

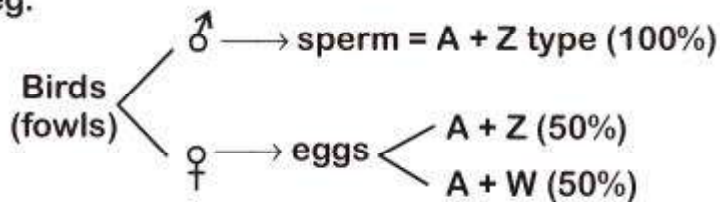
NEET 2019 BIOLOGY SOLUTION

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
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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.

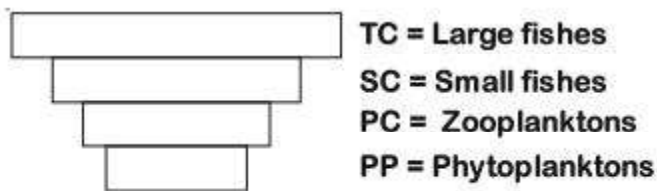
eg.



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.
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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.

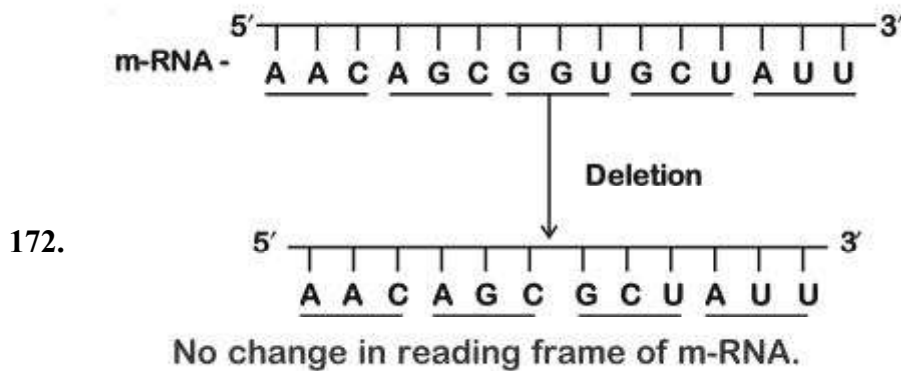


138. In parietal placentation the ovules develop on the inner wall of ovary or in peripheral part.
eg. Mustard, Argemone etc.
139. To control the deleterious effect of the stratospheric ozone depletion an international treaty was signed at Montreal, Canada in 1987. It is popularly known as Montreal protocol.
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.
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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.