Question Papers

ExamCode: CHE_INDCHE_022015

1. **Which statement is false?**

   1) All equipments for size reduction use compression or shear or both as disrupting forces

   2) Centrifugal force is widely used when a force greater than that of gravity is desired for the separation of solid and fluids of different density

   3) Adsorption is used for separating mixtures which are difficult to separate by distillation, extraction or crystallization

   4) Absolute alcohol can be attained from the mixture of alcohol and water by distillation method

2. **Which one of the following is a correct statement?**

   1) Syntans - condensed with phenol and sulfuric acid

   2) Syntans - condensed with sulfonated phenol and formaldehyde

   3) Syntans - condensed with sulfonated phenol and acetaldehyde

   4) Syntans - condensed with phenol and tannic acid

3. **The order of reactivity of alkyl halide towards dehydro halogenation is:**

   1) Tertiary > secondary > primary

   2) Primary > secondary > tertiary

   3) Tertiary = secondary > primary

   4) Primary > secondary = tertiary

4. **Steel used for the plates of jaw crushers is:**

   1) High carbon steel

   2) Martensitic stainless steel

   3) Hadfield steel

   4) Triple-alloy steel

5. **The optimum temperature used in Haber process is:**

   1) 570 - 600 K

   2) 670 - 720 K

   3) 720 - 770 K

   4) Room temperature

6. **Citrol reacts with hydroxylamine to yield a compound with formula:**

   1) $C_{10}H_{16}O$

   2) $C_{10}H_{19}ON$

   3) $C_{10}H_{16}ON$

   4) $C_{10}H_{17}ON$

7. **Which option below is the least desirable, if you want to lower environmental impact?**

   1) Reuse

   2) Put waste in landfill

   3) Using less to begin with

   4) Recycling

8. **The process in which the chemical decomposition of waste is brought about by heating the material in the absence of oxygen is-**

   1) Incineration

   2) Fixation

   3) Stabilization

   4) Pyrolysis

9. **_____ is a naturally occurring protein that has effectively replaced methyl bromide, which is used as a soil fumigant.**

   1) Lecithin

   2) Proline

   3) Harpin

   4) Alanine

10. **Corrosives in the waste water stream can be treated by-**

    1) Electrolysis

    2) Evaporation

    3) Ozonation

    4) Solidification

11. **Which of the following is NOT a cross-flow filtration technique?**

    1) Microfiltration

    2) Ultrafiltration

    3) Reverse osmosis

    4) Disk filter process

12. **Separation of oxygen from nitrogen on molecular sieves is an example of-**

1) Absorption
2) Drying
3) Adsorption
4) Sublimation

13. **The method best suited for the separation of two components of comparable volatility is:**

1) Flash distillation
2) Column separation
3) Continuous distillation with reflux
4) Leaching

14. **Reject salt solution from a reverse osmosis system can be treated by using ____ method.**

1) Dialysis
2) Ultrafiltration
3) Electrodialysis
4) Microfiltration

15. **Drying equipment that can be used for drying solutions and slurries in a unit operation is:**

1) Fluid-bed dryer
2) Drum dryer
3) Rotary dryer
4) Screen conveyor

16. **In a chemical unit operation, separation of two miscible liquids by the use of a solvent that preferentially dissolves one of them is called-**

1) Leaching
2) Liquid extraction
3) Filtration
4) Disintegration

17. **_____ is employed as the primary unit for material balance.**

1) Atoms
2) Energy
3) Chemical
4) Molecules

18. **In the laminar flow, the velocity distribution with respect to radius is a/an ____ with the apex at the centerline of the pipe.**

1) Straight line
2) Sigmoidal curve
3) Parabolic curve
4) Exponential curve

19. **The recycle ratio is:**

1) R^2/F
2) R/F
3) -R/F
4) $-R/F^2$

20. **Which of the following statement is wrong?**

1) Hydrogenation may occur by addition reaction
2) Hydrogenation may occur by substitution reaction
3) The increase of pressure is favorable for hydrogenation
4) Hydrogenation is an endothermic reaction

21. **_____ is used as a dehydrating agent for etherification. 1. H_2SO_4 2. HCl 3. HNO_3 4. $HClO_4$**

1) (2) and (4)
2) (1) and (3)
3) (1) and (2)
4) (1) and (4)

22. **The rate determining step in the sulfonation of aromatic compounds involves-**

1) Formation of SO_3
2) Formation of intermediate carbocation
3) Loss of hydrogen atom
4) Ionization of the SO_3H group

23. **Consider the following statements: 1. Stoichiometry is a theory of the proportions in which chemical species combine with one another 2. Stoichiometric equation of a chemical reaction is a statement indicating relative moles of reactants only. Which one of the statements given above is/are wrong?**

1) (1) only
2) (2) only
3) Both (1) and (2)
4) Neither (1) nor (2)

24. **Consider the chemical reaction. $CO + 2H_2 \rightarrow CH_3OH$ Find the stoichiometric ratio of H_2 to CO.**

1) 1/2
2) 2
3) 3
4) 4

25. **The unsteady state operations involve- 1. Batch distillation 2. Purging of a vessel 3. Sudden change in input or output streams with respect to quantity. 4. Control moisture and temperature**

1) 1, 2 and 4 are correct
2) 1, 2 and 3 are correct
3) 1 is only correct
4) 2 is only correct

26. **The process flow sheet includes- 1. Flow rate or quantity of each stream 2. Head added/removal in a particular equipment 3. The specific information is not understanding 4. Operating conditions of each stream such as pressure and temperature.**

1) 1, 2 and 3 are correct
2) 1, 2 and 4 are correct
3) 1, 2, 3 and 4 are correct
4) 1, 3 and 4 are correct

27. **The approximate chemical formula for Zeolite is-**

1) $Na_2O\ Al_2O_3\ 2SiO_3\ 5H_2O$
2) $Na_2O\ Al_2O_3\ 2SiO_2\ 6H_2O$
3) $Na_2O\ AlO_3\ 3SiO_2\ 6H_2O$
4) $Na_2O\ Al_2O_3\ 6SiO_2\ 2H_2O$

28. **Reverse osmosis units remove- 1) Ionisable matter 2) Non-ionisable matter 3) Colloidal matter 4) High molecular weight organic matter.**

1) (1), (2) and (3) only
2) (1), (2) and (4) only
3) (1), (2), (3) and (4)
4) (2), (3) and (4) only

29. **The fluoride content in water is determined by making use of _____ reagent.**

1) Zirconium - Sodium fluoride
2) Zirconium - Sulphate with hydroxide ions
3) Zirconium - Sodium chloride
4) Zirconium - Alizarin

30. **At which pH does Eriochrome Black T form complex with calcium and magnesium ions present in water?**

1) 4
2) 8
3) 10
4) 12

31. **Which one of the following statement is NOT correct?**

1) Water containing sulphates, chlorides and bicarbonates is known as hard water
2) Boiling removes dissolved gases from water
3) Hard water is not fit for washing purpose
4) Hard water can be used for generating steam in boilers

32. **The oxidising agent in ozone which kills the bacteria in water is _____.**

1) O^{2-}
2) O
3) O_2
4) [O]

33. **The colour of the Eriochrome black T-Mg^{2+} complex is:**

1) Blue
2) Light red
3) Orange
4) Colourless

34. **In the treatment for microbiological growth the excess chlorine is removed by adding _____. 1) SO_2 2) Na_2SO_4 3) Na_2SO_3 4) Soda-lime**

1) (1) and (2) only
2) (1) and (3) only
3) (1), (2) and (4) only
4) (2) and (3) only

35. **Which order is correct with respect to TDS of water?**

1) Rain < river < lake < sea
2) River < lake < rain < sea
3) Rain < lake < river < sea
4) Sea < river < lake < rain

36. **In the reverse osmosis process is:**

1) The solvent moves from concentrated side to dilute side
2) The solute moves from concentrated side to dilute side
3) The solvent moves from dilute side to concentrated side
4) The solute moves from dilute side to concentrated side

37. **The addition of sodium aluminate to water during the cold lime-soda process is:**

1) To decrease the amount of lime needed
2) To facilitate the settling of $CaCO_3$ and $Mg(OH)_2$
3) To remove CO_2
4) To dissolve $CaCO_3$ and $Mg(OH)_2$

38. Match the following chemicals and the problems associated with their presence in water:

i) $MgCl_2$	a) Salinity
ii) Na_2CO_3	b) Hardness
iii) NaCl	c) Alkalinity
iv) Ferric iron	d) Colour

	i)	ii)	iii)	iv)
A.	a)	b)	c)	d)
B.	d)	c)	b)	a)
C.	a)	c)	b)	d)
D.	b)	c)	a)	d)

39. **Green house effect is due to-**

1) CO_2
2) SO_2
3) CFCs
4) H_2S

40. **Chlorine is used to treat domestic water supplies in order to-**

1) Improve the taste
2) Promote sedimentation of suspended solids
3) Disinfect the water
4) Make it suitable for watering plants

41. **In the Anaerobic process of sewage treatment, hydrogen is removed as _____.**
1) Methane
2) H_2 gas
3) H_2O gas
4) HCN

42. **Inhalation of CO causes death in humans because-**
1) CO reacts with oxygen and thus reduces the supply of O_2
2) CO binds with Fe in haemoglobin rather than oxygen
3) CO blocks the inhalation of oxygen
4) CO blocks the exhalation of CO_2

43. **The species that plays an important role in the ozone destruction-**
1) Chlorine radical
2) Oxygen radical
3) O_2
4) Cl_2

44. **Main source of Pb is atmospheric air is:**
1) Automobiles
2) Tanneries
3) Dye industries
4) Paper industries

45. **Photochemical smog in sunlight is formed due to ___.**
1) Nitrogen oxides and hydrocarbons
2) Sulphur oxides
3) Nitrogen oxides
4) Sulphur oxides and hydrocarbons

46. **Ozone hole (depletion) is due to the contamination by-**
1) Mesons
2) Crayons
3) Freons
4) Bosons

47. **Identify the coagulation chemical that is used in waste water treatment.**
1) Potassium Chloride
2) Potassium Permanganate
3) Sodium Aluminate
4) Sodium Carbonate

48. **The amount of oxygen gas dissolved in normal water at room temperature condition is:**
1) 1 - 5 ppm
2) 6 - 10 ppm
3) 11 - 15 ppm
4) 16 - 20 ppm

49. Match List – I with List – II correctly and select your answer the codes given below

List – I	List – II
a) Flocculation	1) Secondary treatment
b) RBC	2) Aggregation of small particles
c) Ozonation	3) Pollution strength
d) BOD	4) Disinfection

	a)	b)	c)	d)
A.	1)	4)	2)	3)
B.	3)	2)	1)	4)
C.	4)	3)	2)	1)
D.	2)	1)	4)	3)

50. **Which of the following is a prime health risk associated with greater UV radiation through the atmosphere?**
1) Damage to digestive system
2) Increased Liver cancer
3) Neurological disorder
4) Increased skin cancer

51. **The optimum temperature is used in contact process-**

1) 570 - 670 K
2) 670 - 720 K
3) 820 - 870 K
4) Room temperature

52. **In the Solvay process, ammonia is used as-**

1) Wetting agent
2) Stabilizing agent
3) Calalithic agent
4) Cyclic reagent

53. **In chlor-alkali production, mercury cell comprises of ___.**

1) Electrolyser
2) Decomposer
3) Both electrolyser and decomposer
4) Diaphragm and decomposer

54. **Sodium carbonate reacts with hydrogen sulphide to form sodium hydrosulphide which in turn is oxidised to sulphur by sodium vanadate. Name of the process is:**

1) Beavon process
2) Chamber process
3) Claude process
4) Stratford process

55. Match the following:

List – I	List – II
a) Modified sodas	1) $Na_2CO_3.10H_2O$
b) Causticized soda ash	2) $Na_2CO_3.NaHCO_3.2H_2O$
c) Sal soda	3) Soda ash with 10 to 50% caustic
d) Sodium sesquicarbonate	4) Soda ash with 25 to 75% $NaHCO_3$

	a)	b)	c)	d)
A.	4)	3)	2)	1)
B.	4)	3)	1)	2)
C.	4)	2)	1)	3)
D.	3)	2)	1)	4)

56. **Regarding Haber's process for (synthesis of NH_3), which statement is false?**

1) Increase in pressure increases the reaction rate
2) Increase in temperature increases the reaction rate
3) Increase in temperature increases the thermal degradation of the catalyst
4) Increase in temperature increases the equilibrium amount of ammonia

57. Match the following:

1) Synthesis gas purification	i) Methanation
2) Desulphurisation of the feed stock	ii) Adsorption
3) Synthetic gas	iii) Coal-gasification process
4) Reforming of hydrocarbon feed stock	iv) Catalytic process

	1	2	3	4
A.	i)	ii)	iii)	iv)
B.	iii)	i)	ii)	iv)
C.	iv)	iii)	i)	ii)
D.	iv)	iii)	ii)	i)

58. **Neutral refractories are ___.**
1) SiC, ZrO_2, $FeOCrO_2$
2) SiC, CaO, MgO
3) Al_2O_3, SiO_2, ZrO_2
4) SiO_2, CaO, $FeOCrO_2$

59. **_____ should not be placed in direct contact of fire clay refractory.**
1) Alumina and Silica
2) Magnesite and dolomite
3) Zirconia and graphite
4) SiC and Chromite

60. **Test piece for determination of RVL of a refractory is heated in a/an ___.**
1) Oxidising atmosphere
2) Reducing atmosphere
3) Electric furnace
4) Neutral atmosphere

61. **TiO_2 is used in manufacture of enamels as-**
1) Colouring agent
2) Opacifier
3) Flux
4) Floating agent

62. **Write the incorrect statement regarding porosity of refractory material.**
1) Lowers strength and density
2) Lowers thermal conductivity
3) Increases insulating property
4) Increases spalling resistance

63. **Which is NOT a basic refractory?**
1) Chrome magnesite
2) $MgCO_3.SiO_2$
3) $Al_2O_3.2SiO_2.2H_2O$
4) Silicon carbide

64. **Skull is not formed on the carbon blocks in the hearth of a blast furnace, when it becomes cold, because of its-**
1) Non-wetting characteristics
2) High thermal conductivity
3) High crushing strength
4) Both high thermal conductivity and crushing strength

65. **Flint glass is made by using-**
1) Magnesium oxide
2) Lead oxide
3) Aluminium oxide
4) Calcium oxide

66. **What is China clay?**
1) A clay with a high content of iron which burns brown
2) A clay with a very low content of iron which burns white
3) A clay with a very high content of iron which burns red
4) A clay without iron content which burns green

67. **What is the formula for Hard glass?**
1) $K_2O.\ CaO.\ 6\ SiO_2$
2) $Na_2O.\ CaO.\ 6\ SiO_2$
3) $CaO.Al_2O_3.2SiO_2$
4) $Al_2O_3.\ 2SiO_2.2H_2O$

68. **Which one of the following material is NOT used for the manufacture of cement?**
1) CaO
2) Al_2O_3 and SiO_2
3) Coal or fuel oil
4) $MgSO_4$

69. **The refractory material that finds application in jet propulsion as well as nuclear reactors is:**

1) Zirconia
2) Silica
3) Beryllia
4) Carborandum

70. **The type of furnace in which preheating of air temperature will be maximum with respect to waste heat recovery system is a _____.**

1) Recuperative type
2) Convective type
3) Regenerative type
4) Both recuperative and regenerative type

71. **What is the material used as a bonding agent in the Carborundom bricks?**

1) Silicon nitrate
2) Magnesium silicate
3) Titanium carbide
4) Silicon nitride

72. **Rock phosphate reacting with sulphuric acid gives-**

1) Super phosphate
2) Diammonium phosphate
3) Calcium sulphate
4) P_2O_5

73. **Which of the following statement is wrong? The need for fertilizing a land is:**

1) To supplement what has been eaten up by plant
2) To supply as an additional tonic and food
3) To maintain the pH 7-8 of the soil
4) To arrest the circulation of water in the soil

74. **The nitrogenous fertilizer with the highest percentage of nitrogen is_____.**

1) Urea
2) Ammonium Nitrate
3) Ammonium Sulphate
4) Calcium Nitrate

75. **Which of the following fertilizer increases the acidity of the soil?**

1) Calcium cynamide
2) Urea
3) Basic calcium nitrate
4) Ammonium sulphate

76. **Non-halogenated esters used as insecticides**

1) Allethrine
2) Gammexane
3) Aldrin
4) Malthion

77. **The formula for Triple super phosphate is:**

1) $Ca_3(PO_4)_2$
2) $3CaH_4(PO_4)_2$
3) $3CaH_4(PO_4)_3$
4) $Ca_3(PO_4)_3$

78. **Calcium cyanamide mixed with carbon is called-**

1) Nitrolim
2) Ethion
3) Oleum
4) Dichlorvos

79. Match the following:

List – I	List – II
a) NaF	1) Cockroaches
b) Na_2SiF_6	2) Mothproofing
c) $BaSiF_6$	3) Chewing insects on plants
d) Na_3AlF_6	4) General stomach poison

	a)	b)	c)	d)
A.	1)	2)	3)	4)
B.	4)	2)	1)	3)
C.	1)	4)	3)	2)
D.	4)	2)	3)	1)

80. **Cunico contains-**
1) Cu, Ni, Fe and Al
2) Cu, Ni, Co and Fe
3) Mn, Cu, Co and Fe
4) Mn, Si, Co and Fe

81. **Which metal is used in anticathodes in x-ray tubes?**
1) Vanadium
2) Titanium
3) Tungsten
4) Copper

82. **A mixture of metallic oxide and aluminium powder is called-**
1) Flux
2) Slag
3) Thermite
4) Gangue

83. **The percentage of carbon in high carbon steel is:**
1) 4 - 6%
2) 0.5 - 1.5%
3) Less than 0.6%
4) 3 - 5%

84. **A bearing alloy should posses the following properties-**

1) High coefficient of friction and high thermal conductivity
2) Low melting point and non-corrosive property
3) Low thermal conductivity and high co-efficient of friction
4) Low co-efficient of friction and high melting point

85. **The reducing agent that is required in matte smelting to produce molten matte and slag is:**
1) Carbon
2) Magnesium
3) Hydrogen
4) No reducing agent is required

86. **Which tool is used for rapid machining of hard metals?**
1) Cemented carbide
2) High speed steel
3) Stellite
4) Constantan

87. **Calcination is the process of-**
1) Adding $CaCO_3$ in the ore for extraction
2) Heating the ore below their melting point
3) Action of heat at high temperature in the absence of air
4) Converting the ore into their oxides

88. Match the following:

a) Roasting	i) Froth flotation process
b) Calcination	ii) Amalgamation process
c) Amyl xanthate	iii) Reverberatory furnace
d) Noble metals	iv) Hot blasts

	a)	b)	c)	d)
A.	iv)	iii)	i)	ii)
B.	iii)	i)	iv)	ii)
C.	ii)	iii)	iv)	i)
D.	iv)	iii)	ii)	i)

89. **Inside a sintering furnace, a reducing gas atmosphere is capable of ____.**

1) Forming a layer of oxide on the top of a steel PM part
2) Maintaining a pre-existing oxide layer on the top of a PM part
3) Removing an oxide layer from a PM part
4) Removing a dust particle layer from a PM part

90. **What are the gases that are effectively used in the working of a polymer electrolyte membrane fuel cell?**

1) H_2 and CO
2) H_2 and CO_2
3) H_2 and air
4) H_2 and oxygen

91. **In the electrolytic method of production of hydrogen gas, oxygen over voltage is reduced by:**

1) A coating of the anode with zinc
2) Nickel plating of the anode
3) Chrome plating of the anode
4) Using hydrochloric acid

92. **The temperature of coke maintained in the reactor is ____ to manufacture water.**

1) 800 - 900°C
2) 1100 - 1200°C
3) 900 - 1000°C
4) 1000 - 1100°C

93. **In the manufacture of the producer gas, the reactions taking place in the reduction zone are-**

1) Exothermic
2) Endothermic
3) Adiabatic
4) Isothermal

94. **The percentage of isobutane in liquified petroleum gas is:**

1) 37 Thirty seven
2) 48 Forty eight
3) 29 Twenty nine
4) 54 Fifty four

95. **In order to increase the calorific value of the producer gas, oxygen(instead of air) is allowed and superheated steam at about 30 atm pressure is passed through the bed of coke. This process is called-**

1) Lurgi's process
2) Kroll's process
3) Piolgeon's process
4) Tropsch's process

96. **Acetylene is produced by thermal decomposition of certain hydrocarbons . This process is called-**

1) Wulff process
2) Sachsse process
3) Linde-Frankl process
4) Claude process

97. Match the following:

Gas	Manufacturing process
1) Oxygen	a) Reich process
2) CO_2	b) Claude process
3) H_2	c) Arc process
4) Acetylene	d) Synthesis process

	1)	2)	3)	4)
A.	b)	a)	d)	c)
B.	a)	b)	c)	d)
C.	d)	a)	c)	b)
D.	d)	c)	b)	a)

98. The fermentation of grain to produce ethyl alcohol also produces a stoichiometric quantity of-

1) CO
2) CO_2
3) O_2
4) H_2

99. The $\Delta H°$ for the oxidation of NH_3 to nitric oxide at 25°C is _____($\Delta H°_f$ of NO, H_2O and NH_3 is 90.25, -241.82 and -46.11 respectively)

1) 906 kcal
2) +906 kJ
3) -906 kJ
4) -906 kcal

100. Chief constituents of light oil distillations are-

1) Benzene, Toluene and Xylene
2) Phenol, Benzene and Toluene
3) Xylene, Cresol and Naphthalene
4) Anthracine, Benzene, Toluene

101. The approximate composition of natural gas is:

1) Methane(CH_4)= 70-90% Ethane(C_2H_5)=5-10%
2) Methane(CH_4)=50%, Ethane(C_2H_5)=50%
Hydrogen(H_2)=3%

3) Hydrogen(H_2)=10%, Ethane(C_2H_5)=50-10%, Methane (CH_4)=60%,
4) Methane(CH_4)=60-80%, Ethane(C_2H_5)=15-20%. Hydrogen (H_2) = 20%

102. The calorific value of natural gas is:

1) 12000 - 14000 kcal/m³
2) 13000 - 15000 kcal/m³
3) 14000 - 16000 kcal/m³
4) 15000 - 17000 kcal/m³

103. 'Solvent Naphtha' used mostly as a solvent in paints and perfumery is produced by the ____ of virgin naphtha into small boiling range.

1) Steam reforming
2) Distillation
3) Desulphurization
4) Discolouration

104. Which one is used to determine the colour of petroleum products?

1) Colour comparator
2) Sabolt chromometer
3) Cleveland apparatus
4) Visbreaking chamber

105. Smoke point of a test sample of kerosene is found to be 15 mm. On removal of _____ from it, the smoke point rises to 25 mm.

1) N-paraffins
2) Olefins
3) Aromatics
4) Naphthene

106. An alternative method to increase the octane number of gasoline is by mixing an additional material such as-

1) Tetra pentyl lead
2) Tetra propyl lead
3) Tetra ethyl lead
4) Tetra butyl lead

107. Bottom product of atmospheric pressure crude oil distillation column is termed as ____.

1) Heavy ends
2) Asphalt
3) Residuum
4) Reduced crude

108. The middle oil is also called as ____.

1) Heavy oil
2) Anthracene oil
3) Creosote oil
4) Wash oil

109. Which energy conversion takes place when a fuel is burnt ?

1) Chemical energy is converted to electrochemical energy
2) Chemical energy is converted to electrical energy
3) Chemical energy is converted no mechanical energy
4) Chemical energy is converted into heat

110. The natural gas that occurs along with petroleum in oil wells is called-

1) Wet gas
2) Producer gas
3) Water gas
4) Bio gas

111. Brown lignite coals is used in the manufacture of ____ gas.

1) Coke oven gas
2) Bio gas
3) Water gas
4) Producer gas

112. Anthracite coal, contains ____ percentage of carbon.

1) 91 - 95%
2) 90 - 98%
3) 92 - 98%
4) 80 - 90%

113. The approximate composition of bituminous coals is:

1) Carbon = 83%, Hydrogen = 6%, Oxygen = 10%
2) Carbon = 73%, Hydrogen = 16%, Oxygen = 10%
3) Carbon = 73%, Hydrogen = 6%, Oxygen = 16%
4) None of these

114. In the distillation of coal, if a plant uses temperature from 450 to 700°C, then the process is termed as-

1) Low-temperature carbonization
2) Medium-temperature carbonization
3) High-temperature carbonization
4) Ultra high-temperature carbonization

115. Calculate the calorific value of a fuel sample of the coal with the following data: Mass of coal = 0.6 g Water equivalent of calorimeter = 2,200 g Specific heat of water = 4.187 kJ/kg/°C Rise in temperature = 6.52°C

1) 100 kJ/g
2) 1000 kJ/g
3) 100 J/g
4) 1000 J/g

116. Net calorific value of hydrogen is :

1) 141.79 B.T.U/lb
2) 61000 B.T.U/lb
3) 45000 B.T.U/lb
4) 75000 B.T.U/lb

117. High temperature carbonization is carried out at ____ temperature to produce high purity and high porosity coke.

1) 1500 - 1700°C
2) 1300 - 1500°C
3) 900 - 1200°C
4) 700 - 900°C

118. An agent present in the deodorant soap to prevent the decomposition of perspiration into odorous compound is:

1) 3, 4, 5 - tribromo salicylanilide
2) 3, 4, 5 - trichloro salicylanilide
3) 1, 3, 5 - tribromo salicylanilide
4) 1, 3, 5 - trichloro salicylanilide

119. Turbidity occurs as a result of separation of phases in a mixture of aniline and _____ called aniline point.

1) Petroleum naptha
2) Caustic potash
3) Ester
4) Palmitic acid

120. Shaving soaps contain a considerable amount of potassium soap with an excess of ____.

1) Resin soap
2) Stearic acid
3) Palmitic acid
4) Glucial acetic acid

121. Which one of the following is NOT a fillers in laundry soap?

1) Sodium silicate
2) Sodium phosphate
3) Rosin soap
4) Sodium bicarbonate

122. Match the following:

a) Shampoo	1) KoH
b) Shaving soap	2) High iodine value
c) Toilet soap	3) Tallow
d) Washing soap	4) Coconut oil

	a)	b)	c)	d)
A.	3)	4)	1)	2)
B.	2)	1)	4)	3)
C.	2)	3)	4)	1)
D.	3)	2)	4)	1)

123. When oil is treated with H_2 in presence of Ni catalyst, fat is produced. This is called-

1) Saponification of oil
2) Hardening of oil
3) Sweetening of oil
4) Salting of oil

124. Which content of the detergent is responsible for the 'whiter-than-white' effect?

1) Diaminostilbene
2) Sodium borate
3) Sodium perborate
4) Sodium silicate

125. Winterisation proeess is the removal of ____.

1) Starch
2) Vitamins
3) Saturated glycerides
4) Unsaturated glycerides

126. Which of the following statement is false?

1) Oils and fats are glycerides of higher fatty acids
2) When oils and fats are treated with alkali, soap and glycerol is produced
3) Oils are glycerides of partially unsaturated fatty acids
4) Soaps are sodium salts of sulphuric acid or alkyl hydrogen sulphate

127. Which one of the following is NOT useful for the removal of colour from the pulp for paper making?

1) Calcium hypochlorite
2) Chlorine dioxide
3) Sodium chlorite
4) Calcium carbonate

128. For the manufacture of card-board ____ machine is used.

1) Compression machine
2) Padding machine
3) Drying machine
4) Cylindrical machine

129. Sizing agents are added with paper to impart resistance to _____ penetration.

1) Gas
2) Impurities
3) Liquid
4) Heat

130. Which is used as fillers in paper industry?

1) Talc
2) Tungsten
3) Carbohydrate
4) None of these

131. Which is obtained as a byproduct during black liquor recovery?

1) Sodium sulphide
2) Sodium sulphate
3) Tall oil
4) Black dye

132. Which is the most economical chemical recovery process that have the advantage of being able to operate at lower odor levels in both air and water?

1) Sulfate process
2) Sulfite process
3) Kraft process
4) Pulping process

133. Rancidity of oils and fats is due to- 1) Hydrogen 2) Double decomposition 3) Hydrolysis 4) Oxidation

1) (1) and (2) only
2) (1) and (3) only
3) (3) and (4) only
4) (2) and (3) only

134. In wood, what is the matrix material?

1) Cellulose
2) Glucose
3) Lignin
4) Chitosan

135. Copper and uranium are commercially leached by which micro-organism?

1) E.coli
2) Thiobacillus
3) T.Versicolor
4) S.Commune

136. Match the following:

Enzymes	Production
1) Pepsin	a) Starch
2) Cyclodextrin	b) Cheese production
3) Oxireductase	c) Brewing
4) Protease	d) Detergents

	1)	2)	3)	4)
A.	d)	a)	c)	b)
B.	a)	b)	c)	d)
C.	b)	a)	d)	c)
D.	a)	d)	c)	b)

137. **By-products obtained from alcohol industry-**

1) CO_2 & CO
2) Acetaldehyde & CO_2
3) Acetaldehyde & CO
4) Hydrocarbons & CO

138. **Which acts as a stabilizer in double base propellant?**

1) Diethyl phthalate
2) Diphenyl amine
3) Petroleum jelly
4) Nitrocellulose

139. **Inversion of cane sugar is an example of-**

1) Unimolecular reaction with first order
2) Unimolecular reaction with second order
3) Bimolecular reaction with first order
4) Bimolecular reaction with second order

140. $2(C_6H_{10}O_5)_5 + nH_2O \xrightarrow{(a)} nC_{12}H_{22}O_{11}$

$C_{12}H_{22}O_{11} \xrightarrow{(b)} 2C_6H_{12}O_6 \xrightarrow{(c)} 4C_2H_5OH + 4CO_2$

find (a), (b) & (c).

A.	Zymase, maltase & diastase
B.	Invertase, maltase & zymase
C.	Diastase, maltase & zymase
D.	Diastase, zymase & invertase

141. **Saccharification of starch consists of the steps:**

1) Distillation and rectification
2) Malting, mashing and hydrolysis
3) Fermentation and fractional distillation
4) Dilution, centrifugation and distillation

142. **L-glutamic acid can be obtained directly from fermentation of carbohydrates with ___.**

1) C.lipolytica
2) Corynebacterium aceloglutamicum
3) Micrococcus glutamicus
4) Streptococcus

143. Match the following:

Enzyme	Source
a) Zymase	1) Malt
b) Diastase	2) Yeast
c) Catalase	3) Soyabean
d) Urease	4) Blood

	a)	b)	c)	d)
A.	2)	1)	4)	3)
B.	1)	2)	3)	4)
C.	3)	1)	2)	4)
D.	3)	2)	1)	4)

144. The product of saccharification of malt is called-

1) Wort
2) Beer
3) Bagasse
4) Green liquor

145. Gun powder consists of ___.

1) 10% charcoal, 10% sulphur and 80% saltpeter
2) 15% charcoal, 10% sulphur and 75% saltpeter
3) 20% charcoal, 10% sulphur and 70% saltpeter
4) 25% charcoal, 10% sulphur and 65% saltpeter

146. Which type of explosive does not exist?

1) Primary explosive
2) Secondary explosive
3) Tertiary explosive
4) Low explosive

147. The single most important step in the detection and analysis of explosive residues is ____.

1) The determination of whether it is a low or a high explosive
2) Locating the ignition source
3) The collection of appropriate samples from the explosion scene
4) The creation of a chain of custody form

148. After Bomb-scene debris has been examined microscopically, the next step is to ____.

1) Utilize x-ray diffraction to "finger print" the organic explosive
2) View the detonating mechanism with a low power stereoscopic
3) Rinse the recovered debris with acetone to separate the debris from explosive material
4) Examine the explosive using spectrophotometry

149. Which reaction is false?

1) $ASF_3 + SbF_5 \rightarrow [AsF_2]^+ + [SbF_6]^-$
2) $AlCl_3 + SbCl_5 \rightarrow [SbCl_4]^+ + [AlCl_4]^-$
3) $SbCl_5 + 5HF \rightarrow SbF_5 + 5HCl$
4) $2SbCl_3 + Cl_2 + 4CSCl \rightarrow 4CS^+ + [SbCl_6]^- + [SbCl_6]^{3-}$

150. Which is/are high explosives? 1)Lead azide 2)Tetracene 3)TNT 4)Cordite

1) (1) and (3) only
2) (3) and (4) only
3) (1) and (2) only
4) (1) (2) (3) and (4)

151. Which is very sensitive to electrostatic discharge?

1) Diazodinitrophenol
2) Lead styphnate
3) Tetrazene
4) Mercury Fulminate

152. An explosive with the composition $C_xH_yO_zN_p$ will have an oxygen balance (OB) of-

1) OB = Z - 2x - y/2
2) OB = Z + 2x + y/2
3) OB = Z - 2x + y/2
4) OB = Z - x - y/2

153. The non-sparking tools is made of ____ alloys.

1) Zn - Cu alloys
2) Pb - Sn alloys
3) Beryllium - Cu alloys
4) Ni - Fe alloys

154. Which explosive is relatively weak and does not store well under adverse conditions?

1) Lead styphnate
2) Diazodinitrophenol
3) Mercury Fulminate
4) Tetrazene

155. Which one of the factor control the reaction rate of explosive materials?

1) Heat transfer
2) Mass transfer
3) Shock transfer
4) Both heat and mass transfer

156. Gun-cotton is also called as ___.

1) Cellulose nitrate
2) Cellulose acetate
3) Cellulose benzoate
4) Cellulose chlorate

157. The common oxidisers used in composite propellants are-

1) NH_4ClO_4, NH_4NO_3, $KClO_4$
2) $KMnO_4$, H_2O_2, $NaClO_4$
3) $K_2Cr_2O_7$ H_2SO_4, HNO_3
4) NH_4SO_4, H_2O, $NaClO_4$

158. LDPE density range is :

1) 0.519 - 0.64 g/cm³
2) 0.715 - 0.84 g/cm³
3) 0.819 - 0.899 g/cm³
4) 0.915 - 0.94 g/cm³

159. The time interval covering in the compression moulding cycle is known as-

1) Process time
2) Cycle time
3) Reaction time
4) Ejection time

160. Plexiglass is obtained by polymerization of-

1) Methyl methacrylate
2) Diphenyl carbonate
3) Hexamethylene diamine
4) Tetrafluoro ethene

161. Stereospecific polymers are prepared by using _____ catalysts, which is an organo-metallic compound.

1) $(C_2H_5)_4Pb$
2) Zeigler-Brazer catalyst
3) Contact catalyst
4) Ziegler-Natta catalysts

162. Arrange number average $(\overline{Mn})$, weight average $(\overline{M\omega})$, viscosity-average $(\overline{Mv})$, and sedimentation-average $(\overline{Mz})$, Molecular masses is increasing order.

A.	$(\overline{Mn}),(\overline{Mv}),(\overline{M\omega}),(\overline{Mz})$
B.	$(\overline{Mn}),(\overline{M\omega}),(\overline{Mv}),(\overline{Mz})$
C.	$(\overline{Mn}),(\overline{M\omega}),(\overline{Mz}),(\overline{Mv})$
D.	$(\overline{Mn}),(\overline{Mv}),(\overline{Mz}),(\overline{M\omega})$

163. An index used for measure of the molecular mass distribution of polymer is:

1) Polydispersity index
2) Monodispersity index
3) Isolactic index
4) Tacticity index

164. Polymides are heat resisting plastics and stable upto ____.

1) 350°C
2) 400°C
3) 450°C
4) 500°C

165. The addition of _____ converts the soluble and fusible novolac into a head, infusible and insoluble solid of cross-linked Bakelite polymer.

1) $(CH_2)_6N_4$
2) HCHO
3) C_6H_5OH
4) $NH_2CO\ NH_2$

166. LDPE and HDPE are prepared by using ____ and _____ respectively.

1) Ionic catalysts and free-radical initiators
2) Free-radical initiators and ionic catalysts
3) Cationic catalysts and free-radical initiators
4) Anionic catalysts and free-radical initiators

167. Melamine resins are obtained from ____ by polymerization.

1) Phenol and formaldehyde
2) Phthalic anhydride and glycerol
3) Cyanamide
4) Adipic acid and hexamethylene diamine

168. In the polyester preparation, _____ is used with terephthalic acid or dimethyl terephthalate.

1) Ethylene
2) Ethyl alcohol
3) Ethylene glycol
4) Polyvinyl alcohol

169. Which type of spinning is used for manufacture of nylon fibre?

1) Both wet and dry spinnings are used
2) Wet spinning
3) Dry spinning
4) Melt spinning

170. The typical elastomerie property of natural rubber is attributed to its-

1) Complete cis configuration
2) Complete trans configuration
3) 50% Cis and 50% trans configuration
4) 25% Cis and 75% trans configuration

171. In the naming of Buna-s, na stands for-

1) Natural
2) Natrium
3) Navel
4) Narrow

172. **Butyl rubber is manufactured by the reaction between isobutylene and-**

1) Formaldehyde
2) Isoprene
3) Phenol
4) Melamine

173. **The chemical added in the vulcanisation process-**

1) Carbon
2) Nitrogen
3) Hydrogen
4) Sulphur

174. **The monomer used in the manufacture of poly carbonate is:**

1) Melamine
2) Urea formaldehyde
3) Bisphenol A
4) Acrylic acid

175. **The mechanism of reaction involved in the preparation of PET is:**

1) Hydrolysis
2) Amination
3) Esterification
4) Halogenation

176. Match the following:

List – I	List – II
a) Nylon 8	1) Caprolactam
b) Nylon 6	2) Hexamethylene di-ammonium adipate
c) Nylon salt	3) Hexamethylene diamine + Adipic acid
d) Nylon 66	4) Cyclo octanone oxime

	a)	b)	c)	d)
A.	1)	3)	4)	2)
B.	4)	1)	2)	3)
C.	2)	3)	4)	1)
D.	1)	2)	3)	4)

177. **Vulcanized rubber is an example of-**

1) Large particle composite
2) Dispersion-strengthened composite
3) Discontinuous fibre composite
4) Distribution-strengthened composite

178. **Among the following resins and plastics, identify the protein derivative type-**

1) Viscose
2) Carboxy methyl cellulose
3) Casein-formaldehyde
4) Polyvinyl acetate

179. **From the following, identify the thermo setting resin-**

1) Cellulose nitrate
2) Cellulose acetate
3) Polymides
4) Polyamides

180. **Solvent used for dewaxing of petroleum products are _____.**

1) Furfural
2) Methyl ethyl ketone
3) Propane
4) Both (B) and (C)

181. **Acid dyes are _____ in acid baths.**

1) Soluble
2) Partially soluble
3) Insoluble
4) Decompose

182. **Which process is used to manufacture plastic pipes?**

1) Injection moulding
2) Extrusion moulding
3) Blow moulding
4) Vacuum forming

183. **Starch and dextrin glues are the examples of adhesive belonging to _____ type.**
1) Rubbery thermosetting
2) Thermoplastic
3) Rigid thermosetting
4) Inorganic

184. **The best known dye in the Vat dye class is:**
1) Mauvine
2) Indigo
3) Methylene blue
4) Malachite green

185. **Celluloid is classified under-**
1) Thermosetting resin
2) Thermoplastic resin
3) Natural resin
4) Protein based resin

186. **Tapioca dextrin is the adhesive used for-**
1) Printing ink
2) Laminated board
3) Rubber stamp
4) Postage stamp

187. **Malachite green dye is manufactured on a large scale by-**
1) Base catalysed addition of Benzaldehyde with dimethyl aniline
2) Base catalysed condensation of Acetaldehyde with dimethyl aniline
3) Acid catalysed condensation of benzaldehyde with excess dimethyl aniline
4) Oxidising a mixture of aniline, p-toluidine and O-toluidine with nitrobenzene

188. **The bodies held together by an adhesive are known as-**
1) Adsorbents
2) Adherends
3) Binders
4) Surfactants

189. **If the liquid fuel is highly viscous, the action required for proper burning in boiler is:**
1) Pre-heating
2) Cooling
3) Mixing
4) Freezing

190. **The drying quality and extent of unsaturation in the oil is obtained from-**
1) Acid value
2) Iodine value
3) Saponification value
4) Reicher-Meisyl value

191. **Rapid drying oils are oils that contains-**
1) High % conjugated fatty acid esters
2) Low % conjugated fatty acid esters
3) Low % saturated fatty acid esters
4) High % of saturated fatty acid esters

192. **A special ingredient present in the temperature indicating paints-**
1) Double salt of Cu
2) Double salt of Ca
3) Double salt of Mg
4) Double salt of Li

193. **The special type of varnishes are added into the paint to give-**
1) Good solubility
2) Good durability
3) Good opacity
4) Good colour and lustre

194. **Gloss paints have the pigment volume concentration range of-**
1) 25 - 35%
2) 40 - 50%
3) 55 - 65%
4) 65 - 75%

195. **Orange peel of effect in paints is due to-**
1) Wetting and setting of paints
2) Uneven leveling results in pock-marked appearance
3) Sagging of paints
4) Improper mixing of paint

196. **When enamel paint is applied on the metal or wood surface, formation of film is due to ____ reaction.**

1) Reduction
2) Reduction and polymerization
3) Solvent evaporation and reduction
4) Cross linking and polymerization

197. **In emulsion paints, surface forming material is an emulsion of binder in ____.**

1) Water
2) Oil
3) Acetone
4) Acid

198. **Poor attachment of paint on the surface is called-**

1) Chalking
2) Erosion
3) Skinning
4) Flaking

199. **A colloidal dispersion of solution of a cellulose derivative, in a solvent and along with other additives is:**

1) Emulsion
2) Enamel
3) Varnish
4) Lacquers

200. _____ is a convenient method for assessing the efficiency of a reaction is expressed as percentage and calculated using this formula

$$= \frac{\text{formula weight of the product}}{\text{Sum of formula weights of all the reactants}}$$

A.	Reaction economy
B.	Molecular economy
C.	Product economy
D.	Atom economy