PREVIOUS YEAR PAPER

UP TGT 2016 — Science (Series A)

UP TGT · 8 or 9 March 2019

125 questions · +3.4 for a correct answer, −0 for a wrong one · 120 minutes

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Questions from the U.P. Secondary Education Services Selection Board's paper of 8 or 9 March 2019. Each question is followed by its answer, and the answer key is repeated on the last page.

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Science

1. If we throw a body upwards with velocity of 4 m/s, at what height its kinetic energy reduces to half of the initial value ? Take g = 10 m/s².

(a) 4m
(b) 2m
(c) 1m
(d) 0.4m

Answer: (d)

2. Nernst equation relates electrode potential with

(a) Temperature
(b) Concentration
(c) Temperature and concentration
(d) Temperature and pressure

Answer: (c)

3. A body of mass m that is undergoing simple harmonic motion passes through its equilibrium position, its velocity is

(a) zero
(b) maximum
(c) half of its maximum value
(d) none of the above

Answer: (b)

4. When hydrogen atom is raised from the ground state to an excited state

(a) P.E. increases and K.E. decreases
(b) P.E. decreases and K.E. increases
(c) Both P.E. and K.E. increases
(d) Both P.E. and K.E. decreases

Answer: (a)

5. Transition metals form complexes due to

(a) Small size

(b) Available d orbital

(c) Large ionic charge

(d) All the above

Answer: (d)

6. Three resistors having resistances in the ratio 1 : 2 : 3 are in parallel. The current through the resistors are in the ratio

(a) 1 : 2 : 3

(b) 2 : 3 : 1

(c) 3 : 2 : 1

(d) 6 : 3 : 2

Answer: (d)

7. A metal surface is illuminated by a light of given intensity and frequency to cause photoemission. If the intensity of illumination is reduced to one fourth of its original value, then the maximum kinetic energy of the emitted photoelectrons would becomes

(a) unchanged

(b) 1/16th of original value

(c) twice the original value

(d) four times the original value

Answer: (a)

8. Among the following, the one which has maximum ionic character is

(a) NaCl

(b) KCl

(c) LiCl

(d) CsCl

Answer: (d)

9. Which of the following is not essential for the simple harmonic motion ?

(a) Inertia

(b) Restoring force

(c) Material medium

(d) Gravity

Answer: —

10. The charge of an electron is

(a) 1.6×10^{-24} C

(b) 1.8×10^{-19} C

(c) 1.6×10^{-19} C

(d) 1.6×10^{-17} C

Answer: (c)

11. The substances which are attracted by the magnetic field are
    (a) Diamagnetic
    (b) Paramagnetic
    (c) Ferromagnetic
    (d) Ferrimagnetic

    Answer: —

12. Outdoors on the winter, why does a piece of metal feel colder than a piece of wood ?
    (a) Metal is a good conductor of heat than wood
    (b) Wood is a good conductor of heat than metal
    (c) Wood conducts heat faster than metal
    (d) Both the metal and wood are bad conductors of heat

    Answer: (a)

13. Which of the following statements is not correct ?
    (a) A secondary cell may be recharged after use.
    (b) A nickel–cadmium cell is an example of a primary cell.
    (c) A Leclanche cell is suitable for use in torches.
    (d) When a cell is being charged its terminal p.d. exceeds the cell e.m.f.

    Answer: —

14. The most electropositive halogen is
    (a) F
    (b) Cl
    (c) Br
    (d) I

    Answer: (d)

15. For which of the following pair of resistors, the balancing length is not 0.25 m in a meter bridge ?
    (a) 1 Ω, 3 Ω
    (b) 7/3 Ω, 7 Ω
    (c) 25 Ω, 75 Ω
    (d) 2 Ω, 3 Ω

    Answer: (d)

16. Transition metals in their compounds show
    (a) Ionic bonds
    (b) Covalent bonds
    (c) Metallic bonds
    (d) Ionic and coordinate bonds

    Answer: (d)

17. The first law of thermodynamic for an adiabatic process is
    (a) du = δW
    (b) du = 0
    (c) du = – δW
    (d) du = – δH + 2 δW
    Answer: —

18. The II group elements in the periodic table is known as
    (a) Alkali metals
    (b) Alkaline earth metals
    (c) Lanthanides
    (d) Transition metals
    Answer: (b)

19. The wavelength in the bright-line emission spectrum of an element are
    (a) characteristic of the particular element
    (b) the same for all the elements
    (c) evenly distributed throughout the visible spectrum
    (d) different from the wavelengths in its dark-line absorption spectrum
    Answer: (a)

20. Which of the following will not give a carbocation an intermediate ?
    (a) Ethyl magnesium halide
    (b) Methyl bromide
    (c) Vinyl chloride
    (d) Ethanol
    Answer: (a)

21. The Azimuthal quantum number for p and f orbitals are respectively
    (a) 0 and 2
    (b) 1 and 3
    (c) 1 and 2
    (d) 2 and 3
    Answer: (b)

22. The cell reaction of a secondary battery is
    (a) Reversible
    (b) Irreversible
    (c) Equilibrium
    (d) Endothermic
    Answer: (a)

23. The dimension of $1/(\mu_0 \in_0)$, where μ_0 represents vacuum permeability and $\in_0$ represents vacuum permittivity

(a) $L^{-1}T$

(b) $L^{2}T^{-2}$

(c) $L^{-2}T^{2}$

(d) LT^{-1}

Answer: (b)

24. The metal used to detect nitrogen in an organic compound is

(a) Li

(b) K

(c) Na

(d) Cs

Answer: (c)

25. If two satellites of masses m1 and m2 are revolving around a earth in a circular orbits of radius r1 and r2, then the ratio of their orbital velocities v1/v2 is

(a) $\sqrt{(r2/r1)}$

(b) $\sqrt{(r1/r2)}$

(c) r1/r2

(d) r2/r1

Answer: (a)

26. Which of the following contain ionic, co-ordinat nd covalent bonds ?

(a) NaCN

(b) NaCl

(c) NaNC

(d) NaOH

Answer: (c)

27. When a resistance R connected in series with a galvanometer of resistance 100 Ω, it acts as a voltmeter. To double the range of the voltmeter, a resistance of 1000 Ω is to be connected in series with R. Then the value of R is (in Ω)

(a) 1000

(b) 1100

(c) 800

(d) 900

Answer: (d)

28. If earth has a mass nine times and radius twice that of the planet mars, calculate the maximum velocity required by a rocket to escape from the gravitational field of mars. Take escape velocity on the earth's surface to be 11.2 km/s.

(a) 5.279 km/s
(b) 23.75 km/s
(c) 9144 km/s
(d) 3.865 km/s

Answer: (a)

29. The d block elements are

(a) All metals
(b) All non-metals
(c) Metals and non-metals
(d) Metalloids

Answer: (a)

30. Which thermometer is preferred for rapidly changing temperature ?

(a) Liquid in glass
(b) Gas thermometer
(c) Resistance thermometer
(d) Thermoelectric thermometer

Answer: (d)

31. Reaction of aniline with excess of bromine wate ves

(a) 2-Bromoaniline
(b) 3-Bromoaniline
(c) 2, 4-Dibromoaniline
(d) 2, 4-6-Tribromoaniline

Answer: (d)

32. The alternating current cannot be used for

(a) heating
(b) lighting
(c) generate mechanical energy
(d) electroplating

Answer: (d)

33. In the voltaic cell, the reaction occur at anode is

(a) Oxidation
(b) Reduction
(c) Elimination
(d) Addition

Answer: (a)

34. The lift is moving down with an acceleration a. A man in the lift drops a ball inside the lift. The acceleration of the ball as observed by the man in the lift and a man standing stationary on the ground are, respectively

(a) g, g
(b) g – a, g – a
(c) g – a, g
(d) a, g

Answer: (c)

35. The difference in isotopes of an element is

(a) Mass number
(b) Atomic number
(c) Number of electrons
(d) Number of protons

Answer: (a)

36. Among the following, the conducting form of carbon is

(a) Diamond
(b) Charcoal
(c) Graphite
(d) All the above

Answer: (c)

37. Which of the following is most acidic ?

(a) Phenol
(b) Benzyl alcohol
(c) Cyclohexanol
(d) m-chlorophenol

Answer: (d)

38. A p-type of semiconductor is

(a) uncharged
(b) +vely charged
(c) – vely charged
(d) uncharged only at 0°C

Answer: (a)

39. Which one of the following molecule is less reactive towards electrophilic aromatic substitution ?

(a) Aniline
(b) Toluene
(c) Nitrobenzene
(d) Phenol

Answer: (c)

40. Work done by an ideal gas when it expands from volume (V1) to (V2) under constant pressure is

(a) V1V2 / P

(b) P V1V2

(c) P (V2 – V1)

(d) (V1 + V2) P

Answer: (c)

41. In Wheatstone bridge method of finding unknown resistance or inductance, the instrument used as null detector is

(a) Ammeter

(b) Voltmeter

(c) Galvanometer

(d) All of these

Answer: (c)

42. Among the following derivatives of ethane, the one having the highest boiling point is

(a) C2H5F

(b) C2H5Cl

(c) C2H5Br

(d) C2H5I

Answer: (d)

43. The combination of atoms take place due to

(a) Acquire stability by increase in energy

(b) Acquire stability by decrease in ene

(c) Acquire high energy state

(d) Acquire instability

Answer: (b)

44. The two ends of a metal rod are maintained at temperature 100°C and 110°C. The rate of heat flow in the rod is found to be 4.0 J/s. If the two ends of a metal rod are maintained at temperature 200°C and 210°C, the rate of heat flow will be

(a) 8.0 J/s

(b) 4.0 J/s

(c) 44.0 J/s

(d) 16.0 J/s

Answer: (b)

45. Chlorination of benzene under photochemical condition takes place by

(a) Nucleophilic substitution

(b) Electrophilic substitution

(c) Free radical mechanism

(d) Carbocation intermediate

Answer: (c)

46. A string of certain length used to whirl a stone in a vertical circle with certain velocity. The tension developed in the string will be

(a) same along the circle
(b) highest at the top of the circle
(c) least at the top of the circle
(d) highest at the bottom of the circle

Answer: —

47. The autocatalyst formed in the reaction of acidified potassium permanganate with oxalic acid at high temperature is

(a) $MnSO_4$
(b) MnO_2
(c) $MnSO_3$
(d) Mn_2O_3

Answer: (a)

48. An autocatalyst is

(a) One which speeds up the catalyst action
(b) One of the products of a reaction acts as a catalyst
(c) One of the reactants act as catalyst
(d) Both the reactants act as a catalyst

Answer: (b)

49. On continuous exposure to air, sodium finally ch ges to

(a) NaCl
(b) Na_2CO_3
(c) Na_2O
(d) Na_2O_2

Answer: (b)

50. The weakest of the four fundamental interactions is the

(a) gravitational
(b) electro-magnetic
(c) strong
(d) weak

Answer: (a)

51. Impossible orbitals among the following is

(a) 2s
(b) 2p
(c) 3f
(d) 4d

Answer: (c)

52. If P, Q, R and S represents resistances of 4 arms of the Wheatstone's bridge, then the sensitivity of Wheatstone's bridge will be maximum when

(a) P = Q = R > S

(b) P = Q = R = S

(c) P > Q > R > S

(d) P < Q < R < S

Answer: (b)

53. Iodoform reaction is a confirmatory test for compounds having

(a) – COH3

(b) – CH3

(c) – CONH2

(d) – COOH

Answer: —

54. Heat transfers by the process of convection occurs

(a) only in liquids

(b) only in solids

(c) only in liquids and gases

(d) in solids, liquids and gases

Answer: (c)

55. If the earth is ¼ of its present distance from the s , then the duration of the year would be

(a) ½ year

(b) ¼ year

(c) 1/8 year

(d) 1/16 year

Answer: (c)

56. The mean life of a radioactive substance is

(a) Equal to disintegration constant

(b) Reciprocal of disintegration constant

(c) Directly proportional to disintegration constant

(d) Multiples of disintegration constant

Answer: (b)

57. Benzoic acid on reacting with lithium aluminium hydride gives

(a) Benzene

(b) Benzyl alcohol

(c) Toluene

(d) None of the above

Answer: (b)

58. The cathodic material present in dry cell is
(a) MgO_2
(b) MgO
(c) MnO_2
(d) Zn
Answer: (d)

59. Which one of the following will release ammonia on hydrolysis ?
(a) Nitrobenzene
(b) Acetanilide
(c) Benzamide
(d) Phenyl benzoate
Answer: (c)

60. A converging lens of focal length f is placed in contact with a diverging lens of focal length 3f. The combination is
(a) A diverging lens of focal length 3f/2
(b) A converging lens of focal length 2f
(c) A diverging lens of focal length 3f
(d) A converging lens of focal length 3f/2
Answer: (d)

61. Which of the following is an example for addition reaction ?
(a) Friedel Crafts reaction
(b) Aldol reaction
(c) Bromination of phenol
(d) Nitration of benzene
Answer: (b)

62. The energy that heats the sun has its origin in
(a) radioactivity
(b) nuclear fission
(c) the production of helium from hydrogen
(d) the production of hydrogen from helium
Answer: (c)

63. Among the following one which does not exist is
(a) NF_5
(b) SbF_5
(c) PF_5
(d) AsF_5
Answer: (a)

64. According to Mendeleev's periodic law, the physical and chemical properties of elements are periodic functions of their

(a) Atomic numbers
(b) Atomic weights
(c) Number of electrons
(d) Number of protons

Answer: (b)

65. A women whose mass is 60 kg on the earth surface is in an spacecraft at an altitude of two times the earth radius. Her mass there is

(a) 6.7 kg
(b) 15 kg
(c) 20 kg
(d) 60 kg

Answer: (d)

66. Two pendulums oscillate with a constant phase difference of 90°. If time period of one of them is 2 sec., then period of the other is

(a) 2 sec.
(b) 4 sec.
(c) 1 sec.
(d) 6 sec.

Answer: (a)

67. Chlorine is

(a) Oxidizing agent
(b) Bleaching agent
(c) Disinfectant
(d) All the above

Answer: (d)

68. Daniel cell consists of

(a) Zn and Cu as electrodes
(b) Zn and Fe as electrodes
(c) Zn and Si as electrodes
(d) Zn and Ag as electrodes

Answer: (a)

69. The work done on a body by an external force contributes to a change in its

(a) Potential energy
(b) Total energy
(c) Kinetic energy
(d) Heat energy

Answer: (c)

70. The most electropositive element in the periodic table is

(a) Iron

(b) Copper

(c) Caesium

(d) Lithium

Answer: (c)

71. In the Bohr model of the hydrogen atom, let R, V and E represent the radius of the orbit, the speed of the electron and the total energy of the electron respectively. Which of the following quantity is proportional to the quantum number n ?

(a) VR

(b) RE

(c) E / V

(d) R / E

Answer: (a)

72. The ratio of the number of turns in primary and secondary coils of transformer is 1 : 20. The ratio of the currents in the primary and the secondary coils will be

(a) 1 : 20

(b) 20 : 1

(c) 1 : 400

(d) 400 : 1

Answer: (b)

73. The process of converting alkyl halides alcohols involve

(a) Addition reaction

(b) Rearrangement reaction

(c) Substitution reaction

(d) Dehydrohalogenation reaction

Answer: (c)

74. The thermal conductivities of brick and pine wood are, respectively 0.6 and 0.13 W/(m.°C). What thickness of brick has the same insulating ability at 5 cm of pine ?

(a) 23 cm

(b) 4.6 cm

(c) 30 cm

(d) 5 cm

Answer: (a)

75. A rectangular metal plate 8 cm × 4 cm at 127°C emits E J/s. If both the length and breadth are halved and the temperature is raised to 327°C, the rate of emission is (J/s)

(a) (27/8) E
(b) (81/64) E
(c) (10/9) E
(d) (9/4) E

Answer: (b)

76. A beam of transverse waves whose vibrations occur in all directions perpendicular to their direction of motion is

(a) polarised
(b) unpolarised
(c) resolved
(d) diffracted

Answer: (b)

77. Among the following, the one has highest mass is

(a) 40 g of Fe
(b) 6 moles of N2 at NTP
(c) 0.2 g of silver
(d) 10^{23} atoms of carbon

Answer: (b)

78. A 2.5 kg iron ball has the same diameter as a 1.2 kg aluminium ball. The balls are dropped at the same time from a cliff. Just before they reach the ground, they have same

(a) acceleration
(b) momentum
(c) kinetic energy
(d) potential energy

Answer: (a)

79. The suitable reaction that will convert benzene to toluene is

(a) Aldol condensation
(b) Hydrogenation and addition
(c) Friedel Crafts alkylation
(d) Friedel Crafts acylation followed by reduction

Answer: (c)

80. The temperature which has same numerical value on Celsius and Fahrenheit scale is

(a) 273
(b) – 40
(c) – 273
(d) 40

Answer: (b)

81. If the nuclei of masses x and y fused together to form a nucleus of mass m, then
(a) x + y = m
(b) x + y > m
(c) x + y < m
(d) m + x = y
Answer: (b)

82. Leclanche cell and Daniel cell are examples of
(a) both dry cell
(b) both wet cell
(c) dry cell, wet cell
(d) wet cell, dry cell
Answer: —

83. According to Dalton, atoms of a given element are
(a) Identical mass, size and shape.
(b) Identical mass, size and different shape.
(c) Identical mass but different size and shape.
(d) Identical size and shape but different mass.
Answer: (a)

84. Oxygen molecule exhibits
(a) Diamagnetism
(b) Paramagnetism
(c) Ferromagnetism
(d) Antiferromagnetism
Answer: (b)

85. If A and B are non-zero vectors which obey the relation $|A + B| = |A - B|$, then the angle between them is
(a) 0°
(b) 60°
(c) 90°
(d) 120°
Answer: (c)

86. Among the following one which exhibits ferromagnetism is
(a) Al
(b) Na
(c) Zn
(d) Co
Answer: (d)

87. An ideal material for making handle of cooking vessels must have
(a) large heat capacity and small conductivity
(b) small heat capacity and large conductivity
(c) small heat capacity and small conductivity
(d) large heat capacity and large conductivity

Answer: (a)

88. Which of the following is most acidic ?
(a) Monochloro acetic acid
(b) Dichloro acetic acid
(c) Trichloro acetic acid
(d) Acetic acid

Answer: (c)

89. The work function of sodium is 2.3 eV. What will be the maximum kinetic energy of the photoelectrons emitted by the surface exposed to the radiation of 2000 Å ?
(a) 2.3 eV
(b) 3.9 eV
(c) 6.2 eV
(d) 3.9 V

Answer: (b)

90. When a cation is formed from a neutral atom, the ionic size
(a) Remains same
(b) Decreases
(c) Increases
(d) Either increases or decreases

Answer: (b)

91. Which of the following will exhibit geometric isomerism ?
(a) Styrene
(b) Cinnamic acid
(c) Lactic acid
(d) All of the above

Answer: (b)

92. On a new scale of temperature called W scale, the freezing and boiling points of water are 39°W and 239°W respectively. What will be the temperature on the new scale, corresponding to a temperature of 39°C ?
(a) 200°W
(b) 139°W
(c) 78°W
(d) 117°W

Answer: (d)

93. At the end of the chemical reaction, the catalyst remains
(a) Unchanged in quantity but changed in composition
(b) Unchanged in quantity and composition
(c) Unchanged in composition but changed in quantity
(d) Changed in quantity and composition

Answer: (b)

94. Which of the following will not react with hydroxyl ions by nucleophilic attack ?
(a) Diethyl ether
(b) Ethyl acetate
(c) Acetamide
(d) Acetonitrile

Answer: (a)

95. A polished metal plate has rough and black spot. It is heated to 1400 K and brought immediately in dark room. Then
(a) The spot will appear darker than the plate
(b) The spot will appear equally bright
(c) The spot will appear darker and brighter than the plate periodically
(d) The spot will appear brighter than the plate

Answer: (d)

96. Which is not a characteristic reaction of benzene
(a) Addition
(b) Electrophilic substitution
(c) Elimination
(d) Nucleophilic substitution

Answer: (c)

97. Choose the correct statement.
(a) α rays have high ionization power.
(b) Isotopes are always radioactive.
(c) β rays are deflected towards cathode when the electric field is applied.
(d) Gamma rays are negatively charged particles.

Answer: (a)

98. The more reactive member in halogen is
(a) Chlorine
(b) Fluorine
(c) Iodine
(d) Bromine

Answer: (b)

99. A women in a car on a level road sees an airplane travelling in the same direction that is climbing at an angle of 30° above the horizontal. By driving at 110 km/h she is able to stay directly below the airplane. The airplane's velocity is

(a) 127 km/h
(b) 110 km/h
(c) 220 km/h
(d) 144 km/h

Answer: (a)

100. Sulphur exhibit variable Valency due to

(a) Bigger size
(b) High electronegativity
(c) Presence of d orbital in sulphur
(d) High ionization energy

Answer: (c)

101. A transformer has 300 turns in its primary coil and 75 turns in its secondary coil. When the current in the secondary coil is 20 A, the current in the primary coil is

(a) 5 A
(b) 25 A
(c) 80 A
(d) 6.4 kA

Answer: (a)

102. Which of the following CH3 – X bond has the highest polarity ?

(a) C – Br
(b) C – F
(c) C – Cl
(d) C – I

Answer: (b)

103. The negative electrode in lead acid battery is

(a) Iron
(b) Lead
(c) Silver
(d) Carbon

Answer: (b)

104. A metal ball with the momentum mv strikes a wall and bounces back. The change in the ball's momentum is ideally

(a) 0
(b) mv
(c) 2mv
(d) – 2mv

Answer: (d)

105. Which of the following substrates will give free radicals under appropriate conditions ?

(a) Alcohols

(b) Alkyl halides

(c) Alkenes

(d) All of the above

Answer: (d)

106. A 10 kW drilling machine is used to drill a bore in a small aluminium block of mass 8 kg. Find the rise in temperature of the block in 2.5 minutes, assuming 50% power is used up in the heating machine itself or lost to the surroundings. (Specific heat of aluminium = 0.91 J $g^{-1}°C^{-1}$)

(a) 103°C

(b) 150°C

(c) 206°C

(d) 155°C

Answer: (a)

107. An object's temperature is raised by 150°C. The resulting increase in its absolute temperature is

(a) 32 K

(b) 150 K

(c) 180 K

(d) 373 K

Answer: (b)

108. The catalyst used in the manufacture of methy cohol from water gas is

(a) ZnO + MnO2

(b) Cr2O3 + MgO

(c) ZnO + Cr2O3

(d) CaO + CrO3

Answer: (c)

109. Ionic compounds dissolve in

(a) Polar solvents

(b) Non-polar solvents

(c) Organic solvents

(d) Non-aqueous

Answer: (a)

110. A body is released from the top of the tower of height h metre. It takes T seconds to reach the ground. Where was the body at time T/2 seconds ?

(a) at h/2 m from the ground

(b) at h/4 m from the ground

(c) at 3h/4 m from the ground

(d) depends upon the mass and volume of the body

Answer: (c)

111. In the case of p – n junction, diode at high value of reverse bias, the current rises sharply. The value of reverse voltage is known as

(a) Cut in voltage

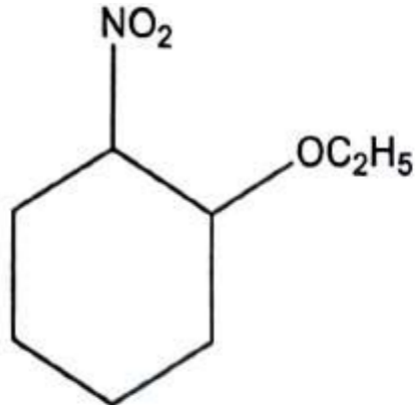
(b) Break-down voltage

(c) Cut off voltage

(d) Inverse voltage

Answer: (b)

112. IUPAC name of the following compound is



(a) 1-ethoxy-2-nitrocyclohexane

(b) 2-ethoxy-1-nitrocyclohexane

(c) 1-ethoxy-2-nitrocyclohexene

(d) 2-ethoxy-1-nitrocyclohexene

Answer: (a)

113. A body cools from 61°C to 59°C in 4 mi[illegible] from 51°C to 49°C in 6 minutes, then temperature of the room is

(a) 30°C

(b) 25°C

(c) 35°C

(d) 20°C

Answer: (a)

114. A wooden wagon wheel has an outside diameter of 3750 mm. The iron tire for this wheel is deliberately made smaller so that it can be shrunk in place to be a tight fit. If the tire's inside diameter is 3737 mm at 20°C, the temperature to which it must be heated to fit over the wheel ? The coefficient of linear expansion of the steel is 1.2 × 10−5 /°C.

(a) 290°C

(b) 20°C

(c) 310°C

(d) 270°C

Answer: (c)

115. The radii of two planets are respectively R1 and R2 and their densities are respectively ρ1 and ρ 2. The ratio of the acceleration due to gravity (g1/g2) at their surface is

(a) $\rho 1R2^2 / \rho 2R1^2$

(b) R1ρ1 / R2ρ2

(c) R1ρ2 / R2ρ1

(d) R1R2 / ρ1ρ2

Answer: (b)

116. The lightest metal in the periodic table is

(a) Li

(b) Sn

(c) He

(d) H

Answer: (a)

117. A satellite orbits the earth in a circle of radius 8000 km. At that distance from the earth, the velocity of the satellite is ($g = 6.2\ m/s^2$)

(a) 0.90 km/s

(b) 7.0 km/s

(c) 8.9 km/s

(d) 0.7 km/s

Answer: (b)

118. Which of the following compounds undergo inv ion in their configuration ?

(a) Methane

(b) Ethane

(c) Ammonia

(d) Acetaldehyde

Answer: (c)

119. The hybridization of oxygen in water is

(a) sp^3

(b) sp^2

(c) sp

(d) sp^2d

Answer: (a)

120. A convex mirror forms an enlarged image of an object

(a) for no values of object distance

(b) when object distance is less than twice the focal length

(c) when object distance is more than twice the focal length

(d) for all values of object distance

Answer: (a)

121. The compound used in refrigeration is

(a) Nitrogen

(b) Liquid ammonia

(c) Liquid ammonium chloride

(d) Liquid fluorine

Answer: (b)

122. Two resistances 1 Ω and 4 Ω are connected in the left and right gaps of a Wheatstone's meter bridge. The balancing length 'l' is noted. Now the resistances are interchanged in the two gaps. The new balancing length 'L' is noted. Then

(a) l/L = 1/4

(b) l = L

(c) L – l = 69 cm

(d) l – L = 60 cm

Answer: (a)

123. The correct order of electronegativity of the elements N, O, F and P is

(a) F > N > P > O

(b) F > O > P > N

(c) F > O > N > P

(d) N > O > F > P

Answer: (c)

124. A baseball is moving at 25 m/s. When it is struck by a bat moves off in the opposite direction at 35 m/s. If the impact lasted 0.010 s, find the baseball's acceleration during the impact.

(a) 2500 m/s²

(b) – 6000 m/s²

(c) – 3500 m/s²

(d) 5000 m/s²

Answer: (b)

125. Nitration of benzoic acid gives following major product

(a) o-nitro benzoic acid

(b) m-nitro benzoic acid

(c) p-nitro benzoic acid

(d) all of the above

Answer: (b)

Answer key

Answer key from the U.P. Secondary Education Services Selection Board's official answer key for this sitting. "—" means the key gave none.

Science

1	**(d)**	2	**(c)**	3	**(b)**	4	**(a)**	5	**(d)**	6	**(d)**
7	**(a)**	8	**(d)**	9	—	10	**(c)**	11	—	12	**(a)**
13	—	14	**(d)**	15	**(d)**	16	**(d)**	17	—	18	**(b)**
19	**(a)**	20	**(a)**	21	**(b)**	22	**(a)**	23	**(b)**	24	**(c)**
25	**(a)**	26	**(c)**	27	**(d)**	28	**(a)**	29	**(a)**	30	**(d)**
31	**(d)**	32	**(d)**	33	**(a)**	34	**(c)**	35	**(a)**	36	**(c)**
37	**(d)**	38	**(a)**	39	**(c)**	40	**(c)**	41	**(c)**	42	**(d)**
43	**(b)**	44	**(b)**	45	**(c)**	46	—	47	**(a)**	48	**(b)**
49	**(b)**	50	**(a)**	51	**(c)**	52	**(b)**	53	—	54	**(c)**
55	**(c)**	56	**(b)**	57	**(b)**	58	**(d)**	59	**(c)**	60	**(d)**
61	**(b)**	62	**(c)**	63	**(a)**	64	**(b)**	65	**(d)**	66	**(a)**
67	**(d)**	68	**(a)**	69	**(c)**	70	**(c)**	71	**(a)**	72	**(b)**
73	**(c)**	74	**(a)**	75	**(b)**	76	**(b)**	77	**(b)**	78	**(a)**
79	**(c)**	80	**(b)**	81	**(b)**	82	—	83	**(a)**	84	**(b)**
85	**(c)**	86	**(d)**	87	**(a)**	88	**(c)**	89	**(b)**	90	**(b)**
91	**(b)**	92	**(d)**	93	**(b)**	94	**(a)**	95	**(d)**	96	**(c)**
97	**(a)**	98	**(b)**	99	**(a)**	100	**(c)**	101	**(a)**	102	**(b)**
103	**(b)**	104	**(d)**	105	**(d)**	106	**(a)**	107	**(b)**	108	**(c)**
109	**(a)**	110	**(c)**	111	**(b)**	112	**(a)**	113	**(a)**	114	**(c)**
115	**(b)**	116	**(a)**	117	**(b)**	118	**(c)**	119	**(a)**	120	**(a)**
121	**(b)**	122	**(a)**	123	**(c)**	124	**(b)**	12	**(b)**		