BE Chemical Part -1 (Semester- VII)

Petroleum Refinery Engineering

01. Which of the following has maximum hydrogen/carbon ratio (by weight)?

(A) Naphtha

(B) Gasoline

(C) Diesel

(D) Fuel oil

0. Methyl tertiary butyl ether (MTBE), a high octane (octane no. = 115) gasoline blending component is produced by the simple additive reaction of isobutylene with

(A) Methyl alcohol

(B) Ethyl alcohol

(C) Methane

(D) Ethane

03. The first crude oil refinery of India is located at

(A) Naharkatiya

(B) Digboi

(C) Kochi

(D) Madras Answer: Option B

04. Carbon percentage (by weight) in crude petroleum may be about

(A) 65

(B) 75

(C) 85

(D) 95

05. Solvent used for dewaxing of petroleum products are

(A) Furfural

(B) Methyl ethyl ketone (MEK)

(C) Propane

(D) Both (B) & (C)

06. In catalytic cracking, the

(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 forming compounds

07. Petroleum liquid fuels having flash point greater than 66°C is considered as safe during storage and handling. Which of the following has flash point > 66°C?

(A) Naphtha

(B) Petrol

(C) Kerosene

(D) Heavy fuel oil

08. Pressure & temperature maintained in catalytic cracking is about

(A) 2 atm & 500°C

(B) 10 atm & 500°C

(C) 30 atm & 200°C

(D) 50 atm & 750°C

09. An upper limit of oil content is limited to about _____ percent for achieving efficient and satisfactory level of wax sweating.

(A) 5

(B) 15

(C) 40

(D) 60

10. Flash point of a liquid petroleum fuel gives an idea about its

(A) Volatility

(B) Explosion hazards characteristics

(C) Nature of boiling point diagram

(D) All Mentioned options

11. Hydrogen percentage (by weight) in crude petroleum may be about

(A) 5

(B) 15

(C) 25

(D) 35

12. Which of the following has the lowest cetane number?

(A) Aromatics

(B) i-paraffins

(C) Naphthene

(D) Olefins

13. Catalyst used in catalytic polymerisation which produces polymer gasoline is

(A) H_2SO_4

(B) H_3PO_4

(C) Both (A) and (B)

(D) $AlCl_3$

14. Liquefied Petroleum Gas (LPG) is mainly a mixture of

(A) Propane & butane

(B) Methane & ethane

(C) High boiling olefins

(D) High boiling naphthenes

15. Pick out the correct statement pertaining to catalytic cracking.

(A) With increase in the reactor pressure, octane number of gasoline decreases

(B) With increase in the reactor temperature, gasoline yield decreases for a given conversion

(C) Percentage conversion increases with increase in the catalyst to oil ratio

(D) All Mentioned options

16. The vacuum maintained in vacuum distillation unit for reduced crude is about _____ mm Hg.

(A) 1.2

(B) 12

(C) 120

(D) 700

17. Flash point of an oil is determined by the

(A) Pensky Martens apparatus

(B) Ramsbottom apparatus

(C) Saybolt viscometer

(D) Conradson apparatus

18. Vacuum maintained in the vacuum distillation tower of the crude distillation plant is about _____ mm Hg (absolute).

(A) 5-10

(B) 30-80

(C) 150-250

(D) 350-400

19. Visbreaking

(A) Uses natural gas as feed

(B) Is carried out at atmospheric pressure

(C) Produces fuel oil of lower viscosity

(D) Produces gasoline only

20. Which of the following is not an important property of fuel oil/furnace oil?

(A) Sulphur content

(B) Viscosity

(C) Aniline point

(D) Flash point

21. Dearomatization of kerosene (by liquid sulphur dioxide extraction) is done to

(A) Increase its smoke point

(B) Improve its oxidation stability

(C) Decrease the breathing loss

(D) None of these

22. High aniline point of a petrofuel (say diesel) indicates that

(A) It is highly aromatic in nature

(B) It is highly paraffinic in nature

(C) It has a very low diesel index

(D) Its ignition quality is very poor

23. The main aim of cracking is to produce

(A) Gasoline

(B) Lube oil

(C) Petrolatum

(D) Coke

24. The most important property for a jet fuel is its

(A) Viscosity

(B) Freezing point

(C) Calorific value

(D) Flash point

25. Presence of aromatics in

(A) Diesel increases its cetane number

(B) Kerosene increases its smoke point

(C) Petrol increases its octane number

(D) All Mentioned options

26. The best method of determining sulphur in crude oil is by the _____ method.

(A) Kjeldahl

(B) Dumas

(C) Bomb calorimeter

(D) Junkers calorimeter

27. Which of the following is the most widely used cracking process in oil refineries?

(A) Dubbs process

(B) T.C.C. moving bed process

(C) Fluidised bed catalytic cracking process

(D) Houdry's fixed bed process

28. Which of the following reactions is undesirable in the production of catalytically reformed gasoline?

(A) Dehydrogenation of Naphthene

(B) Dehydrogenation of lower paraffins

(C) Dehydrocyclization of higher paraffins

(D) Isomerisation of paraffins

29. Catalytic cracking compared to thermal cracking of residue of vacuum distillation of crude oil

(A) Gives higher yield of petrol

(B) Lower octane number of petrol

(C) Higher sulphur content in the product

(D) Higher gum forming material in petrol

30. Pick out the wrong statement.

(A) A pale color of petroleum product indicates lower viscosity

(B) Color of petroleum products indicates the degree of refinement

(C) Lighter petroleum distillates are lighter in color than the heavier residual oils

(D) Fluorescence of oils helps to detect its adulteration

31. Which of the following is an additive used for improving the cetane number of diesel?

(A) Tetraethyl lead

(B) Tetramethyllead

(C) Ethyl nitrate or acetone

(D) None of these

32. Higher boiling fractions like atmospheric residue is distilled under vacuum at low temperature because at high temperature, there is a tendency of the predominance of

(A) Thermal cracking

(B) Gum formation

(C) Coking

(D) Discoloration

33. Octane number of gasoline produced by two stage fluidised catalytic cracking process is

(A) 80

(B) 87

(C) 92

(D) 97

34. Which of the following has the minimum °API gravity of all?

(A) Diesel

(B) Kerosene

(C) Petrol

(D) Furnace oil

35. Which of the following processes is used for the production of petroleum coke?

(A) Stabilisation

(B) Visbreaking

(C) Cracking

(D) Reforming

36. Salt content (measured as sodium chloride) in electrically desalted crude oil comes down to a level of about _____ ptb (pounds per thousand barrel).

(A) 0.03

(B) 3

(C) 35

(D) 70

37. Deoiling of wax is done by its

(A) Heating

(B) Cooling

(C) Solvent extraction

(D) Both (B) & (C)

38. LPG stands for

(A) Liquid petroleum gas

(B) Liquefied petrol gas

(C) Liquid petrol gas

(D) Liquefied petroleum gas

39. The order of preference for feedstock to a catalytic reformer is

(A) Catalytic naphtha - coking naphtha - virgin naphtha

(B) Coking naphtha - virgin naphtha - catalytic naphtha

(C) Virgin naphtha - catalytic naphtha - coking naphtha

(D) Virgin naphtha - coking naphtha - catalytic naphtha

40. Catalyst used in isomerisation process is

(A) H_2SO_4

(B) H_3PO_4

(C) HF

(D) $AlCl_3$

41. The amount of tetraethyl lead added to improve the octane number of motor gasoline is around _____ c.c per gallon of petrol.

(A) 3

(B) 300

(C) 3000

(D) 1000

42. Which of the following does not require preheating during storage in the storage tank as well as during atomisation through burners?

(A) PCM

(B) Tar

(C) Light diesel oil

(D) Low viscosity furnace oil

43. Which of the following categories of gasoline has the highest lead susceptibility?

(A) Straight run gasoline

(B) Platinum reformed gasoline

(C) Catalytical cracked gasoline

(D) Polymer gasoline

44. Octane number of n-heptane is assumed to be

(A) 100

(B) 0

(C) 70

(D) Infinity

45. Tetra-ethyl lead is added in gasoline to

(A) Increase its smoke point

(B) Reduce gum formation

(C) Reduce the pour point

(D) Increase its octane number

46. The conductivity of crude oil-water mixture depends on the

(A) pH value

(B) Water percentage

(C) Temperature

(D) All Mentioned options

47. During electrical desalting of crude oil, the electrical conductivity of a mixture of crude oil and water (which ranges between 3 to 8% water) _____ with increase in the amount of water.

(A) Decreases

(B) Increases

(C) Remains unchanged

(D) Decreases linearly

48. Concentration of H_2SO_4 catalyst in alkylation is kept between 90-98%, because H_2SO_4 having concentration.

(A) Less than 90% promotes polymerisation

(B) More than 98% promotes cracking

(C) Both (A) and (B)

(D) Neither (A) nor (B)

49. Cracking is

(A) An exothermic reaction

(B) An endothermic reaction

(C) Favoured at very low temperature

(D) None of these

50. Choose the correct statement regarding thermal cracking.

(A) Moderate changes in operating temperature does not change the depth of cracking

(B) Increased residence time results in the decreased severity of cracking

(C) At low pressure, the yields of lighter hydrocarbons are more

(D) Greater depth of cracking gives lower octane number gasoline

51. Catalyst used in alkylation process is

(A) Sulphuric acid

(B) Nickel

(C) Silica gel

(D) Alumina

52. Sour crude means the _____ bearing crude.

(A) Asphalt

(B) Sulphur compounds

(C) Wax

(D) Nitrogen compounds

53. Good quality kerosene should have

(A) Low smoke point

(B) High smoke point

(C) High aromatics content

(D) Low paraffins content

54. Which of the following fractions of petroleum contains maximum sulphur?

(A) Diesel

(B) Gasoline

(C) Naphtha

(D) Atmospheric residue

55. The solvent used in Barisol dewaxing process is

(A) Hexane

(B) Furfural

(C) Benzol and ethylene dichloride

(D) Methyl ethyl ketone (MEK)

56. 1 centistoke is equal to _____ Redwood I seconds.

(A) 1

(B) 4.08

(C) 0.408

(D) 40.8

57. Testing of the knocking characteristics of petrofuels is done in a _____ engine.

(A) Carnot

(B) CFR (Co-operative fuel research)

(C) Stirling

(D) Diesel

58. Higher vapour pressure of gasoline indicates

(A) Low flash point

(B) High breathing loss

(C) Both (A) and (B)

(D) Neither (A) nor (B)

59. Aromatics are desired constituents of

(A) Lubricating oil

(B) Diesel

(C) Kerosene

(D) Petrol

60. Which parameter is used for the grading of paraffin waxes?

(A) Specific gravity

(B) Melting point

(C) Viscosity

(D) Penetration number