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

Question Paper Code: 59903

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

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. Which of the following constituents present in petroleum is responsible for ash formation? CO1-R

   (a) Nitrogen compounds (b) Organometallic compounds

   (c) Sulphur compounds (d) Oxygen compounds

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

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

3. Pick out the additive property of a lube oil out of following. CO2- R

   (a) API gravity (b) Flashpoint (c) Specific gravity (d) Viscosity

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. The coking process normally mostly used in Indian oil refineries is the _____ coking process. CO3- R

(a) delayed (b) flexi (c) fluid (d) contact

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. The effect of air pollutants in the refineries such as particulate matter comes from CO5- R

(a) Coking (b) Cracking (c) Reforming (d) Both (b) and (c)

PART – B (5 x 2= 10 Marks)

11. Provide four petroleum refineries in India. 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. Mention the different ways by which you can control hydrocarbon loss in a refinery CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Enumerate the different composition of petroleum. CO1-U (16)

Or

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

17. (a) Elaborate in detail the various physical properties of petroleum. Also, indicate the important testing methods for crude. CO2-U (16)

Or

	(b)	What are the different additives used in gasoline and diesel oils	CO2-U	(16)
18.	(a)	With neat flow diagram, describe the topping operation of atmospheric distillation and vacuum distillation unit.	CO3- U	(16)

Or

	(b)	Describe the houdry fixed bed catalytic cracking process with a neat diagram.	CO3- U	(16)
19.	(a)	Describe the phenol extraction for the upgrading of petroleum crude.	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)	Describe the material and energy balance equations for crude distillation unit.	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)