane
(iv) Duosol

c. In catalytic cracking, the CO1 PO3

(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 CO2 PO1

(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 PO2

(i) Gasoline
(ii) Lube oil
(iii) Petrolatum
(iv) Coke

f. Visbreaking CO2 PO3

(i) Uses natural gas as feed
(ii) Is carried out at atmospheric pressure
(iii) Produces fuel oil of lower viscosity
(iv) Produces gasoline only

g. Liquefied Petroleum Gas (LPG) is mainly a mixture of CO3 PO1

(i) Propane & butane
(ii) Methane & ethane
(iii) High boiling olefins
(iv) High boiling naphthenes

h. Presence of aromatics in CO3 PO2

(i) Diesel increases its cetane number
(ii) Kerosene increases its smoke point
(iii) Petrol increases its octane number
(iv) All (i), (ii) and (iii)

i. Which of the following is the most widely used cracking process in oil refineries? CO4 PO1

(i) Dubbs process
(ii) T.C.C. moving bed process
(iii) Fluidised bed catalytic cracking process
(iv) Houdry's fixed bed process

j. Which of the following is an additive used for improving the cetane number of diesel? CO4 PO2

(i) Tetraethyl lead
(ii) Tetramethyllead
(iii) Ethyl nitrate or acetone
(iv) None of these

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) **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions	Marks	[CO#]	[PO#]
3. a. Discuss about the general properties of Paraffin, unsaturates and Aromatics.	8	CO1	PO1
b. Appraise the different additives for Gasoline which is blended with straight run gasoline in order to increase the quality. Discuss in detail.	7	CO1	PO2
(OR)			
c. Discuss about Indian scenario of petroleum industry highlighting reserve and deposit.	7	CO1	PO3
d. Describe the theories for the origin and formation of crude petroleum in the earth crust. Justify with chemical reaction.	8	CO1	PO2
4. a. Why pre-treatment is essential before refining the crude petroleum? Discuss about all pre-treatment process in detail.	15	CO2	PO2
(OR)			
b. 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.	15	CO2	PO3
5. a. Discuss about Copper Chloride process for sweetening of gasoline with mentioning reactions.	8	CO3	PO2
b. What is Doctors solution? How Sulphur shall be removed by this methods.	7	CO3	PO3
(OR)			
c. How furfural extraction is carried out for upgrading the Lube oil.	8	CO3	PO1
d. Discuss about Deasphalting Process for removal of Asphalt.	7	CO3	PO2
6. a. Discuss in detail about reaction associated in thermal cracking Operations.	8	CO4	PO1
b. Analyse the process involved in Alkylation process for converting i-paraffin to further larger Iso-paraffin.	7	CO4	PO3
(OR)			
c. Discuss in detail about any one commercial process of catalytic cracking Operations.	8	CO4	PO1
d. Why Low temperature isomerisation is more common practice followed in industry.	7	CO4	PO2

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