Full test - 1 2020

1. With which of the given pairs CO_2 resemble

(a) $HgCl_2$, C_2H_2 (b) $HgCl_2$, $SnCl_4$ (c) C_2H_2, NO_2 (d) N_2O and NO_2

2. Which of the following is Lewis acid

(a) BF_3 (b) NH_3 c) PH_3 (d) SO_2

3. Which type of bond is present in H_2S molecule

(a) Ionic bond (b) Covalent bond (c) Co-ordinate (d) All of three

4. H_2S is more acidic than H_2O, due to

(a) O is more electronegative than S

(b) $O-H$ bond is stronger than $S-H$ bond

(c) $O-H$ bond is weaker than $S-H$ bond

(d) None of these

5. Oxygen molecule exhibits

(a) Paramagnetism (b) Diamagnetism

(c) Ferromagnetism (d) Ferrimagnetism

6. Which one is known as oil of vitriol

(a) H_2SO_3 (b) H_2SO_4 (c) $H_2S_2O_7$ (d) $H_2S_2O_8$

7. Aqueous solutions of hydrogen sulphide and sulphur dioxide when mixed together, yield

(a) Sulphur and water (b) Sulphur trioxide and water

(c) Hydrogen peroxide and sulphur (d) Hydrogen and sulphurous acid

8. An example of a neutral oxide is

(a) NO (b) CO_2 (c) CaO (d) ZnO

9. The metal that is extracted from sea water is

(a) Ba (b) Mg (c) Ca (d) Sr

10. All the s–block elements of the periodic table are placed in the groups ...

(a) IA and IIA (b) IIIA and IVA (c) B sub groups (d) VA to VIIA

11. The electronic configuration of halogen is

(a) ns^2np^6 (b) ns^2np^3 (c) ns^2np^5 (d) ns^2

12. Synthetic detergents are more effective in hard water than soaps because

(a) They are highly soluble in water

(b) Their Ca^{++} and Mg^{++} salts are water soluble

(c) Their Ca^{++} and Mg^{++} salts are insoluble in water

(d) None of these

13. The IUPAC name of $K_4[Fe(CN)_6]$ is

(a) Potassium hexacyanoferrate (II)

(b) Potassium ferrocyanide

(c) Tetrapotassium hexacyanoferrate (II)

(d)Tetrapotassium ferroushexacyanide (II)

14. The effective atomic number of cobalt in the complex $[Co(NH_3)_6]^{3+}$ is

(a)36   (b)33   (c)24 (d)30

15. In the coordination compound, $K_4[Ni(CN)_4]$ oxidation state of nickel is

(a) -1 (b)   0 (c) $+1$ (d) $+2$

16. $KMnO_4$ in basic medium is reduced to

(a) K_2MnO_4 (b) MnO_2 (c) $Mn(OH)_2$ (d) Mn^{2+}

17. When $CuSO_4$ is hydrated, then it becomes

(a)Acidic(b)basic (c)Neutral(d)Amphoteric

18. Froth floatation process is used for the concentration of

(a)Oxide ores(b)Sulphide ores(c)Chloride ores(d)Amalgams

19. The salt used for performing 'bead' test in qualitative inorganic analysis is

(a) $K_2SO_4.Al_2(SO_4)_3.24H_2O$ (b) $FeSO_4.(NH_4)_2SO_4.6H_2O$

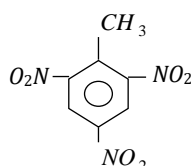(c) $Na(NH_4)HPO_4.4H_2O$ (d) $CaSO_4 2H_2O$

20. Attacking or reactive or electrophilic species in nitration of benzene is or In the nitration of benzene with concentrated HNO_3 and H_2SO_4 the attack on ring is made by

(a) NO_2^- (b) NO_2^+ (c) NO_3^- (d) NO_2

21. Nitration of benzene by nitric acid and sulphuric acid is

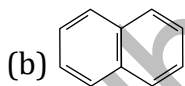(a)Electrophilic substitution(b)Electrophilic addition

(c)Nucleophilic substitution(d)Freeradical substitution

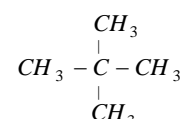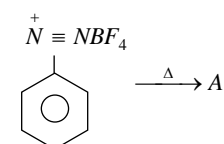**22.** How is is widely used

(a)Insecticide(b)Drug(c)Explosive(d)Dye

23. The compound most likely to decolourize a solution of potassium permanganate is

(a) CH_3CH_3

(b)

(c) $CH_3CH = CHCH_2CH_3$ (d)

24.

In the above process product A is

(a)Fluorobenzene (b) Benzene(c) 1, 4-difluorobenzene(d) 1, 3-difluorobenzene

25. Carbocation which is most stable

(a) $CH_3CH_2^+$ (b) CH_3^+ (c) $C_6H_5CH_2^+$ (d) $CH_3CH_2CH_2^+$

26. Tautomerism is exhibited by

(a) $(CH_3)_3CNO$ (b) $(CH_3)_2NH$ (c) R_3CNO_2 (d) RCH_2NO_2

27. Chlorobenzene is prepared commercially by

(a) Raschig process (b) Wurtz Fitting reaction

(c) Friedel-Craft's reaction (d) Grignard reaction

28. $CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - COOC_2H_5 \xrightarrow[H_2O]{NaOH} A,$

product 'A' in the reaction is

(a) CH_3COOH (b) C_2H_5OH (c) CH_3COCH_3 (d) C_2H_5CHO

29. Which one of the following compounds is prepared in the laboratory from benzene by a substitution reaction

(a) Glyoxal (b) Cyclohexane (c) Acetophenone (d) Hexabromo

30. $CH_3 - CHO + HCN \rightarrow A$; Compound A on hydrolysis gives

(a) $CH_3 - CH_2 - COOH$ (b) $CH_3 - CH_2 - CH_2 - NH_2$

(c) $CH_3 - CO - COOH$ (d) $CH_3 - \underset{\underset{OH}{|}}{CH} - COOH$

31. Which one does not give cannizzaro's reaction

(a) Benzaldehyde (b) 2-methyl propanal

(c) p-methoxy benzaldehyde (d) 2,2 dimethyl propanal

32. When condensation product of hexamethylenediamine and adipic acid is heated to $553\,K\,(80^o\,C)$ in an atmosphere of nitrogen for about 4-5 hours, the product obtained is

(a) Solid polymer of nylon 66 (b) Liquid polymer of nylon 66

(c) Gaseous polymer of nylon 66 (d) Liquid polymer of nylon 6

33. Acetyl bromide reacts with excess of CH_3MgI followed by treatment with a saturated solution of NH_4Cl gives

(a) 2-methyl-2-propanol (b) Acetamide

(c) Acetone (d) Acetyl iodide

34. What is obtained when chlorine is passed in boiling toluene and product is hydrolysed

(a) o-Cresol (b) p-Cresol (c) 2, 4 Dihydroxytoluene (d) Benzyl alcohol

35. The main structural feature of proteins is

(a) The ester linkage (b) The ether linkage

(c) The peptide linkage (d) All of these

36. Pepsin enzyme hydrolyses

(a) Proteins to amino acids (b) Fats to fatty acids

(c) Glucose to ethyl alcohol

(d) Polysaccharides to monosaccharides

37. Number of isomeric primary amines obtained from $C_4H_{11}N$ are

(a)3 (b) 4   (c)5   (d)6

38. Which one of the following is known as broad spectrum antibiotics

(a)Streptomycine(b)Ampicilli(c)Chloramphenicol(d)Penicillin G

39. Camphor is often used in molecular mass determination because

(a)It is volatile (b)It is solvent for organic substances

(c)It is readily available (d)It has a very high cryoscopic constant

40. According to law of mass action rate of a chemical reaction is proportional to

(a)Concentration of reactants(b)Molar concentration of reactants

(c)Concentration of products (d)Molar concentration of products

41. Of all the three common mineral acids, only sulphuric acid is found to be suitable for making the solution acidic because

(a)It does not react with $KMnO_4$ or the reducing agent

(b)Hydrochloric acid reacts with $KMnO_4$

(c)Nitric acid is an oxidising agent which reacts with reducing agent(d)All of the above are correct

42. The molar heat capacity of water at constant pressure is 75 $JK^{-1}\,mol^{-1}$. When 1.0 kJ of heat is supplied to 100 g of water which is free to expand, the increases in temperature of water is

(a)6.6 K(b)1.2 K(c)2.4 K(d)4.8 K

43. If the bond dissociation energies of XY, X_2 and Y_2 (all diatomic molecules) are in the ratio of 1 : 1 : 0.5 and $\Delta_f H$ for the formation of XY is $-200\,kJ\,mole^{-1}$. The bond dissociation energy of X_2 will be

(a) $100\,kJ\,mol^{-1}$ (b) $800\,kJ\,mol^{-1}$ (c) $300\,kJ\,mol^{-1}$ (d) $400\,kJ\,mol^{-1}$

44. If $3A \rightarrow 2B$, then the rate of reaction of $+\frac{d(B)}{dt}$ is equal to

(a) $+2\frac{d(A)}{dt}$ (b) $-\frac{1}{3}\frac{d(A)}{dt}$ (c) $-\frac{2}{3}\frac{d(A)}{dt}$(d) $-\frac{3}{2}\frac{d(A)}{dt}$

45. Equimolar solutions in the same solvent have

(a)Same boiling point but different freezing point

(b)   Same freezing point but different boiling point

(c)Same boiling and same freezing points

(d) Different boiling and different freezing points

Biology

46. The basic unit of classification /taxonomy is

(a)Genus   (b)Species(c)Family (d)Order

47. Which is a taxon

(a)Genera(b)Family(c)Class(d)None of these

48. Transformation experiment was performed on which of the following bacteria

(a)*E. coli*   (b)*Salmonella*(c)*Pasturellapestis*(d)*Diplococcus pneumoniae*

49. Viral genome incorporated and integrates with bacterial genomes is refer to as

(a)Prophages (b)RNA(c)DNA(d)Both (b) and (c)

50. When a fresh-water protozoan possessing a contractile vacuole, is placed in a glass containing marine water, the vacuole will

(a)Increase in size(b)Decrease in size

(c)Increase in number(d)Disappear

51. Which is false for nutrition in *Amoeba*

(a)Omnivorous(b)Pseudopodia feeder

(c)Holozoic nutrition(d)Photoautotroph

52. Which is not related with the sexual reproduction in protozoans

(a)Cytogamy(b)Autogamy(c)Conjugation(d)Schizogony

53. Fibres are obtained from

(a)Xylem, phloem and sclerenchyma

(b)Xylem, phloem, sclerenchyma and epidermis

(c)Xylem, parenchyma, epidermis

(d)Xylem, parenchyma, endodermis

54. Starch is mainly manufacture by

(a)Palisade parenchyma(b)Spongy parenchyma

(c)Guard cells(d)Vascular bundle

55. Ginger plant has an underground stem which is

(a)Rhizome(b)Bulb(c)Tuber (d)Corm

56. Green leaf-like one internode long stem branches are called

(a)Phylloclades (b)Phyllodes(c)Bulbils (d)Cladodes

57. Edible part of mango is

(a)Epicarp   (b)Mesocarp(c)Endocarp(d)Receptacle

58. Edible part of tomato is

(a)Epicarp   (b)Pericarp & placenta(c)Mesocarp(d)Thalamus

59. The pollen grain is

(a)An immature male gametophyte

(b)A mature male gametophyte(c)Partially developed male gametophyte   (d)Last stage of male gametophyte

60. Collar like outgrowth arising from the base of ovule and forming a sort of third integument is known as

(a)Coma   (b)Caruncle (c)Aril(d)Operculum

61. Pollination by wind is called

(a)Geitnogamy(b)Anemophily(c)Autogamy (d)None of the above

62. Double fertilization is a characteristic of

(a)Gymnosperms(b)Bryophytes(c)Angiosperms

(d)Pteridophytes

63. Formation of fruits without fertilization is known as or Ovary $\xrightarrow{\text{No fertilization}}$ Fruit

(a)Parthenocarpy (b)Parthenogenesis (c)Polyembryony (d)Polygamy

64. Cell wall is absent in

(a)Gametes (b)*Amoeba* (c)Mycoplasma (d)All of these

65. Cell wall is absent in

(a)Plants (b)Animals (c)*Mucor* (d)Mango

66. Which is correct for the structure of cell wall of bacteria and fungi

(a)Both are made up of cellulose (b)Both have mucopeptide

(c)Both are made up of N-acetylglucosamine

(d)None of these

67. The homologous chromosomes follow the process of synapsis in the stage or Pairing of homologous chromosome takes place in

(a)Leptotene (b)Zygotene (c)Diplotene (d)Pachytene

68. Crossing over is advantageous because it brings about

(a)Variation (b)Linkage (c)Inbreeding (d)Stability

69. The process of mitosis can be studied in

(a)Onion root tip (b)Garlic root tip

(c)Tendril tip (d)All of the above

70. The conducting tissues of the plants are

(a)Xylem (b)Phloem

(c)Xylem and phloem both (d)Sclerenchyma

71. Exchange of substances between individual cells and their environments takes place by

(a)Osmosis (b)Diffusion (c)Active transport (d)All of these

72. Gray speck disease in oats takes place by the deficiency of

(a)Zinc (b)Copper (c)Potassium (d)Manganese

73. Boron in green plants assists in

(a)Sugar transport (b)Activation of enzymes

(c)Acting as enzyme cofactor (d)Photosynthesis

74. In which plant Calvin experimented by radioactive isotopy to discover the stable product of C_3 cycle [

(a)Chlorella (b)Cycas (c)Carrot (d)Tobacco

75. The first stable compound of dark reaction of photosynthesis is

(a)Phosphoglyceraldehyde (b)Phosphoglyceric acid

(c)Fractose (d)Starch

76. Organism which can respire in absence of O_2 is

(a)*Chlorella* (b)*Solanum* (c)*Saccharum* (d)*Saccharomyces*

77. Cyanide resistant pathway is

(a)Anaerobic respiration(b)Aerobic respiration

(c)Both (a) and (b)(d)None of these

78. Mendel chose pea plants because

(a)They were cheap

(b)They were having seven pairs of contrasting characters

(c)They were easily available(d)Of great economic importance

79. How many pairs of contrasting characters in pea pod were chosen by Mendel

(a)2 (b)3   (c)4   (d)7

80. The genes controlling seven traits in pea studied by Mendel were later found to be located on following number of chromosomes

(a)Seven   (b)Four (c)Five (d)Six

81. Chiasmata firstly seen in

(a)Leptotene(b)Zygotene(c)Pechytene(d)Diplotene

82. Crossing–over occurs in the

(a)Leptotene stage(b)Pachytene stage

(c)Anaphase stage(d)Diakinesis stage

83. Number of linkage group in *Pisum sativum* is

(a)2 (b)5   (c)7   (d)9

84. Sexual reproduction leads to

(a)Genetic recombination(b)Polyploidy

(c)Aneuploidy (d)Euploidy

85. Break through of the year 2002

(a)*c*DNA   (b)16 *Sr*RNA(c)*r*DNA(d)*mi*RNA

86. Uridine monophosphate is found in

(a)Centrosome(b)Lysosome(c)Cell wall   (d)RNA

87. Which form of RNA is most heterogeneous

(a)tRNA(b)mRNA(c)rRNA(d)hnRNA

88. Mendel's law were first published in the year

(a)1875(b)1890(c)1928(d)1866

89.Escherichia coli is an important material for genetic experiments because

(a)It is harmless(b)   It is haploid

(c)It can be easily cultured(d) Both (b) and (c)

90.Which of the character is dominant in pea plant

(a)Wrinkled seeds containing tall plants

(b)Red flower containing dwarf plant

(c)Both (a) and (b)(d)Neither (a) nor (b)

91.The segregation of paired hereditary factors that Mendel postulated occurs during

(a)Anaphase of first meiotic division

(b)Metaphase of second meiotic division

(c)During interphase between two meiotic divisions

(d)Prophase of first meiotic division

92. From a cross *AABb* × *aaBb*, the genotypes *AaBB* : *AaBb* : *Aabb* : *aabb* will be obtained in the following ratio

(a)1 : 1 : 1 : 1 (b)1 : 2 : 1 : 0 (c)0 : 3 : 1 : 0 (d)1 : 1 : 1 : 0

93. Which of the following statements is correct for species

(a)The members of a species occupy the same habitat

(b)They are morphologically similar

(c)They can interbreed among themselves

(d)They cannot interbreed with members of the other species

94. Biotic succession is caused by

(a)Competition amongst species(b)Occurrence of diseases

(c)Changes is grazing habits(d)Adaptive ability to environmental changes

95. Mr. X is eating curd/yoghurt. For this food intake in a food chain he should be considered as occupying

(a)First trophic level(b)Second trophic level

(c)Third trophic level(d)Fourth trophic level

96. In which part of the open sea producers are found

(a)Aphotic zone (b)Abyssal zone(c)Photic zone (d) None of these

97.A treeless biome is

(a)Tundra   (b)Grassland(c)Desert(d)All the above

98. Photochemical smog formed in congested metropolitan cities mainly consists of

(a)Ozone, peroxyacetyl nitrate and NO_x

(b)Smoke, peroxyacetyl nitrate and SO_2

(c)Hydrocarbons, SO_2 and CO_2

(d)Hydrocarbons, ozone and SO_x

99. The phenomenon in which nutrient enrichment of a water body supports a dense growth of one or may organisms but decreases the species diversity is called

(a)Biological magnification(b)Species promotion

(c)Eutrophication (d) None of the above

100. Deforestation leads to

(a)Soil erosion(b)Global warming (c)Soil protection(d)Both (a) and (b)

101. Land mass occupied by forest is about or According to Indian forest policy what percentage of the land area should be under forest cover

(a)11% (b)22%(c)30%(d)60%

102. The presence of diversity at the junction of territories of two different habitats is known as

(a)Bottle neck effect(b)Edge effect(c)Junction effect(d)Pasteur effect

103. Lateral line system is present in

(a)Fish (b)Frog(c)Reptiles(d)Man

104. Poison glands of snake are modified

(a)Sebaceousglands(b)Ceruminousglands(c)Salivary glands(d)Endocrine glands

105. The following mammal lays eggs

(a)Porcupine (b)Platypus(c)Kangaroo(d)Koala

106. The % similarity in $\beta-$ chain of Hb in man and rhesus monkey is

(a)2%   (b)   4%(c)8%(d)40%

107. Carotene pigment is found in the cells of

(a)Dermis   (b)Epidermis(c)Adipose cell(d)Both 'b' and 'c'

108. Different colours of frog skin are controlled by

(a)Hormones(b)Melanocytes(c)Nervous system(d)Both 'a' and 'c'

109. Which of the following controls the peristaltic movement of the intestine

(a)Sacralplexus(b)Brachialplexus(c)Discoidalplexus (d)Auerbach's plexus

110. Protein deficiency in children is called

(a)Obesity   (b)Marasmus(c)Diabetes(d)Kwashiorkor

111. In which animal, diaphragm has no role in respiration

(a)Frog(b)Rat(c)Camel(d)Rabbit

112. Lung ventilation movements are due to

(a)Costal muscles and diaphragm(b)Costal muscles

(c)Diaphragm(d)Wall of the lungs

113. Iliac artery carries blood to the

(a)Lungs   (b)Ileum(c)Hind limbs(d)Brain

114. Which of the following has no muscular wall

(a)Artery   (b)Vein(c)Arteriole(d)Capillary

115. A kidney stone is

(a)Blockage by fats(b)Deposition of sand in kidney

(c)A salt such as oxalate crystallised in pelvis

(d)Blockage by proteins

116. Lumber vertebra are found in

(a)Neck region(b)Abdominal region

(c)Hip rigion(d)Thorax

117. The centre for sense of smell in brain is

(a)Cerebellum(b)Cerebrum(c)Olfactory lobes(d)Midbrain

118. Bats have special sensory system called

(a)Ecobalancing system(b)Echo–location system

(c)Ecoflying system(d)Econervous system

119. ACTH is secreted by

(a)Adrenal cortex(b)Adrenal medulla(c)Pituitary(d)Thymus

120. In which of the following organism testes descends into scrotum in breeding season but in non-breeding season goes up (a)Frog(b)Kangaroo(c)Shrew(d)Bat

121. In most mammals, the testes are located in scrotal sac for

(a)Spermatogenesis (b)Sex differentiation

(c)More space to visceral organs (d)Indepndent functioning of kidney

122. The cyclic period of sexual activity in non-human female mammals is called

(a)Menstruation (b)Luteinization(c)Oogenesis(d)Estrous

123 In mammals the estrogens are secreted by the Graafian follicle from its

(a)External theca(b)Internal theca(c)Zona Pellucida(d)Corona radiata

124. In human females at the time of birth there are two million ova: how many of them normally reach maturity in the course of normal reproductive life

(a)500   (b)1,000(c)2,000(d)5,000

125. Parturition duct in female is called

(a)Uterus   (b)Oviduct(c)Vagina(d)Cervix

126. In human female which of the following is incorrect

(a)Menstrual cycle takes 28 days

(b)Menopause occur at 45-55 years

(c)The ovulated egg released during pregnancy die

(d)Menstruation takes 4 days

127. If both ovaries are removed from a rat, then which hormone is decreased in blood

(a)Oxytocin (b)Estrogen(c)Prolactin(d)Gonadotrophic

128 Certain compounds are released by the WBC which raise the body temperature. These compounds are known as

(a)Pyrogens(b)Histamines(c)Toxigens(d)Pathogens

129. X- rays are used in

(a)ECG (b)EEG(c)CT –Scan(d)Endoscopy

130. Drugs that cause malformation in embryo during pregnancy are called

(a)Tranquillizers(b)Teratogens (c)Alcoholic beverages(d)Nicotin

131. The endothelium of blood vessel is composed of

(a)Cuboidal epithelium(b)Squamous epithelium

(c)Columnar epithelium(d)Ciliated epithelium

132. Most of the glands of the body are of

(a)Holocrine type(b)Merocrine type(c)Apocrine type(d)None of these

133. In connective tissue, the tissue fluid is trapped between

(a)Hyaluronic acid(b)Lactic acid

(c)Sphygmo myelin(d)None of the above

134. New approach to conservation is the establishment of

(a)Sancturies(b)Reserve forests(c)National parks(d)Biosphere reserves

135. The presence of diversity at the junction of territories of two different habitats is known as

(a)Bottle neck effect(b)Edge effect(c)Junction effect(d)Pasteur effect

Physics

136. Suppose the gravitational force varies inversely as the nth power of distance. Then the time period of a planet in circular orbit of radius R around the sun will be proportional to

(a) $R^{\left(\frac{n+1}{2}\right)}$ **(b)** $R^{\left(\frac{n-1}{2}\right)}$ **(c)** R^{n} **(d)** $R^{\left(\frac{n-2}{2}\right)}$

137. Two sphere of mass m and M are situated in air and the gravitational force between them is F. The space around the masses is now filled with a liquid of specific gravity 3. The gravitational force will now be

(a) F (b) $\frac{F}{3}$ (c) $\frac{F}{9}$ (d)$3\,F$

138. Earth binds the atmosphere because of

(a)Gravity

(b)Oxygen between earth and atmosphere

(c)Both (a) and (b) (d)None of these

139. The $x-t$ graph shown in figure represents
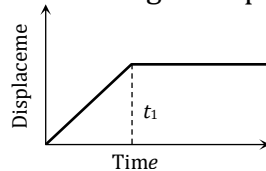
(a)Constant velocity

(b)Velocity of the body is continuously changing

(c)Instantaneous velocity

(d)The body travels with constant speed upto time t_1 and then stops

140. If force on a rocket having exhaust velocity of 300 m/sec is 210 N, then rate of combustion of the fuel is

(a)0.7 kg/s (b)1.4 kg/s(c)0.07 kg/s(d)10.7 kg/s

141.A player caught a cricket ball of mass 150 gm moving at the rate of 20 $m/sec.$ if the catching process be completed in 0.1 sec the force of the blow exerted by the ball on the hands of player is

(a)0.3 N (b)30 N (c)300 N (d)3000 N

142. The adjacent figure is the part of a horizontally stretched net. section AB is stretched with a force of 10 N. The tensions in the sections BC and BF are

(a)10 N, 11 N

(b)10 N, 6 N

(c)10 N, 10 N
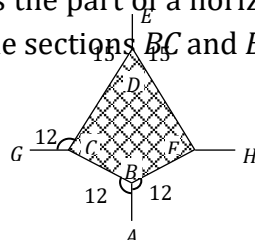
(d)Can't calculate due to insufficient data

143. Air is blown through a hole on a closed pipe containing liquid. Then the pressure will

(a)Increase on sides (b)Increase downwards

(c)Increase in all directions   (d)Never increases

144. Radius of an air bubble at the bottom of the lake is *r* and it becomes 2*r* when the air bubbles rises to the top surface of the lake. If *P cm* of water be the atmospheric pressure, then the depth of the lake is

(a)2*p*(b)8*p*(c)4*p*(d)7*p*

145. If the radius of the earth were to shrink by 1% its mass remaining the same, the acceleration due to gravity on the earth's surface would

(a)Decrease by 2% (b)Remain unchanged

(c)Increase by 2%(d) Increase by 1

146 A simple pendulum has a time period T_1 when on the earth's surface and T_2 when taken to a height *R* above the earth's surface, where *R* is the radius of the earth. The value of T_2/T_1 is

(a)1 (b) $\sqrt{2}$ (c)4(d)2

147. In order to make the effective acceleration due to gravity equal to zero at the equator, the angular velocity of rotation of the earth about its axis should be $(g = 10\,ms^{-2}$ and radius of earth is 6400 *kms*)

(a) $0\ rad\sec^{-1}$ (b) $\frac{1}{800} rad\,sec^{-1}$ (c) $\frac{1}{80} rad\,sec^{-1}$ (d) $\frac{1}{8} rad\,sec^{-1}$

148. If the acceleration due to gravity is $10\,ms^{-2}$ and the units

of length and time are changed in kilometer and hour

respectively, the numerical value of the acceleration is

 (a)360000(b)72,000(c)36,000(d)129600

149. In a Young's double slit experiment, the slit separation is 1 *mm* and the screen is 1 *m* from the slit. For a monochromatic light of wavelength 500 *nm*, the distance of 3rd minima from the central maxima is

(a)0.50 *mm* (b)1.25 *mm* (c)1.50 *mm* (d)1.75 *mm*

150. In Young's double-slit experiment the fringe width is β. If entire arrangement is placed in a liquid of refractive index *n*, the fringe width becomes

(a) $\frac{\beta}{n+1}$ (b)$n\beta$ (c) $\frac{\beta}{n}$ (d) $\frac{\beta}{n-1}$

151. If force and displacement of particle in direction of force are doubled. Work would be

(a)Double (b)4 times(c)Half(d) $\frac{1}{4}$ times

152.A body of mass 5 *kg* is placed at the origin, and can move only on the x-axis. A force of 10 *N* is acting on it in a direction making an angle of 60° with the x-axis and displaces it along the x-axis by 4 *metres*. The work done by the force is

(a)2.5 *J*(b)7.25 *J*(c)40 *J*(d)20 *J*

153.70 calories of heat are required to raise the temperature of 2 *moles* of an ideal gas at constant pressure from 30°*C* to 35°*C*. The amount of heat required to raise the temperature of same gas through the same range (30°*C* to 35°*C*) at constant volume (*R* = 2 *cal*/*mol*/*K*)

(a)30 *cal*(b)50 *cal*(c)70 *cal*(d)90 *cal*

154. Number of particles is given by $n = -D\frac{n_2 - n_1}{x_2 - x_1}$ crossing a unit area perpendicular to *X*-axis in unit time, where n_1 and n_2 are number of particles per unit volume for the value of x meant to x_2 and x_1. Find dimensions of D called as diffusion constant

(a) $M^0 LT^2$ (b) $M^0 L^2 T^{-4}$

(c) $M^0 LT^{-3}$ (d) $M^0 L^2 T^{-1}$

155. If L, C and R represent inductance, capacitance and resistance respectively, then which of the following does not represent dimensions of frequency   [IIT 1984]

(a) $\frac{1}{RC}$ (b)$\frac{R}{L}$ (c) $\frac{1}{\sqrt{LC}}$ (d) $\frac{C}{L}$

156. Work done per mol in an isothermal change is

(a) $RT \log_{10} \frac{V_2}{V_1}$ (b) $RT \log_{10} \frac{V_1}{V_2}$ (c) $RT \log_e \frac{V_2}{V_1}$ (d) $RT \log_e \frac{V_1}{V_2}$

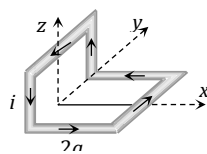**157.**In an isothermal process the volume of an ideal gas is halved. One can say that

(a)Internal energy of the system decreases

(b)Work done by the gas is positive

(c)Work done by the gas is negative

(d)Internal energy of the system increases

158.A thermodynamic process in which temperature *T* of the system remains constant though other variable *P* and *V* may change, is called

(a)Isochoric process   (b)Isothermal process

(c)Isobaric process   (d)None of these

159.A non-planar loop of conducting wire carrying a current *I* is placed as shown in the figure. Each of the straight sections of the loop is of length 2*a*. The magnetic field due to this loop at the point *P* (*a*,0,*a*) points in the direction

(a) $\frac{1}{\sqrt{2}}(-\hat{j} + \hat{k})$ (b) $\frac{1}{\sqrt{3}}(-\hat{j} + \hat{k} + \hat{i})$

(c) $\frac{1}{\sqrt{3}}(\hat{i} + \hat{j} + \hat{k})$ (d) $\frac{1}{\sqrt{2}}(\hat{i} + \hat{k})$

**160.**An electron moves with speed 2×10^5 *m/s* along the positive *x*-direction in the presence of a magnetic induction $B = \hat{i} + 4\hat{j} - 3\hat{k}$ (in *Tesla*.) The magnitude of the force experienced by the electron in Newton's is (charge on the electron = 1.6×10^{-19} *C*)

(a) 1.18×10^{-13} (b) 1.28×10^{-13} (c) 1.6×10^{-13} (d) 1.72×10^{-13}

161. Two magnets of equal mass are joined at right angles to each other as shown the magnet 1 has a magnetic moment 3 times that of magnet 2. This arrangement is pivoted so that it is free to rotate in the horizontal plane. In equilibrium what angle will the magnet 1 subtend with the magnetic meridian

(a) $\tan^{-1}\left(\frac{1}{2}\right)$ (b) $\tan^{-1}\left(\frac{1}{3}\right)$
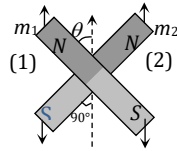
(c) $\tan^{-1}(1)$ (d) $0°$

162. A charge q is placed at the centre of the line joining two equal charges Q. The system of the three charges will be in equilibrium, if q is equal to

(a) $-\frac{Q}{2}$ (b) $-\frac{Q}{4}$ (c) $+\frac{Q}{4}$ (d) $+\frac{Q}{2}$

163. A coil of inductance 8.4 *mH* and resistance 6 Ω is connected to a 12 *V* battery. The current in the coil is 1.0 *A* at approximately the time

(a) 500 *sec*   (b) 20 *sec* (c) 35 *milli sec* (d) 1 *milli sec*

164. N identical spherical drops charged to the same potential v are combined to form a big drop. The potential of the new drop will be

(a) v (b) V / N (c) $V \times N$ (d) $V \times N^{2/3}$

165. Two charges placed in air repel each other by a force of $10^{-4} N$. When oil is introduced between the charges, the force becomes $2.5 \times 10^{-5} N$. The dielectric constant of oil is

(a 2.5 (b) 0.25 (c) 2.0 (d) 4.0

166. In an *LR*-circuit, the inductive reactance is equal to the resistance R of the circuit. An e.m.f. $E = E_0 \cos(\omega t)$ applied to the circuit. The power consumed in the circuit is

(a) $\frac{E_0^2}{R}$ (b) $\frac{E_0^2}{2R}$ (c) $\frac{E_0^2}{4R}$ (d) $\frac{E_0^2}{8R}$

167. The colour sequence in a carbon resistor is red, brown, orange and silver. The resistance of the resistor is

(a) $21 \times 10^3 \pm 10\%$ (b) $23 \times 10^1 \pm 10$

(c) $21 \times 10^3 \pm 5\%$ (d) $12 \times 10^3 \pm 5\%$

168. A thick wire is stretched so that its length become two times. Assuming that there is no change in its density, then what is the ratio of change in resistance of wire to the initial resistance of wire

(a) 2 : 1 (b) 4 : 1 (c) 3 : 1 (d) 1 : 4

169. A copper rod of length l is rotated about one end perpendicular to the magnetic field B with constant angular velocity ω. The induced e.m.f. between the two ends is

(a) $\frac{1}{2}B\omega l^2$ (b) $\frac{3}{4}B\omega l^2$ (c) $B\omega l^2$ (d) $2B\omega l^2$

170. The valence of an impurity added to germanium crystal in order to convert it into a *P*-type semi conductor is

(a) 6 (b) 5 (c) 4 (d) 3

171. In a semiconductor, the concentration of electrons is $8 \times 10^{14} /cm^3$ and that of the holes is $5 \times 10^{12} cm^3$. The semiconductor is

(a)P-type   (b)N-type(c)Intrinsic(d)PNP-type

172. Which state of triply ionised Baryllium (Be^{+++}) has the same orbital radius as that of the ground state of hydrogen

(a)$n = 4$(b)$n = 3$(c)$n = 2$(d)$n = 1$

173. The ratio of areas within the electron orbits for the first excited state to the ground state for hydrogen atom is

(a)$16 : 1$(b)$18 : 1$(c)$4 : 1$(d)$2 : 1$

174. Two rods (one semi-circular and other straight) of same material and of same cross-sectional area are joined as shown in the figure. The points A and B are maintained at different temperature. The ratio of the heat transferred through a cross-section of a semi-circular rod to the heat transferred through a cross section of the straight rod in a given time is

(a)$2 : \pi$

(b)$1 : 2$

(c)$\pi : 2$

(d)$3 : 2$

Semi circular rod

A Straight rod B
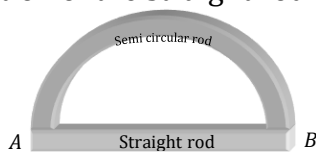
175. A sphere, a cube and a thin circular plate, all made of the same material and having the same mass are initially heated to a temperature of $1000°C$. Which one of these will cool first (a)Plate   (b) Sphere (c)Cube(d) None of these

176. An object 2.5 cm high is placed at a distance of 10 cm from a concave mirror of radius of curvature 30 cm The size of the image is

(a)9.2 cm(b)10.5 cm(c)5.6 cm(d)7.5 cm

177. For a real object, which of the following can produced a real image

(a)Planemirror(b)Concavelens(c)Convexmirror(d)Concave mirror

178. An object of length 6 cm is placed on the principle axis of a concave mirror of focal length f at a distance of $4f$. The length of the image will be

(a)2 cm (b)12 cm(c)4 cm(d)1.2 cm

179. In the ideal double-slit experiment, when a glass-plate (refractive index 1.5) of thickness t is introduced in the path of one of the interfering beams (wavelength λ), the intensity at the position where the central maximum occurred previously remains unchanged. The minimum thickness of the glass-plate is (a)2λ(b)$\frac{2\lambda}{3}$ (c)$\frac{\lambda}{3}$ (d)λ

180. The time period of rotation of the sun is 25 days and its radius is $7 \times 10^8 m$. The Doppler shift for the light of wavelength 6000 Å emitted from the surface of the sun will be

(a)0.04 Å(b)0.40 Å(c)4.00 Å(d)40.0 Å
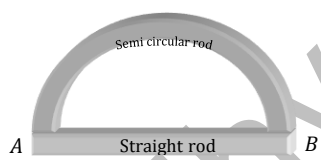
Semi circular rod

A   Straight rod   B

1	a	2	a	3	b	4	b	5	a
6	b	7	a	8	a	9	b	10	a
11	c	12	b	13	a	14	a	15	b
16	b	17	d	18	b	19	c	20	b
21	a	22	C	23	c	24	c	25	c
26	d	27	a	28	B,c	29	c	30	d
31	b	32	b	33	a	34	d	35	c
36	a	37	b	38	c	39	a	40	b
41	d	42	c	43	b	44	c	45	c
46	b	47	d	48	d	49	a	50	d
51	d	52	d	53	b	54	a	55	a
56	d	57	b	58	b	59	c	60	c
61	b	62	c	63	a	64	d	65	b
66	c	67	b	68	a	69	d	70	c
71	b	72	d	73	a	74	a	75	ab
76	d	77	a	78	b	79	a	80	b
81	d	82	b	83	c	84	a	85	d
86	d	87	d	88	d	89	d	90	d
91	a	92	b	93	d	94	d	95	c
96	c	97	d	98	b	99	c	100	d
101	c	102	b	103	a	104	c	105	b
106	d	107	d	108	a	109	d	110	d
111	a	112	a	113	c	114	d	115	c
116	b	117	c	118	b	119	c	120	d
121	a	122	d	123	b	124	a	125	c
126	c	127	b	128	a	129	c	130	b
131	b	132	b	133	a	134	d	135	b
136	a	137	a	138	a	139	d	140	a
141	b	142	c	143	c	144	**d**	145	**c**
146	d	147	b	148	d	149	**b**	150	**c**

151	b	152	d	153	b	154	d	155	d
156	c	157	c	158	b	159	d	160	c
161	b	162	b	163	d	164	d	165	d
166	c	167	a	168	c	169	a	170	d
171	b	172	c	173	d	174	a	175	a
176	d	177	d	178	a	179	a	180	a