DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

COMBINED COMPETITIVE (PRELIMINARY) EXAMINATION, 2013

Serial No. ____

CHEMISTRY
Code No. 04

A

Time Allowed : Two Hours | ***Maximum Marks : 300***

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C OR D** AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE RESPONSE SHEET.
3. You have to enter your Roll Number on this Test Booklet in the Box provided alongside. *DO NOT* write *anything else* on the Test Booklet.

   Your Roll No. _____
4. This Booklet contains 120 items (questions). Each item comprises *four* responses (answers). You will select *one* response which you want to mark on the Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each item.
5. In case you find any discrepancy in this test booklet in any question(s) or the Responses, a written representation explaining the details of such alleged discrepancy, be submitted within three days, indicating the Question No(s) and the Test Booklet Series, in which the discrepancy is alleged. Representation not received within time shall not be entertained at all.
6. You have to mark all your responses ONLY on the separate Response Sheet provided. *See directions in the Response Sheet.*
7. All items carry equal marks. Attempt ALL items. Your total marks will depend only on the number of correct responses marked by you in the Response Sheet.
8. Before you proceed to mark in the Response Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Response Sheet as per instructions sent to you with your Admit Card and Instructions.
9. While writing Centre, Subject and Roll No. on the top of the Response Sheet in appropriate boxes use **"ONLY BALL POINT PEN".**
10. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator only the Response Sheet. You are permitted to take away with you the Test Booklet.

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ROUGH WORK

1. Cerium is a member of :
   (A) s-block element
   (B) f-block element
   (C) d-block element
   (D) p-block element

2. The element with electronic configuration $1s^2$, $2s^2\,2p^6$, $3s^2$ is a/an :
   (A) Metal
   (B) Non Metal
   (C) Metalloid
   (D) Inert gas

3. Which of the following has Noble gas configuration ?
   (A) La^{2+}
   (B) Ce^{3+}
   (C) Ce^{4+}
   (D) Eu^{2+}

4. Nobelium with atomic number 102 has the electronic configuration :
   (A) [Rn] $5f^{7}\,6d^{7}\,7s^{2}$
   (B) [Rn] $5f^{10}\,6d^{4}\,7s^{2}$
   (C) [Rn] $5f^{14}\,6d^{1}\,7s^{1}$
   (D) [Rn] $5f^{14}\,6d^{0}\,7s^{2}$

5. Elements of the same group are characterised by :
   (A) Ionization potential
   (B) Electron affinity
   (C) Same number of electrons in the outer most shell
   (D) Electronegativity

6. Zr and Hf have similar atomic and ionic radii because of :
   (A) Diagonal relationship
   (B) Lanthanide contraction
   (C) Both in the same period
   (D) Similar chemical properties

7. Which of the given elements has the highest second ionization potential ?
   (A) O
   (B) N
   (C) B
   (D) C

8. The attraction of an atom for electrons in a bonded molecule is called :
   (A) Ionization potential
   (B) Oxidation potential
   (C) Electron affinity
   (D) Electronegativity

9. Deuterium atom is an _____ of hydrogen atom.
   (A) Isotope
   (B) Isobar
   (C) Isotone
   (D) Isomer

10. Complete the reaction scheme

$^{9}_{4}Be + {}^{4}_{2}He \rightarrow {}^{12}_{6}C +$ ..... choosing one of the following :

(A) $^{1}_{1}P$ (B) $^{1}_{0}n$

(C) $^{2}_{1}H$ (D) $^{0}_{-1}e$

11. An isobar of $_{20}Ca^{40}$ is :
(A) $_{18}Ar^{38}$ (B) $_{19}K^{42}$
(C) $_{20}Ca^{38}$ (D) $_{18}Ar^{40}$

12. Which of the following complexes is most stable ?
(A) $[M(NH_3)_6]^{2+}$ (B) $[M(H_2O)_6]^{2+}$
(C) $[M(bipyridine)_3]^{2+}$ (D) $[M(pyridine)_6]^{2+}$

13. Which of the following is non polar covalent molecule ?
(A) All (B) CO_2
(C) CCl_4 (D) SiF_4

14. The strong forces operating in diamond structure are :
(A) Hydrophobic (B) Covalent
(C) Ionic (D) Coordinate Covalent

15. The central atom in H_2O molecule undergoes the hybridization :
(A) sp (B) sp^2
(C) dp^2 (D) sp^3

16. In regular trigonal bipyramidal structure the bond angles are :
(A) 180^o and 60^o (B) 60^o and 60^o
(C) 72^o and 90^o (D) 120^o and 90^o

17. The hybridization of Tellurium in $TeCl_4$ molecule is :
(A) sp^3 (B) sp^3d
(C) dsp^2 (D) d^2sp^3

18. The longest C-H bond distance is in the following molecule :
(A) C_2H_2 (B) $C_2H_2Br_2$
(C) C_2H_6 (D) C_2H_4

19. Oxidation state of 2^+ of oxygen is observed in :
(A) F_2O (B) H_2O
(C) H_2O_2 (D) O_2F_2

20. In the reduction of $Cr_2O_7^{2-}$ by Fe^{2+}, the number of electrons involved per atom of chromium is :
(A) 3 (B) 5
(C) 1 (D) 4

21. The oxidation state of Iron in $Fe(CO)_5$ molecule is :
(A) 5^+ (B) 2^+
(C) 0 (D) 3^+

22. During oxidation process electrons are :
(A) lost (B) gained
(C) paired up (D) remains same

23. $B_2H_6 + 2\,NH_3 \xrightarrow{\text{High temperature}}$ gives the product as :
(A) Boron nitrate (B) Borazole
(C) Boric acid (D) Borax

24. Which is the correct order of decreasing acid strength halogen group from Cl to I ?
(A) $HClO_3 > HBrO_3 > HIO_3$ (B) $HIO_3 \simeq HClO_3 \simeq HBrO_3$
(C) $HBrO_3 > HClO_3 > HIO_3$ (D) $HIO_3 > HClO_3 > HBrO_3$

25. Which of the following is soluble in excess of NaOH ?
(A) $Ni(OH)_2$ (B) $Fe(OH)_3$
(C) $Cr(OH)_3$ (D) $Al(OH)_3$

26. What is the 10 Dq value of $[Ni(CN)_4]^{2-}$ complex ?
(A) 120 (B) 12
(C) 24 (D) 4

27. Which of the 0.1 M aqueous solution will have the lowest freezing point ?
(A) $C_5H_{10}O_5$ (B) KI
(C) $Al_2(SO_4)_3$ (D) $C_{12}H_{22}O_{11}$

28. Silver metal dissolves in a solution of sodium cyanide in the presence of air to form the complex :
(A) $Na[Ag(CN)_2]$ (B) AgCN
(C) $Na[Ag(CN)_3]$ (D) AgCl

29. The process of heating the concentrated ore in a limited supply of air or in the absence of air is known as :
(A) Roasting (B) Leaching
(C) Calcination (D) Cupellation

30. If the principal quantum number n = 3, the magnetic quantum number m can take on values :
(A) 3 (B) 9
(C) 7 (D) 5

31. Which of the following is pella magnetic in low spin state ?
(A) Co^{2+} (B) Fe^{2+}
(C) Ni^{2+} (D) Co^{3+}

32. $[Co(NH_3)_4Cl_2]NO_2$ and $[Co(NH_3)_4(Cl)(NO_2)]Cl$ are isomers of :
(A) Coordination (B) Optical
(C) Geometrical (D) Ionization

33. $K_3[Al(C_2O_4)_3]$ is called by its IUPAC name as :
(A) Potassium trioxalatoaluminate (iii) (B) Potassium trioxalatoaluminium (iii)
(C) Potassium trioxalatealumininate (iv) (D) Potassium Aluminum Oxalate

34. What is the structure of IF_7 ?
(A) Trigonal bipyramidal (B) Square pyramidal
(C) Pentagonal bipyramidal (D) Trigonal planar

35. The EAN of $[Ni(NH_3)_6]^{2+}$ is :
(A) 34 (B) 38
(C) 36 (D) 40

36. How many number of chlorides will be precipitated when a solution of $[Co(NH_3)Cl]Cl_2$ will react with an excess of silver nitrate ?
(A) 3 (B) 1
(C) 0 (D) 2

37. Which of the following red substances turns black on heating and restores its colour on cooling ?
(A) Fe_3O_4 (B) Pb_3O_4
(C) Na_2CrO_4 (D) $NaClO_4$

38. Which of the halogens will form most hexahalide with sulphur ?
(A) Cl (B) I
(C) F (D) Br

39. $[Pt(NH_3)_2Cl_2]$ exhibits the isomerism called :
(A) Cis-trans (B) Linkage
(C) Ionization (D) Coordination position

40. When a reagent $K_4[Fe(CN)_6]$ is added to an aqueous solution $FeCl_3$ it gives :
(A) Blood red colouration (B) Apple green colouration
(C) Blue colour precipitate (D) Red precipitate

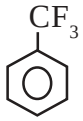
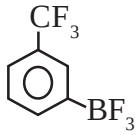
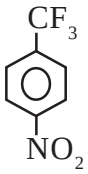
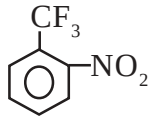
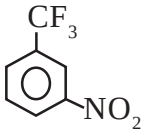
41. Paul-Knorr synthesis of Pyrroles involves the reaction of NH_3 with :
(A) 1, 2-Dicarbonyl Compounds
(B) 1, 3-Dicarbonyl Compounds
(C) 1, 4-Dicarbonyl Compounds
(D) 1, 5-Dicarbonyl Compounds

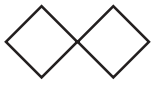
42. Which one of the following is the major product in the nitration of Naphthalene ?
(A) 2-NO_2 naphthalene
(B) 3-NO_2 naphthalene
(C) 6-NO_2 naphthalene
(D) 1-NO_2 naphthalene

43. $HS - CH_2 - \underset{\displaystyle NH_2}{\underset{|}{CH}} - CO_2H$
What is the name of this compound ?
(A) Serine
(B) Alanine
(C) Cysteine
(D) Glycine

44. Which one of the following Vitamins is essential for coagulation of Blood ?
(A) K
(B) C
(C) A
(D) B1

45. Identify the heterocyclic ring containing amino acid from the following :
(A) Valine
(B) Histidine
(C) Leucine
(D) Phenylalanine

46.  + $(NO_2^+)(BF_4^-) \rightarrow z$
z in the above reaction is :
(A) 
(B) 
(C) 
(D) 

47. 
This conformation of cyclohexane is called as :
(A) Twist boat
(B) Deformed chair
(C) Chair
(D) Boat

48. Identify Thiosemicarbazide from the following :

(A) $H_2N–SH$

(B) $H_2N–\underset{\underset{S}{\|}}{C}–NH–NH_2$

(C) $H–\underset{\underset{O}{\|}}{C}–NH–NH_2$

(D) $H_2N–\underset{\underset{O}{\|}}{C}–NH–NH_2$

49. Ethylmethylamine exhibits which one of the following ?

(A) Enantiomerism
(B) Diastereomerism
(C) Dynamic enantiomerism
(D) Geometric isomerism

50. Methyl–α–D–glucoside and Methyl–β–D–glucoside represent :

(A) Epimers
(B) Homomers
(C) Atropisomers
(D) Anomers

51. What is the source of UV radiation ?

(A) Hydrogen gas discharge lamp
(B) RF oscillator
(C) Klystron oscillator
(D) Nernst Filament

52. Which transitions are studied by UV spectrometer ?

(A) Rotational
(B) Electronic
(C) Nuclear
(D) Vibrational

53. One nm is equal to :

(A) 10^{-5} cm
(B) 10^{-6} cm
(C) 10^{-7} cm
(D) 10^{-8} cm

54. The structure of sulphur dioxide molecule (SO_2) may be given as :

(A) Tetrahedral
(B) Bent
(C) Linear
(D) Plane triangle

55. Identify the preferred solvent for recording ^1H–NMR spectrum from the following :

(A) $CDCl_3$
(B) C_6H_6
(C) $H_3C–\underset{\underset{O}{\|}}{C}–CH_3$
(D) $CHCl_3$

56. In ^1H–NMR the aldehydic proton resonates at δ (ppm) value of :

(A) 1.80
(B) 2.50
(C) 9.80
(D) 7.20

57. Which conformation of n-butane has the lowest potential energy ?

(A) Eclipsed
(B) Partially eclipsed
(C) Gauche
(D) Anti

58. An SN1 reaction results in :
(A) Retention
(B) Racemisation
(C) Inversion
(D) Elimination

59. Among the following which alcohol is most reactive with a hydrogen halide ?
(A) Ethyl
(B) t-Butyl
(C) Benzyl
(D) Isopropyl

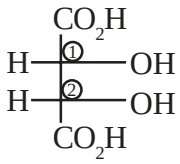
60. $H_3C - C \equiv C - CH_2 - CH_3 \xrightarrow[\text{Lindlar catalyst}]{H_2} z$
Structure of z is :
(A) $H_3C - CH = CH - CH_2 - CH_3$
(B) $H_3C - CH_2 - CH = CH - CH_3$
(C) $H_3C - CH_2 - CH_2 - CH_2 - CH_3$
(D) $H_2C = CH - CH_2 - CH_2 - CH_3$

61. Oxidation of 3–pentanol yields :
(A) Diethyl ketone
(B) Acetone
(C) Methyl ethyl ketone
(D) Acetone + Acetic acid

62. What is the order of a base catalyzed bimolecular elimination reaction of an alkyl halide ?
(A) First order
(B) Pseudo first order
(C) Second order
(D) Zero order

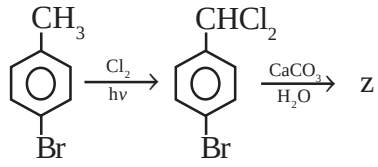
63. Identify the product in the addition reaction of HBr to propene in the presence of peroxide :
(A) 2–Bromopropane
(B) 1–Bromopropane
(C) 1, 2–Dibromopropane
(D) 1, 1–Dibromopropane

64. 3–Hexene $\xrightarrow[2.\ H_2O/Zn]{1.\ O_3}$ product(s)
What are the products in the above reaction ?
(A) Acetaldehyde + Butanal
(B) Formaldehyde + Pentanal
(C) Acetone + Butanal
(D) Propanal + Propanal

65. 

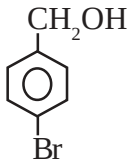
The configuration of this compound is :
(A) 1R, 2S
(B) 1S, 2R
(C) 1R, 2R
(D) 1S, 2S

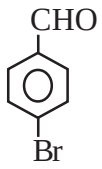
66. $3C_6H_6 + CCl_4 \xrightarrow{AlCl_3} Y$
Structure of Y is :
(A) $C_6H_5CCl_3$
(B) $C_6H_5CHCl_2$
(C) $(C_6H_5)_3CH$
(D) $(C_6H_5)_3C–Cl$

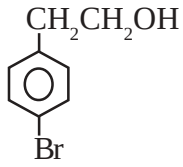
67. 

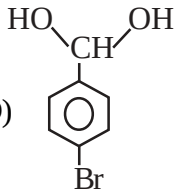
z

Identify z from the following :

(A) 

(B) 

(C) 

(D) 

68. Which one of the following does not give an Iodoform test ?

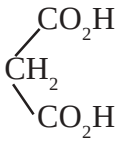
(A) $Ph - CH_2 - CH_2 - OH$

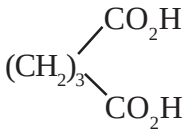
(B) $Ph - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_3$

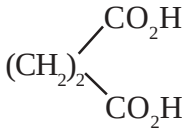
(C) $H_3C - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_2 - CH_3$

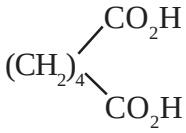
(D) $H_3C - CH_2 - OH$

69. Identify succinic acid from the following :

(A) 

(B) 

(C) 

(D) 

70. $H_5C_2 - O - \underset{\displaystyle O}{\underset{\|}{C}} - O - C_2H_5$. This structure represents which one of the following ?

(A) Carbonyl compound
(B) Alkoxide
(C) Ester
(D) Diether

71. $Ph - \overset{O}{\overset{\|}{C}} - CH_3 + Ph - CHO \xrightarrow{\ominus_{OH}} z$

Structure of z is :

(A) $Ph - CO_2H$

(B) $Ph - CH_2OH$

(C) $Ph - \overset{O}{\overset{\|}{C}} - CH = CH - \overset{O}{\overset{\|}{C}} - Ph$

(D) $Ph - CH = CH - \overset{O}{\overset{\|}{C}} - Ph$

72. The specis formed during the Hofman rearrangement is :

(A) $R - \overset{O}{\overset{\|}{C}} - N_2^+$

(B) RNCO

(C) $R - \overset{O}{\overset{\|}{C}} - N_3$

(D) RCNO

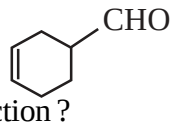
73. Which alkyl halide is most reactive in aliphatic SN2 reaction ?

(A) R – I

(B) R – Br

(C) R – Cl

(D) R – F

74. $Y + H_2C = CH - CHO \rightarrow$ 

What is Y in the above reaction ?

(A) $H_2C = CH_2$

(B) $H_2C = CH - CH = CH_2$

(C) $H_2C = CH - CH = CH - CH_3$

(D) 

75. An alkaline solution of cupric ion complexed with tartarate ion is known as :

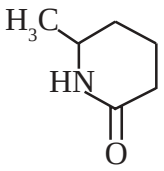
(A) Tollen's reagent

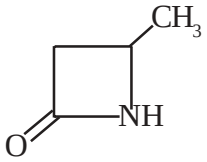
(B) Benedict's reagent

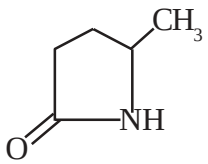
(C) Fehling's reagent

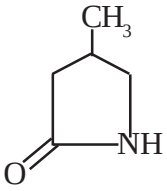
(D) Bayer's reagent

76. $H_2N - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CO_2H \xrightarrow{\Delta}$ product :

(A) 

(B) 

(C) 

(D) 

77. Identify the $n \rightarrow \pi^*$ band (nm) of a $\rangle C = O$ in the UV spectrum from the following :

(A) ~ 300
(B) ~ 200
(C) ~ 250
(D) ~ 150

78. Appearence of two bands in the region of $3500 - 3300^{cm^{-1}}$ in IR spectrum is due to which one of the following groups ?

(A) $-NH_2$
(B) $-\underset{H}{N}-$
(C) $-SH$
(D) $-Cl$

79. Identify the Fundamental NMR equation from the following :

(A) $\gamma B_1 t_p$
(B) $\varepsilon.l.c$
(C) $\frac{H_o V}{2\pi}$
(D) $-\Delta E / kT$

80. Magnetic anisotropy is shown by which one of the following ?

(A) CH_4
(B) $CH_3 - CH_2 - OH$
(C) $H_3C - CH_2 - CH_2 - Cl$
(D) 

81. Average kinetic energy per molecule is :

(A)
(B) $\frac{3}{2}RT$
(C) $\frac{1}{2}kT$
(D) $\frac{1}{2}RT$

82. Rootmean square speed of gas molecule is :

(A) $\sqrt{2RT/M}$
(B) $\sqrt{\frac{3RT}{M}}$
(C) $\sqrt{\frac{3RT}{N}}$
(D) $\sqrt{\frac{8RT}{M}}$

83. For one mole of gas C_P and C_V relations are :

(A) $C_P = C_V$
(B) $C_P = C_V - R$
(C) $C_P = C_V + R$
(D) $C_P = C_V \cdot R$

84. The compressibility factor for ideal gas is :
(A) Zero (B) 1
(C) > 1 (D) < 1

85. The units of van der Waal's constant 'a' are :
(A) Moles/lit (B) Atm litre^2 mol^{-2}
(C) lit/mol (D) atmospheres

86. The value of P_CV_C/RT_C is :
(A) 8.314 (B) 0.375
(C) 2.000 (D) 0.082

87. Half-life period (t½) is not effected by changing concentration of reactants in the reaction of :
(A) First order (B) Second order
(C) Zero order (D) 0.5 order

88. Which of the following is not true for zero order reactions ?
(A) Rate = Rate constant
(B) Rate is independent of concentrations
(C) Rate does not change with time
(D) Rate increase with increase in concentrations

89. The half–life of first order reaction is 0.1 sec. The rate constant is :
(A) 6.93 sec (B) 0.0693 sec^{-1}
(C) 69.3 sec (D) 6.93 sec^{-1}

90. The units of rate of zero order reaction is :
(A) Sec^{-1} (B) Mol lit^{-1}
(C) Mol lit^{-1} sec^{-1} (D) Mol lit^{-1} sec

91. The rate constant for first order reaction is 0.01 sec^{-1}. If the initial concentration of reactant A is 0.1 M, the initial rate is :
(A) 1×10^{-2} (B) 1×10^{-3}
(C) 0.1 (D) 1.1×10^{-2}

92. The pH of 0.05M H_2SO_4 solution is :
(A) 2.70 (B) 5.20
(C) 1.00 (D) 2.05

93. The dissociation constant of weak acid HA is 1×10^{-3} and its concentration is 0.1 M. The pH of solution is :
(A) 1 (B) 2
(C) 3 (D) 4

94. The units of molar conductance are :
(A) $Sm^2 mol^{-1}$ (B) $S^{-1} m^2 m M^{-1}$
(C) S mol m^2 (D) S^{-1} mol M

95. Which of the following ions has highest ionic mobility ?
(A) OH^- (B) Li^+
(C) Cs^+ (D) H^+

96. The cell in which electrical energy is converted to chemical energy is :
(A) Galvanic cell (B) Voltaic cell
(C) Electrolytic cell (D) Electrochemical cell

97. The standard reduction potentials of Zn^{2+}/Zn and Cu^{2+}/Cu are – 0.76v and + 0.34v respectively. The E^o of cell $Zn \mid Zn^{2+}(0.1M) \mid\mid Cu^{2+}(0.1M) \mid Cu$ is :
(A) + 0.42v (B) 1.10v
(C) – 1.10v (D) – 0.42v

98. Arrhenius theory of electrolytic conduction does not apply to :
(A) HCN (B) NH_4OH
(C) CH_3COOH (D) KCl

99. Under Isobaric conditions the heat absorbed by the system qp is given by :
(A) $qp = \Delta H$ (B) $qp = \Delta E$
(C) $qp = \Delta E + \Delta V$ (D) $qp = \Delta E - P\Delta V$

100. C_p and C_V relation for He gas is :
(A) $C_P > C_V$ (B) $C_P = C_V$
(C) $C_P = C_V + R$ (D) $C_P = C_V + 2R$

101. In isothermal expansion of gases, which of the following is zero ?
(A) q (heat absorbed) (B) W
(C) ΔE (D) ΔV

102. Which of the following gases warmed up in adiabatic expansion ?
(A) O_2 (B) N_2
(C) Ne (D) H_2

103. The ΔE and ΔH relation for the reaction
$C_6H_6(\ell) + 7½\ O_2(g) \rightarrow 6\ CO_2\ (g) + 3\ H_2O(\ell)$ is :
(A) $\Delta H = \Delta E - 1.5\ RT$ (B) $\Delta H = \Delta E + 1.5\ RT$
(C) $\Delta H = \Delta E + ½\ RT$ (D) $\Delta H = \Delta E$

104. Which of the following is true for spontaneous process ?
(A) $\Delta G = +$ ve
(B) $\Delta G = -$ ve
(C) $\Delta G = 0$
(D) $\Delta G = \Delta S = \Delta H = 0$

105. The number of degrees of freedom at triple point in H_2O system are :
(A) 1
(B) 0
(C) 2
(D) 3

106. The phase rule for condensed systems (Ex : Pb-Ag System) at constant P is :
(A) $F = C - P + 2$
(B) $F = C - P + 1$
(C) $F = C - P + 3$
(D) $F = C + P - 1$

107. Gels are :
(A) solids dispersed in solid
(B) solids dispersed in gas
(C) solids dispersed in liquid
(D) Liquids dispersed in solids

108. Highest flocculation value exhibited for $Fe(OH)_3$ solution is :
(A) KCl
(B) $K_2Cr_2O_4$
(C) $K_3[Fe(CN)_6]$
(D) $BaCl_2$

109. Tyndall effect is shown by :
(A) Ideal solutions
(B) AgCl suspension
(C) Starch solution
(D) $K_2Cr_2O_7$ solution

110. A catalyst is :
(A) Consumed in reaction
(B) Produced in reaction
(C) Not affected in reaction
(D) Undergoes chemical change

111. In an auto catalytic reaction, the rate of reaction :
(A) Increase with time
(B) Not affected with time
(C) Decrease with time
(D) Can't be predicted

112. $Pb(C_2H_5)_4$ in petrol acts as :
(A) Catalyst
(B) Promoter
(C) Activator
(D) Inhibitor

113. The distribution coefficient expression for distribution of Benzoic acid in Benzene and water is obtained experimentally as $K = \sqrt{C_{Benzene}} / C_{Water}$, the molecular state of Benzoic acid is :
(A) Dimer in Benzene
(B) Monomer in Benzene
(C) Dissociated in Benzene
(D) Dimer in Water

114. At equilibrium the free energy change (ΔG) is :
(A) 0
(B) – ve
(C) + ve
(D) infinity

115. According to Lechateliar principle the reaction in the $2\,NO_2(g) + O_2(g) \rightleftharpoons 2NO_2(g) + \text{heat}$ equilibrium the forward reaction is favoured when :
(A) High T and High P
(B) Low T and Low P
(C) Low T and High P
(D) High T only

116. Which of the following is not colligative property ?
(A) Relative lowering of VP
(B) Elevation of BP
(C) Osmotic pressure
(D) Freezing point

117. Which of the following solution has largest osmotic pressure ?
(A) 0.1M Glucose
(B) 0.11M Urea
(C) 0.1M $BaCl_2$
(D) 0.1 M KCl

118. Two isotonic solutions will have same :
(A) Vapour pressure
(B) Boiling point
(C) Freezing point
(D) Osmotic pressure

119. A non-volatile solid is added to water. Its freezing point will :
(A) Increase
(B) Decrease
(C) No change
(D) Can't be predicted

120. Sea water can be converted into fresh water by :
(A) Osmosis
(B) Sedimentation
(C) Diffusion
(D) Reverse Osmosis

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