A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59903

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Chemical Engineering

15UCH903 - PETROLEUM REFINERY ENGINEERING

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. C_nH_{2n} is the general formula for CO1-R

   (a) Olefins (b) Naphthenes (c) Both (a) and (b) (d) Neither (a) nor (b)

2. Carbon percentage (by weight) in crude petroleum may be about CO1- R

   (a) 65 (b) 75 (c) 85 (d) 95

3. Which of the following fractions of a crude oil will have the maximum gravity API (i.e. °API) ? CO2- R

   (a) Atmospheric gas oil (b) Diesel (c) Gasoline (d) Vacuum gas oil

4. Flash point of atmospheric distillation residue is determined by _____ apparates. CO2- R

   (a) Abel. (b) Cleveland (open cup type)

   (c) Pensky-Martens (closed cup type). (d) none of these.

5. In catalytic cracking, the CO3-R

   (a) Gasoline obtained has a very low octane number

   (b) Pressure & temperature is very high

   (c) Gasoline obtained has very high aromatic content

   (d) Gasoline obtained has very high amount of gum

6. Pressure & temperature maintained in catalytic cracking is about CO3- R

(a) 2 atm & 500°C (b) 10 atm & 500°C (c) 30 atm & 200°C (d) 50 atm & 750°C

7. Solvent used in duo-sol extraction for lube oil upgradation is a mixture of CO4- R

(a) Propane & liquid sulphur dioxide. (b) Methyl ethyl ketone & glycol.

(c) Phenol & furfural (d) Propane & phenol-cresol mixture.

8. Which of the following tests is not done for transformer oil ? CO4- R

(a) Copper strip corrosion test. (b) Flash point and acid value

(c) Aniline point (d) Dielectric strength

9. Pour point and freezing point is equal for CO5- R

(a) Diesel (b) Water (c) Petrol (d) Crude petroleum

10. Which of the following has maximum hydrogen/carbon ratio (by weight)? CO5- R

(a) Naphtha (b) Gasoline (c) Diesel (d) Fuel oil

PART – B (5 x 2= 10 Marks)

11. List the important products obtained from petroleum refinery. CO1- R
12. Give the general properties of naphthenes. CO2- R
13. Recall the meaning of latent heat of vaporisation and give its formula CO3- R
14. Define softening point and penetration index. CO4- R
15. List out any four pollution causing gases in refineries CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Discuss about various organic theories in petroleum formation. CO1-U (16)

Or

(b) What are the various compositions of petroleum and discuss about their properties? CO1-U (16)

17. (a) Enumerate the important test methods for LPG and gasoline CO2-U (16)

Or

(b) What are the different additives used in gasoline and diesel oils CO2-U (16)

18.	(a)	With a neat flow sheet explain the principle and working of Visbreaking process.	CO3- U	(16)
		Or		
	(b)	Describe the houdry fixed bed catalytic cracking process with a neat diagram.	CO3- U	(16)
19.	(a)	What is MEROX Sweetening process. Explain the treatment process of MEROX sweetening for treating LPG, gasolines and kerosenes.	CO4- U	(16)
		Or		
	(b)	With a neat flow sheet describe the principle and working of Furfural extraction process for treating crudes.	CO4- Ana	(16)
20.	(a)	Derive the basic material and energy balance equations involved in petroleum refinery operations.	CO5- U	(16)
		Or		
	(b)	Explain the various sources and causes of pollution in refineries. Enumerate any three pollution control techniques used in refinery operations.	CO5- U	(16)