Atomic Energy Central School No 4 Rawatbhata

Multiple Choice Questions Examination (November 2019-20)

MM: 120 Class XII (Physics, Chemistry, Biology) Time:3hour

Name of student : _____Roll No._____Class Sec_____

Date: _____ Invigilator's Sign: _____

Physics

1. Some scientists have predicted that a global nuclear war on the earth would be followed by a severe 'nuclear winter' with a devastating effect on life on earth. What might be the basis of this prediction? 1

   a) The clouds produced by global nuclear war would perhaps cover substantial parts of the sky preventing solar light from reaching many parts of the globe
   b) Nuclear reactions absorb visible light causing dark days/nights
   c) Nuclear reactions absorb atmospheric heat causing cooling
   d) None of these

2. Electromagnetic waves propagate 1

   a) slower in a dielectric
   b) None of these
   c) at the same speed in a dielectric
   d) faster in a dielectric

3. How much time does it take light to travel from the moon to the earth, a distance of 384,000 km? 1

   a) 1.48 s
   b) 1.58 s
   c) 1.28 s
   d) 1.38 s

4. Radio station WCCO in Minneapolis broadcasts at a frequency of 830 kHz. Wavelength and angular wave number are 1

   a) 361 m, 0.0174 /m
   b) 381 m, 0.0174 rad/m
   c) 391 m, 0.0174 rad/m
   d) 371 m, 0.0174 rad/m

5. These are 3 wavelengths 10^{7}m, 10^{-10}m, 10^{-7}m. Find their respective names: 1

   a) Visible rays, Y-rays, X-rays
   b) X-Rays, Visible rays, Radiowaves
   c) Radiowaves, X-rays, visible rays
   d) X-rays, Y-rays, Visible rays

6. Part of the electromagnetic spectrum to which 14.4 keV [energy of a particular transition in ^{57}Fe nucleus associated with a famous high resolution spectroscopic method (Mossbauer spectroscopy)] belongs is 1

   a) X-rays (or soft γ-rays) region
   b) Microwave
   c) Gamma rays
   d) Ultraviolet

7. The speed of electromagnetic waves in a medium of dielectric constant 2.25 and relative permeability 4 is: 1

   a) $3 \times 10^{8} m/s$
   b) $2 \times 10^{8} m/s$
   c) $2.5 \times 10^{8} m/s$
   d) $1 \times 10^{8} m/s$

8. Medical x rays are taken with electromagnetic waves having a wavelength of around 0.10 nm. What are the frequency and period of such waves? 1

   a) $3.4 \times 10^{15}\text{Hz}, 3.3 \times 10^{-17}\text{s}$
   b) $3 \times 10^{15}\text{kHz}, 3.3 \times 10^{-17}\text{s}$
   c) $3.2 \times 10^{15}\text{Hz}, 3.3 \times 10^{-17}\text{s}$
   d) $3.2 \times 10^{15}\text{Hz}, 3.3 \times 10^{-17}\text{s}$

9. High intensities of UV light 1

   a) are low in energy
   b) kills dangerous bacteria and therefore good
   c) are hazardous to the eyes
   d) is useful to good health

10. 7.5 MHz to 12 MHz band corresponds to wavelength band of 1

    a) 7.5 m - 12 m
    b) 25 m – 40 m
    c) 50 m – 75 m
    d) 12 m - 7.5 m

11. Electromagnetic waves are transverse in nature is evident by: 1

a) Polarization
b) Reflection
c) Diffraction
d) Interference

12. What physical quantity is the same for X-rays of wavelength 10^{-10} m, red light of wavelength 6800 $\overset{0}{A}$ and radio waves of wavelength 500m? 1

a) speed
b) phase
c) frequency
d) energy

13. Do EM waves need a medium to travel through? 1

a) No
b) Yes
c) Ether is required
d) None of these

14. Part of the electromagnetic spectrum to which 2.7 K [temperature associated with the isotropic radiation filling all space-thought to be a relic of the 'big-bang' origin of the Universe] belongs is 1

a) Microwave
b) Radio
c) Gamma rays
d) Ultraviolet

15. Suppose that the electric field part of an electromagnetic wave in vacuum is E = {(3.1 N/C) cos [(1.8 rad/m) y + (5.4 $\times 10^6$ rad/s)t]} i . Wavelength λ, frequency ν and the amplitude of the magnetic field part of the wave are 1

a) 4.0 m, 86 MHz, 250 nT
b) 3.5 m, 90 MHz, 200 nT
c) 5.5 m, 96 MHz, 100 nT
d) 3.5 m, 0.86 MHz, 10 nT

16. Optical and radio telescopes are built on the ground, but X-ray Astronomy is possible only from satellites orbiting the earth because 1

a) Atmosphere reflects X-rays away from earth
b) Atmosphere reflects X-rays horizontally so they don't reach the earth
c) Atmosphere absorbs X-rays, while visible and radio waves can penetrate it.
d) Satellites orbiting the earth make use of interstellar effects

17. The small ozone layer on top of the stratosphere is crucial for human survival because 1

a) It absorbs ultraviolet radiations from the sun and prevents it from reaching the earth's surface and causing damage to life.
b) Layer on top of the stratosphere is crucial as it supplies oxygen to atmosphere
c) It prevents water molecules from escaping into space
d) None of these

18. Velocity of plane electromagnetic waves in vacuum equals _____ 1

a) $\frac{1}{\sqrt{\mu_0 \varepsilon_0}}$
b) $\sqrt{\mu_0 \varepsilon_0}$
c) $\mu_0 \varepsilon_0$
d) $\frac{2}{\sqrt{\mu_0 \varepsilon_0}}$

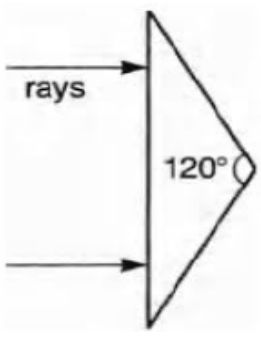
19. The frequencies of X-rays, Y-rays and ultra violet rays are respectively a, b and c. Then 1

a) a > b, b > c
b) a < b. b < c
c) a > b, b < c
d) a < b, b > c

20. The amplitude of the magnetic field part of a harmonic electromagnetic wave in vacuum is B_0 = 510 nT. Amplitude of the electric field part of the wave is 1

a) 163N/C
b) 158N/C
c) 153 N/C
d) 173N/C

21. An isosceles prism of angle 120° has a refractive index of 1.44. Two parallel monochromatic rays enter the prism parallel to each other in air as shown. The rays emerging from the opposite faces 1



a) make an angle of 2 $\sin^{-1}$ (0.72) with each other

b) are diverging

c) make an angle of 2 [$\sin^{-1}$(0.72) – 30°] with each other

d) are parallel to each other

22. A thin convergent glass lens (μ_g = 1.5) has a power of + 5.0 D. When this lens is immersed in a liquid of refractive index μ_1 it acts as a divergent lens of focal length 100 cm. The value of μ_1 must be 1

a) $\frac{4}{3}$

b) $\frac{5}{3}$

c) $\frac{5}{4}$

d) $\frac{6}{5}$

23. A person uses spectacles of power +2D, He is suffering from: 1

a) Presbyopia

b) Short sightedness or myopia

c) Long sightedness or hypermetropia

d) Astigmatism

24. The graph drawn with object distance along abscissa & image as ordinate for a convex lens is 1

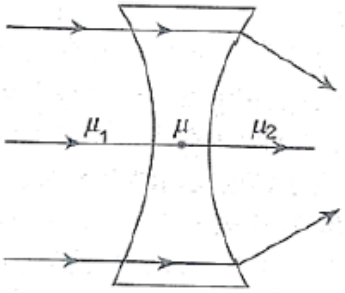
a) straight

b) circle

c) rectangular hyperbola

d) parabola

25. What is the relation between refractive indices μ, μ_1 and μ_2 if the behavior of light rays is as shown in the following figure? 1



a) $\mu < \mu_2; \mu = \mu_1$

b) $\mu < \mu_2 < \mu_1$

c) $\mu > \mu_2 > \mu_1$

d) $\mu_2 < \mu_1; \mu = \mu_2$

26. The largest telescope in the world has a reflector with an aperture of 200 inches in order to achieve 1

a) low dispersive power

b) least spherical aberration

c) high resolving power

d) high accommodation power

27. Blue colour of clear sky is due to phenomenon of: 1

a) Reflection

b) Scattering

c) Refraction

d) Dispersion

28. Band spectrum is also called: 1

a) Molecular spectrum

b) Atomic spectrum

c) Flash spectrum

d) Line absorption spectrum

29. To print a photograph from a negative, the time of exposure to light from a lamp placed 60 cm away is 2.5 s. What exposure time is required if the lamp is placed 1.2 m away? 1

a) 5 s

b) 10 s

c) 15 s

d) 20 s

30. A bird flies down vertically towards a water surface. To a fish inside the water, vertically below the bird, the bird will appear to 1

a) move faster than its actual speed

b) be at its actual distance

c) move slower than its actual speed

d) be closer than its actual distance

31. According to Cartesian sign convention _____ 1

a) Distances measured in the same direction as the incident light are taken as negative

b) None of these

c) Distances measured in the same direction as the incident light are taken as positive

d) Distances measured in the same direction as the reflected/refracted ray are taken as positive

32. A lamp and a screen are set up 100 cm apart and a convex lens is placed between them. The two positions of the lens forming real images on the screen are 40 cm apart. What is the focal length of the lens? **1**

a) 15 cm
b) 21 cm
c) 18 cm
d) 12 cm

33. A telescope has an objective of focal length 100 cm and an eye-piece of focal length 5 cm. What is the magnifying power of the telescope when it is in normal adjustment? **1**

a) 20.0
b) 2.0
c) 0.2
d) 200

34. A plano-convex lens is made of glass of refractive index 1.5.The focal length f of the lens and radius of curvature R of its curved face are related as **1**

a) $f = \frac{R}{2}$
b) f = R
c) f = 2 R
d) $f = \frac{3}{2R}$

35. A spherical surface of radius of curvature R separates air (refractive index =1) from glass (refractive index 1.5). The centre of curvature is in the glass. A point object P placed in air is found to have a real image Q in the glass. The line PQ cuts the surface at point O and PO = OQ. The distance PO is equal to **1**

a) 1.5 R
b) 3 R
c) 5 R
d) 2 R

36. In a compound microscope, maximum magnification is obtained when the final image **1**

a) coincides with the objective
b) is formed at the least distance of distinct vision
c) coincides with the object
d) is formed at infinity

37. The layered lens is made of two kinds of glass. A point source of light is placed on its principal axis. If the reflections from the boundaries between layers are ignored, the lens will form **1**

a) no image at all
b) two images
c) infinite images
d) only one image

38. The magnifying power of telescope is high if **1**

a) the objective has a long focal length and the eye-piece has a short focal length
b) both objective and eye-piece have short focal lengths
c) the objective has a short focal length and the eye-piece has a long focal length
d) both objective and eye-piece have long focal length

39. When light is passed through a prism, the colour which deviates least is: **1**

a) Red
b) Blue
c) Green
d) Violet

40. The objective of a telescope has a focal length of 1.2 m. It is used to view a 10.0 m tall tower 2 km away. What is the height of the image of the tower formed by the objective? **1**

a) 4 mm
b) 2 mm
c) 6 mm
d) 8 mm

Chemistry

41. When ethanal is heated with Fehlings solution, it gives a precipitate of: **1**

a) Cu + Cu_2O + CuO
b) CuO
c) Cu
d) Cu_2O

42. Nucleophilic addition will be most favoured in: **1**

a) CH_3CH_2CHO
b) $CH_3CH_2CH_2-\overset{\overset{O}{\|}}{C}-CH_3$
c) CH_3CHO
d) $(CH_3)_2C = O$

43. CH CHO and C H CH CHO can be distinguished chemically by: **1**

a) Iodoform test
b) Benedict test
c) 2,4 DNP test
d) Tollen's reagent test

44. Oximes are formed by the reaction of aldehydes and ketones with **1**

a) NH_2NH_2
b) NH_2OH
c) NH_3
d) $NH_2NHC_6H_5$

45. One mole of a symmetrical alkane on ozonolysis gives two moles of an aldehyde having molecular mass of 44u. The alkene is 1

a) 1 – butene
b) 2 – butene
c) Propene
d) Ethene

46. For making distinction between 2 – pentanone and 3 – pentanone the reagent to be employed is 1

a) $K_2Cr_2O_7 / H_2SO_4$
b) SeO_2
c) Zn – Hg/HCl
d) Iodine/NaOH

47. In Hell – Volhard Zelinsky reaction, halogen reacts with 1

a) aldehydes
b) ketones
c) carboxylic acids
d) ethers

48. The cannizzaro's reaction is not given by: 1

a) Acetaldehyde
b) Benzaldehyde
c) Trimethyl acetaldehyde
d) Formaldehyde

49. Which of the following acids does not exhibit optical isomerism? 1

a) Maleic acid
b) Tartaric acid
c) α – amino acids
d) Lactic acid

50. Reduction of aldehydes and ketones into hydrocarbons using zinc amalgam and conc. HCl is called 1

a) Clemmensen reduction
b) Wolff – Kishner reduction
c) Cope reduction
d) Dow reduction

51. Which of the following has most acidic hydrogen? 1

a) 2, 3 – Hexanedione
b) 2, 5 – Hexanedione
c) 2, 4 – Hexanedione
d) 3 – Hexanone

52. The reagent which can be used to distinguish acetophenone from benzophenone is: 1

a) I_2 and NaOH
b) 2, 4-dinitrophenyl hydrazine
c) Tollen's reagent
d) Benedict solution

53. Which of the following statements is not correct? 1

a) Aldehydes and ketones undergo nucleophilic addition.
b) Aldehydes and ketones contain polar carbonyl group
c) Aldehydes and ketones undergo electrophilic substitution.
d) Lower members of aldehydes and ketones are soluble in water due to hydrogen bonding

54. What compound is produced when cyclohexene is treated with concentrated KMnO ? 1

a) succinic acid
b) adipic acid
c) hexanoic acid
d) cyclohexanecarboxylic acid

55. Clemmensen reduction of a ketone is carried out in the presence of which of the following? 1

a) Zn – Hg with HCl
b) H_2 and Pt as catalyst
c) $LiAlH_4$
d) Glycol with KOH

56. Benzene reacts with CH COCl in the presence of AlCl to give: 1

a) $C_6H_5COCH_3$
b) C_6H_5COCl
c) $C_6H_5CH_3$
d) C_6H_5Cl

57. Ketones are reduced to the corresponding alcohols by catalytic hydrogenation to form 1

a) secondary alcohols
b) primary alcohols
c) None of these
d) tertiary alcohols

58. Methyl ketones are usually characterized by: 1

a) Benedict's reagent
b) Iodoform test
c) Schiff's test
d) Tollen's reagent

59. What compound is produced when (CH) CHCH Br is subjected to the following sequence of steps: 1

1. Mg, Et_2O,
2. CO_2,
3. H_3O^+?

a) 3 – methylbutanoic acid
b) 2 – methylpropanoic acid
c) 2 – methylhexanoic acid
d) 3 – methylpropanoic acid

60. A mixture of benzaldehyde and formaldehyde on heating with aqueous NaOH solution gives 1

a) benzyl alcohol and methyl alcohol
b) benzyl alcohol and sodium formate
c) sodium benzoate and methyl alcohol
d) sodium benzoate and sodium formate

61. Which of the following is a secondary amine _ 1

a) N,N-dimethylaniline
b) 3 – pentanamine
c) N-ethyl propan -1-amine
d) cyclohexylamine

62. Aniline does not undergo Friedel – Crafts reaction 1

a) Anilium ion deactivates any further reaction
b) Aluminium chloride, reacts with Aniline
c) All of these
d) $AlCl_3$ act as a catalyst

63. Aniline upon heating with conc. HNO and conc. H SO mixture gives: 1

a) mixture of o,p and m nitroaniline
b) no reaction
c) o-and p-nitroaniline
d) o-nitroaniline

64. Arrange the following in order of increasing basicity: aniline, p – nitroaniline, p – toluidine,and p – methoxyaniline 1

a) p – nitroaniline < aniline< p – methoxyaniline < p – toluidine
b) p – methoxyaniline p – nitroaniline < aniline < p – toluidine
c) p – nitroaniline < aniline < p – toluidine < p – methoxyaniline
d) aniline < p – methoxyaniline p – nitroaniline < p – toluidine

65. Direct nitration of aniline yields significant amount of meta derivative. To obtain more p – nitro derivative, one or more of the below can be done 1

a) All of these
b) by increasing temperature
c) controlling the nitration reaction
d) reacting with acetic anhydride

66. In a coupling reaction, the azo products obtained, involve an 1

a) Electrophilic substitution reaction
b) –N=N– bond
c) Nucleophilic substitution
d) –N=N– bond and electrophilic substitution reaction

67. Which gives a primary amine upon reduction? 1

a) CH_3CH_2NC
b) $C_6H_5N = NC_6H_5$
c) $CH_3CH_2 - O - N = O$
d) $CH_3CH_2NO_2$

68. Hinsberg's reagent is: 1

a) Benzene sulphonic acid
b) Benzene sulphonamide
c) Phenyl isocyanide
d) Benzene sulphonyl chloride

69. Reaction of nitrous acid with aliphatic primary amine in cold acidic solution gives: 1

a) A diazonium salt
b) A nitrite
c) A dye
d) An alcohol

70. Aniline does not undergo one of the following 1

a) Bromination
b) Nitration
c) Sulphonation
d) Friedal Craft Reaction

71. The Gabriel synthesis of amine undergo which kind of reaction? 1

a) Nucleophilic substitution reaction (SN_2)
b) Elimination reaction
c) Electrophilic substitution reaction
d) SN^1

72. Arrange the following compounds in order of increasing boiling point: CH NHCH CH ; CH OCH CH ; $(CH_3)_3N$ and $CH_3CH_2CH_2OH$. 1

a) Low to high; $CH_3OCH_2CH_3$.; $(CH_3)_3N$; $CH_3NHCH_2CH_3$; $CH_3CH_2CH_2OH$.
b) Low to high: $CH_3NHCH_2CH_3$; $CH_3CH_2CH_2OH$.; $(CH_3)_3N$; $CH_3OCH_2CH_3$.
c) Low to high: $(CH_3)_3N$; $CH_3OCH_2CH_3$; $CH_3NHCH_2CH_3$; $CH_3CH_2CH_2OH$.
d) Low to high: $CH_3CH_2CH_2OH$; $CH_3NHCH_2CH_3$; $(CH_3)_3N$; $CH_3OCH_2CH_3$.

73. Gabriel synthesis is used for the preparation of : 1

a) Quaternary salt
b) Primary amines
c) Tertiary amine
d) Secondary amine

74. Benzene diazonium chloride reacts with phenol in which the phenol molecule attack para position of phenol to form p – hydroxyazobenzene. This reaction is called 1

a) Carbon tetra chloride
b) DDT
c) Iodoform
d) Coupling reaction

75. Which of the following reacts with NaNO + HCl to give alcohol? 1

a) $C_6H_5CH_2NHCH_3$
b) CH_3NH_2
c) $C_6H_5NH_2$
d) $(CH_3)_3N$

76. Which of the following reactions is given by only primary amines? 1

a) reaction with acetyl chloride
b) reaction with HONO
c) reaction with Grignard reagent
d) reaction with chloroform and alcoholic KOH

77. Which one of the following cannot be obtained by Gabriel phthalimide synthesis? 1

a) CH_3NH_2
b) None of these
c) $CH_3CH_2NH_2$
d) Aromatic primary amines

78. Aniline reacts with NaNO and HCl at low temperature to give: 1

a) chloroaniline
b) diazonium chloride
c) phenol
d) nitroaniline

79. Which one of the following reagents is most suitable in completing the following synthesis? 1

$$R-\overset{\overset{O}{\|}}{C}-NH_2 \rightarrow R-NH_2$$

a) $LiAlH_4$
b) Br_2+ NaOH
c) Sn
d) H_2 + Ni

80. When methylamine reacts with HCl, the product is 1

a) methyl ammonium chloride
b) methane and methyl chloride
c) methonoate chloride
d) methylammonia

Biology

81. Among hydrophytes which of the following xylem component remains absent? 1

a) companion cells
b) vessels
c) parenchyma
d) both vessels and parenchyma

82. Success of an organism in nature can be determined by 1

a) evaluating species importance in that ecosystem
b) analysing its interactions with environment
c) calculating carrying capacity
d) measuring population size and biomass

83. The number of births in polygamous population is often directly related to 1

a) Neither male nor female
b) number of females
c) number of males
d) both male and female

84. In which of the following interaction/s one species is benefitted while other is harmed? 1

a) competition only
b) predation and parasitism
c) parasitism only
d) competition and amensalism

85. Zone of Earth occupied by living organisms is called 1

a) Flora and Fauna
b) Biosphere
c) Ecosystem
d) Biome

86. In deep lakes;littoral,limnetic and profundal zones represent: 1

a) community dynamism
b) community stability
c) community stratification
d) trophic organization

87. Unit of evolution and ecology is **1**

a) Individual b) Ecosystem
c) Population d) Community

88. The birth rate if 7 new plants are added to previous year plant population of 23 Salvinia plants will be **1**

a) 0.5 b) 0.4
c) 0.3 d) 0.25

89. "In Competition, the superior competitor eliminates the inferior one", this statement is called: **1**

a) Allen's rule b) Darwinian fitness
c) Living ability d) Gause's principle

90. A gut parasite will not need **1**

a) high reproductive capacity b) resistant eggs
c) an alimentary canal d) adhesive organs

91. Forests controls drought through **1**

a) Increasing rainfall b) Lot of water plant
c) Retention of water and prevention of soil erosion. d) Functioning as water shed.

92. To attain maximum diversity and niche specialization, biotic succession needs: **1**

a) Transitional community b) Pioneer community
c) Interspecific competition d) Climax community

93. Which of the following is correct: **1**

a) NPP – GPP = R b) NPP – R = GPP
c) GPP – R = NPP d) GPP + NPP = R

94. Successive transitional communities will show **1**

a) increase in instability b) increase in number of species
c) 100% energy transfer d) decrease in the biomass

95. Which of the following is not a layer found in lakes? **1**

a) profundal zone b) littoral zone
c) lentic zone d) limnetic zone

96. The cost of nature's ecosystem services is about **1**

a) Twice the global gross national product. b) Five times the gross national product.
c) Half of the global gross national product. d) Ten times the gross national product.

97. Statement I: Average price tag of US $ 33 trillion a year for fundamental ecosystem services provided by nature. **1**
Statement II: The cost of Fundamental ecosystem services is twice the global gross national prouduct.
Statement III: Fundamental ecosystem services are taken as granted because they are free of cost.

a) Only statement II and III is correct. b) Only statement I and II is correct.
c) All statements are incorrect. d) All statements are correct.

98. The ecological niche of an organism will not represent **1**

a) its functional role in the ecological system b) range of conditions that it can tolerate
c) resources it cannot utilize d) its specialization

99. Which of the following human activities wouldn't set ecological succession back? **1**

a) 

b) 

c) 

d) 

100. Sparrow is **1**

a) only 1° consumer
b) only 2° consumer
c) both 1° consumer and 2° consumer
d) 3° consumer

101. The multipurpose protected area which are meant for preserving genetic diversity in representative ecosystem is called **1**

a) National parks
b) Protected areas
c) Biosphere reserves
d) Sanctuaries

102. International union of conservation of nature and natural resources is now called as **1**

a) National union of conservation of nature.
b) World population organization
c) World conservation union
d) World wide fund

103. Which of the following is a major cause of reduction in gene pool? **1**

a) Reproductive isolation
b) Genetic mutation
c) Breeding programmes
d) Genetic drift

104. Buffer zone in biosphere reserve is zore for **1**

a) Forestry
b) Agriculture
c) Tourism and restoration
d) Research and education

105. Which of the following will maintain species diversity by stabilizing the food web and preventing competition? **1**

a) Scavengers
b) Decomposers
c) Keystone predators
d) Keystone producers

106. Match the following: **1**

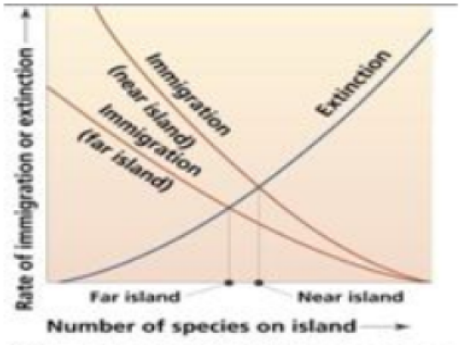
state	sanctuary
a) Andhra Pradesh	i) Barsey rhododendron sanctuary
b) Gujarat	ii) Dandeli wildlife sanctuary
c) Sikkim	iii) Manjira wildlife sanctuary
d) Karnataka	iv) Sansagir wildlife sanctuary

a) a)-iv, b)-ii, c)-i, d)-iii
b) a)-iii, b)-iv, c)-i, d)-ii
c) a)-i, b)-iii, c)-ii, d)-iv
d) a)-ii, b)-iv, c)-iii, d)-i

107. Threatened species list includes **1**

a) Only critically endangered and endangered species.
b) Only vulnerable and lower risk species
c) Only critically endangered species.
d) Critically endangered, endangered, vulnerable

108. Interpret from the following graph: **1**



a) Immigration rates are greater on far islands than near islands
b) Extinction rates are unaffected
c) Immigration rates are unaffected
d) Extinction rates are greater than immigration rates

109. Gene flow i.e. movement of genes will: **1**

a) increase impact of natural selection
b) Homogenized population
c) disturbs and decreases genetic variation
d) Population degradation

110. Indeterminate species are those species which are in danger but **1**

a) Are less in number.
b) Are not reproducing in current habitat.
c) Reason of extinction is known.
d) Reason of extinction is not known.

111. In human eye, cornea absorbs UV-B radiation and a high dose of UV-B causes **1**

a) Inflammation of lens called snow-blinder myopia
b) Myopia
c) Inflammation of retina called snow-blindness cataract.
d) Inflammation of cornea called snow-blindness cataract.

112. Which of the two countries are most affected by global warming **1**

a) Maldives and Bangladesh
b) Maldives and Bhutan
c) Pakistan and Bangladesh
d) India and Maldives

113. Which one represents regulative function of forests **1**

a) Production of essential oils
b) Production of wood
c) Storage and release of gases
d) Conservation of soil and water

114. In case of hereditary methemoglobinemia symptoms of cyanosis appear **1**

a) only if nitrate poisoning occurs
b) from birth
c) after reaching adolescence
d) during adulthood

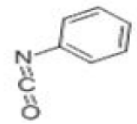
115. Which of the following will be able to cope with greenhouse effect **1**

a) Poikilotherms
b) Homeotherms
c) Stenotherms
d) Hibernators

116. Deforestation is the conversion of **1**

a) Planting of trees on deserts
b) Removal of top soil by flood
c) Forested areas to non-forested ones.
d) Non-forested areas to forested area.

117. Every year 2nd December is observed in India as National Pollution Prevention Day marking the anniversary of Bhopal gas disaster and the chemical representation of lethal gas responsible for this tragedy is **1**

a) C_2H_3NO
b) 
c) C_4H_9NO
d) C_3H_5NO

118. Species diversity is least in **1**

a) Grass land biome
b) Coniferous forest biome
c) Desert biome
d) Tundra biome

119. Match the following: **1**

Pollution control law
a) Insecticide Act
b) Water Act
c) The Air Act
d) The Environment Act

Year of implementation
i) 1986
ii) 1981
iii) 1974
iv) 1968

a) a)-ii, b)-iii, c)-ii, d)-iv
b) a)-iv, b)-iii, c)-ii, d)-i
c) a)-iv, b)-i, c)-ii, d)-iii
d) a)-iii, b)-i, c)-iv, d)-ii

120. "Two closely related species competing for the same resources can not co-exist indefinitely and the competitively inferior one will be eliminated". This is explained by: **1**

a) Gause's principle
b) Bergman's law
c) Allen's rule
d) Gloger's rule

Solution

Class 12 - Physics

Multiple Choice Examination (2019-20)

Section A

1. (a)
   The clouds produced by global nuclear war would perhaps cover substantial parts of the sky preventing solar light from reaching many parts of the globe

   Explanation:
   Nuclear winter is the severe and prolonged global climatic cooling effect hypothesized to occur after widespread firestorms following a nuclear war. The hypothesis is based on the fact that such fires can inject soot into the stratosphere, where it can block some direct sunlight from reaching the surface of the Earth. It is speculated that the resulting cooling would lead to widespread crop failure and famine.
2. (a)
   slower in a dielectric

   Explanation:
   Speed of light is inversely proportional to square root of dielectric constant. Hence it decreases in dielectric.
3. (c)
   1.28 s

   Explanation:
   $time = \frac{distance}{speed} = \frac{384000 \times 1000m}{3 \times 10^8} = 1.28s$
4. (a)
   361 m, 0.0174 /m

   Explanation:
   $\lambda = \frac{c}{\nu} = \frac{3 \times 10^8}{830 \times 10^3} = 361m$
   Angular wave number, $k = \frac{2\pi}{\lambda} = \frac{2\pi}{361} = 0.0174/m$
5. (c)
   Radiowaves, X-rays, visible rays

   Explanation:
   Radiowaves have wavelength > 0.1m
   X-rays have wavelength 1nm to 10^{-3} nm
   visible rays have wavelength 400nm to 700nm
6. (a)
   X-rays (or soft γ-rays) region

   Explanation:
   14.4 keV [energy of a particular transition in ^{57}Fe nucleus associated with a famous high resolution spectroscopic method (Mossbauer spectroscopy)] belongs to X-ray region.
7. (d)
   $1 \times 10^8 m/s$

   Explanation:
   speed of light in medium = $\frac{c}{\sqrt{\epsilon_r \mu_r}} = \frac{3 \times 10^8}{\sqrt{2.25 \times 4}} = 10^8 m/s$

8. (b)
$3 \times 10^{15}\text{kHz}, 3.3 \times 10^{-17}\text{s}$

Explanation:
$\nu = \frac{c}{\lambda} = \frac{3 \times 10^8}{0.1 \times 10^{-9}} = 3 \times 10^{18} Hz = 3 \times 10^{15} kHz$
$T = \frac{1}{\nu} = \frac{1}{3 \times 10^{18} Hz} = 3.33 \times 10^{-17} s$

9. (c) are hazardous to the eyes
Explanation:
UV rays has harmful effects on humans.

10. (b)
25 m – 40 m

Explanation:
$\lambda_1 = \frac{c}{\nu_1} = \frac{3 \times 10^8}{12 \times 10^6} = 25m$
$\lambda_2 = \frac{c}{\nu_2} = \frac{3 \times 10^8}{7.5 \times 10^6} = 40m$
Hence the corresponding wavelength range is 25 m - 40 m.

11. (a)
Polarization

Explanation:
Only transverse waves can be polarized. Longitudinal waves do not undergo polarization.
Whereas both, transverse and longitudinal waves can undergo interference, diffraction and reflection.

12. (a) speed
Explanation:
speed of entire em spectrum is same.

13. (a)
No

Explanation:
Oscillatory electric and magnetic field produces EM wave. As electric and magnetic field can propagate in vacuum, EM wave do not necessarily require medium.

14. (a) Microwave
Explanation:
2.7 K [temperature associated with the isotropic radiation filling all space-thought to be a relic of the 'big-bang' origin of the Universe] belongs to microwaves.

15. (d)
3.5 m, 0.86 MHz, 10 nT

Explanation:
$E_o = 3.1 N/C,\ k = 1.8 rad/m, \omega$
$= 5.4 \times 10^6 rad/s$
$\lambda = \frac{2\pi}{k} = \frac{2 \times 3.14}{1.8} \approx 3.5m$
$\nu = \frac{\omega}{2\pi} = \frac{5.4 \times 10^6}{2 \times 3.14} = 0.86 MHz$
$B_o = \frac{E_o}{c} = \frac{3.1}{3 \times 10^8} \approx 10^{-8} Tor\ 10nT$

16. (c) Atmosphere absorbs X-rays, while visible and radio waves can penetrate it.
Explanation:
Optical and radio waves can penetrate the atmosphere whereas x- rays, are of very short Wavelength and hence absorbed by the atmosphere. This is the reason why we can work with optical and radio telescopes

on earth's surface, but x-rays astronomical telescopes must be used on the satellite orbiting above the earth's atmosphere.

17. (a) It absorbs ultraviolet radiations from the sun and prevents it from reaching the earth's surface and causing damage to life.
Explanation:
Ozone layer absorbs UV rays

18. (a)
$\frac{1}{\sqrt{\mu_0 \epsilon_0}}$

Explanation:
Speed of light depends on electrical and magnetic properties of medium.

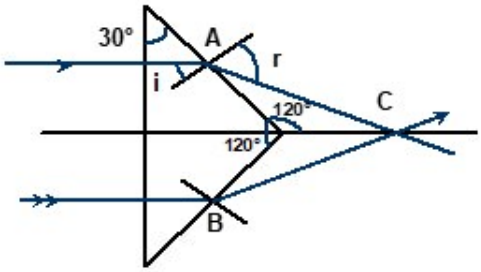
19. (d) a < b, b > c
Explanation:
Of the given region, frequency of Y- rays is maximum and that of UV is minimum, hence a < b, b > c

20. (c)
153 N/C

Explanation:
$E_o = c \times B_o = 3 \times 10^8 \times 510 \times 10^{-9}$
=153 N/C

21. (c)
make an angle of 2 [$\sin^{-1}$(0.72) – 30°] with each other

Explanation:



$\frac{\sin i}{\sin r} = \frac{1}{1.44}$ $[\because i = 30^\circ]$
$\sin r = \frac{1.44}{2} = 0.72$
$\angle ACB = 2[180^\circ - (120^\circ + 90^\circ - r)]$
$= 2(r - 30^\circ) = 2[\sin^{-1}(0.72) - 30^\circ]$

22. (b)
$\frac{5}{3}$

Explanation:
f = 1/P = 1/5 m = 20cm
$\frac{1}{f} = (\frac{\mu_2}{\mu_1} - 1)(\frac{1}{R_1} - \frac{1}{R_2})$
In air, $\frac{1}{20} = (\frac{1.5}{1} - 1)(\frac{1}{R_1} - \frac{1}{R_2}) = 0.5(\frac{1}{R_1} - \frac{1}{R_2})$ ....(i)
In liquid, $\frac{1}{-100} = (\frac{1.5}{\mu_1} - 1)(\frac{1}{R_1} - \frac{1}{R_2})$ ....(ii)
Dividing (i) by (ii)
$-5 = \frac{0.5}{(\frac{1.5}{\mu_1} - 1)}$
On solving we get, $\mu = 5/3 = 1.67$

23. (c) Long sightedness or hypermetropia
Explanation:

In hypermetropia the image of near by objects is formed behind the retina, hence a converging lens (convex lens) of suitable power is used to correct the defect. Focal length and hence the power of convex lens is positive.
Hence lens of positive of power is used to correct hypermetropia or long sightedness.

24. (c)
rectangular hyperbola

Explanation:

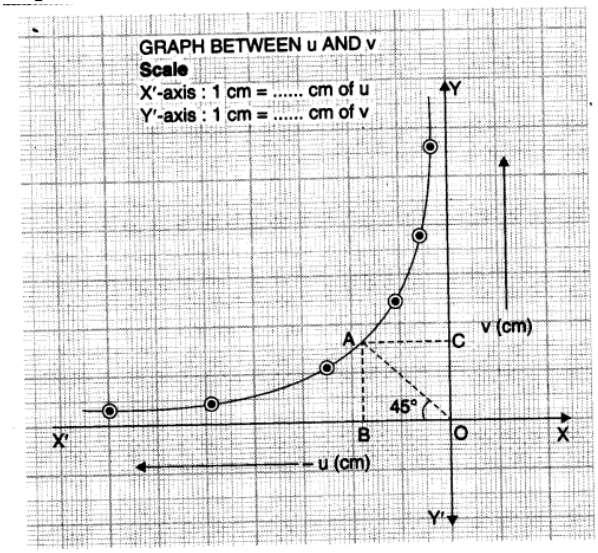


Fig. Graph between u and v. It is a rectangular hyperbola.

25. (a)
$\mu < \mu_2; \mu = \mu_1$

Explanation:
Since light rays do not get refracted while entering the lens, hence $\mu = \mu_1$
After emerging from concave lens, light rays converge hence $\mu < \mu_2$

26. (c) high resolving power
Explanation:
Resolving power is directly proportinal to aperture.

27. (b)
Scattering

Explanation:
Particles of atmosphere in clear sky are very small in size.
According to Rayleigh's criteria for scattering, scattering $\propto \frac{1}{\lambda^4}$
Since wavelength of violet, indigo and blue are very short hence they are scattered the most, resulting in blue appearance of sky.

28. (a)
Molecular spectrum

Explanation:
band spectrum are produced by molecules radiating their rotational or vibrational energies, or both simultaneously.
Whereas line spectra are also called atomic spectra because the lines represent wavelengths radiated from atoms when electrons change from one energy level to another.

29. (b)
10 s

Explanation:
exposure time $t \ \alpha \ d^2$

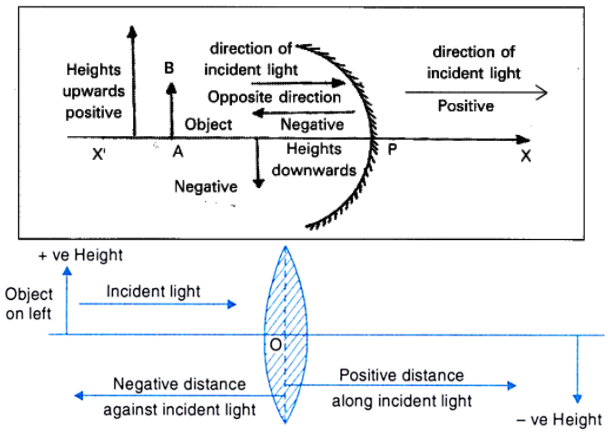
$\therefore t_2 = \frac{d_2^2}{d_1^2} t_1 = \frac{120^2}{60^2} 2.5 = 10s$

30. (a)
move faster than its actual speed

Explanation:
Let h be the actual height and h' be the apparent height of bird at any instant.
Then, $\frac{h}{h'} = \mu_{aw}$ (refractive index of air with respect to water) = 3/4 (since refractive index of water with respect to air is 4/3)
If v is the actual speed and v' be the apparent speed of bird, then
v = dh/dt and v' = dh'/dt
v/v' = (dh/dt) / (dh'/dt) = 3/4
or v' = 4v/3

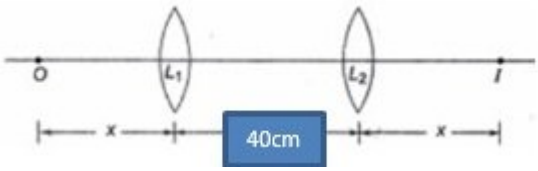
31. (c)
Distances measured in the same direction as the incident light are taken as positive

Explanation:



32. (b)
21 cm

Explanation:



Distance between two positions of lens, L_1L_2 = 40 cm and OI = 100cm
Let distance of object from L_1 = x, therefore u = -x, hence x + 40 + x = 100 or x = 30cm
for L_1 we have, u = -30 cm and v = 70 cm
Putting values in lens formula and solving we get f = +21 cm.

33. (a)
20.0

Explanation:
In case of normal adjustment, final image is formed at inifinity.
So magnifying power, $m = \frac{fo}{fe} = \frac{100}{5} = 20$

34. (c)

f = 2 R

Explanation:
$\frac{1}{f} = (\frac{\mu_2}{\mu_1} - 1)(\frac{1}{R_1} - \frac{1}{R_2})$
For plano convex lens, R_1 = infinite and R_2 = -R
Hence, $\frac{1}{f} = (1.5 - 1)(\frac{1}{\infty} - \frac{1}{-R})$
or f = 2R.

35. (c)
5 R

Explanation:
Given: $\mu_2 = 1.5;\ \mu_1 = 1$; OP = OQ = x (let)
For refraction at spherical surfaces from rarer to denser,
$\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{\mu_2 - \mu_1}{R}$
Applying sign convention, v = x and u = -x
$\frac{1.5}{x} - \frac{1}{-x} = \frac{1.5-1}{R}$
$\frac{2.5}{x} = \frac{1}{2R}$
or x = 5R.

36. (b) is formed at the least distance of distinct vision
Explanation:
magnification of compound microscope is given by:
$(\frac{v_o}{u_o})(1 + \frac{D}{f_e})$, when final image is formed at near point, whereas it is $(\frac{v_o}{u_o})(\frac{D}{f_e})$ when final image is formed at infinity.
Hence magnification is maximum when final image is formed at near point (least distance of distinct vision)

37. (d)
only one image

Explanation:
It is like a combination of two Plano – convex lenses. Therefore only one image is formed.

38. (a)
the objective has a long focal length and the eye-piece has a short focal length

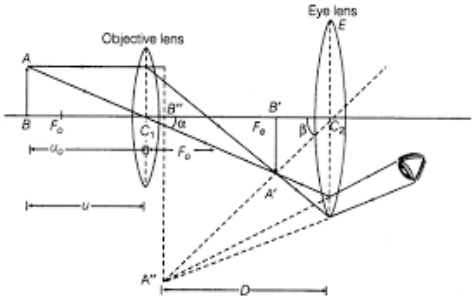
Explanation:
magnifying power of telescope is directly proportional to fo/fe.
Hence fo should be large and fe should be small.

39. (a)
Red

Explanation:
Refracting index is given by, $\mu = A + \frac{B}{\lambda^2}$, where A & B are constant.
Wavelength if red color is maximum, hence refractive index of material of prism for red color light is minimum hence red color deviates the least.

40. (c)
6 mm

Explanation:



Since tower n is situated very far (2000 m) so its image is at the focal plane of objective lens.
So angle subtended by tower is equal to angle subtended by the image, $\beta = \alpha$
or $tan\beta = tan\alpha$
or $\frac{10}{2000} = \frac{A'B'}{1.2}$
$\therefore\ A'B' = 6 \times 10^{-3} m = 6mm$

Solution

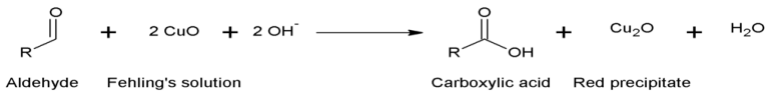
Class 12 - Chemistry

Multiple Choice Questions Examination

Section A

41. (d)
Cu_2O

Explanation:



aldehydes give positive fehling's test with a red precipitate of Cu_2O

42. (c)
CH_3CHO

Explanation:
Aldehydes are more reactive toward nucleophilic addition reaction than ketones because of two main reasons:

1. steric hinderance - ketones are more sterically hindered than aldehydes thus aldehydes are more reactive towards nucleophilic addition reaction.
2. Ketones have two alkyl groups which show +I effect and decreases the electron density on C and hence rate of nucleophilic addition decreases in ketones compared to aldehydes.
   If we have to compare aldehydes reactivity towards nucleophilic addition reaction then, steric hinderance has to be considered as steric hinderance increases, the reactivity of aldehydes decreases. so in given question answer will be CH_3CHO.

43. (a)
Iodoform test

Explanation:
CH_3CHO will give iodoform test and $C_6H_5CH_2CHO$ will not give iodoform test. Methyl aldehydes or ketones give iodoform test. In carbonyls like RCOR' one of R or R' should be a CH_3 group to give positive iodoform test.

$CH_3CHO + NaOI \rightarrow CHI_3 + HCOO^-Na^+$

CHI_3 formed is known as iodoform and is yellow precipitate.

$C_6H_5CH_2CHO + NaOI \rightarrow$ no reaction

44. (b)
NH_2OH

Explanation:
Aldehydes and ketones react with NH_2OH (hydroxylamine) to form oximes as shown in the given reaction.

$RCOR' + NH_2OH \rightarrow RR'C=NOH$ (oxime)

45. (b)
2 – butene

Explanation:
2-butene on reductive ozonolysis with O_3/Zn will give CH_3CHO which has molecular mass of 44u.

$CH_3CH=CHCH_3 + O_3/Zn \rightarrow 2CH_3CHO$

Molecular mass of CH_3CHO = 12+3+12+1+16 = 44u

46. (d)
Iodine/NaOH

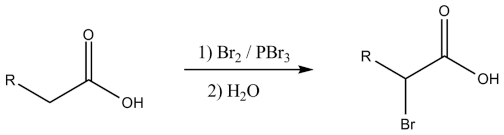
Explanation:
2-pentanone ($CH_3COCH_2CH_2CH_3$) will give iodoform test (reaction with I_2 + NaOH) because of presence CH_3CO- group and yellow precipitate will be formed but 3-pentanone ($CH_3CH_2COCH_2CH_3$) does not have CH_3CO- group hence will not give iodoform test.

$CH_3COCH_2CH_2CH_3 + I_2 + NaOH \rightarrow CHI_3$ (yellow precipitate) + $CH_3CH_2CH_2COO^-Na^+$

$CH_3CH_2COCH_2CH_3 + I_2 + NaOH \rightarrow$ No reaction

47. (c)
carboxylic acids

Explanation:
Alpha Hydrogen containing carboxylic acids undergo HVZ reaction. HVZ reaction is used for alpha halogenation of carboxylic acid.



48. (a)
Acetaldehyde

Explanation:
Acetaldehyde (CH_3CHO) have alpha hydrogen hence will undergo aldol reaction in presence of base rather than cannizaro reaction. Cannizaro reaction is given when there is no alpha hydrogen present on carbonyl group.

49. (a)
Maleic acid

Explanation:
Maleic Acid shows Geometrical Isomerism due restricted bond roation along C=C bond but does not give optical isomerism as it has horizontal plane of symmetry , as C=C bond is planar and thus do not form a non superimposable mirror image and is optically inactive .

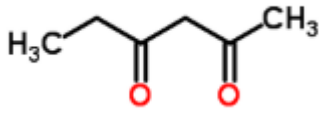
50. (a)
Clemmensen reduction

Explanation:
Clemmenson reduction is the reaction of carbonyl compounds with Zn amalgam in presence of conc. HCl to convert them to alkanes . >C=O group of carbonyl converts to -CH_2 group of alkanes.

$$RCOR' + Zn + Conc.\ HCl \rightarrow RCH_2R'$$
$$RCHO + Zn + Conc.\ HCl \rightarrow RCH_3$$

51. (c)
2, 4 – Hexanedione

Explanation:
2,4-hexanedione will have active methylene group.
The structure of 2,4-hexanedione is



-CH_2 group present between the two carbonyl group is active methylene group, these hydrogens are highly acidic as their conjugate base is highly stable.

52. (a)
I_2 and NaOH

Explanation:
Acetophenone and benzophenone both are ketones so, cannot be distinguised on the basis of tollens or benedicts test. Acetophenone has -$COCH_3$ great which give positive iodoform test while benzophenone doesnot give iodoform test thus I_2 + NaOH can be used.

53. (c)
Aldehydes and ketones undergo electrophilic substitution.

Explanation:
Aldehydes and ketones have polar C=O group therefore they undergo nucleophilic addition reactions. The oxygen being electronegative have a delta (small) negative charge and thus C attached to oxygen bears positive charge. Thus this electrophilic C attracts a nucleophile to add to its double bond. thus aldehydes and ketones undergo nucleophilic addition reactions.

54. (b)
adipic acid

Explanation:
Conc $KMnO_4$ will cause oxidative ozonolysis and ring opening forming adipic acid.
cyclohexene + conc. $KMnO_4 \rightarrow HOOC(CH_2)_4COOH$

55. (a)
Zn – Hg with HCl

Explanation:
For Clemmenson we use Zn-Hg(conc HCl). This reduction reduces carbonyl groups to alkane. this reduction cannot be used when an acid sensitive group is present.

56. (a)
$C_6H_5COCH_3$

Explanation:
$C_6H_6 + CH_3COCl \xrightarrow{AlCl_3} C_6H_5COCH_3$

This is known as friedal craft acylation reaction. $AlCl_3$ act as a lewis acid and will generate CH_3CO^+ carbocation and this will attack benzene to give $C_6H_5COCH_3$

57. (a)
secondary alcohols

Explanation:
Aldehydes on catalytic hydrogenation using H_2/Pt give primary alcohols while ketones on catalytic hydrogenation using H_2/Pt give secondary alcohols.

58. (b)
Iodoform test

Explanation:

$CH_3COR + I_2 + NaOH \rightarrow CHI_3 + RCOO^-Na^+$

Iodoform test is characteristic test given by methyl ketones. CHI formed is yellow precipitate.

59. (a)

3 – methylbutanoic acid

Explanation:

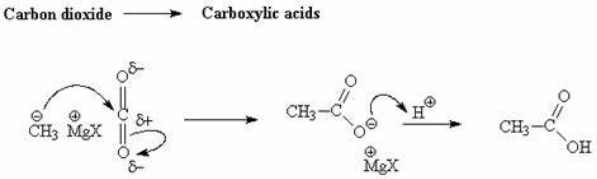
Firstly, alkyl bromide will react with Mg/ether to form Grignard reagent

$(CH_3)_2CHCH_2Br + Mg/ether \rightarrow (CH_3)_2CHCH_2MgBr$

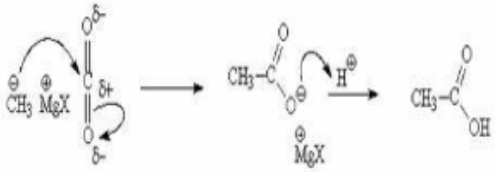
Now Grignard reagent formes will act as a nucleophile and attack O=C=O, followed by hydrolysis will form acid.

$(CH_3)_2CHCH_2MgBr + CO_2 + H_3O^+ \rightarrow (CH_3)_2CHCH_2COOH$

The general reaction of grignard (CH_3MgX) with CO_2 is as shown:



Carbon dioxide ⟶ Carboxylic acids



60. (b)

benzyl alcohol and sodium formate

Explanation:

They will undergo cannizaro reaction as neither benzaldehyde nor formaldehyde has alpha hydrogen. HCHO will be more reactive towards cannizaro compared to benzaldehyde because of less steric hinderance.

So, OH^- nucleophile will attck on HCHO first and then hydride shift from HCHO to benzaldehyde will occur.

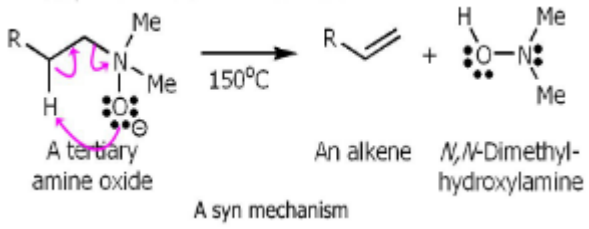
and thus HCHO will oxidise to $HCOO^-$ ion and benzaldehyde will reduce to benzylalcohol.

61. (c)

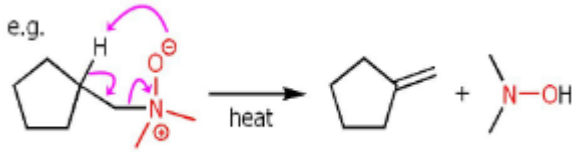
N-ethyl propan -1-amine

Explanation:

This is secondary amine because nitrogen is connected to 2 carbon atoms directly.



A syn mechanism



62. (b)

Aluminium chloride, reacts with Aniline

Explanation:
$AlCl_3$ being a lewis acid reacts with the lone pair of -NH_2 group of aniline forming an adduct ($C_6H_5NH_2^+AlCl_3$) which deactivates the benzene system hence no friedal craft reaction occurs.

63. (a)
mixture of o,p and m nitroaniline

Explanation:
mixture of ortho, meta and para nitroaniline is formed because of formation of anilinium ion which is formed by direct nitration of aniline.

64. (c)
p – nitroaniline < aniline < p – toluidine < p – methoxyaniline

Explanation:
-OMe group at a para position will increase the basicity more than-CH_3 group at the para position. While the presence of –NO_2 at a para position will decrease the basicity.

65. (d)
reacting with acetic anhydride

Explanation:
Direct nitration of aniline yield significant amount of meta derivative, this is because the use of HNO_3 during nitration of aniline causes the formation of anilinium ion($C_6H_5NH_3^+$). Anilinium ion is responsible for the formation of metra nitro aniline. To prevent this, initial reaction of aniline with acetic anhydride acetylates -NH_2 group.
$C_6H_5NH_2 + CH_3COOCOCH_3 \rightarrow C_6H_5NHCOCH_3$.
Now, -$NHCOCH_3$ is an activating group, which on nitration followed by hydrolysis form para nitro aniline as a major product.

66. (d)
–N=N– bond and electrophilic substitution reaction

Explanation:
Due to their positive charge, diazonium cations may participate in an electrophilic aromatic substitution as an electrophile. The electrophilic reaction center is the terminal nitrogen of the -$N=N^+$group. As a result, two aromatic compounds are coupled by a -N=N- group. This is known as the azo group (diazo group). The corresponding reaction is called diazonium coupling (diazo coupling, azo coupling). However, the electrophilicity of diazonium ions is only relatively weak, as their positive charge is delocalized.

67. (d)
$CH_3CH_2NO_2$

Explanation:
A primary nitro compound on reduction will give primary amine. The reduction can be done using Fe/HCl or Sn/HCl

68. (d)
Benzene sulphonyl chloride

Explanation:
Benzene sulphonyl chloride, $C_6H_5SO_2Cl_2$, is called Hinsberg reagent. It is used to distinguish between primary, secondary and tertiary amines.

69. (d)

An alcohol

Explanation:
Primary amine reacts with nitrous acid (HNO_2) to give diazonium salt which is unstable and decomposes to give a carbocation and evolve N_2 gas. The carbocation so formed reacts with H_2O from medium to form alcohol as major product.

$$\underset{ethan\min e(ethyla\min e)}{CH_3CH_2NH_2} \xrightarrow[HCl0^\circ]{NaNO_2} \underset{ethyl\ diazonium\ chloride(unstable)}{CH_3CH_2-\overset{+}{N}\equiv NCl^-}$$

$$CH_3CH_2\overset{+}{N}\equiv NCl^- \rightarrow [CH_3CH_2{}^+] + N_2 \xrightarrow{HOH} CH_3CH_2OH$$

70. (d)
Friedal Craft Reaction

Explanation:
The F.C. alkylation and F.C. acylation reaction take place in presence of Anhyd. $AlCl_3$, which is a Lewis base as it is electron deficient, it attacks the lone pair on nitrogen in aniline and forms an insoluble complex which precipitates out and reaction does not happen further.

$C_6H_5NH_2 + AlCl_3 \rightarrow C_6H_5NH_2{}^+AlCl_3$

71. (a)
Nucleophilic substitution reaction (SN_2)

Explanation:

- The reaction of phthalimide with KOH removes the **N-H** proton giving an imide ion, which is a good nucleophile.
- **Nucleophilic substitution (SN_2)** by the imide ion on the alkyl halide generates an intermediate, N-alkyl phthalimide.
- Hydrolysis or hydrazinolysis liberates a primary alkyl amine.
  Therefore, It is nucleophilic substitution reaction.

72. (c)
Low to high: $(CH_3)_3N$; $CH_3OCH_2CH_3$; $CH_3NHCH_2CH_3$; $CH_3CH_2CH_2OH$.

Explanation:
This is on the basis of inter molecular interactions.

73. (b)
Primary amines

Explanation:
In Gabriel Pthalamide reaction, the sodium or potassium salt of pthalimide is N-alkylated with a primary alkyl halide to give the corresponding *N*-alkylphthalimideis for producing primary amines. This is because of the reaction of sodium or potassium salt of phthalimide with alkyl halide impure SN_2 reaction.

74. (d)
Coupling reaction

Explanation:
In this reaction benzene and phenol get coupled through -N=N- linkage. The compounds containing this type of linkage are called azo compounds.

$C_6H_5N_2{}^+Cl^- + C_6H_5OH \rightarrow p\text{-}C_6H_5N{=}NC_6H_4OH$ (dye)

75. (b)
CH_3NH_2

Explanation:
Aliphatic primary amines react with nitrous acid (prepared in situ from $NaNO_2$ and a mineral acid such as HCl) to form aliphatic diazonium salts, which is unstable and decomposes to give a carbocation and evolve N_2 gas. The carbocation so formed reacts with water from medium to give further produce alcohol.

76. (d)
reaction with chloroform and alcoholic KOH

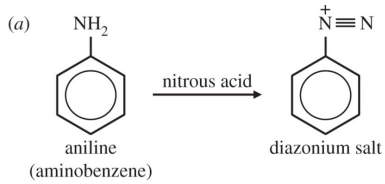
Explanation:
Only primary amines reacts with $CHCl_3$ and alc. KOH to produce foul smelling isocyanide. This test is known as Carbylamine Test (Hoffman's Isocyanide Test) for primary amines

77. (d)
Aromatic primary amines

Explanation:
In Gabriel phthalimide reaction, a potassium salt of phthalimide is formed. It reacts readily with the primary alkyl halide to form the corresponding alkyl derivative. But aryl halide (C_6H_5X) does not react with potassium salt of phthalimide. Because C-X bond in haloarene (alkyl halide) is difficult to be cleaved due to a partial double bond character and hence, do not undergo SN_2 reaction with potassium salt of phthalimide. So, aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis.

78. (b)
diazonium chloride

Explanation:
Aniline reacts with $NaNO_2$ and HCl to produce HNO_2 (nitrous acid). HNO_2 reacts with aniline at low temperature to give benzene diazonium chloride which is stable and the reaction is called diazotization reaction.



79. (b)
Br_2+ NaOH

Explanation:
Conversion of amide to amine having one carbon less is known as Hoffmann bromide reaction.
$RCONH_2 + Br_2 + 4NaOH \rightarrow RNH_2 + Na_2CO_3 + 2NaBr + 2H_2O$

80. (a)
methyl ammonium chloride

Explanation:
Due to the presence of lone pair on nitrogen, methyl amine acts as a Lewis base and reacts with HCl, H+ ion from HCl forms an adduct (salt) methyl ammonium chloride, $CH_3NH_3^+Cl^-$.

Solution

Class 12 - Biology

Multiple Choice Examination (2019-20)

Section A

81. (b)
vessels

Explanation:
Xylem vessels are responsible of water transportation in plants. Hydrophytes grows in plants therefore there is no requirement of special water transporting tissues in hydrophytes.

82.. (d)
measuring population size and biomass

Explanation:
Success of an organism in nature can be determined by measuring population size and biomass of the organism. An organism having large number of species is more successful than those with lesser numbers.

83. (b)
number of females

Explanation:
Polygamous population is often directly related to number of females in the population. Polygamy means having more than one female partner with single male that can reproduce.

84. (b)
predation and parasitism

Explanation:
In predation and parasitism one species is benefitted while other is harmed. Parasite obtain food from host by harming them.

85. (b)
Biosphere

Explanation:
The zone of earth occupied by living organism is called biosphere. It includes, lands, water and air where living organisms survive.

86. (c)
community stratification

Explanation:
In deep lakes differenet zones are formed according to availabilityof light, food and temperature. These zones are called littoral, limnetic and profundal zone. It is a kind of community stratification or separation.

87. (c)
Population

Explanation:
The unit of evolution and ecology is population. Evolution occurs due to change in genome of individual that affects the whole population. Ecology is the study of population along with their variation in ecosystem.

88. (c)
0.3

Explanation:
The birth rate of a population = $\frac{new\ individual\ added}{previous\ population}$
Here birth rate=$\frac{7}{23} = 0.3043$
Hence, birth rate of Salvinia plants is equal to 0.3.

89. (d)
Gause's principle

Explanation:
In competition, superior competitor eliminates the inferior one. This statement is called Gause's competitive exclusion principle. Two closely related competing for same resources cannot co-exist indefinitely and inferior will be eliminated.

90. (c)
an alimentary canal

Explanation:
The parasite obtaintheirfood from host body. Gut parasite like round worm and tap worm absorbed digested food from our body. They do not require alimentary canal as they absorb digested food.

91. (c)
Retention of water and prevention of soil erosion.

Explanation:
The volume of water retained by forests can depend on characteristics such as forest cover area, the length of vegetation growing season, tree composition and tree density, as well as the age and the number of layers of vegetation cover. Water retention by forests affects the amount and timing of the water delivered to streams and groundwater by increasing and maintaining infiltration and storage capacity of the soil. Forests can soak up excess rainwater, preventing run-offs and damage from flooding. By releasing water in the dry season, forests can also help provide clean water and mitigate the effects of droughts. Drought is due to less rainfall.

92. (d)
Climax community

Explanation:

Climax community is the final community of succession that remain stable for sometimes. They have maximum diversity and niche specilisation that makes them stable.

93. (c)
GPP – R = NPP

Explanation:
Net primary productivity (NPP) is equal to Gross primary productivity (GPP) minus Respiration loss (R). NPP is the available biomass for the consumption of heterotrophs in the ecosystem.

94. (b)
increase in number of species

Explanation:
During ecological succession, transitional communities or seral communities will show increase in the number of species due to addition of nutrient medium at successive stages of succession.

95. (c)
lentic zone

Explanation:
Lentic zone is found in flowing terrestrial water such as rivers and streams. Lake stratification have limnetic, littoral and profundal zone only.

96. (a)
Twice the global gross national product.

Explanation:
a team of researchers from the United States, Argentina, and the Netherlands has put an average price tag of US $33 trillion a year on these fundamental ecosystem services, which are largely taken for granted because they are free. That is nearly twice the value of the gl trillion.

97. (d)
All statements are correct.

Explanation:
In one of the first efforts to calculate a global number, a team of researchers from the United States, Argentina, and the Netherlands has put an average price tag of US $33 trillion a year on these fundamental ecosystem services, which are largely taken for granted because they are free. That is nearly twice the value of the gl trillion.

98. (c)
resources it cannot utilize

Explanation:
Ecological niche is the area surrounding an organisms that help them in survive, grow and reproduce.
The ecological niche of an organism represents the position and the role played by the organism in the ecosystem in which it lives.
The ecological niche of an organism will not represent resources it cannot utilize.

99. (a)


Explanation:
Ecological succession can be reduced or reversed back by a number of human activities such as the formation of an artificial ecosystem as crop fields and gardens, overgrazing, dam construction etc.

100. (c)
both 1° consumer and 2° consumer

Explanation:
Sparrow feeds on fruits as well insects. Herbivores or plant eaters are primary consumer and carnivores that feed on herbivores are secondary consumer. So, Sparrow occupy both primary and secondary trophic levels.

101. (c)
Biosphere reserves

Explanation:
The multipurpose protected area which is meant for preserving genetic diversity in representative ecosystem of various natural biomes and unique biological communities is called biosphere reserves.
Total number of Biosphere reserves in India is 18.

102. (c)
World conservation union

Explanation:
International Union for Conservation of Nature and Natural Resources, is called as World Conservation Union, network of environmental organizations founded as the International Union for the Protection of Nature in October 1948 in Fontainebleau, France, to promote nature conservation and the ecologically sustainable use of natural resources.

103. (d)
Genetic drift

Explanation:
Gene pool is the sum total of gemone of different organism of a particular species. Reduction of gene pool is mainly caused by genetic drift along with reasons like geographical isolations.

104. (d)
Research and education

Explanation:
Buffer zone is managed to accommodate variety of resources for restoration of degraded ecosystems and habitats, conservation of genetic resources, species and ecosystem and monitoring of development and conservation programme. It is mainly for research and education.

105

(c)

Keystone predators

Explanation:

Keystone species is plant of animal that plays a unique and crucial role in the way an ecosystem functions. The species diversity in an ecosystem is stabalised by keystone species through food web and preventing competition.

- 106

(b)

a)-iii, b)-iv, c)-i, d)-ii

Explanation:

- Manjira wildlife sanctuary Located across the Manjira River, this wildlife sanctuary is situated in the Medak district in Andhra Pradesh (Now in Telangana).
- Also known as Sasan-Gir, or Gir forest, this is a forest and wildlife sanctuary in Gujarat, established in 1965.
- The Varsey Rhododendron Sanctuary or Barsey Rhododendron Sanctuary occupies 104 km² in the Singalila Range in western Sikkim. It borders on Nepal to the west, and on the state of West Bengal to the south across the Rambong Khola stream.
- Dandeli Wildlife Sanctuary is the second largest sanctuary in Karnataka.

- 107

(d)

Critically endangered, endangered, vulnerable

Explanation:

The International Union for Conservation of Nature (IUCN) is the foremost authority on threatened species, and treats threatened species not as a single category, but as a group of three categories, depending on the degree to which they are threatened:

- Vulnerable species
- Endangered species
- Critically endangered species

- 108.

(b)

Extinction rates are unaffected

Explanation:

Extinction rates are unaffected due to immigration near the island and immigration far island. The extinction rate is affected by human interference.

- 109.

(b)

Homogenized population

Explanation:

Gene flow or movement of genes leads to homogenized populations of an species in an ecosystem. Homogenized populations have all the species having almost same genetic makeup.

- 110.

(d)

Reason of extinction is not known.

Explanation:

Indeterminate species that are susceptible to being in danger, but reason of extinction is not known and we do not have enough information to place them in another category.

For example- short eared rabbit of Sumatra and Mexican Prairie Dog.

- 111.

(d)

Inflammation of cornea called snow-blindness cataract.

Explanation:

Snow blindness is a painful, temporary loss of vision due to overexposure to the sun's UV rays. The medical term for snow blindness is photokeratitis ("photo" = light; "keratitis" = inflammation of the cornea).

Essentially, snow blindness is caused by a sunburned eye — or more specifically, a sunburned cornea. And like sunburned skin, by the time you notice symptoms of snow blindness, you've already been in the sun too long.

- 112.

(a)

Maldives and Bangladesh

Explanation:

Global warming due to green house effect melts the glaciers and ice caps that increase the water level of oceans. The countries like Maldives and Bangladesh are in danger of submersion due to increasing ocean water level.

- 113.

(c)

Storage and release of gases

Explanation:

The regulative function of forest is storage and release of gases. Plants in forests converts carbon dioxide gas into oxygen during photosynthesis.

- 114.

(b)

from birth

Explanation:

Methemoglobinemia is a disorder characterized by the presence of a higher than normal level of methemoglobin in the blood. In case of hereditary methemoglobinemia symptoms of cyanosis appear from birth.

- 115.

(b)

Homeotherms

Explanation:

Greenhouse effect causes increase in temperature of earth.

Warm-blooded animal species can maintain a body temperature higher than their environment. In particular, homeothermic species maintain a stable body temperature by regulating metabolic processes. The only known homeotherms are birds and mammals. Homeotherms can tolerate high temperature. So, homeotherms will be able to cope with the effect of green house effect.

- 116.

(c)

Forested areas to non-forested ones.

Explanation:

Deforestation is the conversion of forested areas to non-forested ones. Deforestation occurs due to industrialization, urbanization and construction of roads etc.

- 117.

(a)

C_2H_3NO

Explanation:

The Bhopal disaster or Bhopal gas tragedy was an industrial accident. It happened at a Union Carbide subsidiary pesticide plant in the city of Bhopal, India. On 3 December 1984, the plant released 42 tonnes of toxic methyl isocyanate (MIC) gas, exposing more than 500,000 people to

toxic gases. The chemical formula of gas is C_2H_3NO

- 118.

(c)
Desert biome

Explanation:
For a habitat to be listed as a desert, it must receive very little precipitation (rainfall or snowfall) throughout the year. This means that the southern polar region is, by definition, a desert. Regardless of whether the temperature is extremely hot or extremely cold, there is very little biodiversity in the desert because it is a harsh climate.

- 119.

(b)
a)-iv, b)-iii, c)-ii, d)-i

Explanation:
Government of India has passed a number of acts to prevent pollution. Insecticide Act was passed in 1968. Water act in 1974, The air act in 1981 and The environment act in 1986.

- 120.

(a)
Gause's principle

Explanation:
The competitive exclusion principle, sometimes referred to as Gause's law, is a proposition named for Georgy Gause that two species competing for the same limiting resource cannot coexist at constant population values.