

NEET UG 2019

BIOLOGY

- Q91.** The Earth Summit held in Rio de Janeiro in 1992 was called
- (1) to reduce CO₂ emissions and global warming
 - (2) for conservation of biodiversity and sustainable utilization of its benefits
 - (3) to assess threat posed to native species by invasive weed species
 - (4) for immediate steps to discontinue use of CFCs that were damaging the ozone layer
- Q92.** Colostrum the yellowish fluid, secreted by mother during the initial days of lactation is very essential to impart immunity to the new born infants because it contains
- (1) Natural killer cells
 - (2) Monocytes
 - (3) Macrophages
 - (4) Immunoglobulin A
- Q93.** Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following
- (1) Closure of stomata
 - (2) Flaccidity of bulliform cells
 - (3) Shrinkage of air spaces in spongy mesophyll
 - (4) Tyloses in vessels
- Q94.** The shorter and longer arms of a submetacentric chromosome are referred to as-
- | | |
|----------------------------------|----------------------------------|
| (1) s-arm and l-arm respectively | (2) p-arm and q-arm respectively |
| (3) q-arm and p-arm respectively | (4) m-arm and n-arm respectively |
-

- Q95.** Respiratory Quotient (RQ) value of tripalmitin is
(1) 0.9 (2) 0.7 (3) 0.07 (4) 0.09
- Q96.** Which of the following is a commercial blood cholesterol lowering agent?
(1) Cyclosporin A (2) Statin (3) Streptokinase (4) Lipases
- Q97.** Match the following structures with their respective location in organs
- | | |
|--------------------------|-----------------------|
| (a) Crypts of Lieberkuhn | (i) Pancreas |
| (b) Glisson's Capsule | (ii) Duodenum |
| (c) Islets of Langerhans | (iii) Small intestine |
| (d) Brunner's Glands | (iv) Liver |
- Select the correct option from the following
- | | | | | |
|-----|-------|------|------|-------|
| | (a) | (b) | (c) | (d) |
| (1) | (iii) | (i) | (ii) | (iv) |
| (2) | (ii) | (iv) | (i) | (iii) |
| (3) | (iii) | (iv) | (i) | (ii) |
| (4) | (iii) | (ii) | (i) | (iv) |
- Q98.** Which of the following is the most important cause for animals and plants being driven to extinction?
(1) Habitat loss and fragmentation (2) Drought and floods
(3) Economic exploitation (4) Alien species invasion
- Q99.** Which part of the brain is responsible for thermoregulation?
(1) Cerebrum (2) Hypothalamus
(3) Corpus callosum (4) Medulla oblongata
- Q100.** Consider following features
(a) Organ system level of organisation
(b) Bilateral symmetry
(c) True coelomates with segmentation of body
Select the correct option of animal groups which possess all the above characteristics
(1) Annelida, Arthropoda and Chordata
(2) Annelida, Arthropoda and Mollusca
(3) Arthropoda, Mollusca and Chordata
(4) Annelida, Mollusca and Chordata
- Q101.** Select the correct sequence of organs in the alimentary canal of cockroach starting from mouth
(1) Pharynx → Oesophagus → Crop → Gizzard → Ileum → Colon → Rectum
(2) Pharynx → Oesophagus → Gizzard → Crop → Ileum → Colon → Rectum
(3) Pharynx → Oesophagus → Gizzard → Ileum? Crop → Colon → Rectum
(4) Pharynx → Oesophagus → Ileum → Crop? Gizzard → Colon → Rectum

Q102. Which of the following pairs of gases is mainly responsible for green house effect?

- | | |
|----------------------------------|--------------------------------|
| (1) Ozone and Ammonia | (2) Oxygen and Nitrogen |
| (3) Nitrogen and Sulphur dioxide | (4) Carbon dioxide and Methane |

Q103. Which of the following muscular disorders is inherited?

- | | |
|-----------------------|------------------------|
| (1) Tetany | (2) Muscular dystrophy |
| (3) Myasthenia gravis | (4) Botulism |

Q104. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in

- | | |
|---------------------------------------|---|
| (1) Bile duct and Bronchioles | (2) Fallopian tubes and Pancreatic duct |
| (3) Eustachian tube and Salivary duct | (4) Bronchioles and Fallopian tubes |

Q105. Match the Column-I with Column-II

Column-I

- (a) P - wave
- (b) QRS complex
- (c) T - wave
- (d) Reduction in the

Column-II

- (i) Depolarisation of ventricles
- (ii) Repolarisation of ventricles
- (iii) Coronary ischemia
- (iv) Depolarisation of size of T-wave atria
- (v) Repolarisation of atria

Select the correct option.

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

Q106. Which one of the following is not a method of in situ conservation of biodiversity?

- | | |
|-----------------------|------------------------|
| (1) Biosphere Reserve | (2) Wildlife Sanctuary |
| (3) Botanical Garden | (4) Sacred Grove |

Q107. In a species, the weight of newborn ranges from 2 to 5 kg. 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weight from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place?

- | | |
|---------------------------|---------------------------|
| (1) Directional Selection | (2) Stabilizing Selection |
| (3) Disruptive Selection | (4) Cyclical Selection |

Q108. The correct sequence of phases of cell cycle is-

- | | |
|---|---|
| (1) $M \rightarrow G_1 \rightarrow G_2 \rightarrow S$ | (2) $G_1 \rightarrow G_2 \rightarrow S \rightarrow M$ |
| (3) $S \rightarrow G_1 \rightarrow G_2 \rightarrow M$ | (4) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$ |

- Q109.** How does steroid hormone influence the cellular activities?
- (1) Changing the permeability of the cell membrane
 - (2) Binding to DNA and forming a gene-hormone complex
 - (3) Activating cyclic AMP located on the cell membrane
 - (4) Using aquaporin channels as second messenger
- Q110.** Which of the following statements is not correct?
- (1) Lysosomes have numerous hydrolytic enzymes
 - (2) The hydrolytic enzymes of lysosomes are active under acidic pH
 - (3) Lysosomes are membrane bound structures
 - (4) Lysosomes are formed by the process of packaging in the endoplasmic reticulum
- Q111.** Which one of the following statements regarding post-fertilization development in flowering plants is incorrect?
- (1) Ovary develops into fruit
 - (2) Zygote develops into embryo
 - (3) Central cell develops into endosperm
 - (4) Ovules develop into embryo sac
- Q112.** Concanavalin A is
- (1) an alkaloid
 - (2) an essential oil
 - (3) a lectin
 - (4) a pigment
- Q113.** Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes?
- (1) BOD incubator
 - (2) Sludge digester
 - (3) Industrial oven
 - (4) Bioreactor
- Q114.** Consider the following statement :
- (A) Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group.
(B) A complete catalytic active enzyme with its bound prosthetic group is called apoenzyme.
Select the correct option.
- (1) Both (A) and (B) are true.
 - (2) (A) is true but (B) is false.
 - (3) Both (A) and (B) are false.
 - (4) (A) is false but (B) is true.
- Q115.** Purines found both in DNA and RNA are
- (1) Adenine and thymine
 - (2) Adenine and guanine
 - (3) Guanine and cytosine
 - (4) Cytosine and thymine
-

Q116. Select the correct sequence for transport of sperm cells in male reproductive system.

- (1) Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra
- (2) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
- (3) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
- (4) Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus

Q117. Match the hominids with their correct brain size :

- (a) Homo habilis (i) 900 cc
- (b) Homo neanderthalensis (ii) 1350 cc
- (c) Homo erectus (iii) 650-800 cc
- (d) Homo sapiens (iv) 1400 cc

Select the correct option.

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

Q118. Variations caused by mutation, as proposed by Hugo de Vries are-

- (1) random and directional
- (2) random and directionless
- (3) small and directional
- (4) small and directionless

Q119. Which of the following pair of organelles does not contain DNA?

- (1) Mitochondria and Lysosomes
- (2) Chloroplast and Vacuoles
- (3) Lysosomes and Vacuoles
- (4) Nuclear envelope and Mitochondria

Q120. Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to

- (1) benign growth on mucous lining of nasal cavity
- (2) inflammation of bronchi and bronchioles
- (3) proliferation of fibrous tissues and damage of the alveolar walls
- (4) reduction in the secretion of surfactants by pneumocytes.

Q121. Select the incorrect statement.

- (1) Male fruit fly is heterogametic
- (2) In male grasshoppers 50% of sperms have no sex-chromosome
- (3) In domesticated fowls, sex of progeny depends on the type of sperm rather than egg
- (4) Human males have one of their sex- chromosome much shorter than the other

Q122. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with

- (1) Isopropanol (2) Chilled ethanol
(3) Methanol at room temperature (4) Chilled chloroform

Q123. Select the correct group of biocontrol agents.

- (1) Bacillus thuringiensis, Tobacco mosaic virus, Aphids
(2) Trichoderma, Baculovirus, Bacillus thuringiensis
(3) Oscillatoria, Rhizobium, Trichoderma
(4) Nostoc, Azospirillum, Nucleopolyhedrovirus

Q124. Select the incorrect statement.

- (1) Inbreeding increases homozygosity
(2) Inbreeding is essential to evolve purelines in any animal.
(3) Inbreeding selects harmful recessive genes that reduce fertility and productivity
(4) Inbreeding helps in accumulation of superior genes and elimination of undesirable genes

Q125. Match the following organisms with the products they produce

- | | |
|-----------------------|----------------------|
| (a) Lactobacillus | (i) Cheese |
| (b) Saccharomyces | (ii) Curd cerevisiae |
| (c) Aspergillus niger | (iii) Citric Acid |
| (d) Acetobacter aceti | (iv) Bread |
| | (v) Acetic Acid |

Select the correct option.

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

Q126. What is the direction of movement of sugars in phloem?

- (1) Non-multidirectional (2) Upward
(3) Downward (4) Bi-directional

Q127. In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as

- (1) Autogamy (2) Parthenocarpy
(3) Syngamy (4) Parthenogenesis

Q128. Persistent nucellus in the seed is known as

- (1) Chalaza (2) Perisperm (3) Hilum (4) Tegmen
-

- Q129.** What map unit (Centimorgan) is adopted in the construction of genetic maps?
- (1) A unit of distance between two expressed genes representing 10% cross over.
 - (2) A unit of distance between two expressed genes representing 100% cross over.
 - (3) A unit of distance between genes on chromosomes, representing 1% cross over.
 - (4) A unit of distance between genes on chromosomes, representing 50% cross over.
- Q130.** What would be the heart rate of a person if the cardiac output is 5 L, blood volume in the ventricles at the end of diastole is 100 mL and at the end of ventricular systole is 50 mL?
- (1) 50 beats per minute
 - (2) 75 beats per minute
 - (3) 100 beats per minute
 - (4) 125 beats per minute
- Q131.** Thiobacillus is a group of bacteria helpful in carrying out.
- (1) Nitrogen fixation
 - (2) Chemoautotrophic fixation
 - (3) Nitrification
 - (4) Denitrification
- Q132.** Which of the following factors is responsible for the formation of concentrated urine?
- (1) Low levels of antidiuretic hormone
 - (2) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.
 - (3) Secretion of erythropoietin by Juxtaglomerular complex
 - (4) Hydrostatic pressure during glomerular filtration
- Q133.** Which of the following statements regarding mitochondria is incorrect?
- (1) Outer membrane is permeable to monomers of carbohydrates, fats and proteins.
 - (2) Enzymes of electron transport are embedded in outer membrane.
 - (3) Inner membrane is convoluted with infoldings.
 - (4) Mitochondrial matrix contains single circular DNA molecule and ribosomes.
- Q134.** Xylem translocates.
- (1) Water only
 - (2) Water and mineral salts only
 - (3) Water, mineral salts and some organic nitrogen only
 - (4) Water, mineral salts, some organic nitrogen and hormones
- Q135.** Cell in G_0 phase :
- (1) exit the cell cycle
 - (2) enter the cell cycle
 - (3) suspend the cell cycle
 - (4) terminate the cell cycle
- Q136.** Which of the statements given below is not true about formation of Annual Rings in trees?
- (1) Annual ring is a combination of spring wood and autumn wood produced in a year
 - (2) Differential activity of cambium causes light and dark bands of tissue early and late wood respectively.
 - (3) Activity of cambium depends upon variation in climate.
 - (4) Annual rings are not prominent in trees of temperate region.
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- Q137.** Which of the following ecological pyramids is generally inverted?
- (1) Pyramid of numbers in grassland (2) Pyramid of energy
(3) Pyramid of biomass in a forest (4) Pyramid of biomass in a sea
- Q138.** Placentation in which ovules develop on the inner wall of the ovary or in peripheral part, is
- (1) Basal (2) Axile (3) Parietal (4) Free central
- Q139.** Which of the following protocols did aim for reducing emission of chlorofluorocarbons into the atmosphere?
- (1) Montreal Protocol (2) Kyoto Protocol
(3) Gothenburg Protocol (4) Geneva Protocol
- Q140.** Which of the following contraceptive methods do involve a role of hormone?
- (1) Lactational amenorrhea, Pills Emergency contraceptives.
(2) Barrier method, Lactational amenorrhea, Pills.
(3) CuT, Pills, Emergency contraceptives.
(4) Pills, Emergency contraceptives, Barrier methods.
- Q141.** Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL, respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?
- (1) 1500 mL (2) 1700 mL (3) 2200 mL (4) 2700 mL
- Q142.** What is the fate of the male gametes discharged in the synergid?
- (1) One fuses with egg other(s) degenerate (s) in the synergid.
(2) All fuse with the egg.
(3) One fuses with the egg, other(s) fuse(s) with synergid nucleus.
(4) One fuses with the egg and other fuses with central cell nuclei.
- Q143.** What is the site of perception of photoperiod necessary for induction of flowering in plants?
- (1) Lateral buds (2) Pulvinus (3) Shoot apex (4) Leaves
- Q144.** Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus.
- (1) *Mangifera indica* Car. Linn. (2) *Mangifera indica* Linn.
(3) *Mangifera indica* (4) *Mangifera Indica*
- Q145.** Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.
- (1) The enzyme cuts DNA molecule at identified position within the DNA.
(2) The enzyme binds DNA at specific sites and cuts only one of the two strands.
(3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.
(4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.
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Q154. Which of the following features of genetic code does allow bacteria to produce human insulin by recombinant DNA technology?

- (1) Genetic code is not ambiguous (2) Genetic code is redundant
(3) Genetic code is nearly universal (4) Genetic code is specific

Q155. Which of the following sexually transmitted diseases is not completely curable?

- (1) Gonorrhoea (2) Genital warts
(3) Genital herpes (4) Chlamydia

Q156. Which of the following statements is incorrect?

- (1) Viroids lack a protein coat.
(2) Viruses are obligate parasites.
(3) Infective constituent in viruses is the protein coat.
(4) Prions consist of abnormally folded proteins.

Q157. Match the following organisms with their respective characteristics :

- | | |
|-------------------|-------------------------|
| (a) Pila | (i) Flame cells |
| (b) Bombyx | (ii) Comb plates |
| (c) Pleurobrachia | (iii) Radula |
| (d) Taenia | (iv) Malpighian tubules |

Select the correct option from the following :

- (a) (b) (c) (d)
(1) (iii) (ii) (i) (iv)
(2) (iii) (iv) (ii) (i)
(3) (ii) (iv) (iii) (i)
(4) (iii) (ii) (iv) (i)

Q158. Expressed Sequence Tags (ESTs) refers to :

- (1) Genes expressed as RNA
(2) Polypeptide expression
(3) DNA polymorphism
(4) Novel DNA sequences

Q159. Which is of the following statements is incorrect?

- (1) Morels and truffles are edible delicacies.
(2) Claviceps is a source of many alkaloids and LSD.
(3) Conidia are produced exogenously and ascospores endogenously.
(4) Yeasts have filamentous bodies with long thread-like hyphae.
-

Q160. Match Column - I with Column - II

Column - I

Column - II

- | | |
|----------------|---|
| (a) Saprophyte | (i) Symbiotic association of fungi with plant roots |
| (b) Parasite | (ii) Decomposition of dead organic materials |
| (c) Lichens | (iii) Living on living plants or animals |
| (d) Mycorrhiza | (iv) Symbiotic association of algae and fungi |

Choose the correct answer from the option given below

- (a) (b) (c) (d)
(1) (i) (ii) (iii) (iv)
(2) (iii) (ii) (i) (iv)
(3) (ii) (i) (iii) (iv)
(4) (ii) (iii) (iv) (i)

Q161. Which of the following glucose transporters is insulin-dependent?

- (1) GLUT I (2) GLUT II (3) GLUT III (4) GLUT IV

Q162. Which of the following immune responses is responsible for rejection of kidney graft?

- (1) Auto-immune response (2) Humoral immune response
(3) Inflammatory immune response (4) Cell-mediated immune response

Q163. Use of an artificial kidney during hemodialysis may result in :

- (a) Nitrogenous waste build-up in the body
(b) Non-elimination of excess potassium ions
(c) Reduced absorption of calcium ions from gastro-intestinal tract
(d) Reduced RBC production

Which of the following options is the most appropriate?

- (1) (a) and (b) are correct
(2) (b) and (c) are correct
(3) (c) and (d) are correct
(4) (a) and (d) are correct

Q164. Which of the following statements is correct?

- (1) Cornea is an external, transparent and protective proteinaceous covering of the eye-ball.
(2) Cornea consists of dense connective tissue of elastin and can repair itself.
(3) Cornea is convex, transparent layer which is highly vascularised.
(4) Cornea consists of dense matrix of collagen and is the most sensitive portion the eye.

Q165. The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

- (1) T.H. Morgan (2) Gregor J. Mendel
(3) Alfred Sturtevant (4) Sutton Boveri
-

Q166. Match the following genes of the Lac operon with their respective products :

- | | |
|------------|----------------------------|
| (a) i gene | (i) β -galactosidase |
| (b) z gene | (ii) Permease |
| (c) a gene | (iii) Repressor |
| (d) y gene | (iv) Transacetylase |

Select the correct option.

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

Q167. It takes very long time for pineapple plants to produce flowers. Which combination of hormones can be applied to artificially induce flowering in pineapple plants throughout the year to increase yield?

- | | |
|-----------------------------------|---------------------------------|
| (1) Auxin and Ethylene | (2) Gibberellin and Cytokinin |
| (3) Gibberellin and Abscisic acid | (4) Cytokinin and Abscisic acid |

Q168. Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes.

- | | | | |
|-----------------|------------------|-------------------|--------------------|
| (1) Chief Cells | (2) Goblet Cells | (3) Oxyntic Cells | (4) Duodenal Cells |
|-----------------|------------------|-------------------|--------------------|

Q169. Which of the following can be used as a biocontrol agent in the treatment of plant disease?

- | | | | |
|-----------------|---------------|--------------|-------------------|
| (1) Trichoderma | (2) Chlorella | (3) Anabaena | (4) Lactobacillus |
|-----------------|---------------|--------------|-------------------|

Q170. Phloem in gymnosperms lacks :

- | | |
|--------------------------------------|--|
| (1) Albuminous cells and sieve cells | (2) Sieve tubes only |
| (3) Companion cells only | (4) Both sieve tubes and companion cells |

Q171. Extrusion of second polar body from egg nucleus occurs :

- (1) after entry of sperm but before fertilization
- (2) after fertilization
- (3) before entry of sperm into ovum
- (4) simultaneously with first cleavage

Q172. Under which of the following conditions will there be no change in the reading frame of following mRNA?

5' AACAGCGGUGCUAAU3'

- (1) Insertion of G at 5th position
- (2) Deletion of G from 5th position
- (3) Insertion of A and G at 4th and 5th positions respectively
- (4) Deletion of GGU from 7th, 8th and 9th positions

Q173. The concept of "Omnis cellula-e cellula" regarding cell division was first proposed by

- | | | | |
|--------------------|---------------------|---------------|---------------|
| (1) Rudolf Virchow | (2) Theodor Schwann | (3) Schleiden | (4) Aristotle |
|--------------------|---------------------|---------------|---------------|

Q174. What triggers activation of protoxin to active Bt toxin of *Bacillus thuringiensis* in boll worm?

- | | |
|------------------------|-----------------------------|
| (1) Body temperature | (2) Moist surface of midgut |
| (3) Alkaline pH of gut | (4) Acidic pH of stomach |

Q175. Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.

- | | |
|--------------------------------------|---|
| (1) Plasmodium vivax / UTI test | (2) Streptococcus pneumoniae / Widal test |
| (3) Salmonella typhi / Anthrone test | (4) Salmonella typhi / Widal test |

Q176. What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile ?

- | | |
|-----------------------|----------------------------|
| (1) Turner's syndrome | (2) Klinefelter's syndrome |
| (3) Edward syndrome | (4) Down's syndrome |

Q177. Polyblend, a fine powder of recycled modified plastic, has proved to be a good material for

- | | |
|---------------------------|----------------------------|
| (1) Making plastic sacks | (2) Use as a fertilizer |
| (3) Construction of roads | (4) Making tubes and pipes |

Q178. Which of these following methods is the most suitable for disposal of nuclear waste?

- (1) Shoot the waste into space
- (2) Bury the waste under Antarctic ice-cover
- (3) Dump the waste within rocks under deep ocean
- (4) Bury the waste within rocks deep below the Earth's surface

Q179. Match the following hormones with the respective disease

- | | |
|-----------------------|-------------------------|
| (a) Insulin | (i) Addison's disease |
| (b) Thyroxin | (ii) Diabetes insipidus |
| (c) Corticoids | (iii) Acromegaly |
| (d) Growth Hormone | (iv) Goitre |
| (v) Diabetes mellitus | |

Select the correct option.

- (a) (b) (c) (d)
- (1) (v) (i) (ii) (iii)
 - (2) (ii) (iv) (iii) (i)
 - (3) (v) (iv) (i) (iii)
 - (4) (ii) (iv) (i) (iii)

Q180. Select the correct option.

- (1) 8 th , 9 th and 10 th pairs of ribs articulate directly with the sternum.
 - (2) 11 th and 12 th pairs of ribs are connected to the sternum with the help of hyaline cartilage.
 - (3) Each rib is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum.
 - (4) There are seven pairs of vertebrosteral, three pairs of vertebrochondral and two pairs of vertebral ribs.
-

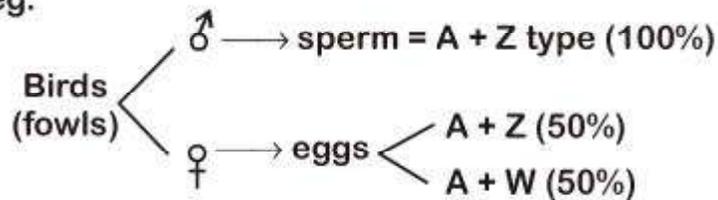
NEET 2019 BIOLOGY SOLUTION

91. Earth Summit (Rio Summit)-1992, called upon all nations to take appropriate measures for conservation of biodiversity and sustainable utilisation of its benefits
92. Colostrum, the yellowish fluid secreted by the mother during initial days of lactation is very essential to impart immunity to the new born infant because it contains Immunoglobulin A. It will impart naturally acquired passive immunity to the newborn
93. Bulliform cells become flaccid due to water loss. This will make the leaves to curl inward to minimise water loss
94. Sub metacentric chromosome is Heterobrachial.
Short arm designated as 'p' arm
(p = petite i.e. short)
Long arm designated as 'q' arm
95. Respiratory Quotient = $\frac{\text{Amount of CO}_2 \text{ released}}{\text{Amount of O}_2 \text{ consumed}}$
(RQ)
- $$2(\text{C}_{51}\text{H}_{98}\text{O}_6) + 145\text{O}_2 \rightarrow 102\text{CO}_2 + 98\text{H}_2\text{O}$$
- Tripalmitin + Energy
- $$\text{RQ} = \frac{102\text{CO}_2}{145\text{O}_2} = 0.7$$
96. Statin is obtained from a yeast (Fungi) called *Monascus purpureus*.
It acts by competitively inhibiting the enzyme responsible for synthesis of cholesterol.
97. Crypts of Lieberkuhn are present in small intestine. Glisson's capsule is present in liver.
Islets of langerhans constitutes the endocrine portion of pancreas. Brunner's glands are found in submucosa of duodenum.
98. Habitat loss and fragmentation is the most important cause driving animals and plants to extinction.
eg: Loss of tropical rainforest reducing the forest cover from 14 % to 6 %.
99. Hypothalamus in the thermoregulatory centre of our brain. It is responsible for maintaining constant body temperature.
100. True segmentation is present in Annelida, Arthropoda and Chordata. They also have organ system level of organisation, bilateral symmetry and are true coelomates

101. The correct sequence of organs in the alimentary canal of cockroach starting from mouth is :
Pharynx → Oesophagus → Crop → Gizzard →
Ileum → Colon → Rectum
102. Relative contribution of various greenhouse gases to total global warming is-
 $\text{CO}_2 = 60\%$
 $\text{CH}_4 = 20\%$
 $\text{CFC} = 14\%$
 $\text{N}_2\text{O} = 6\%$
⇒ Therefore CO_2 and CH_4 are the major greenhouse gases
103. Progressive degeneration of skeletal muscle mostly due to genetic disorder is muscular dystrophy where as tetany is muscular spasm due to low calcium in body fluid. Myasthenia gravis is an auto immune disorder leading to paralysis of skeletal muscles. Botulism is rare and dangerous type of food poisoning caused by bacterium *Clostridium Botulinum*.
104. Bronchioles and Fallopian tubes are lined with ciliated epithelium to move particles or mucus in a specific direction.
105. In ECG P-wave represents depolarisation of atria. QRS complex represents depolarisation of ventricles. T-wave represents repolarisation of ventricle i.e. return from excited to normal state. Reduction in the size of T-wave i.e. if the T-wave represents insufficient supply of oxygen i.e. coronary ischaemia.
106. Botanical garden - ex - situ conservation (off- site conservation) i.e. living plants (flora) are conserved in human managed system.
107. The given data shows stabilising selection as most of the newborn having average weight between 3 to 3.3 kg survive and babies with less and more weight have low survival rate.
108. The correct sequence of phases of cell cycle is
 $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$
109. Steroid hormones directly enter into the cell and bind with intracellular receptors in nucleus to form hormone receptor complex.
Hormone receptor complex interacts with the genome
110. Lysosomes bud off from trans face of Golgi bodies.
Precursor of lysosomal enzymes are synthesised by RER and then send to Golgi bodies for further processing.
111. Following are the post-fertilisation changes.
Ovule → Seed
Ovary → Fruit
Zygote → Embryo
Central cell → Endosperm
-

112. Concanavalin A is a secondary metabolite e.g is lectin, it has the property to agglutinates RBCs.
113. To produce enzyme in large quantity equipment required are bioreactors. Large scale production involves use of bioreactors.
114. Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group. A complete catalytic active enzyme with its bound prosthetic group is called holoenzyme.
115. Purines found both in DNA and RNA are Adenine and guanine
116. The correct sequence for transport of sperm cells in male reproductive system is
Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
117. The correct match of hominids and their brain sizes are :
Homo habilis — 650-800 cc
Homo neanderthalensis — 1400 cc
Homo erectus — 900 cc
Homo sapiens — 1350 cc
118. According to Hugo de Vries, mutations are random and directionless.
Devries believed mutation caused speciation and hence called saltation (single step large mutation).
119. Lysosomes and Vacuoles do not have DNA.
120. Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. It can be due to increasing air born allergens and pollutants. Asthma is an allergic condition. Many people in urban areas are suffering from this respiratory disorder.
121. In birds female heterogamety is found thus sex of progeny depends on the types of egg rather than the type of sperm.

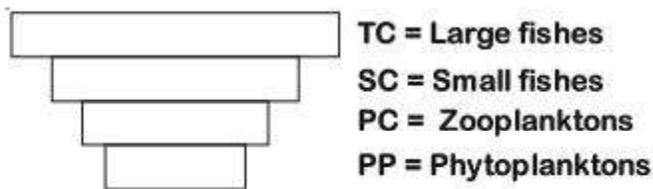
eg.



122. During the isolation of desired gene, chilled ethanol is used for the precipitation of DNA.
123. Fungus Trichoderma, Baculoviruses (NPV) and Bacillus thuringiensis are used as biocontrol agents.
Rhizobium, Nostoc, Azospirillum and Oscillatoria are used as biofertilisers, whereas TMV is a pathogen and aphids are pests that harm crop plants.

124. Inbreeding exposes harmful recessive genes that are eliminated by selection. It also helps in accumulation of superior genes and elimination of less desirable genes. Therefore this is selection at each step, increase the productivity of inbred population. Close and continued inbreeding usually reduces fertility and even productivity.
125. Microbes are used in production of several household and industrial products –
Lactobacillus – Production of curd
Saccharomyces cerevisiae – Bread making
Aspergillus niger – Citric acid production
Acetobacter aceti – Acetic acid
126. The direction of movement of sugar in phloem is bi-directional as it depends on source-sink relationship which is variable in plants.
127. The phenomenon in which female gamete develops into embryo without getting fused with male gamete (fertilisation) is called parthenogenesis.
128. Persistent Nucellus is called Perisperm
e.g.: Black pepper, Beet
129. 1 map unit represent 1 % cross over.
Map unit is used to measure genetic distance.
This genetic distance is based on average number of cross over frequency.
130. Cardiac output = stroke volume \times Heart rate
 \Rightarrow Cardiac output = 5L or 5000 ml
 \Rightarrow Blood volume in ventricles at the end of diastole = 100 ml
 \Rightarrow Blood volume in ventricles at the end of systole = 50 ml
Stroke volume = 100 – 50
= 50 ml.
So,
5000 ml = 50 ml \times Heart rate
So, Heart rate = 100 beats per minute.
131. Thiobacillus denitrificans cause denitrification
i.e., conversion of oxides of nitrogen to free N_2 .
132. The proximity between loop of henle and vasa recta as well as counter current in them help in maintaining an increasing osmolality towards the inner medullary interstitium. This mechanism help to maintain a concentration gradient in medullary interstitium so human urine is nearly four times concentrated than initial filtrate formed.
-

133. In mitochondria, enzymes for electron transport are present in the inner membrane.
134. Xylem is associated with translocation of mainly water, mineral salts, some organic nitrogen and hormones.
135. Cells in G_0 phase are said to exit cell cycle.
These are at quiescent stage and do not proliferate unless called upon to do so.
136. Growth rings are formed by the seasonal activity of cambium. In plants of temperate regions, cambium is more active in spring and less active in autumn seasons. In temperate regions climatic conditions are not uniform throughout the year. However in tropics climatic conditions are uniform throughout the year.
137. In an aquatic ecosystem, the pyramid of biomass is generally inverted.

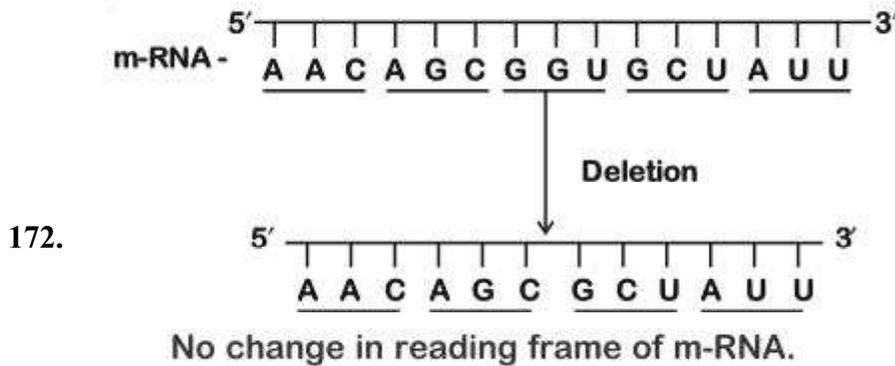


138. In parietal placentation the ovules develop on the inner wall of ovary or in peripheral part.
eg. Mustard, Argemone etc.
139. To control the deleterious effect of the stratospheric ozone depletion an international treaty was signed at Montreal, Canada in 1987. It is popularly known as Montreal protocol.
140. → In lactational amenorrhoea, due to high prolactin level, gonadotropin level decreases.
→ Oral pills are either progestogens or progestogen-estrogen combinations used by the females.
→ Emergency contraceptives includes the administration of progestogens or progestogen estrogen combination or IUDs within 72 hour of coitus.
So, lactational amenorrhoea, oral pills and emergency contraceptives involve a role of hormone.
141. Tidal Volume = 500 ml
Expiratory Reserve Volume = 1000 ml
Expiratory Capacity = TV + ERV
= 500 + 1000
= 1500 ml
142. In flowering plants, out of the two male gametes discharged in synergids, one fuses with the egg and other fuses with the secondary or definitive nucleus present in central cell.
- Egg(n) + 1st male gamete(n) → Zygote(2n)
- Secondary nucleus + 2nd male gamete(n) → [PEN(3n)]
(2n)
(central cell nuclei)

143. During flowering, photoperiodic stimulus is perceived by leaves of plants.
144. According to rules of binomial nomenclature, correctly written scientific name of mango is *Mangifera indica* Linn.
145. Restriction enzymes cut DNA molecules at a particular point by recognising a specific sequence. Each restriction endonuclease functions by inspecting the length of a DNA sequence. Once it finds its specific recognition sequence, it will bind to the DNA and cut each of the two strands of the double helix at specific points in their sugar-phosphate backbone.
146. In Pteridophyte, megaspore is retained for some times in female gametophyte, however the permanent retention is required for seed formation in Gymnosperms. That's why Pteridophytes exhibit precursor to seed habit only.
147. Genes for flower colour in snapdragon shows incomplete dominance which is an exception of Mendel's first principle i.e. Law of dominance.
Whereas Law of segregation is universally applicable.
148. Hexokinase catalyse the conversion of Glucose to Glucose-6 phosphate. It is the first step of activation phase of glycolysis.
149. Heroin, commonly called smack and is chemically diacetylmorphine which is synthesized by acetylation of morphine.
150. Progestasert and LNG-20 are hormone releasing IUDs which make the uterus unsuitable for implantation and the cervix hostile to sperms.
151. Frequency of dominant allele (say p) = 0.4
Frequency of recessive allele (say q)
= $1 - 0.4 = 0.6$
 \therefore Frequency of homozygous dominant individuals (AA)
= $p^2 = (0.4)^2 = 0.16$
Frequency of heterozygous individuals (Aa)
= $2pq = 2(0.4)(0.6) = 0.48$
Frequency of homozygous recessive individuals (aa)
= $q^2 = (0.6)^2 = 0.36$
152. Golden rice is vitamin A enriched rice, with a gene from daffodil and is rich in carotene.
153. Fungus associated with roots of *Pinus* increases minerals & water absorption for the plant by increasing surface area and in turn fungus gets food from plant. Therefore, mycorrhizal association is obligatory for *Pinus* seed germination
154. In recombinant DNA technology bacteria is able to produce human insulin because genetic code is nearly universal.
-

155. Genital herpes is caused by type-II-herpes simplex virus. At present there is no cure for type-II-herpes simplex virus and therefore the disease caused, genital herpes. Other non-curable STIs are hepatitis-B and HIV.
156. Infective constituent in viruses is either DNA or RNA, not protein.
157. (a) Pila is a Mollusc. The mouth contains a file - like rasping organ for feeding called radula.
(b) Bombyx is an Arthropod. In Bombyx excretion takes place through malpighan tubules.
(c) Pleurobrachia is Ctenophore. The body bears eight external rows of ciliated comb plates, which help in locomotion.
(d) Taenia is a platyhelminth specialised cells called flame cells helps in osmoregulation and excretion
158. Expressed Sequence Tags (ESTs) are DNA sequences (genes) that are expressed as mRNA for protein synthesis. These are used in human Genome Project.
159. Yeast is an unicellular sac fungus. It lacks filamentous structure or hyphae.
160. Saprophytes - Decomposition of dead organic materials
Parasites - Grow on/in living plants and animals
Lichens- Symbiotic association of algae and fungi
Mycorrhiza - Symbiotic association of fungi with plant roots
161. GLUT-IV is insulin dependent and is responsible for majority of glucose transport into muscle and adipose cells in anabolic conditions. Whereas GLUT-I is insulin independent and is widely distributed in different tissues.
162. The body is able to differentiate self and nonself and the cell-mediated response is responsible for graft rejection.
163. a and b statements are incorrect because dialysis eliminates urea and potassium from the body whereas, c and d are correct. As phosphate ions are eliminated during dialysis, along with that calcium ions are also eliminated. So, there will be reduced absorption of calcium ions from gastrointestinal tract. RBC production will be reduced, due to reduced erythropoietin hormone.
164. Cornea consists of dense matrix of collagen and corneal epithelium. It is the most sensitive part of eye.
165. Alfred Sturtevant explained chromosomal mapping on the basis of recombination frequency which is directly proportional to distance between two genes on same chromosome
166. In lac operon
i gene - Repressor
z gene - β -galactosidase
y gene - Permease
a gene - Transacetylase
-

167. Plant hormone auxin induces flowering in pineapple. Ethylene also helps in synchronization of flowering and fruit set up in pineapple.
168. Goblet cells secrete mucus and bicarbonates present in the gastric juice which plays an important role in lubrication and protection of the mucosal epithelium from excoriation by the highly concentrated HCl.
169. Fungus *Trichoderma* is a biological control agent being developed for use in the treatment of plant diseases.
170. Phloem in Gymnosperms lacks both sieve tube and companion cells.
171. Extrusion of second polar body from egg nucleus occurs after entry of sperm but before fertilization.
The entry of sperm into the ovum induces completion of the meiotic division of the secondary oocyte.
Entry of sperm causes breakdown of metaphase promoting factor (MPF) and turns on anaphase promoting complex (APC).



173. Concept of “*Omnis cellula-e cellula*” regarding cell division was proposed by Rudolph Virchow.
174. *Bacillus thuringiensis* forms protein crystals during a particular phase of their growth. These crystals contain a toxic insecticidal protein. These protein exist as inactive protoxins but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to alkaline pH of the gut which solubilize the crystals. The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually cause death of insect.
175. *Salmonella typhi* is the causative agent. Confirmatory test = Widal test, it’s based on antigen antibody reaction.

176. Individuals with Klinefelter's syndrome have trisomy of sex chromosome as $44 + XXY$ (47). They show overall masculine development, gynaecomastia and are sterile.
177. Polyblend is a fine powder of recycled modified plastic waste. The mixture is mixed with bitumen that is used to lay roads.
178. Storage of nuclear waste should be done in suitably shielded containers and buried within rocks deep below the earth's surface (500 m deep)
- 179.
- Insulin deficiency leads to diabetes mellitus
 - Hypersecretion or hyposecretion of thyroxine can be associated with enlargement of thyroid gland called goitre
 - Deficiency of corticoids (Glucocorticoid + mineralocorticoid) leads to Addison's disease
 - Growth hormone hypersecretion in adults leads to Acromegaly
- 180.
- Vertebrosteral ribs are true ribs, dorsally they are attached to the thoracic vertebrae and ventrally connected to the sternum with the help of hyaline cartilage. First seven pairs of ribs are called true ribs.
 - 8th, 9th and 10th pairs of ribs do not articulate directly with the sternum but join the seventh ribs with the help of hyaline cartilage. These are vertebrochondral or false ribs.
 - Last 2 pairs (11 & 12) of ribs are not connected ventrally and are therefore, called floating ribs.
 - Only first seven pairs of ribs are ventrally connected to the sternum.