| Uka Tarsadia University (Diwaliba Polytechnic) |
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| Diploma in Chemical Engineering |
| Objective Type Questions (Chemical Process Technology – I) |

## Unit –I : Acid and Alkali

1. In $SO_3$ reaction, which is/are the important variable that determines the rate and course of the reaction?
   a) Solvent
   b) Catalyst
   c) Chemical structure
   d) All of the mentioned
2. Sulphuric acid and oleum are also called _____ of $SO_3$.
   a) Hydrates
   b) Alcohol
   c) Amines
   d) Oxides
3. Excess acid can be used to achieve maximum completion of reaction.
   a) True
   b) False
4. Formation of the sulfuric acid by chemical means has also been considered as a method for completing the chlorosulfonation reaction.
   a) True
   b) False
5. Basicity of sulfuric acid is
   a) Monbasic
   b) Dibasic
   c) Tribasic
   d) None of these

6. Sulfuric acid is used for

   a) Fertilizer and leather
   b) Tin plating
   c) Refining of petroleum
   d) All of these

7. Strength of sulfuric acid is measured by

   a) Electrical conductance
   b) Refractive index
   c) Sonic transmittance
   d) All of these

8. Contact process replaced lead chamber process in the manufacturing of sulfuric acid due to

a) Sulfuric acid obtained by this method is pure and concentrated
b) Acid of any strength can be prepared by this method
c) Quite cheaper and easier to control
d) All of these

9. The most recent process for manufacturing of sulfuric acid is

a) Lead chamber process
b) Contact process
c) Double contact double absorption
d) None of these

10. Tower of Glover produced by nitrose method contain sulfuric acid

a) 93%
b) 98%
c) 75%
d) 80%

11. Sulphur dioxide is obtained at commercial scale from

a) Sulphur
b) Pyrites
c) Hydrogen sulfide source
d) All of these

12. Select the correct statement of an appropriate catalyst system

a) A catalyst system consists of diatomeous earth impregnated with 7% $V_2O_5$
b) By addition of alkali added in traces along with $V_2O_5$
c) By addition of water soluble compound along with $V_2O_5$
d) All of these

13. Oxidation of $SO_2$ to $SO_3$ is favoured by

a). low temperature and low pressure.

b). low temperature and high pressure.

c). high temperature and low pressure.

d). high temperature and high pressure.

14. The main use of HCl is in the

a). drilling of petroleum wells and pickling of steel sheets.

b). manufacture of cationic detergent.

c). treatment of spent fuel of nuclear reactor.

d). none of these.

15. The chamber process for the manufacturing of sulfuric acid is non catalytic process.
True
False

16. Sulphur addition in soap is done to

a) improve the soap texture.

b) cure pimples & dandruff.

c) fasten lather formation.

d) increase its cleansing action.

17. _____ process is used for the manufacture of sodium carbonate by ammonia soda process.

a) Ostwald's

b) Bosch

c) Solvay

d) Haber's

18. Frasch process is for

a) making oxygen

b) producing helium

c) mining sulphur

d) making nitrogen

19. Pick out the wrong statement.

a) Conversion of $SO_2$ to $SO_3$ in Monsanto-4 pass converter is about 98%.

b) The chemical formula of oleum is $H_2S_2O_7$, which is formed by saturating sulphuric acid with sulphur trioxide.

c) Vitriol oil is nothing but technical sulphuric acid.

d) Decomposition of sulphuric acid on heating does not start before its boiling.

20. Which of the following has sodium bicarbonate as its main constituent ?

a) Baking soda

b) Baking powder

c) Washing soda

d) none of these

21. Raw materials for 'Solvay Process' for manufacture of the soda ash are

a) salt, limestone and coke or gas.

b) ammonia, salt and limestone.

c) ammonia limestone and coke.

d) none of these.

22. Absorption of $SO_3$ in 97% $H_2SO_4$ is

a) exothermic

b) endothermic

c) not possible

d) none of these

23. Sulphuric acid solution having a specific gravity of 1.20 at room temperature is used mainly for the

a) fertiliser manufacture

b) car battery solution

c) synthesis of oleum

d) water treatment

24. The catalyst used in the production of elemental sulphur from (by oxidation-reduction) is

a) alumina

b) silica gel

c) platinum

d) nickel

25. The catalyst used in shift converter is

a) nickel

b) vanadium

c) silica gel

d) alumina

26. Catalyst used in the manufacture of sulphuric acid by chamber & contact processes are respectively

a) $V_2O_5$ & $Cr_2O_3$.

b) oxides of nitrogen & $Cr_2O_3$.

c) $V_2O_5$ on a porous carrier & oxides of nitrogen.

d) oxides of nitrogen & $V_2O_5$ on a porous carrier.

27. Which of the following processes does not produce $Cl_2$ as a co-product during the manufacture of caustic soda ?

a) Diaphragm electrolytic cell process

b) Mercury electrolytic cell process

c) Lime-soda process

d) None of these

28. Which of the following is not required in the manufacture of soda ash by Solvay process ?

a) Ammonia

b) Limestone

c) Nitric acid

d) None of these

29. Mannheim furnace is used in the manufacture of

a) hydrochloric acid.

b) $H_2SO_4$ by Chamber process.

c) calcium carbide.

d) corundum.

30. Pick out the wrong statement.

a) Chamber process of sulphuric acid manufacture produces pure acid of concentration < 80%.

b) Contact process of sulphuric acid manufacture produces pure acid of concentration $\geq$ 98%.

c) 75% oleum can be produced by distillation of 20% oleum.

d) Contact process of sulphuric acid manufacture uses nickel as the catalyst.

31. Platinum catalyst used in the earlier days of sulphuric acid manufacture by contact process suffers from the drawback like

a) high cost

b) fragile nature

c) easy poisoning tendency

d) all (a), (b) and (c)

32. In the manufacture of $H_2SO_4$, vanadium catalyst as compared to platinum catalyst

a) gives higher conversion efficiency.

b) has a longer life and is not poisoned by arsenic.

c) handles lower $SO_2$ content gas (7 -10% $SO_2$), thus increasing the capital cost of the plant.

d) all (a), (b) and (c).

33. At a given temperature, the equilibrium yield of $SO_3$ obtained from the oxidation of $SO_2$ is proportional to (where, *P* = pressure of the system )

a) *P*

b) $P^2$

c) 1/P

d) None of the above

34. Oleum produces fumes of

a) $SO_2$

b) $H_2SO_4$

c) $SO_3$

d) $SO_2 + H_2SO_4$

35. 20% oleum means that in 100 kg oleum, there are 20 kg of

a) $SO_3$ and 80kg of $H_2SO_4$.

b) $H_2SO_4$ and 80kg of $SO_3$.

c) $SO_3$ for each 100 kg of $H_2SO_4$.

d) none of these.

36. In the manufacture of sulphuric acid from elemental sulphur, the following sequence of major operations is followed :

a) furnace → converter → bsorber

b) furnace → evaporator → absorber

c) furnace → converter → evaporator

d) converter → furnace → absorber

37. $SO_2$ is bubbled through hot sugar cane juice to

a) act as an acidifying agent.

b) increase its concentration.

c) increase the amount of molasses.

d) increase the crystal size.

38. Sulphuric acid is mainly used in the _____ industry.

a) fertiliser

b) steel

c) paper

d) paint

39. Comparing sulphate process with sulphite process, we find that _____ in the later.

a) both temperature & pressure in the former is less than that

b) both temperature & pressure in the former is more than that

c) temperature is more in the former whereas pressure is more

d) pressure is more in the former whereas temperature is less

40. With increase in temperature, the equilibrium constant at constant pressure (Kp) for oxidation of sulphur dioxide

a) increases

b) increases linearly

c) decreases

d) decreases linearly

41. Chemical formula of oleum is

a) $H_2SO_3$

b) $H_2SO_4$

c) $H_2S_2O_7$

d) $H_2SO_7$

42. In multistage equilibrium conversion of $SO_2$ to $SO_3$ ($2SO_2 + O_2 \rightleftharpoons 2SO_3$), the reverse reaction becomes appreciable at a temperature of 550° C. The percentage equilibrium conversion of $SO_2$ to $SO_3$ can be increased by

a) increasing the oxygen concentration.

b) putting more quantity of $V_2O_5$ catalyst in the converter.

c) removing some quantity of $SO_3$ during intermediate stage.

d) maintaining low temperature & pressure in the converter

43. Sodium carbonate (soda ash) is not used in the manufacture of

a) fire extinguishers

b) sugar

c) baking powder

d) detergents

44. Glauber's salt is chemically represented by

a) $Na_2SO_4.10H_2O$

b) CaCl(OCl)

c) $CaSO_4.H_2O$

d) $(NH_4)_2SO_4$

45. Hydrochloric acid is also known as

a) oil of vitriol

b) muriatic acid

c) strong organic acid

d) green acid

46. Chemical name of soda ash is

a) sodium bicarbonate

b) sodium thiosulphate

c) potassium carbonate

d) none of these

47. Multistage catalytic converter is not used in the

a) conversion of $SO_2$ to $SO_3$

b) $NH_3$ synthesis reaction.

c) both (a) & (b).

d) neither (a) nor (b).

48. In contact process, $SO_3$ is absorbed in 97% $H_2SO_4$ and not in water, because

a) $SO_3$ gas is sparingly soluble in water.

b) water forms an acid mist, which is difficult to absorb.

c) the purity of acid is affected.

d) scale formation in the absorber is to be avoided.

49. _____ is obtained as a by-product in the manufacture of sodium hydroxide using brine.

a) Chlorine

b) Ammonium chloride

c) Sodium carbonate

d) Sodium bi-carbonate

50. Sulphuric acid completely saturated with sulphur trioxide is called

a) concentrated sulphuric acid.

b) oleum.

c) sulphurous acid.

d) dilute sulphuric acid.

51. Molecular weight of Sulfuric Acid is _____gm/mole.

a) 78
b) 88
c) 98
d) 108

52. Molecular weight of Hydrochloric Acid is _____gm/mole.

a) 25.5
b) 36.5
c) 47.5
d) 58.5

53. Molecular weight of Sodium Hydroxide is _____gm/mole.

a) 30
b) 40
c) 50
d) 60

54. Molecular weight of Sodium Carbonate is _____gm/mole.

a) 100
b) 106
c) 110
d) 120

55. Molecular weight of Sulfur trioxide is _____gm/mole.

a) 80
b) 90
c) 100
d) 110

56. Sulfuric Acid is known as strong acid.

True

False

Ans: True

57. Sodium Hydroxide is known as weak base.

True

False

Ans: False

## Unit 2: Cement and Lime

1) Excess in lime causes _____
a) The cement to shrink and integrate
b) The cement to shrink and disintegrate
c) The cement to expand and integrate
d) The cement to expand and disintegrate

2) Silica in excess causes _____
a) The cement to set slowly
b) The cement to set quickly
c) The cement to expand
d) The cement to disintegrate

3) Alumina in excess causes _____
a) Reduces the strength of the cement
b) Inceases the strength of the cement
c) No change
d) Sometimes increase or decrease the strength of the cement

4) Which compound gives the colour to the cement?
a) Lime
b) Silica
c) Iron Oxide
d) Alumina

5) When concrete is to be laid under water _____ is to used.
a) Rapid Hardening Cement
b) Ordinary Portland Cement
c) Quick Setting Cement
d) Low Heat Cement

6) Which of the following is correct for Low Heat Cement?
a) Suitable for use in cold weather areas
b) Heat of hydration is reduced by tri calcium aluminate content
c) This cement requires longer period of curing
d) This cement contains high aluminate %age usually between 35-55%.

7) Which cement is used in sewage and water treatment plants?
a) Rapid Hardening Cement
b) Low Heat Cement
c) Sulphate Resisting Cement
d) Quick Setting Cement

8) Which cement is used for mainly building construction where strength required with age?
a) Rapid Hardening Cement
b) Low Heat Cement
c) Portland Pozzolana Cement
d) Quick Setting Cement

9) Which cement is used for artificial marble?
a) Rapid Hardening Cement
b) Sulphate Resisting Cement
c) Coloured Cement
d) Quick Setting Cement

10) Which cement is used to create bond with old concrete surface?
a) Rapid Hardening Cement
b) Expansive Cement
c) Sulphate Resisting Cement
d) Low Heat Cement

11) Which cement is used to store for longer duration in wet climatic conditions?
a) Expansive Cement
b) Ordinary Portland cement
c) Hydrophobic Cement
d) Quick Setting Cement

12) Which cement is used for the construction of water-retaining structure like tank, reservoirs, swimming pool, dam etc?
a) Waterproof Portland cement
b) Colored Cement
c) High Alumina Cement
d) Low Heat Cement

13) ____ cement is used for formwork that can be removed earlier and reused in other areas which save the cost of formwork.
a) Rapid Hardening Cement

b) Colored Cement
c) High Alumina Cement
d) Low Heat Cement

14) Which cement is mainly used for interior and exterior decorative works?
a) Rapid Hardening Cement
b) Colored Cement
c) High Alumina Cement
d) Low Heat Cement

15) Which cement is used for works economic where considerations is predominant? Reservoirs, retaining walls, swimming pools, dams, bridges, piers etc.
a) Waterproof Portland Cement
b) Colored Cement
c) High Alumina Cement
d) Blast Furnace Slag Cement

16) Portland cement is composed of four major oxides (CaO, $SiO_2$, $Al_2O_3$, $Fe_2O_3$ $\geq$90%).
a) True
b) False

17) Insoluble Residue mainly comes from which compound?
a) Lime
b) Soda
c) Silica
d) Alumina

18) On cooling below 1250$^oC$, tricalcium silicate decomposes _____
a) Fast
b) Slowly
c) Never
d) Depends on the conditions

19) Tricalcium silicate and Dicalcium Silicate require approximately the _____ amount of water for hydration.
a) Same
b) More
c) Less
d) Depends on the paste

20) _____ is not use to make Portland Cement (PC).
a) Calcareous Rocks
b) Argillocalcareous Rocks
c) Argillaceous Rocks
d) Sand

21) Which one doesn’t comes under Calcareous Rocks?
a) Limestone
b) Cement rock
c) Chalk
d) Marine shell deposits

22) What is the percentage of CLINKER in Portland Cement (PC)?
a) 2-3%
b) 4-6%
c) 2-6%
d) 3-5%

23) In cement industry, as the materials pass through the kiln their temperature is rised upto ____
a) 1300-1600 °C
b) 1100-1500 °C
c) 1300-1500 °C
d) 1100-1600 °C

24) What is the diameter and length of the kiln respectively for the manufacturing of cement?

a) 6m and 200m
b) 200m and 6m
c) 6m and 6m
d) 200m and 200m

25) In cement industry, prepared raw mix is fed into the rotary kiln.
a) True
b) False

26) What is the composition of making the Mortar?
a) Portland Cement + Water
b) Portland Cement + Water + Sand
c) Portland Cement + Water + Sand + Gravel
d) Water + Sand + Gravel

27) Cement is a material with adhesive and cohesive properties.
a) True
b) False

28) What is wet process?
a) Grinding and mixing of the raw materials in their dry state
b) Grinding and mixing of the raw materials in their medium state
c) Grinding and mixing of the raw materials in their wet state
d) Grinding and mixing of the raw materials in their overheated state

29) In cement industry, what is the moisture content in slurry for wet process?
a) 35-50%
b) 12%
c) 40-45%
d) 100%

30) Size of the kiln needed to manufacture the cement is bigger for wet process.
a) True
b) False

31) Among the below statement, which one is correct for wet process?
a) The amount of heat required is high, so the required fuel amount is high
b) The amount of heat required is lesser, so the required fuel amount is less
c) The amount of heat required is high, so the required fuel amount is less
d) The amount of heat required is less, so the required fuel amount is high

32) In cement industry, the slurry with the desired lime content passes into the _____
a) Clinker
b) Rotary kiln
c) Slurry tank
d) Cement silo

33) In the wet process of cement manufacturing, the machinery and equipments do not need much maintenance.
a) True
b) False

34) In the wet process of cement manufacturing, the kiln is _____
a) Horizontal
b) Vertical
c) Slightly inclined with vertical
d) Slightly inclined with horizontal

35) In the wet process of cement manufacturing raw material is heated to about _____.
a) 650-900 °C
b) 900-1300 °C
c) 1300-1450 °C
d) 900-1050 °C

36) What is dry process of cement manufacturing?

a) Grinding and mixing of the raw materials in their dry state
b) Grinding and mixing of the raw materials in their wet state
c) Grinding and mixing of the raw materials in their medium state
d) Grinding and mixing of the raw materials in their super dry state

37) To obtain cement dry powder, lime stones and shales or their slurry, is burnt in a rotary kiln at a temperature between ___
a) 1100° and 1200°C
b) 1200° and 1300°C
c) 1300° and 1400°C
d) 1400° and 1500°C

38) The blended meal is sieved and fed into a rotating dish called a _____ in the process of cement manufacturing
a) Clinker
b) Kiln
c) Granulator
d) Raw meal

39) What is the moisture content in slurry for dry process of cement manufacturing?
a) 35-50%
b) 12%
c) 40-45%
d) 100%

40) Among the below statement, which one is correct for dry process of cement manufacturing?
a) The amount of heat required is high, so the required fuel amount is high
b) The amount of heat required is less, so the required fuel amount is less
c) The amount of heat required is high, so the required fuel amount is less
d) The amount of heat required is less, so the required fuel amount is high

41) In dry process of cement manufacturing, the machinery and equipment do not need much maintenance.
a) True
b) False

42) What is the percentage of cement produced in dry process?
a) 85%
b) 70%
c) 75%
d) 80%

43) What is hydration of cement?
a) Chemical reaction of cement with acid
b) Chemical reaction of cement with water
c) Chemical reaction of cement with base
d) Chemical reaction of cement with salt, and acid

44) By which of the following ways is lime obtained?
a) Naturally

b) Quarrying
c) Burning limestone
d) Crushing limestone

45) Lime obtained from calcination of Pure Limestone is called:
a) Quick Lime
b) Pure Lime
c) Lean Lime
d) Rich Lime

46) What is the speciality of Hydraulic Lime?
a) Contains impurities
b) Does not set under water
c) Contains clay
d) Perfectly white in colour

47) Lime is widely used for:
a) Waste water treatment
b) Manufacturing tiles
c) Jewellery making
d) As an aggregate

48) Slaking of lime refers to:
a) Mixing NaCl in hydraulic lime
b) Mixing water in quick lime
c) Mixing water in limestone
d) Mixing NaCl in quick lime

49) Which of the following methods yields quick, small supplies of Quick Lime?
a) Intermittent kiln
b) Continuous kiln
c) Clamp burning
d) Kankar burning

50) The term Calcination comes from:
a) Greek word Calcinare
b) Latin word Calcinare
c) Greek word Calcinate
d) Latin word Calcinate

51) The chemical composition of quick lime is _____
a) CaS
b) CaO
c) MgO
d) MgS

52) Slaked lime is _____
a) Calcium oxide
b) Hydrated oxide of calcium
c) Calcium carbonate
d) Calcium silicate

53) Pure limestones are indicated by _____ colour.
a) Brown
b) Blue
c) Grey
d) White

## Unit 3: Coal and Coal Chemicals

1) In proximate analysis, which of the following elements can be found?
a) % of moisture content
b) % of carbon
c) % of hydrogen
d) % of nitrogen

2) The moisture content in the coal can be given by heating the coal for _____ hours.
a) 2
b) 1
c) 4
d) 6

3) To find the % of volatile matter in coal, it must be heated in the crucible at _____ temperature.
a) $5261^0$C
b) $3281^0$C
c) $825^0$C+$10^0$C
d) $925^0$C+$20^0$C

4) To calculate the % of ash content the dry coal is heated in _____
a) blast furnace
b) muffle furnace
c) reverberatory furnace
d) electric furnace

5) High % of moisture in coal is undesirable because _____
a) increases the cost of transport
b) increases the cost of calorific value
c) increases the cost of efficiency
d) decreases the cost of storage cost

6) Ultimate analysis of coal is also called as:
a) quantitative analysis

b) elementary analysis
c) qualitative analysis
d) secondary analysis

7) In determination of % of C and H, the coal is burnt in the stream of _____
a) pure sulphur
b) pure nitrogen
c) pure alcohol
d) pure oxygen

8) Weight of the coal is 2g and after heating the coal sample, the weight of the coal is 1.82g. What is the % of the moisture in coal?
a) 20%
b) 9%
c) 10%
d) 30%

9) Most available form of solid fuel is:
a) coal
b) wood
c) petrol
d) lignite

10) For the generation of electricity, which source is used largely throughout the world?
a) coal
b) hydro power
c) wood
d) solar energy

11) The formation of coal is explained by _____
a) ex-situ theory
b) in-situ theory
c) molecular theory
d) nuclear theory

12) What is the main application of lignite?
a) domestic fuel
b) railway engines
c) used for steam generation in thermal power plant
d) in vehicles

13) Lignite is also called as _____
a) black coal
b) brown coal
c) char coal
d) crude oil

14) Which of the following fuels has the highest calorific value?
a) lignite
b) wood
c) bituminous
d) anthracite

15) All types of coals can be converted into coke.
a) True
b) False

16) The process of converting coal into coke is called _____
a) Coking
b) Carbonization
c) Decarbonization
d) Isomerization

17) Which coals are suitable for metallurgical purposes?
a) Coking
b) Carburized
c) Non-coking
d) Decarburized

18) Only bituminous type of coal can be coking.
a) True
b) False

19) Which of the following is a secondary solid fuel?
a) Wood
b) Charcoal
c) Peat
d) Anthracite

20) Which product is formed after the process of carbonisation?
a) Charcoal
b) Coal tar
c) Coal gas
d) Coke

21) Which of the following should be present in least amount, so as to give a good metallurgical coke?
a) Ash content
b) Moisture content
c) Volatile matter
d) Sulphur and phosphorous content

22) What happens when coke breaks into fine particles during the charging of the furnace?
a) It increases the rate of combustion

b) It cools down the temperature of furnace
c) It chokes the air passages
d) It stops the whole process

23) Coal is a good conductor of heat and electricity.
a) True
b) False

24) In which type of plant does the carbonisation process is done?
a) Thermal power plant
b) Blast furnace process
c) Coke-ovens
d) Destructive distillation plant

25) How much yield of coke is produced in low temperature carbonisation?
a) 75-80 %
b) 60-70 %
c) 100 %
d) 85-90%

26) High temperature carbonisation process is used to produce _____
a) Brown coal
b) Gas coke
c) Coal tar
d) Coal gas

27) Proximate analysis includes the estimation of ash, carbon, hydrogen, sulphur, nitrogen and oxygen.
a) True
b) False

28) At what temperature should the coal be heated so as to determine the moisture content of coal?
a) 90-100$^{o}$C
b) 145-155$^{o}$C
c) 125-140$^{o}$C
d) 105-110$^{o}$C

29) On what factors does the specific gravity of coal depends?
a) Its calorific value and ash content
b) Its ignition temperature and calorific value
c) Type of coal and ash content
d) Type of coal and calorific value

30) In analysis of coal, determination of _____ is done by Kjeldahl method.
a) Volatile matter
b) Nitrogen
c) Ash
d) Oxygen

31) Good quality of coal should have _____ % of oxygen.
a) low
b) high
c) 100
d) 0

32) Percentage of ash by analysis of coal is given by _____
a) (weight of residue/weight of sample) × 100
b) (weight of sample – weight of residue) × 100
c) (weight of sample – weight of residue)/weight of sample × 100
d) (weight of residue – weight of sample) × 100

33) In proximate analysis of coal, %fixed carbon = _____
a) 100 – % (ash + volatile matter + moisture)
b) 100 – % (ash + moisture)
c) 100 – % (ash + moisture) + %volatile matter
d) 100 – % (moisture + volatile matter)

34) By which process does the impurities of coal are generally removed?
a) Screening process
b) Sorting
c) Blending
d) Wet washing

35) Which of the following is not an advantage of the cleaning of coal?
a) It increases the cost of the coal
b) It increases the efficiency of coal
c) It removes the impurities like phosphorous and sulphur
d) It reduces its ash content

36) What is the main purpose for a blending of coal?
a) To produce more amount of coal
b) To produce good quality of coal
c) To decrease the cost of coal
d) To produce different types of coal at same time

37) The rate of combustion cannot be easily controlled in combustion of pulverised coal.
a) True
b) False

38) A good quality coal should have
a) high ash content
b) high sulphur
c) low fusion point of ash
d) none of the above

39) How can we obtain liquid coal synthetically?
a) Carbonisation of coal
b) Hydrogenation of coal
c) By heating of coal
d) By cooling of coal

40) The greyish-black residue left after the destructive distillation of coal is called coke.

True

False

41) Coke is used in the manufacture of _____.

A. sodium

B. mercury

C. steel

D. potassium

42) Which amongst the following is used in the manufacturing of perfumes?

A. Coal tar

B. Coal gas

C. Coke

D. Kerosene

43) Which of the following is an exhaustible resource?

A. Air

B. Coal

C. Water

D. Sunlight

44) Which of the following is used for making naphthalene balls?

A. Coal tar

B. Petroleum

C. CNG

D. Paraffin

45) Which one of the following is an inexhaustible natural resource

a. Coal

b. Petroleum

c. Water

d. forests

46) Which of the following is known as black gold?

(a) Petroleum

(b) Coal Tar

(c) Coal

(d) Natural gas

47) ***Hydrogenation*** is a chemical reaction between molecular hydrogen and an element or compound, ordinarily in the presence of a catalyst.

True

False

48) Which of the following coal has highest moisture content?

a) Sub-bituminous coal

b) Bituminous coal

c) Anthracite coal

d) Peat coal

49) Grindability of coal should be low.

a) True

b) False

50) What do you mean by pulverization?

a) Burning of crushed coal

b) Burning of uncrushed coal

c) Crushing of coal into small particles

d) None of the above

51) Calorific value of bagasse is higher than lignite.

a) True

b) False

## Unit-4: Metallurgical Industries

1. Pig iron is a product of _____
   a) Cupola
   b) Bessemer converter
   c) Open hearth furnace
   d) Blast furnace
2. Cast iron is a product of _____
   a) Cupola
   b) Bessemer converter
   c) Open hearth furnace
   d) Blast furnace
3. Wrought iron is a product of _____
   a) Cupola
   b) Bessemer converter
   c) Puddling furnace
   d) Blast furnace
4. Steel is a product of _____
   a) Cupola
   b) Blast furnace
   c) Puddling furnace
   d) Bessemer converter
5. Red hardness of an alloy steel can be improved by adding _____
   a) Tungsten
   b) Vanadium
   c) Manganese
   d) Titanium
6. Wear resistance of an alloy steel can be improved by adding _____
   a) Tungsten
   b) Vanadium
   c) Manganese
   d) Titanium
7. Corrosion resistance of an alloy steel can be improved by adding _____
   a) Tungsten
   b) Vanadium
   c) Chromium
   d) Titanium
8. Tensile strength of an alloy steel can be improved by adding _____
   a) Nickel
   b) Vanadium
   c) Manganese
   d) Titanium
9. Which of the following induces fine grain distribution in alloy steel?
   a) Nickel

b) Vanadium
c) Manganese
d) Titanium

10. Abrasion resistance of an alloy steel can be improved by adding _____
a) Tungsten
b) Vanadium
c) Manganese
d) Chromium

11. Annealing improves
(A) Grain size

(B) Mechanical properties

(C) Electrical properties

(D) All of above

12. The product from blast furnace is called
(A) Cast Iron

(B) Wrought Iron

(C) Pig Iron

(D) Steel

13. Which is closest to the purest form of the iron?
(A) Cast Iron

(B) Wrought Iron

(C) Pig Iron

(D) Steel

14. Steel can be hardened quickly by the process of
(A) Induction hardening

(B) Nitriding

(C) Cyaniding

(D) Carburizing

15. Materials are softened by
(A) carburising

(B) tempering

(C) normalizing

(D) annealing

16. Steel is mainly an alloy of
    a) Iron and Carbon
    b) Sulphur and Zinc
    c) Zinc and tin
    d) Phosphorous and Tin
17. Which of the following is a disadvantage of Steel?
    a) High strength per unit mass
    b) High durability
    c) Fire and corrosion resistance
    d) Reusable
18. Structural Steel normally has carbon content less than _____
    a) 1.0%
    b) 0.6%
    c) 3.0%
    d) 5.0%
19. What happens when Manganese is added to steel?
    a) decreases strength and hardness of steel
    b) improves corrosion resistance
    c) decreases ductility
    d) improves strength and hardness of steel\
20. Which of the following is added to steel to increase resistance to corrosion?
    a) Carbon
    b) Manganese
    c) Sulphur
    d) Copper
21. High conductivity copper is used _____
    a) In electrical engineering
    b) To reduce porosity
    c) To raise softening temperature
    d) To manufacture semiconductor elements

22. Which one of the following is not an ore of aluminium?

(a) Bauxite

(b) Corundum

(c) Epsomite

(d) Cryolite

23. Aluminium metal is purified by:

(a) Hooe’s process

(b) Hall’s process

(c) Serpeck's process

(d) Baeyer's process

24. In the alumino – thermite process, Al acts as

(a) An oxidising agent

(b) A flux

(c) Solder

(d) A reducing agent

25. Which of the following reaction forms the basis of Goldschmith alumino – thermite process?

(a) $2Al + N_2$----->2AIN

(b) $2Al + 3Cl_2$---->.$2AlCl_3$

(c) $2Al + 6HCl$ ----> $2AlCl_3 + 3H_2$

(d) $2Al + Fe_2O_3$---->$Al_2O_3 + 2Fe$

26. The function of fluorspar in the electrolytic reduction of alumina dissolved in fused cryolite (Na3AlF6) is:

(a) As a catalyst

(b) To lower the temperature of the melt and to make fused mixture very conducting

(c) To decrease the rate of oxidation of carbon at the anode

(d) None of the above

27. Copper is extracted from sulphide ore using the method

(a) Carbon reduction

(b) Carbon monoxide reduction

(c) Auto reduction

(d) None of these

28. In the extraction of copper from copper pyrites, iron is removed as

(a) $FeSO_4$

(b) $FeSiO_3$

(c) $Fe_3O_4$

(d) $Fe_2O_3$

29. Froth floatation process is used for the concentration of the ore of

(a) Fe

(b) Al

(c) Cr

(d) Cu

30. In the extraction of copper, metal is formed in the Bassemer converted due to reaction

$Cu_2S + 2Cu_2O$ ---->$6Cu + SO_2$

$Cu_2S$ ----> $2Cu + S$

$Fe + Cu_2O$---->$6Cu + FeO$

$2Cu_2O$ ---->$4Cu + O_2$

31. High purity copper metal is obtained by

(a) Carbon reduction

(b) Hydrogen reduction

(c) Electrolytic reduction

(d) Thermite reduction

32. Silica is added to roasted copper ore during extraction in order to remove

(a) Cuprous sulphide

(b) Ferrous oxide

(c) Ferrous sulphide

(d) Cuprous oxide

33. In the electrolytic refining of copper, Ag and Au are found

(a) On anode

(b) In electrolyte solution

(c) In anode mud

(d) In cathode mud

34. Blister copper is

(a) Pure copper

(b) Ore of copper

(c) Alloy of copper

(d) Impure copper

35. Silver can be separated from lead by

(a) Fractional crystallization

(b) Amalgamation

(c) Cupellation

(d) Addition of zinc (Parke's method)

36. Percentage of silver in the alloy german silver is

(a) 2.5%

(b) 1.5%

(c) 10 %

(d) 0%

37. AgCl on fusion with sodium carbonate, gives

(a) $Ag_2CO_3$

(b) $Ag_2O$

(c) Ag

(d) $Ag_2C_2$

38. An alloy which does not contain copper is

(a) Bronze

(b) Magnalium

(c) Brass

(d) Bell metal

39. Cinnabar is the ore of

(a) Zn

(b) Cd

(c) Hg

(d) Ag

40. Heamatite ore is concentrated by

(a) Gravity separation method

(b) Forth floatation

(c) Amalgamation

(d) Hand picking

41. The material mixed before ore is subjected for smelting in the extraction of iron are

(a) Cake and silica

(b) Coke and limestone

(c) Limestone and silica

(d) Coke, limestone and silik

42. Electrolysis usually used for materials like _____
a) Zinc, cadmium
b) Aluminum, nickel
c) Silver, tin
d) Silicon, antimony

43. The definition of ore is dependent on _____
a) Quantity
b) Size
c) Colour
d) Quality

44. Which of the following is a chemical process used to extract aluminium?
a) Osmosis
b) Radiography
c) Heliography
d) Pyrometallurgy

45.Recycling of aluminium requires _____ of energy to make new aluminium.
a) 0.5%
b) 25%
c) 5%
d) 50%

46. Hydrometallurgy is the process of extracting _____ from _____
a) flight parts, metals
b) metals, flight parts
c) metals, ores
d) ores, metals

47. Aluminium can be extracted using electrometallurgy.
a) True
b) False

48. The Hall-Heroult process is used for _____ aluminium.
a) breaking
b) distributing
c) smelting
d) mixing

49. The Hall-Heroult process is carried out at a temperature of _____ industrially.
a) 940-980°C
b) 200-300°C
c) 10,000-50,000°C
d) 50-70°C

50. Cryolite cannot be used in the Hall-Heroult process of smelting aluminium.
a) True
b) False

51. The Hall-Heroult process produces around _____ pure aluminium.
a) 100%
b) 20%
c) 98%
d) 4%

52. What amount of impurity is allowed for copper to be used in electric applications?
a) 0.1%
b) 0.2%
c) 0.3%
d) 0.4%

53. High conductivity copper is used _____
a) In electrical engineering
b) To reduce porosity
c) To raise softening temperature
d) To manufacture semiconductor elements

54. What is the melting point of Copper?
a) 419
b) 600
c) 1084
d) 2562

55. Brass is an alloy of copper and _____
a) Zinc
b) Tin
c) Tin and zinc
d) Nickel

56. What is the appearance of copper?
a) Gold
b) Blue
c) Yellow-green
d) Red-orange

57. _____ is an alloy of copper and tin.
a) Brass
b) Bronze
c) Gunmetal
d) Cupro-nickel

58. _____ is added to aluminum bronze to increase strength and hardness.
a) Nickel
b) Lead
c) Iron
d) Silicon

59. Alloys containing copper, tin, and zinc are known as _____
a) Gunmetal
b) Bronze

c) Brass
d) Cupro-nickel

60. Which copper alloy is used for making cutlery?
a) German silver
b) Cupronickel
c) Brass
d) Bronze

61. Copper is mostly used in

a) roofing
b) construction
c) electrical equipment
d) plumbing

62. Brass is an alloy made up of copper and

a) zinc
b) carbon
c) Sulphur
d) water

63. Copper and aluminum have effect on magnet of

a) attract
b) repel
c) both attract and repel
d) no effect

64. Due to its high heat exchange rate, copper is used in

a) dispenser
b) refrigerator
c) AC
d) all of the above

65. Iron needs higher temperature ranges for its extraction.
a) True
b) False

66. Which colour is obtained by copper alloys, when zinc is added to it?
a) Red
b) Blue
c) Silver
d) Yellow

67. What is the general density of steel?
a) 6.67 g/cc
b) 7.87 g/cc
c) 8.77 g/cc
d) 5.77 g/cc

68. Which of the following metals is present in the anode mud during the electrolytic refining of copper?
(a) Sodium
(b) Aluminium
(c) Gold
(d) Iron
69. Rusting of iron takes place in
(a) ordinary water
(b) distilled water
(c) both ordinary and distilled water
(d) none of the above
70. During smelting, an additional substance is added which combines with impurities to form a fusible product known as
(a) slag
(b) mud
(c) gangue
(d) flux
71. Which one of the following metals is the best conductor of electricity?

a) iron
b) copper
c) silver
d) aluminium

72. Duralumin is an alloy of copper and

a) lead
b) zinc
c) tin
d) aluminium

73. Metals are good conductors of electricity because

a) they are electrically unstable
b) atoms in their molecules are loosely packed
c) they have free electrons
d) they are ductile

74. Wrought iron is

(a) hard

(b) high in strength

(c) highly resistant to corrosion

(d) heat treated to change its properties

(e) least resistant to corrosion.

75. Pig iron is the name given to

(a) raw material for blast furnace
(b) product of blast furnace made by reduction of iron ore
(c) iron containing huge quantities of carbon
(d) iron in molten form in the ladles
(e) iron scrap.
76. Mild steel belongs to the following category
(a) low carbon steel
(b) medium carbon steel
(c) high carbon steel
(d) alloy steel
(e) special steel.

77. Malleability of a material can be defined as
(a) ability to undergo large permanent deformations in compression
(b) ability to recover its original form
(c) ability to undergo large permanent deformations in tension
(d) all of the above
(e) none of the above.
78. Ductility of a material can be defined as
(a) ability to undergo large permanent deformations in compression
(b) ability to recover its original form
(c) ability to undergo large permanent deformations in tension
(d) all of the above
(e) none of the above.

## Unit 5: Polymers

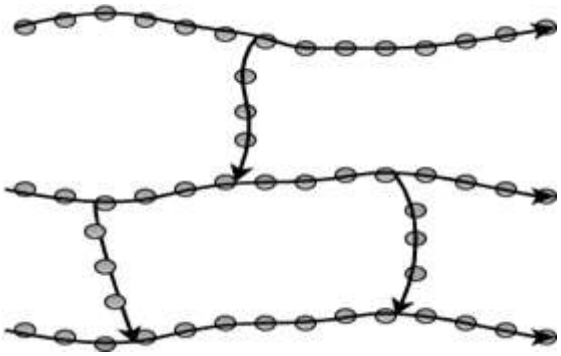
1) Which of the following is a thermosetting polymer?
a) polystyrene
b) polyolefins
c) nylons
d) phenolic resins

2) The number of repeating units in a polymer is known as _____
a) monomer
b) degree of polymerization

c) molecule
d) chain

3) A polymer made of identical monomer units is called _____
a) Homopolymer
b) Linear polymer
c) Copolymer
d) Branched polymer

4) Which molecular structure does the below figure represent?



a) Linear
b) Branched
c) Cross-linked
d) Network

5) Which of the following is not a stage of addition polymerization?
a) Initiation
b) Propagation
c) Termination
d) Recrystallisation

6) Addition of different types of monomers to form polymer chains is known as _____
a) Chain reaction polymerization
b) Copolymerization
c) Combination
d) Disproportionation

7) Which of the following is thermosetting polymer
(a) Neoprene
(b) PVC
(c) Nylon-6,6
(d) Bakelite

8) Caprolactum is used for preparation of
(a) Nylon-6
(b) Nylon-6,6

(c) Nylon 6, 10
(d) Nylon-2 – Nylon-6

9) The polymer which is used in manufacture of squeeze bottles is
(a) Polystyrene
(b) Teflon
(c) Polypropene
(d) Low density polythene

10) Which of the following is a biodegrable polymer?
(a) Cellulose
(b) Polyethene
(c) PVC
(d) Nylon-6

11) A polymer of butadiene and acrylonitrile is called
(a) Buna-2
(b) Buna-N
(c) Buna-S
(d) Buna-A

12) The manufacture of nylon-6,6 involves condensation of
(a) Phenol and formaldehyde
(b) Urea and formaldehyde
(c) Adipic acid and hexamethylene diamine
(d) Ethylene glycol and pthalic acid

13) $F_2C = CF_2$ is a monomer of
(a) Teflon
(b) Glyptal
(c) Nylon-6
(d) Buna-S

14) Which of the following statements is not true about low density polythene?

(a) Tough
(b) Hard
(c) Poor conductor of electricity
(d) Highly branched structure

15) Where among the following fields polypropylene cannot be used?
a) insulating cables and wires
b) home appliances
c) automobile appliances
d) furniture

16) Thermoplastics are formed by _____
a) Addition polymerization
b) Copolymerization
c) Condensation polymerization
d) Isomerism

17) Which of the following is not a property of thermoplastics?
a) Recyclable
b) Soft and weak
c) Easy to mold
d) Can be used at high temperatures

18) Which of the following is an example of a thermoplastic?
a) Urethane
b) Melamine
c) Acetal
d) Epoxide

19) Which of the following is not an example of a commodity thermoplastic?
a) Polyethylene
b) Polypropylene
c) Polystyrene
d) Phenolic

20) Which of these is not a type of polyethylene?
a) Low-density polyethylene
b) High-density polyethylene
c) Linear high-density polyethylene
d) Ultra-high molecular weight polyethylene

21) Which of the following are applications of polypropylene?
a) Buckets, bottle crates
b) CD cases, food boxes
c) Wire insulation, piping
d) Valves, fittings

22) Thermosetting plastics are formed by _____
a) addition polymerization
b) copolymerization
c) condensation polymerization
d) isomerism

23) Which of the following is a property of thermosetting plastics?
a) Can be molded
b) Soft

c) Recyclable
d) Can be used at high temperatures

24) Phenolics are otherwise commonly known as _____
a) Bakelite
b) Polyformaldehyde
c) Urea formaldehyde
d) Melamine formaldehyde

25) An ***addition polymer*** is a ***polymer*** that forms by simple linking of monomers without the co-generation of other products.

True

False

26) **Condensation polymers** *are any kind of* **polymers** *formed through a* **condensation** *reaction, where molecules join together and losing small molecules as byproducts*

True

False

27) Polyethylene is called a ***linear*** or straight-chain ***polymer***

True

False

28) A **linear polymer** is simply a chain in which all of the carbon-carbon bonds exist in a single straight line.

True

False

29) HDPE is known as

a) High Density Polyethylene
b) High Definition Polyethylene
c) Hexa Diamine Polyethylene
d) None of Above

30) Epoxy resins are used in the manufacturing of:
a) Glass
b) Fabric
c) Plywood
d) Plastic

31) A ***monomer*** is a small molecule. When ***monomers*** connect to each other, they form a polymer

True

False

32) A ***copolymer*** is a polymer that is made up of two or more monomer species.

True

False

33) The most commonly used polyester is known as

a) Terylene
b) nylon
c) fat
d) protein

34) Nylon 6 and Nylon 6,6 are synthetic polymers called a

a) Polyethers
b) Polyesters
c) Polyamides
d) Polyolefins

35) A fiber that will float on water is

a) Nylon
b) Polyester
c) Acrylic
d) Polypropylene

36) Among the following, the fiber that has the lowest density is,

a) Cotton
b) Nylon
c) Polyester
d) Polypropylene

37) One of the raw materials of polyester is ……..

a) caprolactum
b) terephthalic acid
c) adipic acid
d) citric acid

38) The density of polyester fibre is

a) More than cotton
b) Less than cotton but more than nylon
c) Less than nylon but more than polypropylene
d) Nearly equal to that of acrylic fibre

39) Teflon is known as the trademark name for _____
a) Tetrafluoride
b) Tetrafluoroethylene
c) Fluorinated ether propane
d) Fluoro ethyl propylene

40) PVC is widely used to make pipes because:
a) Cost effective
b) Does not react to chemicals
c) Easily available
d) Easy to transport

41) Which of the following PVC product is not there in the market?
a) PVC brick decor
b) PVC door
c) PVC cement
d) PVC plaster

42) Poly vinyl chloride is a _____
a) Blue coloured compound
b) Inflammable
c) Weak
d) Brittle

43) Bakelite is _____
a) Good anion exchanging resin
b) Attacked by acids
c) Attacked by salts
d) Resistant to alkalis

44) TEFLON has _____
a) High melting point
b) Low melting point
c) Low density
d) Good conduction of electricity

45) TEFLON is used to make chemical carry pipes due to its _____
a) extreme chemical resistance
b) Resistance towards alkalis
c) Resistance towards strong acids
d) Resistance towards salts

46) Thermo plastics becomes _____ on heating.
a) Rigid
b) Moulded
c) Soft
d) Brittle

47) _____ increases the flexibility of the polymer.
a) Resins
b) Catalysts
c) Lubricants
d) Plasticizers

48) Poly vinyl chloride is produced by the free radical chain polymerisation of the vinyl chloride in presence of the benzoyl peroxide.
a) True
b) False

49) LDPE is known as

a) Low Density Polyethylene
b) Low Definition Polyethylene
c) Large Density Polyethylene
d) None of the above

50) Bakelite cannot be molded very quickly.

True

False

51) Bakelite cannot be used for making the handles of a variety of utensils.

True

False

52) Melamine formaldehyde is not an example of cross-linked polymer.

True

False

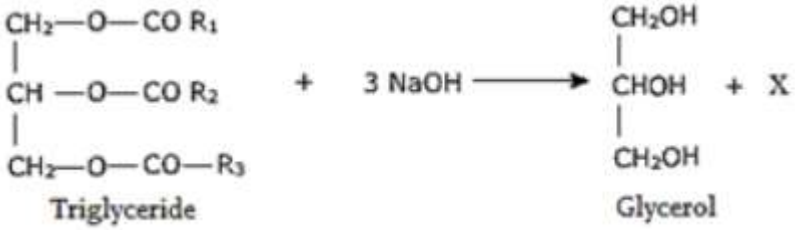
53) Cross linked polymers are polymers in which monomer units are cross linked together to form a three dimensional network polymers .

True

False

## Unit- 6: Miscellaneous

1. Glycerol can be formed through digestion of which of the following?
   a) galactose
   b) fats
   c) glucose
   d) sucrose
2. What is the name of the process of formation of glycerol via formation of allyl chloride?
   a) Epichlorohydrine
   b) Acrolein
   c) Propylene oxide
   d) Chloroform process
3. Fatty acids and glycerol ($C_3H_8O_3$) are produced after hydrolysis of which of the following?
   a) amino acids
   b) fats
   c) starch
   d) cellulose
4. Why synthetic production of glycerol is not commercially successful?
   a) Because process is expensive
   b) Because no marketing demands
   c) Because process is hazardous
   d) Because of the large-scale production of biodiesel from fats
5. Which of the following is not the step for the isolation of glycerine form spent lye?
   a) Brine Solution Preparation
   b) Saponification and salting
   c) Zone distillation
   d) Glycerin Recovery from Spent Soap Lye
6. What will be the product X in the formation of glycerol?

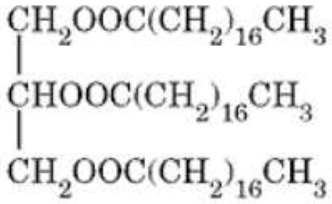



   a) R-ONa
   b) RCOH

c) RCOONa
d) R-ONa and RCOONa both can be formed

7. Soaps are _____ based soapy detergents.
   a) Water
   b) Kerosene
   c) Oil
   d) Acid
8. The saponification of a fat or oil is done using _____ solution for hot process.
   a) KOH
   b) NaOH
   c) HCl
   d) NaCl
9. The saponification of a fat or oil is done using _____ solution for cold process.
   a) KOH
   b) NaOH
   c) HCl
   d) NaCl
10. Soft soaps are the limitation of hot process because of their _____
    a) High alkalinity
    b) Low alkalinity
    c) Low solubility in water
    d) High solubility in water
11. Select the incorrect statement from the following option.
    a) Hard soaps are the sodium carboxylates
    b) Soft soaps are potassium carboxylates
    c) Hard soaps are manufactured by cold process
    d) Example of soft soap – shampoo and shaving cream
12. . Which of the following is the residual product in the formation of soap?
    a) Glyceraldehyde
    b) Glycerol
    c) Glycerine
    d) Acrylonitrile
13. Which of the following is a typical soap molecule?
    a) Calcium stearate
    b) Potassium permanganate
    c) Sodium bicarbonate
    d) Sodium stearate
14. Select the correct statement from the following options.
    a) The soap micelle is unstable due to positive charge on its head
    b) The soap micelle is stable due to positive charge on its head
    c) The soap micelle is unstable due to negative charge on its head
    d) The soap micelle is stable due to negative charge on its head

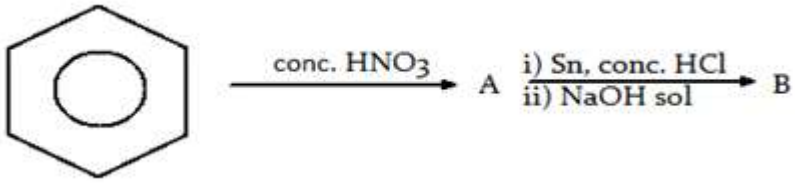
15. Soaps do not act efficiently in hard water and in acidic solution.
    a) True
    b) False
16. What is the name of the soap produced through the saponification of this triglyceride?



    a) Sodium dececanoate
    b) Sodium oleate
    c) Sodium stearate
    d) Sodium acetate
17. Which of the following is considered a useful alkali in saponification reactions?
    a) $CCl_4$
    b) $Cl^-$
    c) NaOH
    d) $Pb^+$
18. Which of the following fat or oil is unsaponifiable?
    a) Paraffin wax
    b) Bee wax
    c) Olive oil
    d) Shea butter
19. Saponification value is the number of milligrams of KOH required to saponify what present in the 1g of oil or fat?
    a) Salts
    b) Hydrocarbon
    c) Fatty acids
    d) unsaturation
20. Soap can be precipitated out by salting by using which chemical compound?
    a) Sodium chloride
    b) Potassium hydroxide
    c) Glycerol
    d) Sodium hydroxide
21. Aniline is usually purified by which of the following method?
    a) Steam distillation
    b) Simple distillation
    c) Vacuum distillation
    d) Extraction with a solvent
22. Which of the following method cannot be used for preparation of aromatic amine?
    a) Gabriel phthalimide synthesis
    b) Reduction of nitro compound

c) Reduction of nitrile with LiAl4
d) Decarboxylation of amino acids

23. What are A and B in the given sequence, respectively?




a) Aldehyde, nitro compound
b) Nitro compound, phenyl amine
c) Phenyl amine, nitro compound
d) Phenthalene, phenyl amine

24. Which reducing agent is used for the reduction of nitro compound to phenyl amine?
a) $LiAlH_4$
b) Sn/HCl
c) Na/alcohol
d) $H_2$/Ni

25. Which type medium is required for the formation of aniline by reaction of aryl boric acid and HAS?
a) Acidic
b) Basic aqueous
c) Neutral dry
d) aqueous

26. Which of the following compound is expected to be most basic?
a) Aniline
b) Methylamine
c) Hydroxylamine
d) Ethylamine

27. Aniline number is the minimum equilibrium solution temperature for _____ volume of aniline and lubricating oil.
a) More
b) Less
c) Equal
d) Very high

28. Aniline _____ with oil.
a) Immiscible
b) Forms crystals
c) Forms lumps
d) Miscible

29. A mixture of benzene and aniline can be separated by which of the following?
a) Hot water
b) dil. HCl
c) dil. NaOH
d) Alcohol

30. Chemical formula of aniline is $C_6H_5$-$NH_3$(TRUE)
31. Ink consists of pigments or dyes, a vehicle (binder) to attach the pigment to the paper
    a) True
    b) False

32. Pigments which are _____ variant of organic dyes are called vat dyes.
    a) Soluble
    b) Insoluble
    c) Acidic
    d) Basic

33. An azo dye is fixed on fabrics by the process applicable in

    a) Vat dyes
    b) Mordant dyes
    c) Developed dyes
    d) Substantive dyes

34. Red ink is prepared from

    a) Phenol
    b) Aniline
    c) Congo red
    d) Eosin

35. The blue print process involves the use of

    a. Indigo dyes
    b. Vat dyes
    c. Iron compounds
    d. Zinc compounds

36. An azo dye is formed by interaction of an aromatic diazonium chloride with
    a) A phenol
    b) An aliphatic primary amine
    c) Benzene
    d) Nitrous acid

37. An insoluble coloured compound formed by action of metallic salts on dyes is known as
    a) Lake
    b) Mordant
    c) Dye intermediate
    d) None of these

38. Alizarin dye obtained from the root of madder plant is anthraquinone derivative.

Its structure corresponds to

a) 1, 2-dihydroxy anthraquinone
b) 2, 3-dihydroxy anthraquinone
c) 1, 4-dihydroxy anthraquinone
d) 1-hydroxy anthraquinone

39. To which class of dyes does phenolphthalein belong
a) Azo dyes
b) Nitro dyes
c) Triphenyl methane dyes
d) Phthalein dyes

40. Alizarin a mordant dye is not used in

a) Cotton dyeing
b) Printing
c) Painting
d) Chromium lakes for wood dyeing

41. The rose odour from an ester is formed by the action of HCOOH on
a) Pine oil
b) Olive oil
c) Geraniol
d) Turpentine oil

42. Which of the following is dye
a) Methyl orange
b) Orange I
c) Aniline yellow
d) All of these

43. Which of the following is an example of basic dye
a) Alizarin
b) Malachite green
c) Indigo
d) Orange I

44. Which of the following is a direct dye
a) Phenolphthalein
b) Congo red
c) Alizarin
d) Indigo

45. Which of the following is a vat dye and often used in dyeing jeans
a) Indigo
b) Alizarin
c) Picric acid
d) Crystal violet

46. The compounds used to fix a dye to the fabric is known as
a) Mordant
b) Azeotrope
c) Bleaching agents
d) Lake

47. Which one is disperse dye
a) Congo red

b) Alizarin
c) Celliton
d) None of these

48. Malachite green is a direct dye for silk and wool. It is prepared by condensing
    a) Benzaldehyde and dimethyl aniline
    b) Carbonyl chloride and dimethyl aniline
    c) Benzene diazonium chloride with dimethyl aniline
    d) None of the above
49. Identify the wrong statement regarding alizarin
    a) Alizarin was extracted from the roots of the madder plant
    b) It's chemical name is 1, 2-dihydroxy anthraquinone
    c) It is fixed to fabrics by using mordants like aluminium sulphate giving fast red colour
    d) It has red crystal soluble in alkalies and the solution imparts red colour to fabrics
50. Methyl orange is an indicator in acid-alkali titration. It gives
    a) Yellow colour in alkaline medium
    b) Red colour in acid medium
    c) Yellow colour in acid medium
    d) Yellow colour in alkaline medium and red colour in acid medium

51. A dye imparts red colour on fabric. What colour of light was absorbed by the dye
    a) Blue
    b) Red
    c) Green
    d) Orange