

NEET - 2018

(QUESTION WITH ANSWER)

91. Which of the following statements is correct ?

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

Ans. – (1)

Sol. Gymnosperms have naked ovule.

Called phanerogams without womb/ovary

92. Pneumatophores occur in

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

Ans. – (1)

Sol. Halophytes like mangroves have pneumatophores.

Apogeotropic (-vely geotropic) roots having lenticels called pneumathodes to uptake O₂.

93. Sweet potato is a modified

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

Ans. – (3)

Sol. Sweet potato is a modified adventitious root for storage of food

Rhizomes are underground modified stem

Tap root is primary root directly elongated from the radicle

94. Plants having little or no secondary growth are

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

Ans. – (1)

Sol. Grasses are monocots and monocots usually do not have secondary growth.

Palm like monocots have anomalous secondary growth.

95. Casparian strips occur in

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

Ans. – (4)

Sol. Endodermis have casparian strip on radial and inner tangential wall.

It is suberin rich.

- 96.** Secondary xylem and phloem in dicot stem are produced by
- (1) Apical meristems
 - (2) Phellogen
 - (3) Vascular cambium
 - (4) Axillary meristems

Ans. – (3)

Sol. Vascular cambium is partially secondary Form secondary xylem towards its inside and secondary phloem towards outsides. 4-10 times more secondary xylem is produced than secondary phloem.

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

Ans. – (2)

Sol. Pseudopodia are locomotory structures in sarcodines (Amoeboid)

- 98.** The experimental proof for semiconservative replication of DNA was first shown in a
- (1) Fungus
 - (2) Plant
 - (3) Bacterium
 - (4) Virus

Ans. – (3)

Sol. Semi-conservative DNA replication was first shown in Bacterium Escherichia coli by Matthew Maselson and Franklin Stahi.

- 99.** Select the correct match

- (1) Alec Jeffreys - Streptococcus pneumoniae
- (2) Matthew Meselson - Pisum sativum and F. Stahl
- (3) Alfred Hershey and- Martha Chase - TMV
- (4) Francois Jacob - Lac operon and Jacques Monod

Ans. – (4)

Sol. Francois Jacob and Jacque Monod proposed model of gene regulation known as operon model/lac operon.

- Alec Jeffreys – DNA fingerprinting technique.
- Matthew Meselson and F. Stahi – Semiconservative DNA replication in E. coli.
- Alfred Hershey and Martha Chase – Proved DNA as genetic material not protein

- 100.** Select the correct statement

- (1) Franklin Stahl coined the term “linkage”
- (2) Spliceosomes take part in translation
- (3) Punnett square was developed by a British scientist
- (4) Transduction was discovered by S. Altman

Ans. – (3)

Sol. Punnett square was developed by a Britishgeneticist, Reginald C. Punnett.

–Franklin Stahl proved semi-conservative mode of replication.

–Transduction was discovered by Zinder and Laderberg.

–Spliceosome formation is part of post-transcriptional change in Eukaryotes

101. Which of the following pairs is wrongly matched?

- (1) Starch synthesis in pea : Multiple alleles
 (2) XO type sex determination : Grasshopper
 (3) ABO blood grouping : Co-dominance
 (4) T.H. Morgan : Linkage

Ans. – (1)

Sol. Starch synthesis in pea is controlled by pleiotropic gene.

Other options (2, 3 & 4) are correctly matched.

102. Offsets are produced by

- (1) Meiotic divisions
 (2) Parthenocarpy
 (3) Mitotic divisions
 (4) Parthenogenesis

Ans. – (3)

Sol. Offset is a vegetative part of a plant, formed by mitosis.

Meiotic divisions do not occur in somatic cells.

Parthenogenesis is the formation of embryo from ovum or egg without fertilisation.

Parthenocarpy is the fruit formed without fertilisation, (generally seedless)

103. Which of the following flowers only once in its life-time ?

- (1) Bamboo species
 (2) Mango
 (3) Jackfruit
 (4) Papaya

Ans. – (1)

Sol. Bamboo species are monocarpic i.e., flower generally only once in its life-time after 50-100 years.

Jackfruit, papaya and mango are polycarpic i.e., produce flowers and fruits many times in their life-time.

104. Which of the following has proved helpful in preserving pollen as fossils ?

- (1) Pollenkitt
 (2) Oil content
 (3) Cellulosic intine
 (4) Sporopollenin

Ans. – (4)

Sol. Sporopollenin cannot be degraded by enzyme; strong acids and alkali, therefore it is helpful in preserving pollen as fossil.

Pollenkitt – Help in insect pollination.

Cellulosic Intine – Inner sporoderm layer of pollen grain known as intine made up cellulose & pectin.

Oil content – No role is pollen preservation.

105. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes ?

- (1) Retrovirus
 (2) λ phage
 (3) Ti plasmid
 (4) pBR 322

Ans. – (1)

Sol. Retrovirus is commonly used as vector for introducing a DNA fragment in human lymphocyte.

Gene therapy : Lymphocyte from blood of patient are grown in culture outside the body, a functional gene is introduced by using a retroviral vector, into these lymphocyte.

106. The correct order of steps in Polymerase Chain Reaction (PCR) is

- (1) Extension, Denaturation, Annealing
- (2) Denaturation, Extension, Annealing
- (3) Annealing, Extension, Denaturation
- (4) Denaturation, Annealing, Extension

Ans. – (4)

Sol. This technique is used for making multiple copies of gene (or DNA) of interest in vitro. Each cycle has three steps

- (i) Denaturation
- (ii) Primer annealing
- (iii) Extension of primer

107. In India, the organization responsible for assessing the safety of introducing genetically modified organisms for public use is

- (1) Indian Council of Medical Research (ICMR)
- (2) Research Committee on Genetic Manipulation (RCGM)
- (3) Council for Scientific and Industrial Research (CSIR)
- (4) Genetic Engineering Appraisal Committee (GEAC)

Ans. – (4)

Sol. Indian Government has setup organisation such as GEAC (Genetic Engineering Appraisal Committee) which will make decisions regarding the validity of GM research and safety of introducing GM-organism for public services. (Direct from NCERT).

108. Use of bioresources by multinational companies and organisations without authorization from the concerned country and its people is called

- (1) Bio-infringement
- (2) Biodegradation
- (3) Biopiracy
- (4) Bioexploitation

Ans. –(3)

Sol. Biopiracy is term used for or refer to the use of bioresources by multinational companies and other organisation without proper authorisation from the countries and people concerned with compensatory payment (definition of biopiracy given in NCERT).

109. 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) Co-667
- (2) Lerma Rojo
- (3) Sharbati Sonora
- (4) Basmati

Ans. –(4)

Sol. In 1997, an American company got patent rights on Basmati rice through the US patent and trademark office that was actually been derived from Indian farmer's varieties.

The diversity of rice in India is one of the richest in the world, 27 documented varieties of Basmati are grown in India.

Indian basmati was crossed with semi-dwarf varieties and claimed as an invention or a novelty.

Sharbati Sonora and Lerma Rojo are varieties of wheat.

110. Select the correct match

- (1) Ribozyme - Nucleic acid
- (2) T.H. Morgan - Transduction
- (3) $F_2 \times$ Recessive parent - Dihybrid cross
- (4) G. Mendel - Transformation

Ans. -(1)

Sol. Ribozyme is a catalytic RNA, which is nucleic acid.

111. Niche is

- (1) all the biological factors in the organism's environment
- (2) the range of temperature that the organism needs to live
- (3) the physical space where an organism lives
- (4) the functional role played by the organism where it lives

Ans. -(4)

Sol. Ecological niche was termed by J. Grinnel. It refers the functional role played by the organism where it lives.

112. Which of the following is a secondary pollutant ?

- (1) CO
- (2) SO₂
- (3) CO₂
- (4) O₃

Ans. -(4)

Sol. O₃ (ozone) is a secondary pollutant. These are formed by the reaction of primary pollutant.

CO - Quantitative pollutant

CO₂ - Primary pollutant

SO₂ - Primary pollutant

113. World Ozone Day is celebrated on

- (1) 5th June
- (2) 16th September
- (3) 21st April
- (4) 22nd April

Ans. -(2)

Sol. World Ozone day is celebrated on 16th September.

5th June - World Environment Day

21st April - National Yellow Bat Day

22nd April - National Earth Day

114. Natality refers to

- (1) Death rate
- (2) Number of individuals leaving the habitat
- (3) Birth rate
- (4) Number of individuals entering a habitat

Ans. -(3)

Sol. Natality refers to birth rate.

- Death rate - Mortality
- Number of individual entering a habitat is - Immigration
- Number of individual leaving the habitat - Emigration

115. In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen?

- (1) Carbon
- (2) Fe
- (3) Cl
- (4) Oxygen

Ans. -(3)

Sol. UV rays act on CFCs, releasing Cl atoms, chlorine reacts with ozone in sequential method converting into oxygen

Carbon, oxygen and Fe are not related to ozone layer depletion

116. 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) Inverted pyramid of biomass
- (2) Upright pyramid of numbers
- (3) Pyramid of energy
- (4) Upright pyramid of biomass

Ans. -(1)

Sol. The given data depicts the inverted pyramid of biomass, usually found in aquatic ecosystem.

Pyramid of energy is always upright

Upright pyramid of biomass and numbers are not possible, as the data depicts primary producer is less than primary consumer and this is less than secondary consumers.

117. The Golgi complex participates in

- (1) Fatty acid breakdown
- (2) Respiration in bacteria
- (3) Formation of secretory vesicles
- (4) Activation of amino acid

Ans. -(3)

Sol. Golgi complex, after processing releases secretory vesicles from their trans-face.

118. Which of the following is not a product of light reaction of photosynthesis ?

- (1) ATP
- (2) NADPH
- (3) NADH
- (4) Oxygen

Ans. -(3)

Sol. ATP, NADPH and oxygen are products of light reaction, while NADH is a product of respiration process.

119. Which among the following is not a prokaryote ?

- (1) Saccharomyces
- (2) Nostoc
- (3) Mycobacterium
- (4) Oscillatoria

Ans. -(1)

Sol. Saccharomyces i.e. yeast is an eukaryote (unicellular fungi)
Mycobacterium-a bacterium
Oscillatoria and Nostoc are cyanobacteria.

120. Stomatal movement is not affected by

- (1) Temperature
- (2) O₂ concentration
- (3) Light
- (4) CO₂ concentration

Ans. -(2)

Sol. Light, temperature and concentration of CO₂ affect opening and closing of stomata while they are not affected by O₂ concentration.

121. Which of the following is true for nucleolus?

- (1) Larger nucleoli are present in dividing cells
- (2) It takes part in spindle formation
- (3) It is a membrane-bound structure
- (4) It is a site for active ribosomal RNA synthesis

Ans. -(4)

Sol. Nucleolus is a non membranous structure and is a site of r-RNA synthesis.

122. The stage during which separation of the paired homologous chromosomes begins is

- (1) Pachytene
- (2) Diakinesis
- (3) Diplotene
- (4) Zygotene

Ans. – (3)

Sol. Synaptonemal complex disintegrates.

Terminalisation begins at diplotene stage i.e. chiasmata start to shift towards end.

123. The two functional groups characteristic of sugars are

- (1) Hydroxyl and methyl
- (2) Carbonyl and phosphate
- (3) Carbonyl and methyl
- (4) Carbonyl and hydroxyl

Ans. – (4)

Sol. Sugar is a common term used to denote carbohydrate.

Carbohydrates are polyhydroxy aldehyde, ketone or their derivatives, which means they have carbonyl and hydroxyl groups.

124. Stomata in grass leaf are

- (1) Dumb-bell shaped
- (2) Rectangular
- (3) Kidney shaped
- (4) Barrel shaped

Ans. – (1)

Sol. Grass being a monocot, has Dumb-bell shaped stomata in their leaves.

125. 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) *Hydrilla*
- (2) Banana

(3) *Yucca*

(4) *Viola*

Ans. –(3)

Sol. *Yucca* have an obligate mutualism with a species of moth i.e. *Pronuba*.

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

- (1) -120°C
- (2) -196°C
- (3) -80°C
- (4) -160°C

Ans. – (2)

Sol. Pollen grains can be stored for several years in liquid nitrogen at -196°C (Cryopreservation)

127. Double fertilization is

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

Ans. – (4)

Sol. Double fertilization is a unique phenomenon that occur in angiosperms only.

Syngamy + Triple fusion = Double fertilization

128. Oxygen is not produced during photosynthesis by

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

Ans. – (1)

Sol. Green sulphur bacteria do not use H₂O as source of proton, therefore they do not evolve O₂.

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

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

Ans. – (2)

Sol. Potassium helps in maintaining turgidity of cells.

130. What is the role of NAD⁺ in cellular respiration?

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

Ans. – (3)

Sol. In cellular respiration, NAD⁺ act as an electron carrier.

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

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

Ans. – (1*)

Sol. Iron is absorbed by plants in the form of ferric ions. (According to NCERT)

*Plants absorb iron in both form i.e. Fe⁺⁺ and Fe⁺⁺⁺. (Preferably Fe⁺⁺)

132. Winged pollen grains are present in

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

Ans. – (4)

Sol. In *Pinus*, winged pollen grains are present. It is extended outer exine on two lateral sides to form the wings of pollen. It is the characteristic feature, only in *Pinus*.

Pollen grains of Mustard, *Cycas* & Mango are not winged shaped.

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

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

Ans. – (2)

Sol. • In *Agaricus* (a genus of basidiomycetes), basidiospores or meiospores are produced exogenously.
 • *Neurospora* (a genus of ascomycetes) produces ascospores as meiospores but endogenously inside the ascus.)
 • *Alternaria* (a genus of deuteromycetes) does not produce sexual spores.
 • *Saccharomyces* (Unicellular ascomycetes) produces ascospores, endogenously.

134. Which one is wrongly matched?

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

Ans. – (1)

- Sol. • *Polysiphonia* is a genus of red algae, where asexual spores and gametes are non-motile or non-flagellated.
- Other options (2, 3 & 4) are correctly matched

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

Column I	Column II
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.

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

Ans. – (4)

- Sol. • Herbarium – Dried and pressed plant specimen
- Key – Identification of various taxa

- Museum – Plant and animal specimen are preserved
- Catalogue – Alphabetical listing of species

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

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

Ans. – (1)

Sol. Epinephrine is derived from tyrosine amino acid by the removal of carboxyl group. It is a catecholamine.

137. Which of the following structures or regions incorrectly paired with its functions?

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

Ans. – (3)

Sol. Limbic system is emotional brain. It controls all emotions in our body but not movements.

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

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

body

Ans. – (1)

Sol. Lens in the human eye is held in its place by suspensory ligaments attached to the ciliary body.

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

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

Ans. – (2)

Sol. Estrogen promotes the activity of osteoblast and inhibits osteoclast. In an ageing female osteoporosis occurs due to deficiency of estrogen. Parathormone promotes mobilisation of calcium from bone into blood. Excessive activity of parathormone causes demineralisation leading to osteoporosis.

140. Among the following sets of examples for divergent evolution, select the incorrect option :

- (1) Forelimbs of man, bat and cheetah
- (2) Brain of bat, man and cheetah
- (3) Heart of bat, man and cheetah
- (4) Eye of octopus, bat and man

Ans. – (4)

Sol. Divergent evolution occurs in the same structure, example - forelimbs, heart, brain of vertebrates which have developed along different directions due to adaptation to different needs whereas eye of octopus, bat and man are examples of analogous organs showing convergent evolution.

141. Which of the following is not an autoimmune disease?

- (1) Psoriasis
- (2) Alzheimer's disease
- (3) Rheumatoid arthritis
- (4) Vitiligo

Ans. – (2)

Sol. Rheumatoid arthritis is an autoimmune disorder in which antibodies are produced against the synovial membrane and cartilage.

Vitiligo causes white patches on skin also characterised as autoimmune disorder.

Psoriasis is a skin disease that causes itchy or sore patches of thick red skin and is also autoimmune whereas Alzheimer's disease is due to deficiency of neurotransmitter acetylcholine.

142. 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, c and e
- (2) b, d and e
- (3) a, b and c
- (4) a, c and e

Ans. – (3)

Sol. • |**A**|**O**, |**B**|**O** - Dominant-recessive relationship
 • |**A**|**B** - Codominance
 • |**A**, |**B** & |**O** - 3-different allelic forms of a gene (multiple allelism)

143. In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?

- (1) Elephantiasis
- (2) Ringworm disease
- (3) Ascariasis
- (4) Amoebiasis

Ans. – (1)

Sol. Elephantiasis is caused by roundworm, *Wuchereria bancrofti* and it is transmitted by *Culex* mosquito.

144. The similarity of bone structure in the forelimbs of many vertebrates is an example of

- (1) Homology
- (2) Convergent evolution
- (3) Analogy
- (4) Adaptive radiation

Ans. – (1)

Sol. In different vertebrates, bones of forelimbs are similar but their forelimbs are adapted in different way as per their adaptation, hence example of homology.

145. Conversion of milk to curd improves its nutritional value by increasing the amount of

- (1) Vitamin D
- (2) Vitamin B₁₂
- (3) Vitamin A
- (4) Vitamin E

Ans. – (2)

Sol. • Curd is more nourishing than milk.
• It has enriched presence of vitamins specially Vit-B₁₂.

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

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

Ans. – (4)

Sol. Amensalism/Antibiosis (0, –)

- Antibiotics are chemicals secreted by one microbial group (eg : *Penicillium*) which harm other microbes (eg : *Staphylococcus*)
- It has no effect on *dPenicillium* or the organism which produces it.

147. All of the following are included in 'ex-situ conservation' except

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

Ans. – (3)

Sol. • Sacred groves – *in-situ* conservation.
• Represent pristine forest patch as protected by Tribal groups.

148. 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

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

Ans. – (2)

Sol.

a. Eutrophication	iii. Nutrient enrichment
b. Sanitary landfill	iv. Waste disposal
c. Snow blindness	i. UV-B radiation
d. Jhum cultivation	ii. Deforestation

149. In a growing population of a country,

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

Ans. – (1)

Sol. Whenever the pre-reproductive individuals or the younger population size is larger than the reproductive group, the population will be an increasing population.

150. Which part of poppy plant is used to obtain the drug ‘Smack’?

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

Ans. – (3)

Sol. ‘Smack’ also called as brown sugar/Heroin is formed by acetylation of morphine. It is

obtained from the latex of unripe capsule of Poppy plant.

151. Hormones secreted by the placenta to maintain pregnancy are

- (1) hCG, hPL, progesterones, prolactin
- (2) hCG, hPL, progesterones, estrogens
- (3) hCG, hPL, estrogens, relaxin, oxytocin
- (4) hCG, progesterones, estrogens, glucocorticoids

Ans. – (2)

Sol. Placenta releases human chorionic gonadotropic hormone (hCG) which stimulates the Corpus luteum during pregnancy to release estrogen and progesterone and also rescues corpus luteum from regression. Human placental lactogen (hPL) is involved in growth of body of mother and breast. Progesterone maintains pregnancy, keeps the uterus silent by increasing uterine threshold to contractile stimuli.

152. The contraceptive ‘SAHELI’

- (1) blocks estrogen receptors in the uterus, preventing eggs from getting implanted.
- (2) is an IUD.
- (3) increases the concentration of estrogen and prevents ovulation in females.
- (4) is a post-coital contraceptive.

Ans. – (1)

Sol. Saheli is the first non-steroidal, once a week pill. It contains centchroman and its functioning is based upon selective Estrogen Receptor modulation.

153. The amnion of mammalian embryo is derived from

- (1) ectoderm and mesoderm

- (2) mesoderm and trophoblast
- (3) endoderm and mesoderm
- (4) ectoderm and endoderm

Ans. – (1)

Sol. The extraembryonic or foetal membranes are amnion, chorion, allantois and Yolk sac.

Amnion is formed from mesoderm on outer side and ectoderm on inner side.

Chorion is formed from trophoectoderm and mesoderm whereas allantois and Yolk sac membrane have mesoderm on outside and endoderm in inner side.

154. The difference between spermiogenesis and spermiation is

- (1) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
- (2) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.
- (3) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
- (4) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

Ans. – (4)

Sol. Spermiogenesis is transformation of spermatids into spermatozoa whereas spermiation is the release of the sperms from sertoli cells into the lumen of seminiferous tubule.

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

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

Ans. – (1)

Sol. Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased.

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

Column I	Column II
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

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

Ans. - (1)

Sol. Tricuspid valves are AV valve present between right atrium and right ventricle. Bicuspid valves are AV valve present between left atrium and left ventricle. Semilunar valves are present at the openings of aortic and pulmonary aorta.

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

Column-I	Column-II
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

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

Ans. - (3)

Sol. Tidal volume is volume of air inspired or expired during normal respiration. It is approximately 500 mL. Inspiratory reserve volume is additional volume of air a person can inspire by a forceful inspiration. It is around 2500 – 3000 mL. Expiratory reserve volume is additional volume of air a person can be expired by a forceful expiration. This averages 1000 – 1100 mL. Residual volume is volume of air remaining in lungs even after forceful expiration. This averages 1100 – 1200 mL.

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

Column-I	Column-II
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 in glucose urine

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

Ans. - (4)

Sol. Glycosuria denotes presence of glucose in the urine. This is observed when blood glucose level rises above 180 mg/100 ml of blood, this is called renal threshold value for glucose. Gout is due to deposition of uric acid crystals in the joint. Renal calculi are precipitates of calcium phosphate produced in the pelvis of the kidney. Glomerular nephritis is the inflammatory condition of glomerulus characterised by proteinuria and haematuria.

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

Column-I (Function)	Column-II (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
	v. Proximal convoluted tubule

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

Ans. – (3)

Sol. Ultrafiltration refers to filtration of very fine particles having molecular weight less than 68,000 daltons through malpighian corpuscle.

Concentration of urine refers to water absorption from glomerular filtrate as a result of hyperosmolarity in the medulla created by counter-current mechanism in Henle's loop.

Urine is carried from kidney to bladder through ureter.

Urinary bladder is concerned with storage of urine.

160. Which of the following events does not occur in rough endoplasmic reticulum?

- (1) Protein folding

- (2) Cleavage of signal peptide
(3) Protein glycosylation
(4) Phospholipid synthesis

Ans. – (4)

Sol. Phospholipid synthesis does not take place in RER. Smooth endoplasmic reticulum are involved in lipid synthesis.

161. Which of these statements is incorrect?

- (1) Enzymes of TCA cycle are present in mitochondrial matrix
(2) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms
(3) Glycolysis occurs in cytosol
(4) Oxidative phosphorylation takes place in outer mitochondrial membrane

Ans. – (4)

Sol. Oxidative phosphorylation takes place in inner mitochondrial membrane.

162. Nissl bodies are mainly composed of

- (1) Proteins and lipids
(2) Nucleic acids and SER
(3) DNA and RNA
(4) Free ribosomes and RER

Ans. – (4)

Sol. Nissl granules are present in the cyton and even extend into the dendrite but absent in axon and rest of the neuron.

Nissl granules are in fact composed of free ribosomes and RER. They are responsible for protein synthesis.

163. Which of the following terms describe human dentition?

- (1) Thecodont, Diphyodont, Homodont
(2) Pleurodont, Monophyodont, Homodont
(3) Thecodont, Diphyodont, Heterodont

(4) Pleurodont, Diphyodont, Heterodont

Ans. – (3)

Sol. In humans, dentition is

- Thecodont : Teeth are present in the sockets of the jaw bone called alveoli.
- Diphyodont : Teeth erupts twice, temporary milk or deciduous teeth are replaced by a set of permanent or adult teeth.
- Heterodont dentition : Dentition consists of different types of teeth namely incisors, canine, premolars and molars.

164. Select the incorrect match :

- (1) Lampbrush chromosomes – Diplotene bivalents
- (2) Submetacentric chromosomes – L-shaped chromosomes
- (3) Allosomes – Sex chromosomes
- (4) Polytene chromosomes – Oocytes of amphibians

Ans. – (4)

Sol. Polytene chromosomes are found in salivary glands of insects of order Diptera.

165. Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as

- (1) Polysome
- (2) Plastidome
- (3) Polyhedral bodies
- (4) Nucleosome

Ans. – (1)

Sol. The phenomenon of association of many ribosomes with single m-RNA leads to formation of polyribosomes or polysomes or ergasomes.

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

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

Ans. – (3)

Sol. As per mutation theory given by Hugo de Vries, the evolution is a discontinuous phenomenon or saltatory phenomenon/saltation.

167. 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

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

Ans. – (2)

Sol. During proliferative phase, the follicles start developing, hence, called follicular phase.

Secretory phase is also called as luteal phase mainly controlled by progesterone secreted by corpus luteum. Estrogen further thickens the endometrium maintained by progesterone.

Menstruation occurs due to decline in progesterone level and involves breakdown of overgrown endometrial lining.

- 168.** All of the following are part of an operon except
- (1) an operator
 - (2) an enhancer
 - (3) structural genes
 - (4) a promoter

Ans. – (2)

- Sol. • Enhancer sequences are present in eukaryotes.
• Operon concept is for prokaryotes.

- 169.** AGGTATCGCAT is a sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA?
- (1) AGGUAUCGCAU
 - (2) ACCUAUGCGAU
 - (3) UGGTUTCGCAT
 - (4) UCCAUGCGUA

Ans. – (1)

- Sol. Coding strand and mRNA has same nucleotide sequence except, 'T' – Thymine is replaced by 'U' – Uracil in mRNA.

- 170.** A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by
- (1) Only daughters
 - (2) Only grandchildren
 - (3) Only sons
 - (4) Both sons and daughters

Ans. – (4)

- Sol. • Woman is a carrier
• Both son & daughter inherit X-chromosome
• Although only son be the diseased

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

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

Ans. – (4)

- Sol. Parietal or oxyntic cell is a source of HCl and intrinsic factor. HCl converts iron present in diet from ferric to ferrous form so that it can be absorbed easily and used during erythropoiesis.

Intrinsic factor is essential for the absorption of vitamin B₁₂ and its deficiency causes pernicious anaemia.

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

Column I	Column II
a. Fibrinogen	i. Osmotic balance
b. Globulin	ii. Blood clotting
c. Albumin	iii. Defence mechanism

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

Ans. – (4)

- Sol. Fibrinogen forms fibrin strands during coagulation. These strands form a network and the meshes of which are occupied by blood cells, this structure finally forms a clot.

Antibodies are derived from γ -Globulin fraction of plasma proteins which means globulins are involved in defence mechanisms.

Albumin is a plasma protein mainly responsible for BCOP.

173. Which of the following is an occupational respiratory disorder?

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

Ans. – (3)

Sol. Silicosis is due to excess inhalation of silica dust in the workers involved grinding or stone breaking industries.

Long exposure can give rise to inflammation leading to fibrosis and thus causing serious lung damage.

Anthrax is a serious infectious disease caused by *Bacillus anthracis*. It commonly affects domestic and wild animals.

Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased.

Botulism is a form of food poisoning caused by *Clostridium botulinum*.

174. Calcium is important in skeletal muscle contraction because it

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

Ans. – (1)

Sol. • Signal for contraction increase Ca^{++}

level many folds in the sarcoplasm.

- Ca^{++} now binds with sub-unit of troponin (troponin "C") which is masking the active site on actin filament and displaces the sub-unit of troponin.
- Once the active site is exposed, head of the myosin attaches and initiate contraction by sliding the actin over myosin.

175. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system

- (1) Amphibia
- (2) Aves
- (3) Reptilia
- (4) Osteichthyes

Ans. – (2)

Sol. The digestive tract of Aves has additional chambers in their digestive system as crop and Gizzard.

Crop is concerned with storage of food grains.

Gizzard is a masticatory organ in birds used to crush food grain.

176. Ciliates differ from all other protozoans in

- (1) using flagella for locomotion
- (2) using pseudopodia for capturing prey
- (3) having a contractile vacuole for removing excess water
- (4) having two types of nuclei

Ans. – (4)

Sol. Ciliates differs from other protozoans in having two types of nuclei.

eg. *Paramecium* have two types of nuclei i.e. macronucleus & micronucleus.

177. Which of the following features is used to identify a male cockroach from a female cockroach?

- (1) Presence of a boat shaped sternum on the 9th abdominal segment
- (2) Forewings with darker tegmina
- (3) Presence of caudal styles
- (4) Presence of anal cerci

Ans. – (3)

Sol. Males bear a pair of short, thread like anal styles which are absent in females.

Anal/caudal styles arise from 9th abdominal segment in male cockroach.

178. Which one of these animals is not a homeotherm?

- (1) Macropus
- (2) Camelus
- (3) Chelone
- (4) Psittacula

Ans. – (3)

Sol. Homeotherm are animals that maintain constant body temperature, irrespective of surrounding temperature.

Birds and mammals are homeotherm.

Chelone (Turtle) belongs to class reptilia which is Poikilotherm or cold blood.

179. Which of the following animals does not undergo metamorphosis?

- (1) Earthworm
- (2) Moth
- (3) Tunicate
- (4) Starfish

Ans. –(1)

Sol. Metamorphosis refers to transformation of larva into adult.

Animal that perform metamorphosis are said to have indirect development.

In earthworm development is direct which means no larval stage and hence no metamorphosis.

180. Which of the following organisms are known as chief producers in the oceans?

- (1) Dinoflagellates
- (2) Cyanobacteria
- (3) Diatoms
- (4) Euglenoids

Ans. –(3)

Sol. Diatoms are chief producers of the ocean.
