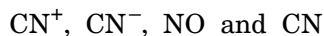


87. Consider the following species :



Which one of these will have the highest bond order ?

- (1)  $\text{CN}^+$
- (2)  $\text{CN}^-$
- (3)  $\text{NO}$
- (4)  $\text{CN}$

88. Magnesium reacts with an element (X) to form an ionic compound. If the ground state electronic configuration of (X) is  $1s^2 2s^2 2p^3$ , the simplest formula for this compound is

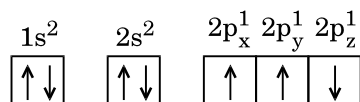
- (1)  $\text{Mg}_2\text{X}$
- (2)  $\text{MgX}_2$
- (3)  $\text{Mg}_2\text{X}_3$
- (4)  $\text{Mg}_3\text{X}_2$

89. Iron exhibits bcc structure at room temperature. Above  $900^\circ\text{C}$ , it transforms to fcc structure. The ratio of density of iron at room temperature to that at  $900^\circ\text{C}$  (assuming molar mass and atomic radii of iron remains constant with temperature) is

- (1)  $\frac{3\sqrt{3}}{4\sqrt{2}}$
- (2)  $\frac{4\sqrt{3}}{3\sqrt{2}}$
- (3)  $\frac{\sqrt{3}}{\sqrt{2}}$
- (4)  $\frac{1}{2}$

90. Which one is a **wrong** statement ?

(1) The electronic configuration of N atom is



- (2) An orbital is designated by three quantum numbers while an electron in an atom is designated by four quantum numbers.
- (3) Total orbital angular momentum of electron in 's' orbital is equal to zero.
- (4) The value of m for  $d_{z^2}$  is zero.

91. Oxygen is **not** produced during photosynthesis by

- (1) *Cycas*
- (2) *Nostoc*
- (3) Green sulphur bacteria
- (4) *Chara*

92. Double fertilization is

- (1) Fusion of two male gametes with one egg
- (2) Fusion of one male gamete with two polar nuclei
- (3) Fusion of two male gametes of a pollen tube with two different eggs
- (4) Syngamy and triple fusion

93. Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other ?

- (1) Banana
- (2) *Yucca*
- (3) *Hydrilla*
- (4) *Viola*

94. Pollen grains can be stored for several years in liquid nitrogen having a temperature of

- (1)  $-196^\circ\text{C}$
- (2)  $-80^\circ\text{C}$
- (3)  $-120^\circ\text{C}$
- (4)  $-160^\circ\text{C}$

95. Which of the following elements is responsible for maintaining turgor in cells ?

- (1) Potassium
- (2) Sodium
- (3) Magnesium
- (4) Calcium

96. What is the role of  $\text{NAD}^+$  in cellular respiration ?

- (1) It is a nucleotide source for ATP synthesis.
- (2) It functions as an electron carrier.
- (3) It functions as an enzyme.
- (4) It is the final electron acceptor for anaerobic respiration.

97. In which of the following forms is iron absorbed by plants ?

- (1) Free element
- (2) Ferrous
- (3) Ferric
- (4) Both ferric and ferrous

98. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes ?
- (1)  $\lambda$  phage
  - (2) Ti plasmid
  - (3) Retrovirus
  - (4) pBR 322
99. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called
- (1) Biodegradation
  - (2) Biopiracy
  - (3) Bio-infringement
  - (4) Bioexploitation
100. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is
- (1) Research Committee on Genetic Manipulation (RCGM)
  - (2) Council for Scientific and Industrial Research (CSIR)
  - (3) Indian Council of Medical Research (ICMR)
  - (4) Genetic Engineering Appraisal Committee (GEAC)
101. The correct order of steps in Polymerase Chain Reaction (PCR) is
- (1) Denaturation, Extension, Annealing
  - (2) Annealing, Extension, Denaturation
  - (3) Extension, Denaturation, Annealing
  - (4) Denaturation, Annealing, Extension
102. Select the **correct** match :
- (1) T.H. Morgan – Transduction
  - (2)  $F_2 \times$  Recessive parent – Dihybrid cross
  - (3) Ribozyme – Nucleic acid
  - (4) G. Mendel – Transformation
103. A 'new' variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to
- (1) Lerma Rojo
  - (2) Sharbati Sonora
  - (3) Co-667
  - (4) Basmati
104. Which of the following pairs is **wrongly** matched ?
- (1) XO type sex determination : Grasshopper
  - (2) ABO blood grouping : Co-dominance
  - (3) Starch synthesis in pea : Multiple alleles
  - (4) T.H. Morgan : Linkage
105. Select the **correct** statement :
- (1) Spliceosomes take part in translation.
  - (2) Punnett square was developed by a British scientist.
  - (3) Franklin Stahl coined the term "linkage".
  - (4) Transduction was discovered by S. Altman.
106. The experimental proof for semiconservative replication of DNA was first shown in a
- (1) Plant
  - (2) Bacterium
  - (3) Fungus
  - (4) Virus
107. Which of the following flowers only once in its life-time ?
- (1) Mango
  - (2) Jackfruit
  - (3) Bamboo species
  - (4) Papaya
108. Offsets are produced by
- (1) Parthenocarpary
  - (2) Mitotic divisions
  - (3) Meiotic divisions
  - (4) Parthenogenesis
109. Select the **correct** match :
- (1) Matthew Meselson – *Pisum sativum* and F. Stahl
  - (2) Alfred Hershey and Martha Chase – TMV
  - (3) Alec Jeffreys – *Streptococcus pneumoniae*
  - (4) Francois Jacob and Jacques Monod – *Lac operon*
110. Which of the following has proved helpful in preserving pollen as fossils ?
- (1) Oil content
  - (2) Cellulosic intine
  - (3) Pollenkitt
  - (4) Sporopollenin

- 111.** Natality refers to
- (1) Number of individuals leaving the habitat
  - (2) Birth rate
  - (3) Death rate
  - (4) Number of individuals entering a habitat
- 112.** World Ozone Day is celebrated on
- (1) 16<sup>th</sup> September
  - (2) 21<sup>st</sup> April
  - (3) 5<sup>th</sup> June
  - (4) 22<sup>nd</sup> April
- 113.** Which of the following is a secondary pollutant ?
- (1) SO<sub>2</sub>
  - (2) CO<sub>2</sub>
  - (3) CO
  - (4) O<sub>3</sub>
- 114.** Niche is
- (1) the range of temperature that the organism needs to live
  - (2) the physical space where an organism lives
  - (3) all the biological factors in the organism's environment
  - (4) the functional role played by the organism where it lives
- 115.** What type of ecological pyramid would be obtained with the following data ?  
 Secondary consumer : 120 g  
 Primary consumer : 60 g  
 Primary producer : 10 g
- (1) Upright pyramid of numbers
  - (2) Pyramid of energy
  - (3) Inverted pyramid of biomass
  - (4) Upright pyramid of biomass
- 116.** In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen ?
- (1) Fe
  - (2) Cl
  - (3) Carbon
  - (4) Oxygen
- 117.** The two functional groups characteristic of sugars are
- (1) carbonyl and phosphate
  - (2) carbonyl and methyl
  - (3) hydroxyl and methyl
  - (4) carbonyl and hydroxyl
- 118.** Which among the following is **not** a prokaryote ?
- (1) *Nostoc*
  - (2) *Mycobacterium*
  - (3) *Saccharomyces*
  - (4) *Oscillatoria*
- 119.** The Golgi complex participates in
- (1) Respiration in bacteria
  - (2) Formation of secretory vesicles
  - (3) Fatty acid breakdown
  - (4) Activation of amino acid
- 120.** Which of the following is **not** a product of light reaction of photosynthesis ?
- (1) NADPH
  - (2) NADH
  - (3) ATP
  - (4) Oxygen
- 121.** Which of the following is true for nucleolus ?
- (1) It takes part in spindle formation.
  - (2) It is a membrane-bound structure.
  - (3) Larger nucleoli are present in dividing cells.
  - (4) It is a site for active ribosomal RNA synthesis.
- 122.** Stomatal movement is **not** affected by
- (1) O<sub>2</sub> concentration
  - (2) Light
  - (3) Temperature
  - (4) CO<sub>2</sub> concentration
- 123.** The stage during which separation of the paired homologous chromosomes begins is
- (1) Diakinesis
  - (2) Diplotene
  - (3) Pachytene
  - (4) Zygotene
- 124.** Stomata in grass leaf are
- (1) Rectangular
  - (2) Kidney shaped
  - (3) Dumb-bell shaped
  - (4) Barrel shaped

125. Secondary xylem and phloem in dicot stem are produced by

- (1) Phellogen
- (2) Vascular cambium
- (3) Apical meristems
- (4) Axillary meristems

126. Pneumatophores occur in

- (1) Carnivorous plants
- (2) Free-floating hydrophytes
- (3) Halophytes
- (4) Submerged hydrophytes

127. Casparian strips occur in

- (1) Cortex
- (2) Pericycle
- (3) Epidermis
- (4) Endodermis

128. Plants having little or no secondary growth are

- (1) Conifers
- (2) Deciduous angiosperms
- (3) Grasses
- (4) Cycads

129. Sweet potato is a modified

- (1) Tap root
- (2) Adventitious root
- (3) Stem
- (4) Rhizome

130. Which of the following statements is **correct** ?

- (1) Horsetails are gymnosperms.
- (2) *Selaginella* is heterosporous, while *Salvinia* is homosporous.
- (3) Ovules are not enclosed by ovary wall in gymnosperms.
- (4) Stems are usually unbranched in both *Cycas* and *Cedrus*.

131. Select the **wrong** statement :

- (1) Pseudopodia are locomotory and feeding structures in Sporozoans.
- (2) Mushrooms belong to Basidiomycetes.
- (3) Cell wall is present in members of Fungi and Plantae.
- (4) Mitochondria are the powerhouse of the cell in all kingdoms except Monera.

132. After karyogamy followed by meiosis, spores are produced exogenously in

- (1) *Agaricus*
- (2) *Alternaria*
- (3) *Neurospora*
- (4) *Saccharomyces*

133. Match the items given in Column I with those in Column II and select the **correct** option given below :

- | <i>Column I</i> |      | <i>Column II</i>  |  |
|-----------------|------|---|--|
| a. Herbarium    | i.   | It is a place having a collection of preserved plants and animals.  |  |
| b. Key          | ii.  | A list that enumerates methodically all the species found in an area with brief description aiding identification.  |  |
| c. Museum       | iii. | Is a place where dried and pressed plant specimens mounted on sheets are kept.                                      |  |
| d. Catalogue    | iv.  | A booklet containing a list of characters and their alternates which are helpful in identification of various taxa. |  |

- |     | <b>a</b> | <b>b</b> | <b>c</b> | <b>d</b> |
|-----|----------|----------|----------|----------|
| (1) | ii       | iv       | iii      | i        |
| (2) | iii      | ii       | i        | iv       |
| (3) | i        | iv       | iii      | ii       |
| (4) | iii      | iv       | i        | ii       |

134. Winged pollen grains are present in

- (1) Mango
- (2) *Cycas*
- (3) Mustard
- (4) *Pinus*

135. Which one is **wrongly** matched ?

- (1) Gemma cups – *Marchantia*
- (2) Biflagellate zoospores – Brown algae
- (3) Uniflagellate gametes – *Polysiphonia*
- (4) Unicellular organism – *Chlorella*

**136.** Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively ?

- (1) Increased respiratory surface; Inflammation of bronchioles
- (2) Increased number of bronchioles; Increased respiratory surface
- (3) Inflammation of bronchioles; Decreased respiratory surface
- (4) Decreased respiratory surface; Inflammation of bronchioles

**137.** Match the items given in Column I with those in Column II and select the **correct** option given below :

<i>Column I</i>		<i>Column II</i>	
a. Tricuspid valve	i.	Between left atrium and left ventricle	
b. Bicuspid valve	ii.	Between right ventricle and pulmonary artery	
c. Semilunar valve	iii.	Between right atrium and right ventricle	

- |     | <b>a</b> | <b>b</b> | <b>c</b> |
|-----|----------|----------|----------|
| (1) | i        | ii       | iii      |
| (2) | i        | iii      | ii       |
| (3) | iii      | i        | ii       |
| (4) | ii       | i        | iii      |

**138.** Match the items given in Column I with those in Column II and select the **correct** option given below :

<i>Column I</i>		<i>Column II</i>	
a. Tidal volume	i.	2500 – 3000 mL	
b. Inspiratory Reserve volume	ii.	1100 – 1200 mL	
c. Expiratory Reserve volume	iii.	500 – 550 mL	
d. Residual volume	iv.	1000 – 1100 mL	

- |     | <b>a</b> | <b>b</b> | <b>c</b> | <b>d</b> |
|-----|----------|----------|----------|----------|
| (1) | i        | iv       | ii       | iii      |
| (2) | iii      | i        | iv       | ii       |
| (3) | iii      | ii       | i        | iv       |
| (4) | iv       | iii      | ii       | i        |

**139.** The transparent lens in the human eye is held in its place by

- (1) smooth muscles attached to the iris
- (2) ligaments attached to the iris
- (3) ligaments attached to the ciliary body
- (4) smooth muscles attached to the ciliary body

**140.** Which of the following is an amino acid derived hormone ?

- (1) Estradiol
- (2) Ecdysone
- (3) Epinephrine
- (4) Estriol

**141.** Which of the following hormones can play a significant role in osteoporosis ?

- (1) Estrogen and Parathyroid hormone
- (2) Progesterone and Aldosterone
- (3) Aldosterone and Prolactin
- (4) Parathyroid hormone and Prolactin

**142.** Which of the following structures or regions is **incorrectly** paired with its function ?

- (1) Hypothalamus : production of releasing hormones and regulation of temperature, hunger and thirst.
- (2) Limbic system : consists of fibre tracts that interconnect different regions of brain; controls movement.
- (3) Medulla oblongata : controls respiration and cardiovascular reflexes.
- (4) Corpus callosum : band of fibers connecting left and right cerebral hemispheres.

143. The amnion of mammalian embryo is derived from
- (1) mesoderm and trophoblast
  - (2) endoderm and mesoderm
  - (3) ectoderm and mesoderm
  - (4) ectoderm and endoderm
144. Hormones secreted by the placenta to maintain pregnancy are
- (1) hCG, hPL, progestogens, estrogens
  - (2) hCG, hPL, estrogens, relaxin, oxytocin
  - (3) hCG, hPL, progestogens, prolactin
  - (4) hCG, progestogens, estrogens, glucocorticoids
145. The difference between spermiogenesis and spermiation is
- (1) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.
  - (2) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
  - (3) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
  - (4) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.
146. The contraceptive 'SAHELI'
- (1) is an IUD.
  - (2) increases the concentration of estrogen and prevents ovulation in females.
  - (3) blocks estrogen receptors in the uterus, preventing eggs from getting implanted.
  - (4) is a post-coital contraceptive.
147. Ciliates differ from all other protozoans in
- (1) using pseudopodia for capturing prey
  - (2) having a contractile vacuole for removing excess water
  - (3) using flagella for locomotion
  - (4) having two types of nuclei
148. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system.
- (1) Aves
  - (2) Reptilia
  - (3) Amphibia
  - (4) Osteichthyes
149. Which of the following features is used to identify a male cockroach from a female cockroach ?
- (1) Forewings with darker tegmina
  - (2) Presence of caudal styles
  - (3) Presence of a boat shaped sternum on the 9<sup>th</sup> abdominal segment
  - (4) Presence of anal cerci
150. Which one of these animals is **not** a homeotherm ?
- (1) *Camelus*
  - (2) *Chelone*
  - (3) *Macropus*
  - (4) *Psittacula*
151. Which of the following animals does **not** undergo metamorphosis ?
- (1) Moth
  - (2) Tunicate
  - (3) Earthworm
  - (4) Starfish
152. Which of the following organisms are known as chief producers in the oceans ?
- (1) Cyanobacteria
  - (2) Diatoms
  - (3) Dinoflagellates
  - (4) Euglenoids

153. Which one of the following population interactions is widely used in medical science for the production of antibiotics ?

- (1) Parasitism
- (2) Mutualism
- (3) Commensalism
- (4) Amensalism

154. All of the following are included in 'Ex-situ conservation' *except*

- (1) Botanical gardens
- (2) Sacred groves
- (3) Wildlife safari parks
- (4) Seed banks

155. Match the items given in Column I with those in Column II and select the **correct** option given below :

Column I		Column II	
a. Eutrophication		i. UV-B radiation	
b. Sanitary landfill		ii. Deforestation	
c. Snow blindness		iii. Nutrient enrichment	
d. Jhum cultivation		iv. Waste disposal	
<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>
(1) iii	iv	i	ii
(2) i	iii	iv	ii
(3) ii	i	iii	iv
(4) i	ii	iv	iii

156. In a growing population of a country,

- (1) reproductive and pre-reproductive individuals are equal in number.
- (2) reproductive individuals are less than the post-reproductive individuals.
- (3) pre-reproductive individuals are more than the reproductive individuals.
- (4) pre-reproductive individuals are less than the reproductive individuals.

157. Which part of poppy plant is used to obtain the drug "Smack" ?

- (1) Roots
- (2) Latex
- (3) Flowers
- (4) Leaves

158. All of the following are part of an operon *except*

- (1) an enhancer
- (2) structural genes
- (3) an operator
- (4) a promoter

159. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by

- (1) Only grandchildren
- (2) Only sons
- (3) Only daughters
- (4) Both sons and daughters

160. According to Hugo de Vries, the mechanism of evolution is

- (1) Phenotypic variations
- (2) Saltation
- (3) Multiple step mutations
- (4) Minor mutations

161. AGGTATCGCAT is a sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA ?

- (1) ACCUAUGCGAU
- (2) UGGTUTCGCAT
- (3) AGGUAUCGCAU
- (4) UCCAUAGCGUA

162. Match the items given in Column I with those in Column II and select the **correct** option given below :

Column I		Column II	
a. Proliferative Phase		i. Breakdown of endometrial lining	
b. Secretory Phase		ii. Follicular Phase	
c. Menstruation		iii. Luteal Phase	
<b>a</b>	<b>b</b>	<b>c</b>	
(1) ii	iii	i	
(2) i	iii	ii	
(3) iii	ii	i	
(4) iii	i	ii	

**163.** Match the items given in Column I with those in Column II and select the **correct** option given below :

<i>Column I</i>		<i>Column II</i>	
a.	Glycosuria	i.	Accumulation of uric acid in joints
b.	Gout	ii.	Mass of crystallised salts within the kidney
c.	Renal calculi	iii.	Inflammation in glomeruli
d.	Glomerular nephritis	iv.	Presence of glucose in urine
	<b>a</b>	<b>b</b>	<b>c</b>
(1)	ii	iii	i
(2)	i	ii	iii
(3)	iii	ii	iv
(4)	iv	i	ii

**164.** Match the items given in Column I with those in Column II and select the **correct** option given below :

<i>Column I</i> (Function)		<i>Column II</i> (Part of Excretory System)	
a.	Ultrafiltration	i.	Henle's loop
b.	Concentration of urine	ii.	Ureter
c.	Transport of urine	iii.	Urinary bladder
d.	Storage of urine	iv.	Malpighian corpuscle
	<b>a</b>	<b>b</b>	<b>c</b>
(1)	v	iv	i
(2)	iv	i	ii
(3)	iv	v	ii
(4)	v	iv	i

**165.** Which of the following gastric cells indirectly help in erythropoiesis ?

- (1) Goblet cells
- (2) Mucous cells
- (3) Chief cells
- (4) Parietal cells

**166.** Match the items given in Column I with those in Column II and select the **correct** option given below :

<i>Column I</i>		<i>Column II</i>	
a.	Fibrinogen	i.	Osmotic balance
b.	Globulin	ii.	Blood clotting
c.	Albumin	iii.	Defence mechanism
	<b>a</b>	<b>b</b>	<b>c</b>
(1)	i	iii	ii
(2)	i	ii	iii
(3)	iii	ii	i
(4)	ii	iii	i

**167.** Which of the following is an occupational respiratory disorder ?

- (1) Botulism
- (2) Silicosis
- (3) Anthracis
- (4) Emphysema

**168.** Calcium is important in skeletal muscle contraction because it

- (1) detaches the myosin head from the actin filament.
- (2) activates the myosin ATPase by binding to it.
- (3) binds to troponin to remove the masking of active sites on actin for myosin.
- (4) prevents the formation of bonds between the myosin cross bridges and the actin filament.



- 169.** Nissl bodies are mainly composed of
- (1) Nucleic acids and SER
  - (2) DNA and RNA
  - (3) Proteins and lipids
  - (4) Free ribosomes and RER
- 170.** Which of these statements is *incorrect* ?
- (1) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.
  - (2) Glycolysis occurs in cytosol.
  - (3) Enzymes of TCA cycle are present in mitochondrial matrix.
  - (4) Oxidative phosphorylation takes place in outer mitochondrial membrane.
- 171.** Select the *incorrect* match :
- (1) Submetacentric – L-shaped chromosomes
  - (2) Allosomes – Sex chromosomes
  - (3) Lampbrush – Diplotene bivalents
  - (4) Polytene – Oocytes of amphibians
- 172.** Which of the following terms describe human dentition ?
- (1) Pleurodont, Monophyodont, Homodont
  - (2) Thecodont, Diphyodont, Heterodont
  - (3) Thecodont, Diphyodont, Homodont
  - (4) Pleurodont, Diphyodont, Heterodont
- 173.** Which of the following events does *not* occur in rough endoplasmic reticulum ?
- (1) Cleavage of signal peptide
  - (2) Protein glycosylation
  - (3) Protein folding
  - (4) Phospholipid synthesis
- 174.** Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as
- (1) Plastidome
  - (2) Polyhedral bodies
  - (3) Polysome
  - (4) Nucleosome
- 175.** In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels ?
- (1) Ringworm disease
  - (2) Ascariasis
  - (3) Elephantiasis
  - (4) Amoebiasis
- 176.** Which of the following is *not* an autoimmune disease ?
- (1) Alzheimer's disease
  - (2) Rheumatoid arthritis
  - (3) Psoriasis
  - (4) Vitiligo
- 177.** Among the following sets of examples for divergent evolution, select the *incorrect* option :
- (1) Brain of bat, man and cheetah
  - (2) Heart of bat, man and cheetah
  - (3) Forelimbs of man, bat and cheetah
  - (4) Eye of octopus, bat and man
- 178.** Conversion of milk to curd improves its nutritional value by increasing the amount of
- (1) Vitamin B<sub>12</sub>
  - (2) Vitamin A
  - (3) Vitamin D
  - (4) Vitamin E
- 179.** The similarity of bone structure in the forelimbs of many vertebrates is an example of
- (1) Convergent evolution
  - (2) Analogy
  - (3) Homology
  - (4) Adaptive radiation
- 180.** Which of the following characteristics represent 'Inheritance of blood groups' in humans ?
- a. Dominance
  - b. Co-dominance
  - c. Multiple allele
  - d. Incomplete dominance
  - e. Polygenic inheritance
- (1) b, d and e
  - (2) a, b and c
  - (3) b, c and e
  - (4) a, c and e