101PC11

Test Booklet Series | B

ROLL No. | | | | | |

QN. BOOKLET No. **21626**

TEST FOR FIRST DEGREE PROGRAMMES IN
ENGINEERING AND TECHNOLOGY

PHYSICS & CHEMISTRY

Time: 1 Hour and 30 Minutes

Maximum Marks: 375

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Question Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil your OMR Sheet. Read carefully all the instructions given on the OMR Sheet.

2. Write your Roll Number in the space provided on the top of **this page.**

3. Also write your Roll Number, Test Centre Code, Test Centre Name, Test Subject and the date and time of the examination in the columns provided for the same on the **Answer Sheet.** Darken the appropriate bubbles with HB pencil.

4. Darken the appropriate bubble corresponding to the Test Booklet Series, as given on the top of this page, in the OMR Answer Sheet. **If the corresponding bubble is not darkened, such answer sheets will not be valued and will be summarily rejected.**

5. The paper consists of 125 objective type questions, out of which the first 75 questions are from Physics and the remaining 50 questions are from Chemistry. All questions carry equal marks.

6. Each Question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by **HB pencil** corresponding to the correct response as indicated in the example shown on the Answer Sheet. Also write the alphabet of your response with ball pen in the starred column against attempted questions and put an '×' mark by ball pen in the starred column against unattempted questions as given in the example in the OMR Sheet.

7. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.

8. Please do your rough work only on the space provided for it at the end of this question booklet.

9. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However Question Booklet may be retained with the Candidate.

10. Every precaution has been taken to avoid errors in the Question Booklet. In the event of such unforeseen happenings, suitable remedial measures will be taken at the time of evaluation.

11. Please feel comfortable and relaxed. You can do better in this test in a tension-free disposition.

WISH YOU A SUCCESSFUL PERFORMANCE

PHYSICS

1. When the light is refracted from air to glass, which one of the following will not change?

(A) Wavelength (B) Amplitude
(C) Frequency (D) Velocity

2. The phase difference between any two points in a wave front is

(A) π (B) $\frac{\pi}{2}$
(C) zero (D) 2π

3. Two coherent sources of monochromatic light of wavelength 6000 A° produce an interference pattern on the screen kept at a distance of 1m. The distance between two consecutive bright fringes on the screen is 0.5mm, then the distance between the coherent sources is

(A) $1.2m$ (B) $1.2mm$
(C) $12mm$ (D) $1.26m$

4. Angular speed of charged particle of charge q and mass m, in a magnetic field B is

(A) Bq/m (B) Bm/q
(C) Bq^2/m (D) B^2q/m

5. Two electron beams having velocities in the ratio of 1:2 are subjected to identical magnetic fields separately. The ratio of the deflections produced is

(A) 4:1 (B) 1:2
(C) 1:4 (D) 2:1

6. Two bodies of masses m and $4m$ are moving with equal kinetic energy. The ratio of their linear momenta is

(A) 1:4 (B) 4:1
(C) 2:1 (D) 1:2

7. A wire suspended vertically from one end, is stretched by attaching a weight $200N$ to the lower end. The weight stretches the wire by 1mm. The energy gained by the wire is

(A) $0.1\,J$ (B) $0.2\,J$
(C) $0.4\,J$ (D) $10\,J$

8. A gas at a temperature $250K$ is contained in a closed vessel. If the gas is heated through $1°C$, the percentage increase in the pressure is

(A) 0.4 (B) 0.6
(C) 0.8 (D) 1.0

9. For accurate measurements, the resistance of a voltmeter should be

(A) as large as possible (B) infinity
(C) as small as possible (D) zero

10. A galvanometer has an internal resistance of 1 *ohm*. It gives a maximum deflection for a current of $50mA$. Then the shunt resistance used to convert galvanometer into an ammeter of maximum reading $2.5A$ is

(A) $0.002\ \Omega$ (B) $.02\ \Omega$
(C) $0.2\ \Omega$ (D) $2\ \Omega$

11. Who confirmed experimentally that the electric current in a conductor is carried by an electron?

(A) Tolman and Stewart (B) Ohm and Volt
(C) Coulomb and Gauss (D) Farad and Stewart

12. The wavelength of K_α line from an element of atomic number 41 is λ. Then the wavelength of K_α line of an element of atomic number 21 is

(A) 4λ (B) $\frac{\lambda}{4}$
(C) 3.06λ (D) 0.26λ

13. Electromagnetic radiations like X – rays and UV rays when incident on certain elements, the emission of electrons takes place and this is known as

(A) Stark effect (B) Zeeman effect
(C) Photoelectric effect (D) Compton effect

14. The stem or leaves of the plant are periodically tested for radioactivity using

(A) G.M. Counter
(B) Proportional counter
(C) Photographic plates
(D) Radiation counter

15. Which radio isotope is called the radioactive clock?

(A) Lead 206
(B) Uranium 238
(C) Carbon 14
(D) Iodine 131

16. Moment of inertia of a sphere of mass M and radius R with the diameter as the axis of rotation is

(A) $\frac{2}{5}MR^2$
(B) $\frac{7}{5}MR^2$
(C) $\frac{3}{5}MR^2$
(D) $\frac{5}{7}MR^2$

17. If a million tiny droplets of water coalesce into one larger drop, the ratio of total surface energy of the larger drop to that of the all the smaller drops combined will be

(A) 1:100
(B) 100:1
(C) 1:10
(D) 10:1

18. A simple pendulum of frequency f has a metal bob. If the bob is charged negatively and is allowed to oscillate with a positively charged plate placed under it, the frequency will

(A) remain as f
(B) become less than f
(C) become more than f
(D) become zero

19. A freely falling stone from a tower of height h covers a distance $h/2$ in the last second of its motion. The height of the tower is $\left(g = 10ms^{-2}\right)$ nearly

(A) 55m
(B) 56m
(C) 57m
(D) 58m

20. A bullet hits and gets embedded in a solid block resting on a frictionless surface. In this process

(A) momentum is conserved
(B) energy is conserved
(C) both momentum and kinetic energy are conserved
(D) neither momentum nor kinetic energy is conserved

21. If a man of mass M jumps to the ground from a height h and his center of mass moves a distance x in the time taken by him to hit the ground, the average force acting on him is

(A) $\frac{Mgh}{x}$ (B) $\frac{Mgx}{h}$
(C) $\frac{Mgh^2}{x}$ (D) $\frac{Mgh}{x^2}$

22. Water rises in capillary tube of radius r to a height of h when it is immersed in water. The potential energy of this mass of water, m, in the capillary tube is

(A) mgh (B) $\frac{mgh}{2}$
(C) $2mgh$ (D) $4mgh$

23. A spring of force constant k is broken into three equal parts. If these three parts are connected parallel, the spring constant of the equivalent spring will be

(A) $\frac{k}{3}$ (B) k
(C) $3k$ (D) $9k$

24. What stress would cause a wire to increase in length by 0.1% if the Young's modulus of the wire is $12\times10^{10}\ Nm^{-2}$?

(A) 1.2×10^{10} (B) 1.2×10^{9}
(C) 1.2×10^{8} (D) 1.2×10^{7}

25. Two identical waves, each of frequency $10Hz$, are traveling in opposite directions in a medium with a speed of 20 ms^{-1}. The distance between the adjacent nodes is

(A) 1.0 cm
(B) 1.2 cm
(C) 1.5 cm
(D) 2.0 cm

26. A pipe closed at one end and open at the other will give

(A) all the harmonics
(B) all even harmonics
(C) all odd harmonics
(D) no harmonics

27. A source of sound is moving along a circular orbit of radius 3 m with an angular velocity of $10\,rad\,s^{-1}$. The linear speed of the source along the circular orbit is

(A) $15ms^{-1}$
(B) $25ms^{-1}$
(C) $45ms^{-1}$
(D) $30ms^{-1}$

28. When a copper ball is heated, the largest percentage increase will occur in its

(A) diameter
(B) area
(C) volume
(D) density

29. Pressure-volume relationship for an adiabatic process is

(A) $P^{\gamma-1}V = \text{constant}$
(B) $P^{\gamma}V = \text{constant}$
(C) $PV^{\gamma} = \text{constant}$
(D) $P^{1-\gamma}V = \text{constant}$

30. Inside a uniform charged spherical conductor, the electric

(A) field is zero everywhere
(B) potential is zero everywhere
(C) potential is same only at specific points
(D) field has the same magnitude everywhere but it is not zero

31. The light emitting diode

(A) emits light when forward biased
(B) emits light when reverse biased
(C) emits light when no bias is given
(D) is made from *Si* or *Ge*

32. In an *NPN* transistor circuit, the collector current is $10mA$. If 90% of the electrons emitted reach the collector,

(A) the emitter current will be nearly 9 mA
(B) the emitter current will be nearly 11 mA
(C) the base current will be nearly 9 mA
(D) the base current will be nearly -1 mA

33. Two single stage amplifiers, having gains of p and q are connected in cascade. The net gain will be

(A) $p+q$ (B) pq
(C) $p-q$ (D) $\sqrt{(pq)}$

34. At magnetic poles of the Earth, the total magnetic field intensity is

(A) greater than the vertical component
(B) equal to the vertical component
(C) less than the vertical component
(D) independent of the vertical component

35. Mutual inductance between two coils with number of turns N_1 and N_2 is

(A) proportional to N_1N_2
(B) inversely proportional to N_1N_2
(C) proportional to $\sqrt{N_1N_2}$
(D) inversely proportional to $\sqrt{N_1N_2}$

36. Ex-OR gate is nothing but a

(A) half adder (B) half adder without carry
(C) full adder (D) full adder without a carry

37. When a piece of ebonite rod is rubbed with a fur, a charge of $-32\times10^{-9}C$ is developed. The number of electrons transferred is

(A) 20×10^{10} (B) 20×10^{-19}
(C) 20×10^{19} (D) 32×10^{9}

38. Two conducting spheres of radii r_1 and r_2 are charged to same surface charge density. The ratio of electric field near the surface is

(A) $\frac{r_1}{r_2}$ (B) $\frac{r_1^2}{r_2^2}$

(C) $\frac{r_2}{r_1}$ (D) 1 : 1

39. Four parallel plate capacitors are connected in series. Which of the following is true?

(A) The capacitors carry same charge
(B) Potential difference across the capacitors is same
(C) The charges in the capacitors are different
(D) The total capacitance is the sum of individual capacitances

40. When a potential difference V is applied across a conductor at temperature T, the drift velocity of electrons is proportional to

(A) V (B) T

(C) VT (D) $\frac{V}{T}$

41. The characteristic of a fuse wire is

(A) high melting point and high specific resistance
(B) high melting point and low specific resistance
(C) low melting point and high specific resistance
(D) low melting point and low specific resistance

42. Which of the following is not true, in the case of magnetic Lorentz force?

(A) The force is zero, if the direction of motion of charge is parallel to the magnetic field
(B) The force is zero, when the charge moves perpendicular to the magnetic field
(C) The force is zero, when the charges are at rest
(D) The force is proportional to the magnetic induction

43. Lenz's law is the consequence of

(A) law of conservation of momentum
(B) law of conservation of energy
(C) law of conservation of velocity
(D) law of conservation of charge

44. In Raman scattering, the Stokes line has

(A) greater frequency and greater intensity
(B) greater frequency and lower intensity
(C) lower frequency and greater intensity
(D) lower frequency and lower intensity

45. The refractive index of the medium is 1.5. The velocity of light in the medium is

(A) $3\times10^{8} m/s$ (B) $2\times10^{8} m/s$
(C) $4.5\times10^{8} m/s$ (D) $1.5\times10^{8} m/s$

46. The transverse nature of light is demonstrated by

(A) interference (B) diffraction
(C) refraction (D) polarization

47. Which of the following is not a uniaxial crystal?

(A) Calcite (B) Mica
(C) Quartz (D) Tourmaline

48. The condition for observing Fraunhofer diffraction from a single slit is that the wavefront should be

(A) spherical (B) cylindrical
(C) elliptical (D) plane

49. The specific charge of cathode ray is

(A) dependent upon the material of the cathode
(B) dependent upon the nature of the gas in the discharge tube
(C) constant
(D) variable

50. In Bohr atom model, the energy of the electron in its orbit

(A) increases as n increases
(B) decreases as n increases
(C) is independent of n
(D) decreases as the square of n

51. In Helium –Neon laser, the emitted laser is due to

(A) transition of helium atom from excited state to ground state
(B) transition of neon atom from excited state to ground state
(C) transition of both helium and neon atoms from excited state to ground state
(D) absorption of radiation by neon atoms

52. The momentum of the electron of wavelength 3 Å is

(A) $0.5\times10^{-24}\,kg\,m\,s^{-1}$
(B) $2.2\times10^{24}\,kg\,m\,s^{-1}$
(C) $0.5\times10^{24}\,kg\,m\,s^{-1}$
(D) $2.2\times10^{-24}\,kg\,m\,s^{-1}$

53. The mass of an electron increases to 2 times the rest mass, when the speed of the electron is equal to

(A) $\left(\frac{\sqrt{3}}{2}\right)c$
(B) $\left(\frac{2}{\sqrt{3}}\right)c$
(C) $2c$
(D) $\frac{c}{2}$

54. A circular orbit appears as an ellipse for a fast moving observer due to

(A) time dilation
(B) variation of mass with velocity
(C) Lorentz- Fitzgerald contraction
(D) Einstein's mass energy equivalence

55. The half life period of a radioactive element with disintegration constant 0.00693 per day is

(A) one year
(B) 100 years
(C) 100 seconds
(D) 100 days

56. An element with atomic number A emits an α-particle, two β-particles and a γ-ray. The atomic number of the residual element will be

(A) $Z-3$ (B) $Z+2$
(C) $Z-1$ (D) Z

57. The efficiency of a half wave rectifier is

(A) 50% (B) 40.6%
(C) 81.2% (D) 25%

58. In multistage amplifiers, the overall voltage gain is

(A) equal to the sum of voltage gain of individual stages
(B) product of voltage gain of individual stages
(C) average gain of all the stages
(D) the difference of gains of alternate stages

59. The value of the Boolean expression $(\overline{A}+B)\ (A+B)$ is equivalent to

(A) $A\overline{A}+B\overline{B}$ (B) B
(C) A (D) $(A+B)$

60. An operational amplifier has

(A) very low input impedance and very low output impedance
(B) very high input impedance and very high output impedance
(C) very low input impedance and very high output impedance
(D) very high input impedance and very low output impedance

61. In phase modulation

(A) only the phase of carrier wave changes
(B) only the frequency of carrier wave changes
(C) both the frequency and the phase changes
(D) the amplitude and frequency of the carrier and signal changes

62. In television systems

(A) sound signals are frequency modulated and picture signals are amplitude modulated
(B) sound signals are amplitude modulated and picture signals are frequency modulated
(C) both sound and picture signals are amplitude modulated
(D) both sound and picture signals are frequency modulated

63. Which of the following is a first order transducer?

(A) Potentiometer
(B) Bare thermocouple immersed in water
(C) Thermocouple covered with thermowell
(D) Resistance temperature detector

64. An example for damped oscillations is

(A) vibrations in a stretched string
(B) a tuning fork struck against a rubber pad
(C) the oscillations of a pendulum in air
(D) sound boards of stringed instruments

65. Which of the following waves can be polarized?

(A) Transverse waves on a string (B) Longitudinal waves in a spring
(C) Sound waves in a gas (D) Sound waves in a liquid

66. In Young's double slit experiment, if the distance between the slits and the screen is doubled and the separation between the slits is reduced to half, the fringe width

(A) is doubled (B) is halved
(C) becomes four times (D) remains unchanged

67. A man is watching two trains one leaving and the other coming in with equal speeds of 4m/s. If they sound their whistles, each of frequency 240 Hz, the number of beats heard by the man (velocity of sound = 320 m/s) will be equal to

(A) 6 (B) 3
(C) 0 (D) 12

68. Miller indices represent

(A) a single plane
(B) a set of parallel planes
(C) a set of alternative planes
(D) two successive planes

69. With increase in temperature the electrical conductivity of intrinsic semi-conductor

(A) increases
(B) decreases
(C) first decreases and then increases
(D) first increases and then decreases

70. When forward biased, P-N diode behaves as

(A) a high resistor
(B) a capacitor
(C) an ON switch
(D) an OFF switch

71. If a bar magnet of magnetic moment 80 units is cut into two halves of equal lengths, the magnetic moment of each half will be

(A) 80 units
(B) 40 units
(C) 60 units
(D) 20 units

72. Which one of the following quantity in electricity is analogous to temperature in mechanics?

(A) Potential
(B) Resistance
(C) Inductance
(D) Capacitance

73. Dielectric strength of a material is

(A) the capacity to take two or more stresses
(B) the capacity to withstand higher voltage
(C) the capacity to withstand electrical shocks
(D) the capacity to withstand mechanical shocks

74. The kind of luminescence persisting for long time after the removal of exciting source is

(A) beta luminescence
(B) fluorescence
(C) phosphorescence
(D) thermo luminescence

75. A Schmitt trigger behaves as

(A) square wave generator
(B) monostable multivibrator
(C) bistable multivibrator
(D) free-running multivibrator

CHEMISTRY

76. Which among the following gases will diffuse at the same rate as N_2 at the same temperature and pressure?

(A) O_2
(B) CO_2
(C) CO
(D) NO

77. Which of the following elements would you expect to have the largest electron affinity?

(A) Al
(B) Cl
(C) P
(D) Si

78. A species which has coordinate covalence is

(A) H_2O
(B) NH_3
(C) NH_4^+
(D) BF_3

79. The projectile experiencing minimum repulsive forces on approaching a particular nucleus is

(A) alpha particle
(B) protons
(C) neutrons
(D) beta Particles

80. Which of the following oxides gives metal on heating?

(A) ZnO
(B) Al_2O_3
(C) TiO_2
(D) HgO

81. The values of the standard oxidation electrode potentials of the following reactions are given:

$Zn \rightarrow Zn^{2+} + 2e$; $E^0_{ox} = +0.762$ V
$Fe \rightarrow Fe^{2+} + 2e$; $+0.440$ V
$Cu \rightarrow Cu^{2+} + 2e$; -0.345 V
$Ag \rightarrow Ag^{+} + e$; -0.800 V

Which one of the above is easily reduced?

(A) Fe (B) Zn
(C) Cu (D) Ag

82. The dissociation energy of methane is 360 kcal/mol and that of ethane is 620 kcal/mol. The C-C bond energy (kcal/mol) is

(A) 260 (B) 130
(C) 180 (D) 80

83. AgCl has solubility of 10^{-5} moles/litre. Assuming complete ionization, the value of solubility product will be

(A) 10×10^{-5} (B) 0.1×10^{-10}
(C) 1×10^{-10} (D) 0.01×10^{-10}

84. When the same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volume of hydrogen evolved is

(A) 1:1 (B) 1:2
(C) 2:1 (D) 9:1

85. Which of the following represents the correct set of the four quantum numbers of 4d electron?

(A) $4, 3, 2, +\frac{1}{2}$ (B) $4, 2, 1, 0$
(C) $4, 3, -2, +\frac{1}{2}$ (D) $4, 2, -1, -\frac{1}{2}$

86. Terylene is formed by the reaction of:

(A) terephthalic acid and ethylene glycol
(B) oxalic acid and polyethylene glycol
(C) benzoic acid and ethylene glycol
(D) formaldehyde and terephthalic acid

87. The molecularity of the S_N1 hydrolysis of t-butyl chloride is

(A) 1
(B) 2
(C) 0
(D) 1.5

88. Pick out the compound that will have a definite dipole moment.

(A) *cis*-2-butene
(B) *trans*-2-butene
(C) benzene
(D) cyclohexane

89. Which of the following statements is true?

(A) An acid and its conjugate base reacts to form a salt and water
(B) The acid water is its own conjugate base
(C) The conjugate base of a weak acid is a strong base
(D) The conjugate base of a strong acid is a strong base

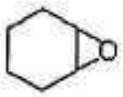
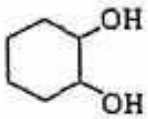
90. IUPAC name for potassium ferrocyanide is

(A) potassium hexacyanoferrate(II)
(B) potassium hexacyanoferrate(III)
(C) potassium cyanide complex with iron
(D) potassium iron cyanide

91. A bomb based on atomic fission involves

(A) $^{238}_{92}U$ and $^{1}_{0}n$
(B) $^{235}_{92}U$ and $^{1}_{1}H$
(C) $^{235}_{92}U$ and $^{1}_{0}n$
(D) $^{238}_{92}U$ and $^{1}_{1}H$

92. Ozonolysis of cyclohexene gives

(A) 
(B) 

(C) 

(D) 

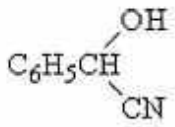
93. Acetone can be transformed into propane by reacting with

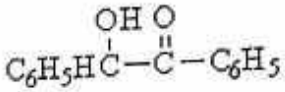
(A) Hg^{2+}/H_2O
(B) Zn/Hg, HCl
(C) $NaBH_4$
(D) $LiAlH_4$

94. Benzaldehyde reacts with alc. KCN to give

(A) benzyl alcohol

(B) benzoic acid

(C) 

(D) 

95. The correct order of basicities is

(A) Thiophen>pyridine>piperidine
(B) Piperidine> pyridine>thiophen
(C) Pyridine>piperidine>thiophen
(D) Piperidine>thiophen>pyridine

96. Benzene reacts with n-propyl bromide in the presence of $AlCl_3$ to yield

(A) n-propylbenzene
(B) 1,2-di-n-propylbenzene
(C) 1,4-di-n-propylbenzene
(D) Isopropylbenzene

97. Hoffman rearrangement is useful in the preparation of

(A) amines from amides
(B) amides from amines
(C) alcohols from amines
(D) amines from alcohols

98. The IUPAC name for CH_3-CH_2-$CH(CH_3)$-COOH is

(A) α -methylbutyric acid
(B) 3-methylbutanoic acid
(C) 2-methylbutanoic acid
(D) isopentanoic acid

99. Among the following, the one with maximum unpaired electrons is

(A) Mn^{2+}
(B) V^{3+}
(C) Ti^{3+}
(D) Fe^{2+}

100. Hybridisation of Boron in BF_3 is

(A) sp^3
(B) sp^2
(C) sp
(D) sp^3d

101. The half life period of a first order reaction is 10 min. Then the rate constant of the reaction is

(A) $6.93\times10^{2}\ min^{-1}$
(B) $0.693\times10^{2}\ min^{-1}$
(C) $69.3\times10^{-1}\ min^{-1}$
(D) $6.93\times10^{-2}\ min^{-1}$

102. Heat of neutralization of any strong acid with any strong base is almost the same because

(A) they involve the combination of H^+ and OH^- ions to form unionized molecules of water
(B) they involve the formation of salt and water
(C) they produce the conjugate acid and base
(D) they have the same heats of formation

103. Which one of the following substances would decolorize acidified $KMnO_4$ in the cold?

(A) $H_2C_2O_4$ (B) $FeSO_4$
(C) $Fe_2(SO_4)_3$ (D) $Na_2C_2O_4$

104. Which one of the following will be precipitated by HCl as well as H_2S?

(A) Pb^{2+} (B) Mn^{2+}
(C) Cu^{2+} (D) Hg^{2+}

105. As_2S_3 sol is negatively charged. Which of the following electrolytes is required in minimum concentration to precipitate this sol?

(A) NaCl (B) $Mg_3(PO_4)_2$
(C) $AlCl_3$ (D) Na_2SO_4

106. If the temperature (K) of the gas is halved and the pressure is doubled, the volume of the gas will

(A) remain unchanged (B) be doubled
(C) increase four fold (D) be reduced to one fourth

107. Which of the following would be most reactive towards bromine?

(A) anisole (B) m-hydroxyanisole
(C) o-methylanisole (D) m-methylanisole

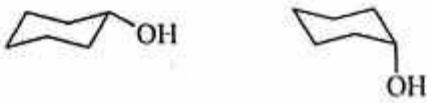
108. Which of the following is least basic?

(A) aniline (B) p-methylaniline
(C) diphenylamine (D) triphenylamine

109. Which of the following groups would you introduce into a drug or dye to make it water soluble?

(A) $-NO_2$
(B) $-Cl$
(C) $-SO_3H$
(D) $-OH$

110. The following pair is known as:



(A) conformers
(B) regioisomers
(C) configurational isomers
(D) anomers

111. Oxidation of phenol with chromyl chloride affords:

(A) *p*-benzoquinone
(B) 2-hydroxybenzoquinone
(C) *p*-hydroquinone
(D) 1,2-dihydroxybenzene

112. The C-C and Si-C inter-atomic distances are 154 pm and 188 pm. The atomic radius of Si is

(A) 91 pm
(B) 77 pm
(C) 111 pm
(D) 188 pm

113. When N_2 is ionized it gives rise to N_2^+, the bond order ..... and when O_2 is ionized to O_2^+ the O-O bond order ..... The words that suit the two blanks are:

(A) *increases* and *decreases*
(B) *decreases* and *increases*
(C) *increases* and *increases*
(D) *decreases* and *decreases*

114. Treatment of $K_4[Fe(CN)_6]$ with $FeCl_3$ leads to the formation of

(A) $K_3[Fe(CN)_6]$
(B) $K_4[Fe(CN)_3Cl_3]$
(C) $KFe[Fe(CN)_6]$
(D) $K_3[Fe(CN)_5Cl]$

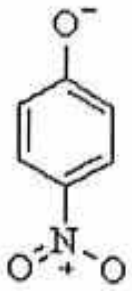
115. The anhydride of nitrous acid is

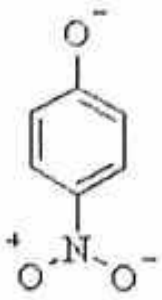
(A) NO
(B) N_2O
(C) NO_2
(D) N_2O_3

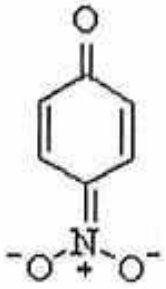
116. The element which is not known to form an oxyacid is

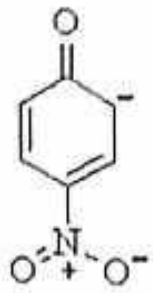
(A) Sulphur
(B) Iodine
(C) Chlorine
(D) Fluorine

117. The most unreasonable resonance structure for *p*-nitrophenoxide ion is:

(A) 

(B) 

(C) 

(D) 

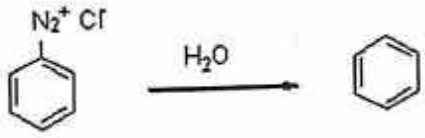
118. The pair of reactants that cannot be used for preparing *t*-butanol is

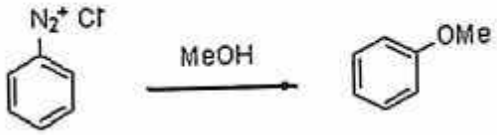
(A) acetone and EtMgBr
(B) CH_3COOMe and excess MeMgBr
(C) acetone and MeMgBr
(D) *t*-butylchloride and H_2O

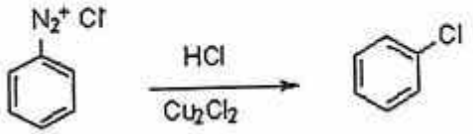
119. Which one of the following statements is wrong?

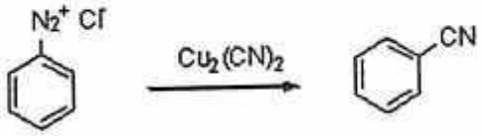
(A) Aldehydes act as reducing agents
(B) 2-Butanol upon oxidation gives ethyl methyl ketone
(C) Benzaldehyde undergoes Cannizzaro reaction upon treatment with con. NaOH
(D) Aldehydes and ketones undergo nucleophilic substitution

120. Which of the following reactions will not occur?

(A) 

(B) 

(C) 

(D) 

121. Nitromethane reacts with acetaldehyde in presence of a base to give

(A) nitropropane
(B) 2-nitro-1-propanol
(C) 1-nitro-2-propanol
(D) 3-nitropropanol

122. The process of concentrating Au and Ag ores is based on their solubility in

(A) Ammonia
(B) HCl
(C) HNO_3
(D) KCN

123. An example of hexadentate ligand is

(A) 2 2' – dipyridyl
(B) ethylene diamine
(C) ethylene diamine tetraacetate ion
(D) dimethylglyoxime

124. $[Co(NH_3)_4Cl_2]NO_2$ and $[Co(NH_3)_4Cl(NO_2)]Cl$ are ..... isomers

(A) geometrical
(B) ligand
(C) optical
(D) ionization

125. The ejection of electrons when a metal surface is irradiated is termed as

(A) Black body radiation
(B) Atomic spectra
(C) Zeeman effect
(D) Photoelectric effect

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