Guidelines :

In every subject :

(a) In section – A, 35 questions will be given. Answer all 35 questions from section – A

(b) In section – B, 15 questions will be given. Out of which Answer 10 questions only.

BOTANY

SECTION – A

1. The number and types of organisms present on earth is referred to as
   (1) Biomagnification
   (2) Biofortification
   (3) Biodiversity
   (4) Bioethics

02. One of the following can fix atmospheric nitrogen in specialised cells called heterocysts
   (1) *Agaricus* (2) *Polygonum*
   (3) *Penicillum* (4) *Nostoc*

03. Which type of Protozoans have silica cell wall?
   (1) Fresh water amoeboid protozoans
   (2) Marine flagellated protozoans
   (3) Marine ciliated protozoans
   (4) Marine amoeboid protozoans

04. The first plants on land were
   (1) Bryophytes
   (2) Monocotyledons
   (3) Gymnosperms
   (4) Dicotyledons

05. Integumented megasporangium is first developed in
   (1) Gymnosperms (*Pinus)*
   (2) Angiosperms (*Polygonum)*
   (3) Pteridophytes (*Selaginella)*
   (4) Algae (*Chlorella)*

06. Which of the following is an example of sub- aerial modification of stem ?
   (1) Ginger (2) Potato
   (3) Jasmine (4) *Asparagus*

07. Select erroneous pair ?
   (1) Tendrillar stipule – *Smilax*
   (2) Phylloclade – *Opuntia*
   (3) Tendrillar leaf lets – *Pisum sativum*
   (4) Simple receme – *Triticum*

08. Select incorrect statement
   (1) In dicotyledonae roots , vascular cambium is completely secondary in origin.
   (2) Lenticels occur in mostly in older stems of woody plants.
   (3) Secondary growth occurs in stems of dicotyledons and gymnosperms.
   (4) After secondary growth primary medullary rays are more prominent in dicotyledonae root as compared to dicotyledonae stem.

09. Cell organelle not involved in photorespiration is
(1) Mitochondria (2) Peroxysome
(3) Chloroplast (4) Glyoxysome

10. Chromosome having only one arm is
(1) Metacentric (2) Submetacentric
(3) Telocentric (4) Acrocentric

11. Wrongly matched pair in the following is
(1) Alkaloid - Morphine and codeine
(2) GLUT-4- Protein enables glucose transport into cells
(3) Insulin - Genetically engineered Enzyme
(4) Drugs - Vinblastin and Curcumin

12. Most of the duplication of cell organelles occurs in following phase of cell cycle
(1) G_1-Phase (2) G_2-Phase
(3) S-Phase (4) M-Phase

13. Doubling of chromosomal number in mitosis occurs in
(1) Prophase (2) Anaphase
(3) Metaphase (4) Telophase

14. Which of the following statement is incorrect regarding simple diffusion ?
(1) It occurs along concentration gradient
(2) It is a passive process
(3) It is a active process
(4) It is not dependent on a living system

15. Which of the following is not true for, criteria for essentiality of minerals ?
(1) The element must be absolutely necessary for supporting normal growth.
(2) The requirement of the element must be specific and non replaceable by another element.
(3) The element must be directly involved in the metabolism of the plant.
(4) The deficiency of any one element can be met by supplying some other element.

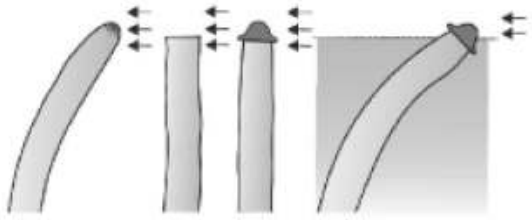
16. The isotope of carbon and oxygen used extensively for studies in photosynthes is are
(1) C^{13} & O^{16} (2) C^{14} & O^{18}
(3) C^{13} & O^{18} (4) C^{12} & O^{16}

17. Ribulose 1, 5 bisphosphate is present in
(1) Plants showing C_2 cycle only
(2) Plants showing C_4 cycle only
(3) Plants showing C_3 cycle only
(4) All photosynthetic plants

18. Source of electrons for electron transport chain during aerobic respiration is
(1) $NADH_2$ (2) $FADH_2$
(3) H_2O (4) 1 and 2 Both

19. How many CO_2 molecules are released during complete oxidation of glucose by the stepwise removal of all hydrogen atoms in Krebs cycle of mitochondria ?
(1) 3 (2) 4
(3) 5 (4) 6

20. Choose the correct option for given diagram



(1) Experiment used to demonstrate that tip of the coleoptile is the source of gibbrellin.

(2) Experiment used to demonstrate that movement of auxin is acropetal.

(3) Experiment used to demonstrate that tip of the coleoptile is the source of auxin.

(4) Arrow indicates direction of Air

21. One of the following not propagates through modified stem:

(1) Ginger (2) Turmeric

(3) *Colocasia* (4) Sweet Potato

22. One of the most resistant organic material is seen associated with

(1) Embryo

(2) Female gametophyte of angiosperms

(3) Seed

(4) Male gametophyte of angiosperms

23. The type of pollination that brings genetically more diverse types of pollen grains to the stigma is

(1) Xenogamy (2) Geitonogamy

(3) Autogamy (4) Parthenogenesis

24. The unequivocal proof that DNA is the genetic material came from the experiment of

(1) Avery, Mac Leod and Mc Carty

(2) Hershey and Chase

(3) Hargovind Khorana

(4) Griffith

25. The genotype of a husband and wife are I^AI^0 and I^BI^0 respectively. Among the blood types of their children, how many different genotypes and phenotypes are possible

(1) 3 genotypes ; 4 – phenotypes

(2) 4 genotypes ; 4 – phenotypes

(3) 4 genotypes ; 3 – phenotypes

(4) 3 genotypes ; 3 – phenotypes

26. In F_2 generation of dihybrid cross, the ratio between double homozygous double dominant individuals to double heterozygous individuals is

(1) 4 : 1 (2) 1 : 1

(3) 2 : 1 (4) 1 : 4

27. Find out correct match

(1) Himgiri - Variety of sugarcane

(2) Atlas-66 - High protein content wheat variety

(3) Golden rice - Low content of Fe&vitamin-A

(4) Parbhani kranti - Variety of rice

28. *Trichoderma* is a fungus used commercially in the production of

(1) Citric acid

(2) Blood cholesterol lowering statins

(3) Ethanol

(4) Immunosuppressive agent

29. Pick out the odd one regarding nature of reservoir
(1) Oxygen cycle
(2) Phosphorus cycle
(3) Carbon cycle
(4) Nitrogen cycle

30. Which of the following statement is best to describe a climax community ?
(1) More stable and less diverse
(2) More stable and more diverse
(3) Less stable and more diverse
(4) Less stable and less diverse

31. Which of the following enzyme is used to ligate desired gene to cleaved vector?
(1) Protease (2) Ribonuclease
(3) DNA ligase (4) All the above

32. Nematode resistant tobacco is produced by
(1) Micropropagation
(2) Gene silencing using RNAi
(3) Transformation by retrovirus
(4) Micro injection

33. Amplification of gene of interest using PCR does not require
(1) Primers
(2)Thermostable enzyme (Taq polymerase)
(3) Gene of interest
(4) Restriction endonuclease

34. Vector used to transfer nematode specific genes into host plant is
(1) *Bacillus thuringiensis*
(2) Ti plasmid of *Agrobacterium tumefacines*
(3) *Salmonella typhimurium*
(4) Retroviruses

35. In gel electrophoresis, the smaller DNA fragment moves far away from
(1) Cathode (2) Anode
(3) Positively charged electrode
(4) More than one option is correct

SECTION – B

36. In the five Kingdom - classification *Chlamydomonas* and *Chlorella* are placed in
(1) Protista (2) Plantae
3) Monera (4) Fungi

37. Which of the following fruit is developed from mono carpellary gynoecium with superior Ovary?
(1) Mango (2) Guava
(3) Sunflower (4) Rose

38. The cross section of a plant material shows the following anatomical features under micro scope
i) Number of xylem bundles are more than six with exarch protoxylem
ii) Well developed pith Plant material should be
(1) Dicot stem (2) Monocot stem
(3) Dicot root (4) Monocot root

39. If each amino acid weighs 200 mass units, what is the weight (in mass units) of the protein molecule synthesized from an mRNA having 603 bases ?
(1) 2000 (2) 6000
(3) 20,000 (4) 40,000

40. Reservoir of protons in chloroplast during light reaction of photosynthesis is
(1) Stroma of chloroplast
(2) Lumen of thylakoid
(3) Reaction centre of photosystem
(4) Matrix of mitochondria

41. Mendels Laws predict accurately the pattern of inheritance when
(1) Alleles of a character are co-dominant
(2) Alleles of a character are incomplete dominant
(3) Alleles of a character show complete dominance
(4) Given character is determined by more than one gene

42. One turn of TCA cycle releases
(1) $3\,NADH + H^+, 1FADH_2, 1GTP,\ 2CO_2$
(2) $6\,NADH + H^+, , 1GTP, 2CO_2$
(3) $3\,NADH + H^+, 2FADH_2, 2GTP,\ 4CO_2$
(4) $4\,NADH + H^+, 2FADH_2, 2GTP,\ 4CO_2$

43. Scientist who developed the method of isolation of plasmid from bacterial cell is
(1) Boyer (2) Calvin
(3) S.Cohen (4) Kary Mullis

44. Number of prothalial cells in the mature male gametophyte of Angiosperms is
(1) One (2) Two
(3) Three (4) Zero

45. In a primary transcript
(1) Only exons are non-functional
(2) Only introns are non-functional
(3) Both exons and introns are functional
(4) Both exons and introns are non-functional

46. Duplication of centrioles occur in
(1) G_1 phase (2) S phase
(3) G_2 phase (4) M phase

47. Sickle cell anemia is not due to
(1) Frame shift mutation
(2) Transition
(3) Transversion
(4) Substitution of acidic amino acid by neutral amino acid

48. Statement-I: By knowing sequence of nucleotides on mRNA, one can predict the amino acid sequence coded by it.
Statement-II : Genetic code is degenerate.
(1) Both Statement I and Statement II are wrong
(2) Both Statement I and Statement II are true
(3) Statement I is correct, Statement II is wrong
(4) Statement I is wrong, Statement II is correct

49. The most notable disease caused by prions in cattle is

(1) CJD (2) BSE

(3) Mosaic disease (4) Flu

50. The two alleles of a gene pair are located on __A__ sites on __B__ chromosomes. A and B are respectively

(1) Homologous, Heterologous

(2) Heterologous, Homologous

(3) Heterologous, Heterologous

(4) Homologous, Homologous

ZOOLOGY

SECTION-A

51. Which of the following is the best breeding method for animals that are below average in productivity in milk production and growth rate etc., ?

(1) Close breeding

(2) Inbreeding

(3) Out-crossing

(4) Interspecific hybridisation

52. Match the following common diseases (Column-I) with their causative agent (Column-II) and select the correct option

Column-I	Column-II
(A) Pneumonia	(i) *Wuchereria*
(B) Ringworm	(ii) *Salmonella*
(C) Typhoid	(iii) *Haemophilus*
(D) Filariasis	(iv) *Epidermophyton*

	A	B	C	D
(1)	(iv)	(iii)	(ii)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(iii)	(iv)	(ii)	(i)

53. Natality refers to

(1) Birth Rate

(2) Death Rate

(3) Number of individuals entering the habitat

(4) Number of individuals leaving the habitat

54. Out of 'X' serially arranged units of vertebrae in humans only 'Y' and 'Z' are fused units. Select the option that correctly represents the value of X and provides Y and Z explanation.

(1)	X=26, Y=sternum, Z=coccyx	Three bones are fused to form sternum and four caudal vertebrae are fused to form coccyx.
(2)	X=26, Y=sacrum, Z=coccyx	Five sacral vertebrae and four coccygeal vertebrae are fused to form sacrum and coccyx.
(3)	X=33, Y=coccyx, Z=sacrum	Five caudal vertebrae and four sacral vertebrae are fused to form coccyx and sacrum.
(4)	X=33, Y=cervicum, Z=sacrum	Seven cervical vertebrae and five sacral vertebrae are fused to form cervicum and sacrum.

55. Which cells of 'gastric glands' secrete the substance which can convert pepsinogen into pepsin ?

(1) Chief cells (2) Paneth cells

(3) Oxyntic cells (4) Zymogen cells

56. After how many years of formation of earth, the life originated on this planet?

(1) 50 Billion years

(2) 500 Billion years

(3)50 Million years

(4) 500 Million years

57. Deoxygenated blood pumped into the pulmonary artery is passed on to the lungs from where the oxygenated blood is carried by the pulmonary veins into the left atrium. This pathway constitutes

(1) Systemic circulation

(2) Portal circulation

(3)Coronarycirculation

(4) Pulmonary circulation

58. Which of the following is the reason for species diversification in tropical latitudes?

(1) They have remained relatively undisturbed for millions of years.

(2) More solar energy is available in tropics which contributes to lower productivity.

(3) They were subjected to frequent glaciations in the past.

(4)1 and 2 are correct.

59. One patient is suffering from pain and burning sensation in stomach. The gastroenterologist noticed that it is due to the excoriation of mucosal epithelium. Which components may be absent in the digestive juice ?

(1) Mucus and bicarbonates

(2) Bile salts and water

(3) Lysozyme and HCl

(4)Rennin and electrolytes

60. Cranium and vertebral column are cartilaginousin which vertebrate of the following ?

(1)*Pterophyllum* (2)*Psittacula*

(3)*Petromyzon* (4)*Pteropus*

61. Erythroblastosis foetalis develops in Rh^+ foetus in which combination of the following?

	Father	**Mother**
(1)	Rh negative	Rh positive
(2)	Rh positive	Rh positive
(3)	Rh negative	Rh negative
(4)	Rh positive	Rh negative

62. If a person is infected with some deadly microbes to which quick immune response is required, we need to inject

i) Preformed antibodies

ii) Vaccines

iii) Antitoxins

iv) Active Pathogens

Select the correct option from the following

(1) i and iii only (2) i, iii and iv only

(3) ii, iii and iv only (4) i, ii, iii and iv

63. Which statements of the following are true for formed elements ?

(1) Leucocytes are generally short lived.

(2) Eosinophils are the most abundant agranulocytes

(3) Platelets are cell fragments produced from thrombocytes.

(4) Neutrophils and basophils are non phagocytic cells.

64. The movement of air into and out of the lungs is carried out by creating a pressure gradient between the lungs and the atmosphere. Inspiration can occur if the pressure within the lungs is

(1) Less than the atmospheric pressure

(2) More than the atmospheric pressure

(3) Equal to that of atmospheric pressure

(4) More than the systemic pressure

65. Select the correct route for the passage of ova in female frogs.

(1) Ovary → Oviduct → Body cavity → Cloaca → Cloacal aperture
(2) Ovary → Oviduct → Ureter → Cloaca → Cloacal aperture
(3) Ovary → Ureter → Oviduct → Cloacal aperture → Cloaca
(4) Ovary → Body cavity → Oviduct → Cloaca → Cloacal aperture

66. Which one of the following statements is not valid for UV–B radiation ?

(1) High dose of UV-B causes snow – blindness

(2) It damages DNA and mutation may occur

(3) It increases the melting of polar ice caps

(4) It causes aging of skin and damage to skin cells

67. Which of the following statements is correct?

(1) The ascending limb of loop of Henle allows passage of small amounts ofurea into the medullary interstitium.
(2) Distal convoluted tubule reabsorbs 70-80 per cent of electrolytes and water.
(3) The collecting duct is lined by simple squamous epithelium.
(4) Proximal convoluted tubule is linedby simple cuboidal brush border epithelium.

68. When a sparrow eats seeds, fruits, insects and worms then it is a

(1) Primary consumer

(2) Primary carnivore

(3) Tertiary carnivore

(4) Both 1 and 2 are correct

69. Function/s of oral contraceptive pills

(1) They inhibit ovulation

(2) They inhibit implantation

(3) They alter the quality of cervical mucus to prevent entry of sperms

(4) All the three

70. The immune responses of old persons are weak because

(1) MALT looses its efficiency in old people
(2) The binding ability of antibodies decreases significantly
(3) Thymus gland degenerates in old individuals
(4) The spleen cannot filter the blood-born antigens

71. In HGP, the sequence of which chromosome was completed in May 2006?
(1) X Chromosome (2) Chromosome 1
(3) Y Chromosome (4) Chromosome 10

72. Which one of the following is a form of hyperthyroidism?
(1) Disfigurement of face
(2) Formation of ketone bodies
(3) Exopthalmicgoitre
(4) Piloerection and over sweating

73. Which among these is the correct combination of poisonous snakes ?
(1) *Naja, Ptyas, Hemidactylus*
(2) *Python, Calotes, Bangarus*
(3) *Testudo, Vipera, Naja*
(4)*Bangarus, Naja, Vipera*

74. Eminent conservationists identified that maximum protection is required to 'biodiversity hot spots'. Which of the following statement(s) is/are most appropriate for this view ?
(I) These are the regions with very high levels of species richness.
(II) These are the areas where alien species were introduced.
(III) These are the regions with high degree of endemism.
(IV) These have a history of religious and cultural traditions.
(1) Only (I) (2) Only (III)
(3) (I) and (III) (4) (II) and (IV)

75. Haemophilia is a genetic disease. Select the correct option from the following in relation to it.
(1) It is an autosome linked dominanttrait.
(2) The affected male should have anaffected father.
(3) The heterozygous female cannot transmit the disease to her sons.
(4)The possibility of a female becoming a haemophilic is extremely rare.

76. Failure of segregation of chromatids during cell division cycle results in 'aneuploidy'. Down's syndrome results due to
(1) Gain of extra copy of chromosome 18
(2) Gain of extra copy of chromosome 21
(3) Loss of an X chromosome in human females
(4) Loss of one of the chromosome 21

77. In the members of Phylum – Aschelminthes, the alimentary canal is
(1) Complete with a muscular pharynx
(2) Complete with a muscular intestine
(3) Incomplete with a muscular oesophagus
(4) Incomplete without muscles in any part of it

78. Atrial Natriuretic Factor can decrease the blood pressure by
(1) Dilating the blood vessels
(2) Constricting the blood vessels
(3) Activating JG cells
(4) Activating adrenal cortex

79. In which of the following interactions both partners are adversely affected ?
(1) Sea anemone and clown fish
(2) Flamingoes and resident fishes in South American lakes
(3) Fig tree and pollinator wasp
(4) Epiphytic orchid on a mango branch

80. Coronal suture between the parietal and frontal bones is a type of
(1) Cartilaginous joint
(2) Fibrous joint
(3) Synovial joint
(4) Pivot joint

81. During peak summer and winter frogs take shelter in deep burrows to protect them from extreme heat and cold. Select the best statement in relation to this.
(1) They have the ability of camouflage.
(2) They can survive on glycogen andfat reserves.
(3) They are eurythermal and stenohaline organisms.
(4) They are warm blooded tetrapod's.

82. Identify the correct statement in relation to human eye ball
(1)The space between the lens and the retina is filled with aqueous humor.
(2)The eye ball contains a lens which is held in place by ligaments attached to the iris.
(3)The photopic vision and colour vision are the functions of cones.
(4) The fovea is a thinned-out portion of the retina where only the rods are densely packed.

83. During which phase of menstrual cycle, the primary follicles in the ovary grow to become a fully mature Graafian follicle ?
(1) Luteal phase
(2) Proliferative phase
(3) Secretory phase
(4) Menstrual phase

84. In which technique of the following, the semen collected from husband / donor is artificially introduced into the uterus of the female ?
(1) Zygote intra fallopian transfer
(2) Intra cytoplasmic sperm injection
(3) Gamete intra fallopian transfer
(4) Intra-Uterine insemination

85. Which of the following options, best represents enzyme composition of succus entericus ?
(1) Sucrase, nuclease, steapsin
(2)Lactase, pepsin, procarboxypeptidase
(3) Maltase, aminopeptidase, lipase
(4) Amylase, lipase, pepsinogen

SECTION-B

86. Four pairs of gills which are covered by operculum on each side in which of the following ?
(1)*Myxine* (2) *Betta*
(3) *Pristis* (4)*Trygon*

87. In female humans urinary tract infections are very common. Pick out the correct reason from the following

(1) Kidneys are close to the genital organs

(2) Urinary bladder opens into the vagina

(3) There is no relation with urinary and genital tracts

(4)In females the urethra is shorter than in the male human beings

88. Secondary lymphoid organs provide the sites for interaction of __(A)__ with the __(B)__ , then __(A)__ proliferate to become effector cells.

Fill the blanks with correct option

(1) (A) - Lymphocytes, (B) - antigens

(2) (A)- Memory cells, (B) - lymphocytes

(3) (A) - Auxillary cells, (B) - antibodies

(4) (A) - Antigens, (B) - antibodies

89. Vesicles filled with neurotransmitters are present in

(1) Dendrites (2) Cyton

(3) Synaptic knobs (4) Axon hillock

90. Olecranon process is at the proximal end of

(1) Ulna (2) Radius

(3) Both radius and ulna

(4) Both tibia and fibula

91. 'Calciferol' is required to our body for

(1) Maintenance of fertility and gonadial activity

(2) Healing of wounds and healthy gums

(3) Absorption of calcium from intestine

(4) Maturation of RBC and coagulation of blood

92. FSH and LH are gonadotropins, in males FSH acts on

(1) Spermatogonia and stimulates the process of spermiation

(2) Sertoli cells and stimulates the secretion of some factors which help in spermiogenesis

(3) Leydig cells to release male sex hormones

(4) Sertoli cells and stimulate the secretions of epididymis

93. Diffusion of digested food from the lumen of the gut into the surrounding pseudocoelomic fluid becomes easier in round worms because of this reason

(1) Intestine contains thin layer of muscles

(2) Gut wall is made of only endodermal epithelium

(3) Mesoderm is absent in pseudocoelomates

(4) Sac like gut is present in round worms

94. Which of the following most appropriately describes Protonopia

(1) Autosomal gene disorder

(2) X – linked recessive gene disorder

(3) Chromosomal disorder

(4) Y – linked gene disorder

95. Very small animals are rarely found in polar regions. Pick out the main reason in support of this

(1) They have a larger surface area relative to their volume.

(2) They tend to lose body heat slowly, when it is cold outside.

(3) They have a smaller surface area relatively to their volume.

(4) They can generate more body heat through metabolism by expending much energy.

96. Infected females may often be asymptomatic during the infection of

(1) Hepatitis - A (2) SCID

(3) STD (4) Cholera

97. Which factors of the following inhibit decomposition ?

(1) High temperature and aerobiosis

(2) Low temperature and anaerobiosis

(3) High temperature, Nitrogen and sugars

(4) Low temperature and slightly alkaline nature

98. Which of the following latitudinal range harbours more species with very few exceptions ?

(1) 20° N to 40° N

(2) 23.5° N to 23.5°S

(3) 30.5° N to 30.5°N

(4) 40°S to 60°S

99. Which of the following represents order of 'Elephant' ?

(1) Perissodactyla (2) Proboscidea

(3) Cetacea (4) Chiroptera

100. Depletion of which gas in the atmosphere can lead to an increase incidence of skin cancers.

(1) Nitrous Oxide (2) Ozone

(3) Ammonia (4) Methane

PHYSICS

SECTION-A

101. If L, R, C and V respectively represent inductance, resistance, capacitance and potential difference, then the dimensions of $\frac{L}{RCV}$ are the same as those of

(1) current (2) 1/current

(3) charge (4) 1/charge

102. The sum and difference of the surface areas of two soap bubbles are in the ratio 5 : 3. The ratio of the excess pressures in them is

(1) $\sqrt{3} : \sqrt{5}$ (2) $\sqrt{5} : \sqrt{3}$

(3) 1 : 4 (4) 1 : 2

103. A body is moving along a straight line with a variable velocity 'v' = a – b×t. Its displacement before coming to rest is

(1) $\frac{a^2}{b}$ (2) $\frac{a^2}{2b}$

(3) $\frac{b^2}{a}$ (4) $\frac{b^2}{2a}$

104. A boy aims a gun at a target from a point, at a horizontal distance of 100m. If the gun can impart a horizontal velocity of 500 ms^{-1} to the bullet, the height above the target where he must aim his gun, in order to hit is (take $g = 10\ ms^{-2}$)

(1) 20 cm (2) 10 cm

(3) 50 cm (4) 100 cm

105. A tall tank has a side hole at a depth of 10 m below the free surface of water in it. The speed with which water emerges from the hole will be

(1) 7 m/s (2) 14 m/s

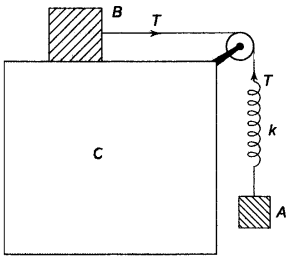
(3) 21 m/s (4) 28 m/s

106. A balloon of mass M is rising up with an acceleration a. If a mass m is removed from the balloon, its upward acceleration becomes

(1) $\frac{Ma+mg}{M-m}$ (2) $\frac{Ma+mg}{M+m}$

(3) $\frac{ma+Mg}{M-m}$ (4) $\frac{ma+Mg}{M+m}$

107. Two blocks A and B are connected to each other by a string and a spring of force constant k, as shown in Fig. The string passes over a frictionless pulley as shown. The block B slides over the horizontal top surface of a stationary block C and the block 'A' slides along the vertical side of C. both with the same uniform speed. The coefficient of friction between the surfaces of the blocks is If the mass of block A is m, what is the mass of block B?



(1) $\frac{m}{\sqrt{\mu}}$ (2) $\frac{m}{\mu}$

(3) $\sqrt{\mu}m$ (4) μm

108. A body of mass 4 kg moving with velocity 12m/s collides with another body of mass 6 kg at rest. If two bodies stick together after collision, then the loss of kinetic energy of system is

(1) Zero (2) 288 J

(3) 172.8 J (4) 144 J

109. A cord is wound around the circumference of a bicycle wheel (without tyre) of diameter 1 m and a mass of 2 kg is tied to the end of the cord and it is allowed to fall from rest. The weight falls 2 m in 4s. The axle of the wheel is horizontal and the wheel rotates with its plane vertical. The angular acceleration produced is (Take $g = 10\ ms^{-2}$)

(1) $0.5\,rad\,s^{-2}$ (2) $1.0\,rad\,s^{-2}$

(3) $2.0\,rad\,s^{-2}$ (4) $4.0\,rad\,s^{-2}$

110. A man stands at one end of a boat, which is stationary in water. Neglect water resistance. The man now moves to the other end of the boat and again becomes stationary. The center of mass of the 'man plus boat' system will remain stationary with respect to water

(1) only if the man and the boat have equal masses

(2) only when the man is stationary initially and finally

(3) only if the man moves without acceleration on the boat

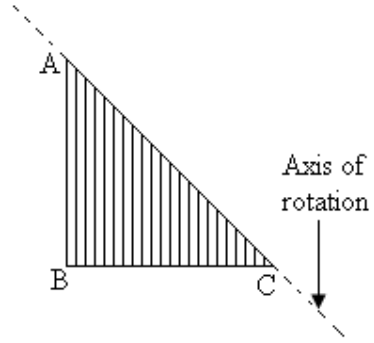
(4) in all cases

111. An ideal monatomic gas expands at constant pressure absorbing "Q" joules of heat. The work done by the gas in joules during the expansion is

(1) 2Q/5 (2) 3Q/5

(3) 2Q/7 (4) Q/4

112. A thin uniform metallic triangular sheet of mass M has sides AB = BC = L. What is its moment of inertia about axis AC lying in the plane of the sheet ?



(1) $\frac{ML^2}{12}$ (2) $\frac{ML^2}{6}$

(3) $\frac{ML^2}{3}$ (4) $\frac{2ML^2}{3}$

113. A cylinder rolls up an inclined plane, reaches some height, and then rolls down (without slipping throughout these motions). The direction of the frictional force acting on the cylinder are

(1) up the incline while ascending and down the incline while descending

(2) up the incline while ascending as well as descending

(3) down the incline while ascending and up the incline while descending

(4) down the incline while ascending as well as descending.

114. Weight of a given body is maximum at

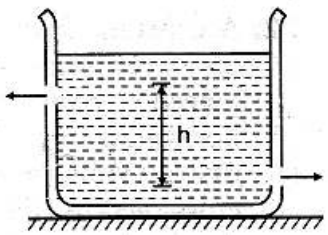
(1) equator of earth

(2) poles of earth

(3) center of earth

(4) angle of lattitute 30^0 on the surface of earth

115. There are two identical small holes of area of cross–section a on the opposite sides of a tank containing a liquid of density ρ. The difference in height between the holes is h. Tank is resting on a smooth horizontal surface. Horizontal force which will have to be applied on the tank to keep it in equilibrium is



(1) $gh\rho a$ (2) $\frac{2gh}{\rho a}$

(3) $2\rho agh$ (4) $\frac{\rho gh}{a}$

116. A block of mass M is suspended from a wire of mass m, cross-sectional area *a* and length L. If all the energy stored in the wire is converted into heat, the rise in the temperature of the wire is (Y = young's modulus and s = specific heat capacity of the material of the wire)

(1) $\frac{2YAL}{(Mg)^2 ms}$ (2) $\frac{MgLms}{2YA}$

(3) $\frac{(Mg)^2 L}{2YAms}$ (4) $\frac{\text{MgL}}{\text{2YAmg}}$

117. A uniform metal rod of length L and mass M is rotating with angular speed ω about an axis passing through one of the ends perpendicular to the rod. If the temperature increases by t^0C, then the fractional change in its angular speed is proportional to

(1) t^2 (2) t

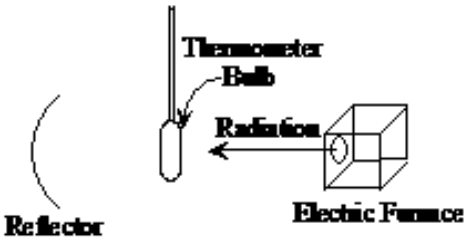
(3) t^3 (4) t^{-1}

118. An electric fan, with effective area of cross-section 'A', accelerates air of density 'd' to a speed 'v'. What is the power needed for this process ?

(1) d Av (2) $\frac{1}{2}$ d Av

(3) d Av^2 (4) $\frac{1}{2}$ d Av^3

119. A mercury thermometer is kept at the focus of a concave reflector behind its bulb as shown in the figure and in front of an electric furnace. Which of the following combinations will cause the smallest reading of the thermometer ?



(1) Black reflector and black bulb

(2) Black reflector and shiny bulb

(3) Shiny reflector and shiny bulb

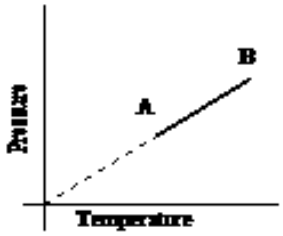
(4) Shiny reflector and black bulb

120. A block of ice with mass *m* falls into a lake. After impact, a mass of ice *m/5* melts. Both the block of ice and the lake have a temperature of 0°C. If *L* represents the heat of fusion, the minimum distance the ice fell is

(1) L/5g (2) 5L/g

(3) gL/5m (4) mL/5g

121. An ideal gas changes its state from A to B represented in the diagram. The work done by the gas in this process is



(1) zero (2) positive

(3) negative (4) infinity

122. A 1 litre flask made of glass contains some mercury. It is found that at different temperatures the volume of the air in the flask remained constant. What is the volume of the mercury in the flask? α of glass 9×10^{-6}/C° and γ of mercury is 180×10^{-6}/C°.

(1) 150 ml (2) 140 ml

(3) 850 ml (4) 860 ml

123. 'n' tuning forks, where 'n' is an odd number, are arranged in the ascending order of their frequencies. The last tuning fork has twice the frequency of the first tuning fork. Each tuning fork gives 'b' number of beats in one second with the next tuning fork. The frequency of the 1st tuning fork is

(1) $(n-1)\times b$ (2) $2\times(n-1)\times b$

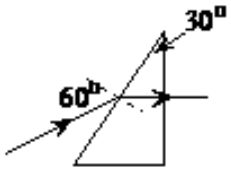
(3) $\frac{3}{2}(n-1)\times b$ (4) $\frac{3}{2}(n+1)\times b$

124. A telescope has an objective lens of focal length 200 cm and an eyepiece with focal length 2 cm. If this telescope is used to see a 50 m tall building at a distance of 2 km, what is the height of the image of the building formed by the objective lens ?

(1) 5 cm (2) 10 cm

(3) 1 cm (4) 2 cm

125. A right angled prism with an apex angle 30° is shown in the figure. A ray of monochromatic light is incident one surface at an angle of 60° and emerges normal to the other surface. The refractive index of the material of the prism is



(1) 1.5 (2) $\sqrt{2}$

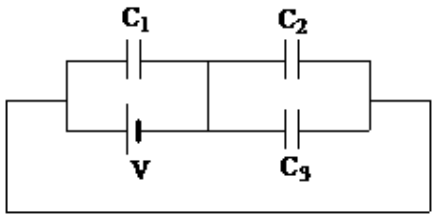
(3) $\sqrt{3}$ (4) 4/3

126. When the polarizer and the analyzer are arranged such that the angle between their optical axes is 30°, the intensity of the light emerging from the analyzer is I_1 and when the angle is increased to 60°, the intensity of the light emerging from the analyzer is I_2. The ratio $I_1 : I_2$ is

(1) 1 : 1 (2) 1 : 3

(3) 3 : 1 (4) $\sqrt{3} : 1$

127. In the circuit shown the battery of 'V' volts has no internal resistance. All three condensers are equal in capacity. The condenser that carries more charge is



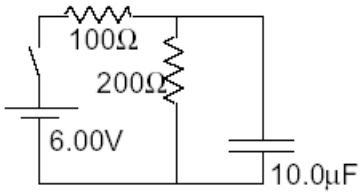
(1) C_1

(2) C_2

(3) C_3

(4) all three carry the same charge

128. The switch is closed in the circuit shown to the right. What is the charge on the capacitor when it is fully charged



(1) 60.0 μC (2) 10 μC

(3) 20 μC (4) 40 μC

129. A thin hollow spherical shell of radius R is charged uniformly. At what distance from its center is the electrostatic potential half of the potential at the center

(1) R (2) R/2

(3) R/3 (4) 2R

130. A set of Christmas tree lights consists of 20 identical lamps connected in series to a 240 V mains supply and the set is found to draw a current of 0.25 A. What is the power dissipated by each lamp ?

(1) 80 W (2) 3 W

(3) 48 W (4) 960 W

131. Kirchhoff's first law, i.e. $\sum i = 0$ at a junction, deals with the conservation of

(1) Momentum

(2) Angular momentum

(3) Charge

(4) Energy

132. A physicist works in a laboratory where the magnetic field is 2 T. She wears a necklace enclosing an area 100 cm^2 of field and having a resistance of 0.1Ω. Because of power failure, the field decays to 1 T in a millisecond. Find the electric charge circulated in the necklace assuming that the magnetic field is perpendicular to area covered by the necklace.

(1) 0.01 C (2) 0.001 C

(3) 0.1 C (4) 1.0 C

133. Which of the following is called the motor rule ?

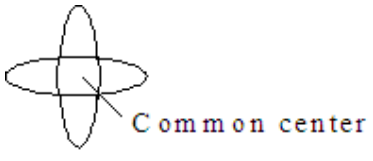
(1) Fleming's left hand rule

(2) Fleming's right hand rule

(3) Ampere's swimming rule

(4) Maxwell's cork screw rule

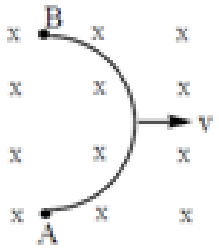
134. Two identical circular loops each of radius 'r' and carrying a current 'i' are arranged concentric with each other and in perpendicular planes as shown in the diagram. The resultant dipole moment of the arrangement is



(1) $\pi r^2 i$ (2) $2\pi r^2 i$

(3) $\sqrt{2}\pi r^2 i$ (4) zero

135. A semicircular wire is moving with uniform velocity in a uniform magnetic field as shown in figure. Hence the wire becomes



(1) Positively charged at end A

(2) Positively charged at end B

(3) Hot due to joules heating effect

(4) Neither A nor B are positively charged

SECTION-B

136. An electron initially at rest falls through a potential difference of 16 V. The De Broglie wavelength of the electron is nearly.

(1) 0.3 Å (2) 3 Å

(3) 0.03 Å (4) 30 Å

137. A parallel beam of monochromatic light of wavelength "λ" is incident normally on a perfectly reflecting surface. If "N" photons are striking the surface in every second, the force produced on the surface is (h : Planck's constant)

(1) Nh/λ (2) 2Nh/λ

(3) Nh/2λ (4) 4Nh/λ

138. Einstein's photoelectric equation is nothing but

(1) Law of conservation of momentum

(2) Laws of conservation of mass

(3) Law of conservation of angular momentum

(4) Law of conservation of energy

139. The function of a moderator in a nuclear reactor is to

(1) speed up the slow neutrons

(2) slow down the fast neutrons

(3) absorb the excess neutrons

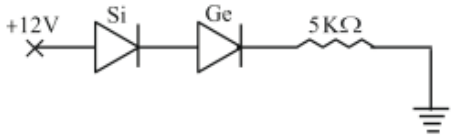
(4) absorb all the neutrons

140. Two radioactive materials x_1 and x_2 contain same number of nuclei. If $8\lambda s^{-1}$ and $3\lambda s^{-1}$ are the decay constants of x_1 & x_2 respectively. The ratio of number of nuclei undecayed of x_1 to that of x_2 will be $\frac{1}{e}$ after a time

(1) $\frac{1}{2\lambda}s$ (2) $\frac{1}{10\lambda}s$

(3) $\frac{1}{5\lambda}s$ (4) $\frac{1}{8\lambda}s$

141. The current flow through the resistance in the given circuit is nearly



(1) 2 mA (2) 3.2 mA

(3) 2.9 mA (4) 3 mA

142. The output of the given circuit in Fig, taken across diode is

(1) Would be zero at all times.

(2) Would be like a half wave rectifier with positive cycles in output.

(3) Would be like a half wave rectifier with negative cycles in output.

(4) Would be like that of a full wave rectifier.

143. In the spectrum of hydrogen, the ratio of the longest wavelength in the Lyman series to the longest wavelength in the Balmer series is:

(1) 5/27 (2) 4/9

(3) 9/4 (4) 27/5

144. A mass *m* attached to a spring oscillates every 2 *sec*. If the mass is increased by 2 *kg*, then time-period increases by 1 *sec*. The initial mass is

(1) 1.6 *kg* (2) 3.9 *kg*

(3) 9.6 *kg* (4) 12.6 *kg*

145. Two stationary observers A and B are 100 m apart. A source of sound is initially at the mid point of the line joining A and B. If the source starts moving towards A with a speed of 20 m/s, the ratio of the wavelengths of the sound received by A and B will be (take velocity of sound in air as 340 m/s)

(1) 8 : 9 (2) 9 : 8

(3) 17 : 16 (4) 18 : 17

146. A particle starts from rest and moves along a circular path with constant tangential acceleration. After one rotation the ratio of its centripetal acceleration to its tangential acceleration will be equal to

(1) 1 (2) 2π

(3) $1/2\pi$ (4) 4π

147. A uniform disc of radius 14.14cm lies in x - y plane with its centre at origin. Its moment of inertia about z - axis is equal to its moment of inertia about line y = x + c. The value of c is ____ cm

(1) 10 (2) 20

(3) 5 (4) 15

148. Self inductance of a system can be increased by

a) Increasing the current through it

b) Decreasing the current through it

c) Inserting an iron core

d) Increasing the number of turns

(1) a, c only (2) c, d only

(3) a, c, d (4) d only

149. The rate of change of torque with deflection $\frac{d\tau}{d\theta}$ is maximum for a magnet suspended freely in a uniform magnetic field, when θ is

(1) 0° (2) 45°

(3) 60° (4) 90°

150. Two identical pith balls are charged by rubbing against each other. They are suspend from a horizontal rod through strings of length $\sqrt{401}\,cm$ each, the separation between the suspension points being 5 cm. In equilibrium the separation between the balls is 3 cm. If the mass of each ball is 8g then the number of electron transferred from one ball to another during rubbing is

(1) $2x10^{8}$ (2) $1.25x10^{11}$

(3) $8x10^{11}$ (4) $2.5x10^{12}$

CHEMISTRY

SECTION-A

151. If an electron has spin quantum number of +1/2 and a magnetic quantum number of -1, then it cannot be represented in:

(1) s-orbital (2) p-orbital

(3) d-orbital (4) f-orbital

152. A gaseous mixture contains CH_4 and C_2H_6 in equimolar proportion. The weight of 2.24 litres of this mixture at STP is

(1) 4.6 g (2) 1.6 g

(3) 2.3 g (4) 23 g

153. In the reaction,

$$Hg_2S + MnO_4^- + H^+ \rightarrow Hg^{+2} + SO_4^{2-} + Mn^{+2} + H_2O$$

the n-factor for Hg_2S will be:

(1) 8 (2) 10

(3) 6 (4) 3

154. The raw materials involved in Solvay's process are

(1) $Na_2CO_3, CaCO_3.NH_3$

(2) $Na_2SO_4, CaCO_3.NH_3$

(3) NaOH, CaO, NH_3

(4) NaC*l*, NH_3, $CaCO_3$

155. The half life of a radioactive substance is 10 days. What weight of it is left undecayed in 5 days, if 2 grams of it is taken initially ?

(1) 1 g (2) 0.8 g

(3) 1.75 g (4) 1.414 g

156. In which case change in entropy is negative?

(1) Evaporation of water

(2) Expansion of gas at constant temperature

(3) Sublimation of solid to gas

(4) Fe(*l*) $\rightarrow$ Fe(S)

157. Match the following

I	II
A) Calcination	a) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
B) Roasting	b) $Fe_2O_3, xH_2O_{(s)} \rightarrow Fe_2O_{3(s)} + xH_2O_{(g)}$
C) Flux	c) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$
D) Thermite	d) $SiO_2 + FeO \rightarrow FeSiO_3$

The correct match is

(1) A - a, B - b, C - c, D - d

(2) A - b, B - a, C - d, D - c

(3) A - d, B - a, C - b, D - c

(4) A - c, B - a, C - b, D - d

158. Statement-I : Specific conductance of 0.1M HCl is greater than that of 0.1M CH_3COOH.

Statement-II : Increase in molar conductance with dilution is more in 0.1M CH_3COOH than in 0.1M HCl.

(1) Both I and II are false

(2) Both I and II are true

(3) I is true, II is false

(4) I is false, II is true

159. For the reaction equilibrium mixture contained 3 moles each of PCl_5, PCl_3 and Cl_2. If the total pressure is 3 atm. What is the value of Kp, for the decomposition of gaseous PCl_5

(1) 1 (2) 3

(3) 4 (4) 6

160. Canesugar + $H_2O \xrightarrow{H^+}$ Glucose + Fructose. What is the final product of reduction of above glucose by HI in presence of red P ?

(1) Fructosazone

(2) Penta acetyl glucose

(3) Sorbitol and penta acetyl fructose

(4) Hexane

161. Which of the following transition metal is present in misch metal

(1) Cu (2) Fe

(3) Zn (4) Mn

162. Silicon doped with electron-rich impurity forms _____.

(1) p-type semiconductor

(2) n-type semiconductor

(3) intrinsic semiconductor

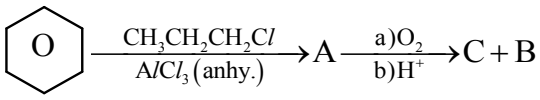
(4) insulator

163. Which among the following has highest protective power?

(1) Gelatin (2) Casein

(3) Potato starch (4) Gum arabic

164.



If "B" is simplest aliphatic ketone then conversion "C" to a mixture of o-hydroxy acetophenone and p-hydroxy acetophenone with $(CH_3CO)_2O$ and $AlCl_3$(anhy.) is

(1) Kolbe's reaction

(2) Dow's process

(3) Raschig reaction

(4) Fries rearrangement

165. When zeolite, which is hydrated sodium aluminium silicate is treated with hard water, the sodium ions are exchanged with

(1) H^+ ions

(2) Ca^{+2} ions only

(3) Both Ca^{+2} and Mg^{+2} ions

(4) HCO_3^{-1} ions

166. Wrong match is

(1) Cellulose acetate….SPM in reverse osmosis

(2) 90% N_2…. Respiratory kit in scuba diving

(3) 0.9% (w/v) NaCl …. Saline water

(4) Amalgams …. true solution of liquid dissolved in solid

167. Which of the following polymer is used in the manufacture of wood laminates ?

(1) cis-poly isoprene

(2) Melamine formaldehyde resin

(3) Urea formaldehyde resin

(4) Phenol and formaldehyde resin

168. The functions of antihistamine are :

(1) Anti allergic and Analgesic

(2) Antacid and anti allergic

(3) Analgesic and antacid

(4) Anti allergic and antidepressant

169. $CN^- + H_2O \rightleftharpoons HCN + OH^-, K = 10^{-9}$ then equilibrium constant for the neutralization of HCN with strong base will be

(1) 10^{-6} (2) 10^4

(3) 10^9 (4) 10^{-14}

170. $$Fe(OH)_{3(s)} \rightleftharpoons Fe^{+3}_{(aq)} + 3OH^-_{(aq)}$$

Solubility of ferric hydroxide is maximum at

(1) $P^H = 14$ (2) $P^H = 1$

(3) $P^H = 7$ (4) $P^H = 10$

171. Vant Hoff's factor for aq. K_2SO_4 is maximum at

(1) 0.1m

(2) 0.01 m

(3) 0.001m

(4) Vant Hoff's factor is independent of molality

172. Which of the following is an endothermic process (gaseous state reactions)

(1) $O + e^{-1} \rightarrow O^{-1}$ (2) $N + e^{-1} \rightarrow N^{-1}$

(3) $S + e^{-1} \rightarrow S^{-1}$ (4) $F + e^{-1} \rightarrow F^{-1}$

173. Correct order of basic strength in aqueous medium

A) $CH_3CH_2NH_2$ B) NH_3

C) $(CH_3CH_2)_3N$ D) $(C_2H_5)_2NH$

(1) A > B > C > D (2) D > C > A > B

(3) B > D > C > A (4) C > D > B >

174. Which of the following water sample is toxic? The sample containing

(1) SO_4^{-2} = 600 *ppm*

(2) NO_3^- = 60 *ppm*

(3) Pb = 55 *ppb*

(4) All of these

175. The ratio of rates of diffusion of SO_2, O_2 and CH_4 is

(1) $1: 2: \sqrt{2}$ (2) $2: \sqrt{2}: 1$

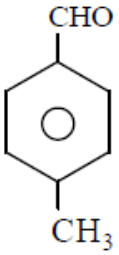
(3) 1: 2 : 4 (4) $1: \sqrt{2}: 2$

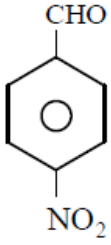
176. In thin layer chromatography the components A,B,C,D have their retardation factors on silica gel as 0.2, 0.4, 0.3, 0.05 respectively. Most adsorbed component is

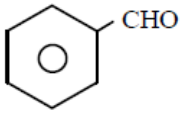
(1) D (2) C

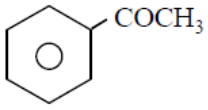
(3) B (4) A

177. Which one is most reactive towards nucleophilic addition reaction

(1) 

(2) 

(3) 

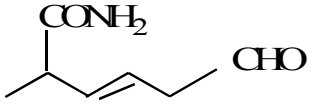
(4) 

178. The number of optical isomers possible for the monochloro derivatives of isopentane are

(1) 6 (2) 8

(3) 2 (4) 4

179. The IUPAC name of the following compound is



(1) 2-Carbamoylhexanal

(2) 2-Carbamoylhex – 3 - enal

(3) 2-Methyl-6-oxohex – 3 - enamide

(4) 6-Keto – 2 - methyl hexamide

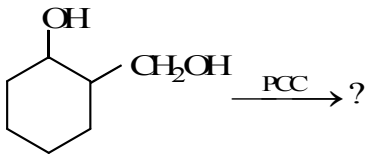
180. Propene on hydroboration and oxidation gives

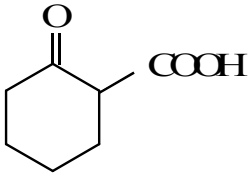
(1) n-propyl alcohol

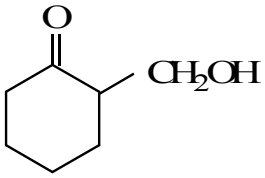
(2) isopropyl alcohol

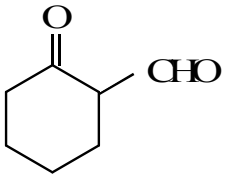
(3) propanal

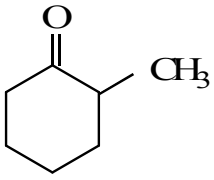
(4) propanone

181. 

(1) 

(2) 

(3) 

(4) 

182. $2CH_3Cl + Si \xrightarrow{X} (CH_3)_2 SiCl_2$, then 'X' is

(1) Ni/573K

(2) Cu powder/573K

(3) V_2O_5/573K

(4) Fe powder/573K

183. $H_3C-CH=CH_2+HCl \xrightarrow{\text{peroxide}} \text{product}$

The most stable intermediate formed during this process is

(1) $H_3C-\dot{C}H-CH_3$

(2) $H_3C-CH_2-CH_2$

(3) $H_3C-\overset{\oplus}{C}H-CH_3$

(4) $H_3C-CH_2-\overset{\oplus}{C}H_2$

184. Which of the following group-13 element has positive SRP value ($E^0_{(M^{+3}/M)}$) ?

(1) In (2) Al

(3) Ga (4) Tl

185. Allotropy is not exhibited

(1) Phosphorous(s) (2) Sulphur(s)

(3) Boron(s) (4) Nitrogen(g)

SECTION-B

186.

$$CH_3COOH \xrightarrow[THF]{B_2H_6} A \xrightarrow{PCC} B \xrightarrow[dryHCl]{2CH_3OH} C$$

(1) Oxime (2) Hydrazone

(3) Acetal (4) Hemiacetal

187. P – O – P bond is absent in

(1) $(HPO_3)_2$ (2) $H_4P_2O_7$

(3) P_4O_6 (4) $H_4P_2O_6$

188. HCl reacts with a salt "X" to form a chloride salt and acid. "X" can not be

(1) $NaNO_2$ (2) Na_2S

(3) Na_2SO_4 (4) Na_2CO_3

189. Incorrect about XeF_4 is

(1) It has square planar shape

(2) It can sublime

(3) It is prepared when Xe and fluorine react in the ratio 1:5 at 7 bar

(4) It is a polar molecule

190. $H_{2(g)}+\frac{1}{2}O_{2(g)} \rightarrow H_2O_{(g)}$, from the above reaction the bond energies of H-H, O = O, O - H are x_1, x_2, x_3 respectively and enthalpy of vaporization of liquid water into water vapour is x_4, then ΔH_f^o of water is

(1) $2x_1+\frac{x_2}{2}-x_3+2x_4$

(2) $2x_3-x_1-\frac{x_2}{2}-x_4$

(3) $x_1+\frac{x_2}{2}-2x_3-x_4$

(4) $x_1-\frac{x_2}{2}-2x_3+x_4$

191.

$$CH_3-CH=CH-CH_2-\overset{\overset{O}{\|}}{C}-CH_3 \xrightarrow{NaOCl} CHCl_3+X. \quad "X" is$$

(1) $CH_3CH=CH-CH_2-COO^-Na^+$

(2) $CH_3CH_2CH_2CH_2CHO$

(3) $CH_3CH_2CH_2CH_2COO^-Na^+$

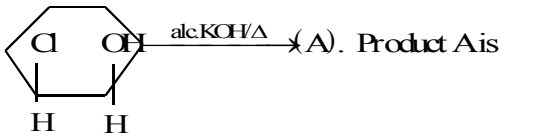
(4) $CH_3CH=CHCH_2CHO$

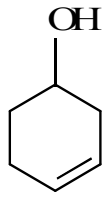
192. Dative bond is absent in:

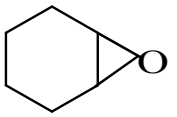
(1) Al_2Cl_6 (2) NH_4Cl

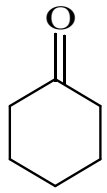
(3) B_2H_6 (4) O_3

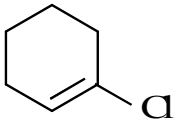
193.



(1) 

(2) 

(3) 

(4) 

194. Based on spectrochemical series, the correct field strength of ligand is

(1) $I^- > Br^- > SCN^-$

(2) $H_2O > C_2O_4^{-2} > OH^-$

(3) $CN^- > CO > NO_2^-$

(4) $H_2O > NH_3 > en$

195. Phenol does not react with

(1) NaOH (2) Na

(3) $NaHCO_3$ (4) $CHCl_3$ / KOH

196. Which of the statements about solutions of electrolytes is not correct?

(1) Conductivity of solution depends upon size of ions.

(2) Conductivity depends upon viscosiy of solution.

(3) Conductivity does not depend upon solvation of ions present in solution.

(4) Conductivity of solution increases with temperature.

197. In a face centred cubic lattice, atoms A occupies the corner positions and atoms B occupies the face centre positions. If one atom of B is missing from one of the face centered points, the formula of the compound is

(1) A_2B (2) AB_2

(3) A_2B_2 (4) A_2B_5

198. Which of the following statements is not correct about order of a reaction?

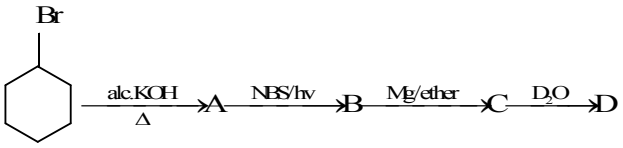
(1) The order of a reaction can be a fractional number.

(2) Order of a reaction is experimentally determined quantity.

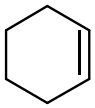
(3) The order of a reaction is always equal to the sum of the stoichiometric coefficients of reactants in the balanced chemical equation for a reaction.

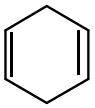
(4) The order of a reaction is the sum of the powers of molar concentration of the reactants in the rate law expression.

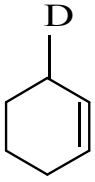
199.

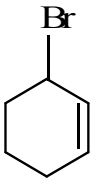


In the above sequence of reaction D is

(1) 

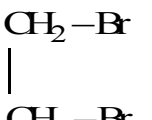
(2) 

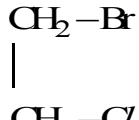
(3) 

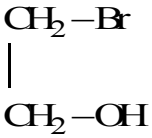
(4) 

200. For the reaction given below, which of the following is not a possible product ?

$$H_2C = CH_2 + Br_{2(aq)} \xrightarrow{NaCl(aq)} \text{Products}$$

(1) 

(2) 

(3) 

(4)