

009/2020

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Which of the following is a carbonate ore?
(A) Magnetite (B) Siderite
(C) Rutile (D) Pyrolusite
2. Nitriding is the process of :
(A) heating steel with ammonia
(B) heating steel with nitrogen oxides
(C) heating steel with nitrogen gas
(D) keeping steel in inert atmosphere
3. Which of the following is an acidic refractory material?
(A) Graphite (B) Silica
(C) Carborundum (D) Dolomite
4. Addition of sodium dichromate to molten glass imparts _____ colour to glass.
(A) Green (B) Yellow
(C) Red (D) Violet
5. Cinnabar is ore of :
(A) Pb (B) Hg
(C) Sn (D) Ti
6. NPK value of a fertilizer denotes the nitrogen, phosphorous and potassium contents in terms of _____ respectively.
(A) Elementary nitrogen, P_2O_5 , K_2O
(B) N_2O , elementary phosphorous, elementary potassium
(C) Elementary nitrogen, elementary phosphorous, elementary potassium
(D) N_2O , P_2O_5 , KCl
7. Alnico is an alloy of :
(A) Cu, Ni, Al, Co (B) Fe, Co, Al, Ni
(C) Al, Co, Ni (D) Al, Ni, Cu

A

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[P.T.O.]

8. Self-ionisation of liquid SO_2 forms :
- (A) SO^{2+} and SO_3^{2-} (B) SO and SO_3^-
(C) SO^+ and SO_3^{2-} (D) SO^- and SO_3^{2+}
9. Which one is direct fertilizer?
- (A) Gypsum (B) Lime
(C) sodium carbonate (D) Super phosphate
10. Chemical formula of triphosphazene is :
- (A) $\text{N}_3\text{P}_3\text{Cl}_6$ (B) $\text{N}_3\text{P}_3\text{Cl}_3$
(C) $\text{N}_3\text{P}_3\text{O}_6$ (D) $\text{N}_3\text{P}_3\text{O}_3$
11. Which type of glass is used for making lenses?
- (A) lead glass (B) soft glass
(C) crooks glass (D) pyrex glass
12. Cupellation is involved in the metallurgy of :
- (A) Sn (B) Ag
(C) Zn (D) Al
13. Clay belongs to :
- (A) orthosilicate (B) chain silicate
(C) cyclic silicate (D) sheet silicate
14. Identify the aprotic solvent :
- (A) H_2O (B) CHCl_3
(C) NH_3 (D) HF
15. In thermite process reducing agent employed is :
- (A) Carbon (B) Aluminium
(C) Magnesium (D) Chromium

16. Which of the following is true for solutions showing dissociation?
- (A) Vant Hoff factor is less than one (B) Vant Hoff factor is greater than one
(C) Vant Hoff factor is equal to one (D) Vant Hoff factor is equal to zero
17. The heat of combustion of $\text{CH}_4(\text{g})$, $\text{C}(\text{s})$ and $\text{H}_2(\text{g})$ at 25°C are -212.4 kcal, -94.0 kcal and -68.4 kcal respectively. Heat of formation of CH_4 will be :
- (A) $+ 50.0$ kcal (B) $+ 18.4$ kcal
(C) $- 18.4$ kcal (D) $+ 212.8$ kcal
18. Osmotic pressure of equimolar solutions of sugar (I), AlCl_3 (II) and BaCl_2 (III) is in the order of :
- (A) $\text{I} = \text{II} = \text{III}$ (B) $\text{II} > \text{III} > \text{I}$
(C) $\text{I} > \text{III} > \text{II}$ (D) $\text{III} > \text{II} > \text{I}$
19. In cold countries ethylene glycol is added to water in radiators of automobiles during winter. This is to :
- (A) lower the boiling point (B) lower the freezing point
(C) reduce viscosity (D) increase the vapour pressure
20. If 50 ml of 2N HCl is mixed with 50 ml of 2M KOH ,the solution will be :
- (A) acidic (B) neutral
(C) basic (D) cannot be predicted
21. If the solubility of a salt Ag_2SO_4 is X mol/litre, then solubility product is :
- (A) $3X$ (B) X^3
(C) $3X^2$ (D) $4X^3$
22. pH of solution is 3.0 .If its hydrogen ion concentration is decreased by 100 times ,then the pH of the solution becomes :
- (A) 1.0 (B) .03
(C) 5.0 (D) 9.0
23. Purple of Cassius is :
- (A) colloidal solution of silver (B) colloidal solution of gold
(C) colloidal solution of platinum (D) colloidal solution of starch

24. Heat of neutralization of strong acid and strong base is :
- (A) $- 57.1 \text{ KJ/mol}$ (B) $+ 13.7 \text{ KJ/mol}$
 (C) $- 13.7 \text{ KJ/mol}$ (D) $+ 57.1 \text{ KJ/mol}$
25. Relationship between the molar specific heat at constant pressure (C_p) and the molar specific heat at constant volume (C_v) is :
- (A) $C_p + C_v = R$ (B) $C_p/C_v = R$
 (C) $C_p - C_v = R$ (D) $C_p/C_v = 1$
26. Which of the following is true about the octane number of isooctane, n-butane and n-hexane?
- (A) isooctane > n-hexane > n-butane (B) isooctane > n-butane > n-hexane
 (C) n-hexane > n-butane > isooctane (D) n-hexane > isooctane > n-butane
27. First stage of coal formation is :
- (A) Lignite (B) Bituminous
 (C) Peat (D) Anthracite
28. Which of the following is a secondary fuel?
- (A) coal gas (B) natural gas
 (C) peat (D) petroleum
29. The reaction of isobutane and isobutene in presence of anhydrous HF at room temperature yields :
- (A) isooctane (B) n-octane
 (C) n-decane (D) heptane
30. Sweetening of petroleum is the process of :
- (A) desulphurisation (B) de-emulsification
 (C) addition of antiknocking agents (D) fractional distillation
31. The main components of natural gas is
- (A) methane and butane (B) methane and ethane
 (C) methane and isooctane (D) butane and isooctane
32. Which of the following cannot be purified by sublimation?
- (A) iodine (B) arsenic oxide
 (C) ammonium chloride (D) calcium chloride

33. Sulphur containing amino acid is :
(A) aspartic acid (B) leucine
(C) glycine (D) cysteine
34. _____ is a maximum boiling azeotrope.
(A) 95% ethanol and 5% water (B) 68% nitric acid and 32% water
(C) 60% chloroform and 40% benzene (D) 50% ethanol and 50% water
35. Sesquiterpenoids contains _____ number of isoprene units.
(A) 1 (B) 2
(C) 3 (D) 4
36. Alkaloid nicotine contains _____ nucleus.
(A) pyridine (B) pyrrole
(C) benzene (D) furan
37. Major fattyacid present in coconut oil is :
(A) caproic acid (B) stearic acid
(C) oleic acid (D) lauric acid
38. Which one is not a drying agent?
(A) calcium chloride (B) calcium oxide
(C) calcium sulphate (D) calcium carbonate
39. Oil of rose contains :
(A) citral (B) geraniol
(C) camphor (D) coniine
40. Vinca alkaloids are used as _____ drugs.
(A) antimalarial (B) antibiotic
(C) anticancer (D) antipyretic
41. A Molal solution is one that contains one mole of the solute in :
(A) 1 litre of solution (B) 100 gm of solvent
(C) 1 litre of solvent (D) 22.4 litre of solvent

42. In the titration of $K_2Cr_2O_7$ iodometrically, near the end point the colour of the solution becomes :
- (A) green (B) red
(C) yellow (D) blue
43. The Indicator used in iodometric titration is :
- (A) KI (B) Litmus
(C) Methyl orange (D) Starch
44. In qualitative analysis cd is under :
- (A) I group (B) II group
(C) III group (D) IV group
45. A mixture when rubbed with organic acid smells like vinegar. It contains :
- (A) sulphite (B) nitrate
(C) nitrite (D) acetate
46. Which of the following is a primary standard?
- (A) $KMnO_4$ (B) I_2
(C) Na_2CO_3 (D) H_2SO_4
47. When NH_4Cl is added to NH_4OH solution the dissociation of ammonium hydroxide is reduced :
- (A) common ion effect (B) hydrolysis
(C) oxidation (D) reduction
48. The solubility product of $BaSO_4$ is 1.5×10^{-9} at $18^\circ C$. Its solubility in water at $18^\circ C$ is :
- (A) 1.5×10^{-9} moles litre⁻¹ (B) 1.5×10^{-5} moles litre⁻¹
(C) 3.9×10^{-9} moles litre⁻¹ (D) 3.9×10^{-5} moles litre⁻¹
49. The basis principle of paper chromatography is :
- (A) adsorption (B) partition
(C) absorption (D) diffusion

50. Which parameter is measured in thermogravimetry?
(A) change in temperature (B) change in mass
(C) reflectance (D) change in enthalpy
51. Amino acid composition of protein is determined by :
(A) GIC (B) AAS
(C) Electrophoresis (D) Ion-exchange chromatography
52. 0.1 N solution of Na_2CO_3 is being titrated with 0.1 N HCl, the best indicator to be used is :
(A) Potassium ferri cyanide (B) Phenolphthalein
(C) Methyl orange (D) Litmus
53. Which property is measured in absorption spectrophotometry?
(A) Absorption of radiation (B) Optical density of the solution
(C) Refractive index (D) Voltage
54. Calculate significant figures in $21.697 - 20.802$:
(A) 2 (B) 4
(C) 3 (D) 5
55. Normality of 2 M H_2SO_4 is :
(A) 4 N (B) 2 N
(C) 0.5 N (D) 0.25 N
56. The reagent commonly used to determine hardness of water titrimetrically is :
(A) Disodium salt of EDTA (B) Oxalic acid
(C) Sodium thiosulphate (D) Sodium citrate
57. What is the weighing form of gravimetric estimation of iron?
(A) Fe_2O_3 (B) FeO
(C) Fe_3O_4 (D) $\text{Fe}(\text{OH})_2$
58. Dimethyl Glyoxime is used for the test of _____ in alkaline medium.
(A) Hg (B) Zn
(C) Co (D) Ni

59. Scientific creativity originates from :
- (A) knowledge (B) various skills
(C) experiments (D) imagination
60. Nebulization is a term associated with :
- (A) chromatography (B) colloids
(C) atomic absorption spectroscopy (D) solvent extraction
61. Ozone layer is present in :
- (A) troposphere (B) stratosphere
(C) mesosphere (D) exosphere
62. Which air pollutant is not released by automobiles?
- (A) SO₂ (B) Hydrocarbon
(C) Fly ash (D) CO
63. When huge amount of sewage is dumped in a river, the BOD will :
- (A) increase (B) decrease
(C) remain unchanged (D) none of these
64. Which of the following is the uppermost region of the atmosphere?
- (A) stratosphere (B) troposphere
(C) exosphere (D) none of these
65. Depletion of ozone layer causes :
- (A) blood cancer (B) lung cancer
(C) skin cancer (D) breast cancer
66. In 1984, Bhopal gas tragedy took place because methyl isocyanate :
- (A) reacted with DDT (B) reacted with NH₃
(C) reacted with CO₂ (D) reacted with water
67. Which of the following is most abundant hydrocarbon pollutant?
- (A) butane (B) ethane
(C) methane (D) propane

68. Which is true about DDT?
(A) Green house gas (B) A fertilizer
(C) Bio degradable pollutant (D) Non-Biodegradable pollutant
69. Sewage water is purified by :
(A) aquatic plants (B) micro organisms
(C) light (D) fishes
70. The greatest affinity for haemoglobin is shown by which of the following?
(A) NO (B) CO
(C) O₂ (D) CO₂
71. The polymer obtained from caprolactum is :
(A) Terylene (B) Nylon-6
(C) Nylon-66 (D) PTFE
72. Plexi glass is a polymer of :
(A) Methyl methacrylate (B) Acrolein
(C) Acrylonitrile (D) Ethyl acrylate
73. Name a gas that causes Green house effect :
(A) Oxygen (B) Nitrogen
(C) Carbon di oxide (D) Hydrogen
74. Which one of the following is a hard detergent ?
(A) Potassium Pthalate (B) Alkyl Benzene Sulphonate
(C) Lauryl Ethoxylate (D) Sodium Stearate
75. Gun cotton is :
(A) Cellulose Hydrochloride (B) Cellulose Acetate
(C) Cellulose Chloride (D) Cellulose Nitrate
76. Flavour of pineapple can be obtained by mixing the additive :
(A) Amyl acetate (B) Amyl oxalate
(C) Ethyl Butyrate (D) Ethyl Acetate

77. Which one of the following is a naturally occurring dye ?
- (A) Azo dye (B) Vat dye
(C) Alizarin (D) Indigo
78. The objective of ISO-9000 family of Quality management is :
- (A) Employee satisfaction (B) Skill enhancement
(C) Customer satisfaction (D) Environmental issues
79. Soaps and detergents are :
- (A) Ionic Compounds (B) Non polar Compounds
(C) Molecular compounds (D) Covalent compounds
80. When is a detergent more useful for cleaning than soap?
- (A) Removing grease (B) Emulsifying oil droplets
(C) Cleaning in hard water (D) None of the answers are correct
81. Equanil is :
- (A) Artificial sweetener (B) Tranquilizer
(C) Antihistamine (D) Antifertility drug
82. Polyethylene glycols are used in the preparation of which type of detergents?
- (A) Cationic detergents (B) Anionic detergents
(C) Non- ionic detergents (D) Soaps
83. Which of the following chemicals can be added for sweetening of food items at cooking temperature and does not provide calories?
- (A) Sucrose (B) Glucose
(C) Aspartame (D) Sucralose
84. Which of the following is NOT one of the twelve principles of green chemistry?
- (A) Using renewable feedstock
(B) Designing safer chemicals and products
(C) Avoiding the use of catalysts
(D) Maximising atom economy

85. Green chemistry is also called as :
- (A) Life chemistry (B) Environmental Chemistry
(C) Organic Chemistry (D) Sustainable Chemistry
86. _____ are greener than the conventional methods.
- (A) Electromagnetic waves
(B) Micro waves
(C) Ultra violet waves
(D) Radio waves
87. $C_2H_4 + 1/2 O_2 \rightarrow C_2H_4O$ (Ethylene oxide). This reaction will take place under presence of catalyst. Find out the % atom economy :
- (A) 100% (B) 75%
(C) 50% (D) 25%
88. The bio diesel is the long chain of carbon atoms contains _____ group at one end.
- (A) Alcohol (B) Aldehyde
(C) Ester (D) Ketone
89. Gas related to Bhopal tragedy was :
- (A) Potassium Isocyanate
(B) Potassium Isothiocyanate
(C) Methyl Isocyanate
(D) Methyl Iso-thiocyanate
90. Which one of the following is not a condensation polymer?
- (A) Dacron (B) Neoprene
(C) Melamine (D) Bakelite
91. Which of the following is a chain growth polymer?
- (A) Polystyrene (B) Nucleic acid
(C) Protein (D) Starch
92. Presence of _____ in a dry gaseous fuel does not contribute to its calorific value.
- (A) Sulphur (B) Hydrogen
(C) Oxygen (D) Carbon

93. Which of the following is not a permitted synthetic food colour?
(A) Indigo carmine (B) Rhodamine B
(C) Tartrazine (D) Erythrosine
94. The advantage of using conducting polymers in place of metals is their :
(A) Cost (B) Light-weight
(C) Thermal conductivity (D) Solubility
95. Laboratory gas is obtained by the cracking of :
(A) Gasolene (B) Diesel
(C) Fuel oil (D) Kerosene
96. Using Chromatogram as detector in Chromatography, a graph is obtained between _____ and time.
(A) Quantity (B) Density
(C) Concentration (D) Specific gravity
97. In photometers, the readings of the specimen are initially obtained in the form of which of the following parameters?
(A) Transmittance (B) Absorption
(C) Volume (D) Wavelengths
98. Which of the following organic compounds will have the highest intensity of response when introduced in a flame ionization detector?
(A) Ethane (B) Butane
(C) Methane (D) Propane
99. Which of the following hydrocarbon series are almost absent in crude petroleum?
(A) Paraffins (B) Naphthenes
(C) Aromatic (D) Olefins
100. Occupational Safety and Health Act (OSHA) was created for :
(A) Reducing hazards (B) Insurance
(C) Ecological development (D) EIA analysis

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