

ZOOLOGY

SECTION-A

151. Match **List I** with **List II**.

List I	List II
A. Heroin	I. Effect on cardiovascular system
B. Marijuana	II. Slow down body function
C. Cocaine	III. Painkiller
D. Morphine	IV. Interfere with transport of dopamine

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-IV, B-III, C-II, D-I | (2) A-III, B-IV, C-I, D-II |
| (3) A-II, B-I, C-IV, D-III | (4) A-I, B-II, C-III, D-IV |

Answer (3)

Sol. The correct answer is option (3) as

- Heroin belongs to the category of opioids and it is a depressant that slows down body functions.
- Marijuana is known for its effect on the cardiovascular system of the body.
- Cocaine interferes with the transport of the neurotransmitter dopamine.
- Morphine is used as a sedative and painkiller.

152. Given below are two statements:

Statement I: RNA mutates at a faster rate.

Statement II: Viruses having RNA genome and shorter life span mutate and evolve faster.

In the light of the above statements, choose the **correct** answer from the options given below:

- | | |
|--|--|
| (1) Statement I is true but Statement II is false. | (2) Statement I is false but Statement II is true. |
| (3) Both Statement I and Statement II are true. | (4) Both Statement I and Statement II are false. |

Answer (3)

Sol. RNA being unstable, mutates at a faster rate. Consequently, viruses having RNA genome and having shorter life span mutate and evolve faster.

153. Given below are two statements:

Statement I: Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.

Statement II: The cavity of the cervix is called cervical canal which along with vagina forms birth canal.

In the light of the above statements, choose the correct answer from the options given below:

- | | |
|---|--|
| (1) Statement I is correct but Statement II is false. | (2) Statement I is incorrect but Statement II is true. |
| (3) Both Statement I and Statement II are true. | (4) Both Statement I and Statement II are false. |

Answer (3)

Sol. Option (3) is the correct answer to this question because statement I and statement II both are correct. Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct. The cavity of cervix is called cervical canal which along with vagina forms the birth canal.

154. Which of the following functions is carried out by cytoskeleton in a cell?
- | | |
|----------------------|-----------------------|
| (1) Motility | (2) Transportation |
| (3) Nuclear division | (4) Protein synthesis |

Answer (1)

Sol. An elaborate network of filamentous proteinaceous structures consisting of microtubules, microfilaments and intermediate filaments present in cytoplasm is collectively referred to as the cytoskeleton. It is involved in many functions such as mechanical support, motility, maintenance of the shape of the cell.

155. Which of the following statements are correct regarding female reproductive cycle?
- In non-primate mammals cyclical changes during reproduction are called oestrus cycle.
 - First menstrual cycle begins at puberty and is called menopause.
 - Lack of menstruation may be indicative of pregnancy.
 - Cyclic menstruation extends between menarche and menopause.

Choose the **most appropriate** answer from the options given below.

- | | |
|---------------------|---------------------|
| (1) A, B and C only | (2) A, C and D only |
| (3) A and D only | (4) A and B only |

Answer (2)

Sol. The correct answer is option (2) as first menstrual cycle that begins at puberty is called menarche. Cyclic menstruation is an indicator of normal reproductive phase and extends between menarche and menopause. Lack of menstruation can be indicative of pregnancy. Reproductive cycle in non-primates is called oestrus cycle.

156. Match **List I** with **List II**.

List I	List II
A. Vasectomy	I. Oral method
B. Coitus interruptus	II. Barrier method
C. Cervical caps	III. Surgical method
D. Saheli	IV. Natural method

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-II, B-III, C-I, D-IV | (2) A-IV, B-II, C-I, D-III |
| (3) A-III, B-I, C-IV, D-II | (4) A-III, B-IV, C-II, D-I |

Answer (4)


Sol. Option (4) is the correct answer because

- Vasectomy is a surgical method of contraception
- Coitus interruptus is a natural method of contraception
- Cervical cap is a barrier method of contraception
- Saheli is an oral method of contraception which is a non-steroidal pill

157. Which one of the following symbols represents mating between relatives in human pedigree analysis?

- | | |
|---|--|
| (1)  | (2)  |
| (3)  | (4)  |

Answer (4)

Sol. The symbol representing mating between relatives (consanguineous mating) in human pedigree analysis is 

158. Which of the following are NOT considered as the part of endomembrane system?
- Mitochondria
 - Endoplasmic reticulum
 - Chloroplasts
 - Golgi complex
 - Peroxisomes

Choose the **most appropriate** answer from the options given below:

- | | |
|------------------|---------------------|
| (1) A and D only | (2) A, D and E only |
| (3) B and D only | (4) A, C and E only |

Answer (4)

Sol. The endomembrane system include endoplasmic reticulum (ER), golgi complex, lysosomes and vacuoles.

Since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components, these are not considered as part of endomembrane system.

159. Match **List I** with **List II** with respect to human eye.

List I	List II
A. Fovea	I. Visible coloured portion of eye that regulates diameter of pupil.
B. Iris	II. External layer of eye formed of dense connective tissue.
C. Blind spot	III. Point of greatest visual acuity or resolution.
D. Sclera	IV. Point where optic nerve leaves the eyeball and photoreceptor cells are absent.

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-I, B-IV, C-III, D-II | (2) A-II, B-I, C-III, D-IV |
| (3) A-III, B-I, C-IV, D-II | (4) A-IV, B-III, C-II, D-I |

Answer (3)

Sol. Option (3) is the correct answer because

- Fovea is the point of greatest visual acuity or resolution.
- Iris is the visible coloured portion of the eye that regulates diameter of pupil.
- Blind spot is the point where optic nerve leaves the eye-ball and photoreceptor cells are absent.
- Sclera is the external layer of eye formed of dense connective tissue.

160. Match **List I** with **List II**.

List I	List II
A. P-wave	I. Beginning of systole
B. Q-wave	II. Repolarisation of ventricles
C. QRS complex	III. Depolarisation of atria
D. T-wave	IV. Depolarisation of ventricles

Choose the **correct** answer from the options given below :

- | | |
|----------------------------|----------------------------|
| (1) A-II, B-IV, C-I, D-III | (2) A-I, B-II, C-III, D-IV |
| (3) A-III, B-I, C-IV, D-II | (4) A-IV, B-III, C-II, D-I |

Answer (3)

Sol. The correct answer is option (3) as in a standard ECG, P-wave represents the electrical excitation (or depolarisation) of the atria which leads to the contraction of both the atria. Q-wave marks the beginning of the systole.

- QRS complex represents the depolarisation of ventricles which initiates the ventricular contraction.
- T-wave represents the return of the ventricles from excited to normal state (repolarisation).

161. Match **List I** with **List II**.

List I	List II
A. CCK	I. Kidney
B. GIP	II. Heart
C. ANF	III. Gastric gland
D. ADH	IV. Pancreas

Choose the **correct** answer from the options given below :

- | | |
|----------------------------|----------------------------|
| (1) A-II, B-IV, C-I, D-III | (2) A-IV, B-II, C-III, D-I |
| (3) A-IV, B-III, C-II, D-I | (4) A-III, B-II, C-IV, D-I |

Answer (3)

Sol. The correct answer is option (3) as

- Cholecystokinin (CCK) acts on both gall bladder and pancreas and stimulates the secretion of bile juice and pancreatic enzymes respectively.
- GIP inhibits gastric secretion and motility.
- Atrial Natriuretic Factor (ANF) is released from the atrial wall of our heart.
- Anti-diuretic hormone (ADH) acts mainly on the kidney and stimulates resorption of water and electrolytes by the distal tubules.

162. Match **List I** with **List II**.

List I	List II
A. Gene 'a'	I. β -galactosidase
B. Gene 'y'	II. Transacetylase
C. Gene 'i'	III. Permease
D. Gene 'z'	IV. Repressor protein

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-III, B-IV, C-I, D-II | (2) A-III, B-I, C-IV, D-II |
| (3) A-II, B-I, C-IV, D-III | (4) A-II, B-III, C-IV, D-I |

Answer (4)

Sol. In a *lac* operon,

Gene a codes for enzyme transacetylase.

Gene y codes for enzyme permease.

Gene i codes for repressor protein

Gene z codes for enzyme β -galactosidase.

163. Vital capacity of lung is _____.

- | | |
|-------------------------|-------------------------|
| (1) IRV + ERV + TV – RV | (2) IRV + ERV + TV |
| (3) IRV + ERV | (4) IRV + ERV + TV + RV |

Answer (2)

Sol. Option (2) is the correct answer because vital capacity is the maximum volume of air a person can breathe in after forced expiration. This includes ERV, TV and IRV.

164. Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.

- (1) Mole, Flying squirrel, Tasmanian tiger cat (2) Lemur, Anteater, Wolf
 (3) Tasmanian wolf, Bobcat, Marsupial mole (4) Numbat, Spotted cuscus, Flying phalanger

Answer (4)

Sol. Option (4) is the correct answer because numbat, spotted cuscus and flying phalanger are Australian marsupials exhibiting adaptive radiation.

Option (1) is incorrect because mole and flying squirrel are placental mammals.

Option (2) is incorrect because lemur and wolf are placental mammals.

Option (3) is incorrect because bobcat is a placental mammal.

165. Match **List I** with **List II**.

List I	List II
A. Ringworm	I. <i>Haemophilus influenzae</i>
B. Filariasis	II. <i>Trichophyton</i>
C. Malaria	III. <i>Wuchereria bancrofti</i>
D. Pneumonia	IV. <i>Plasmodium vivax</i>

Choose the **correct** answer from the options given below:

- (1) A-III, B-II, C-I, D-IV (2) A-III, B-II, C-IV, D-I
 (3) A-II, B-III, C-IV, D-I (4) A-II, B-III, C-I, D-IV

Answer (3)

Sol. Option (3) is the correct answer because:

- (i) Ringworm is caused by *Trichophyton*.
 (ii) Filariasis is caused by *Wuchereria bancrofti*.
 (iii) Malaria is caused by *Plasmodium species*.
 (iv) Pneumonia is caused by *Haemophilus influenzae*.

166. Match **List I** with **List II**.

List I (Type of Joint)	List II (Found between)
A. Cartilaginous Joint	I. Between flat skull bones
B. Ball and Socket Joint	II. Between adjacent vertebrae in vertebral column
C. Fibrous Joint	III. Between carpal and metacarpal of thumb
D. Saddle Joint	IV. Between Humerus and Pectoral girdle

Choose the **correct** answer from the options given below:

- (1) A-I, B-IV, C-III, D-II (2) A-II, B-IV, C-III, D-I
 (3) A-III, B-I, C-II, D-IV (4) A-II, B-IV, C-I, D-III

Answer (4)

Sol. Option (4) is the correct answer because cartilaginous joint is present in between the adjacent vertebrae in the vertebral column.

Option (1) is not the answer because cartilaginous joint is not present between flat skull bones.

Option (2) is not the answer because fibrous joint is not present in between the carpal and metacarpal of thumb.

Option (3) is not the answer because saddle joint is not present in between humerus and pectoral girdle.

167. Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A: Nephrons are of two types: Cortical & Juxta medullary, based on their relative position in cortex and medulla.

Reason R: Juxta medullary nephrons have short loop of Henle whereas, cortical nephrons have longer loop of Henle.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **A** is true but **R** is false.
- (2) **A** is false but **R** is true.
- (3) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (4) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

Answer (1)

Sol. The correct answer is option (1) because Assertion is true as there are two types of nephrons, *i.e.*, cortical nephrons and juxtamedullary nephrons based on their relative position in the cortex and medulla. Reason is not correct as loop of Henle in juxtamedullary nephrons is very long and runs deep into the medulla. Therefore, Assertion is true but Reason is false.

168. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

- (1) Polymerase Chain Reaction (PCR) technique
- (2) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique
- (3) Recombinant DNA Technology
- (4) Serum and Urine analysis

Answer (4)

Sol. The correct answer is option (4) because using conventional methods of diagnosis like serum and urine analysis, *etc.* do not help in early diagnosis. Recombinant DNA technology, Polymerase Chain Reaction [PCR] and Enzyme Linked Immuno-Sorbent Assay (ELISA) are some of the techniques that serve the purpose of early diagnosis.

169. Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?

- | | |
|--------------------|-------------------|
| (1) Hepatitis-B | (2) HIV Infection |
| (3) Genital herpes | (4) Gonorrhoea |

Answer (4)

Sol. The correct answer is option (4) because except for hepatitis-B, genital herpes and HIV infection other STIs are completely curable if detected early and treated properly.

Gonorrhoea is a bacterial disease which can be treated and cured completely, other diseases mentioned are viral diseases.

170. Given below are two statements:

Statement I: Electrostatic precipitator is most widely used in thermal power plant.

Statement II : Electrostatic precipitator in thermal power plant removes ionising radiations

In the light of the above statements, choose the **most appropriate** answer from the options given below:

- (1) **Statement I** is correct but **Statement II** is incorrect.
- (2) **Statement I** is incorrect but **Statement II** is correct.
- (3) Both **Statement I** and **Statement II** are correct.
- (4) Both **Statement I** and **Statement II** are incorrect.

Answer (1)

Sol. Electrostatic precipitator is most widely used in thermal power plants.

It can remove over 99 percent particulate matter present in the exhaust from a thermal power plant.

171. Which of the following is not a cloning vector?

- | | |
|------------|-----------|
| (1) pBR322 | (2) Probe |
| (3) BAC | (4) YAC |

Answer (2)

Sol. Option (2) is correct answer because a single stranded DNA or RNA tagged with a radioactive molecule is called a probe and it helps in the detection of mutated gene.

Option (1), (3) and (4) are not correct because YAC, BAC, pBR322 are vectors.

172. Radial symmetry is NOT found in adults of phylum _____.

- | | |
|------------------|-------------------|
| (1) Coelenterata | (2) Echinodermata |
| (3) Ctenophora | (4) Hemichordata |

Answer (4)

Sol. Option (4) is the correct answer because hemichordates are bilaterally symmetrical animals.

Option (1) is not the answer because coelenterates are radially symmetrical organisms.

Option (2) is not the answer because adult echinoderms are radially symmetrical in adult stage.

Option (3) is not the answer because ctenophores are radially symmetrical organisms.

173. Match **List I** with **List II**

List I	List II
(Cells)	(Secretion)
A. Peptic cells	I. Mucus
B. Goblet cells	II. Bile juice
C. Oxyntic cells	III. Proenzyme pepsinogen
D. Hepatic cells	IV. HCl and intrinsic factor for absorption of vitamin B ₁₂

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-III, B-I, C-IV, D-II | (2) A-II, B-IV, C-I, D-III |
| (3) A-IV, B-III, C-II, D-I | (4) A-II, B-I, C-III, D-IV |

Answer (1)

Sol. Option (1) is the correct answer because gastric glands have three major types of cells namely

- (i) Mucus neck cells which secrete mucus
- (ii) Peptic or chief cells which secrete the proenzyme pepsinogen
- (iii) Parietal or oxyntic cells which secrete HCl and intrinsic factor for absorption of vitamin B₁₂.

174. Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by
- | | |
|----------------------------------|-----------------------|
| (1) Gastro-oesophageal sphincter | (2) Pyloric sphincter |
| (3) Sphincter of Oddi | (4) Ileo-caecal valve |

Answer (4)

Sol. Option (4) is the correct answer because the undigested food (faeces) enters into caecum of the large intestine through ileo-caecal valve, which prevents the backflow of the faecal matter.

Option (1) is not the answer because a muscular sphincter i.e., the gastro-oesophageal sphincter regulates the opening of oesophagus into the stomach.

Option (2) is not the answer because pyloric sphincter regulates the opening in between stomach and duodenum.

Option (3) is not the answer because the opening of common hepato-pancreatic duct is guarded by sphincter of Oddi.

175. Given below are two statements:

Statement I: In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.

Statement II: In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

In the light of the above statements, choose the **correct** answer from the options given below:

- | | |
|---|--|
| (1) Statement I is correct but Statement II is false. | (2) Statement I is incorrect but Statement II is true. |
| (3) Both Statement I and Statement II are true. | (4) Both Statement I and Statement II are false. |

Answer (2)

Sol. In prokaryotes, the negatively charged DNA is held with some positively charged proteins in a region termed as nucleoid.

In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form a structure called nucleosome.

176. Given below are two statements:

Statement I: Ligaments are dense irregular tissue.

Statement II: Cartilage is dense regular tissue.

In the light of the above statements, choose the **correct** answer from the options given below:

- | | |
|---|---|
| (1) Statement I is true but Statement II is false | (2) Statement I is false but Statement II is true |
| (3) Both Statement I and Statement II are true | (4) Both Statement I and Statement II are false |

Answer (4)

Sol. Option (4) is the correct answer because ligament is an example of dense regular connective tissue so Statement I is incorrect and cartilage is an example of specialised connective tissue and not dense regular tissue. Therefore Statement II is also incorrect.

177. Given below are two statements :

Statement I : Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat.

Statement II : When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor.

In the light of the above statements, choose the correct answer from the options given below :

- | | |
|--|--|
| (1) Statement I is true but Statement II is false. | (2) Statement I is false but Statement II is true. |
| (3) Both Statement I and Statement II are true. | (4) Both Statement I and Statement II are false. |

Answer (3)

Sol. The correct answer is option (3) as low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat.

- Competitive inhibitor due to its close structural similarity with the substrate, competes with the substrate for the substrate-binding site of the enzyme.

178. Which of the following statements is correct?

- (1) Presence of large amount of nutrients in water restricts 'Algal Bloom'
- (2) Algal Bloom decreases fish mortality
- (3) Eutrophication refers to increase in domestic sewage and waste water in lakes.
- (4) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.

Answer (4)

Sol. Increase in the concentration of the toxicant at successive trophic level is called biomagnification.

Large amount of nutrients in water promotes growth of algal bloom. Algal bloom increases fish mortality.

Eutrophication refers to the natural aging of a lake by nutrient enrichment of its water.

179. Given below are two statements:

Statement I: A protein is imagined as a line, the left end represented by first amino acid (C-terminal) and the right end represented by last amino acid (N-terminal).

Statement II: Adult human haemoglobin, consists of 4 subunits (two subunits of α type and two subunits of β type.)

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **Statement I** is true but **Statement II** is false.
- (2) **Statement I** is false but **Statement II** is true.
- (3) Both **Statement I** and **Statement II** are true
- (4) Both **Statement I** and **Statement II** are false.

Answer (2)

Sol. The correct answer is option (2) as a protein is imagined as a line, the left end represented by the first amino acid and the right end is represented by the last amino acid. The first amino acid is also called N-terminal amino acid. The last amino acid is called the C-terminal amino acid.

180. In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?

- (1) Basophils
- (2) Eosinophils
- (3) T_H cells
- (4) B-lymphocytes

Answer (3)

Sol. The correct answer is option (3) because HIV enters into helper T-lymphocytes (T_H), replicates and produces progeny viruses. The progeny viruses released into blood attack other helper lymphocytes.

181. Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A: Endometrium is necessary for implantation of blastocyst.

Reason R: In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

In the light of the above statements, choose the **correct** answer from the options given below:

- (1) **A** is true but **R** is false.
- (2) **A** is false but **R** is true.
- (3) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (4) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

Answer (4)

Sol. Option (4) is the correct answer because both Assertion and Reason are true.

Implantation is embedding of the blastocyst into endometrium of uterus.

Correct explanation of reason is

Corpus luteum secretes large amount of progesterone which is essential for maintenance of endometrium of uterus. In absence of fertilisation, the corpus luteum degenerates hence the decrease in the level of progesterone hormone will cause disintegration of endometrium leading to menstruation.

182. Match **List I** with **List II**.

List I	List II
A. <i>Taenia</i>	I. Nephridia
B. <i>Paramoecium</i>	II. Contractile vacuole
C. <i>Periplaneta</i>	III. Flame cells
D. <i>Pheretima</i>	IV. Urecose gland

Choose the **correct** answer from the options given below:

- | | |
|----------------------------|----------------------------|
| (1) A-III, B-II, C-IV, D-I | (2) A-II, B-I, C-IV, D-III |
| (3) A-I, B-II, C-III, D-IV | (4) A-I, B-II, C-IV, D-III |

Answer (1)

Sol. Option (1) is the correct answer because protonephridia or flame cells are the excretory structures in platyhelminthes. Nephridia are the tubular excretory structures of earthworms (*Pheretima*) and other annelids. Single celled organisms like *Paramoecium* have contractile vacuoles for excretion. Urecose glands are present in cockroach.

183. Match **List I** with **List II**.

List I (Interacting species)	List II (Name of interaction)
A. A Leopard and a Lion in a forest/grassland	I. Competition
B. A Cuckoo laying egg in a Crow's nest	II. Brood parasitism
C. Fungi and root of a higher plant in Mycorrhizae	III. Mutualism
D. A cattle egret and a Cattle in a field	IV. Commensalism

Choose the **correct** answer from the options given below.

- | | |
|----------------------------|----------------------------|
| (1) A-III, B-IV, C-I, D-II | (2) A-II, B-III, C-I, D-IV |
| (3) A-I, B-II, C-III, D-IV | (4) A-I, B-II, C-IV, D-III |

Answer (3)

Sol. A leopard and a lion in a forest/grassland exemplify competition where both the species are competing for the same resources.

A cuckoo laying egg in a crow's nest is brood parasitism where cuckoo is the parasitic bird that lays its egg in the nest of crow (host bird).

Fungi and root of a higher plant in mycorrhizae exemplify mutualism where both the species are benefitted. The fungi help the plant in the absorption of essential nutrients from the soil while the plant in turn provides the fungi with energy yielding carbohydrates.

A cattle egret and a cattle in a field exemplify commensalism where one species benefits and the other remains unaffected.

The egrets always forage close to where cattle are grazing because the cattle, as they move, stir up and flush out insects from the vegetation that otherwise might be difficult for the egrets to find and catch.

184. Given below are two statements: one is labelled as **Assertion A** and other is labelled as **Reason R**.

Assertion A : Amniocentesis for sex determination is one of the strategies of Reproductive and Child Health Care Programme.

Reason R : Ban on amniocentesis checks increasing menace of female foeticide.

In the light of the above statements, choose the **correct** answer from the options given below.

- (1) **A** is true but **R** is false.
- (2) **A** is false but **R** is true.
- (3) Both **A** and **R** are true and **R** is the correct explanation of **A**.
- (4) Both **A** and **R** are true and **R** is NOT the correct explanation of **A**.

Answer (2)

Sol. The correct answer is option (2) as 'Reproductive and Child Health Care (RCH) programme' deals with creating awareness among people about various reproduction related aspects and providing facilities and support for building up a reproductively healthy society.

Amniocentesis is basically used to test for the presence of certain genetic disorders such as Down's syndrome, haemophilia, etc., to determine the survivability of the foetus.

Amniocentesis is not a sex determination technique in India and is not a strategy of RCH.

185. Broad palm with single palm crease is visible in a person suffering from-

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

Answer (3)

Sol. Down's syndrome is caused by an additional copy of chromosome number 21. Its symptoms include-

- a. Broad palm with characteristic palm crease
- b. Short statured with small round head
- c. Furrowed tongue and partially open mouth, etc.

SECTION-B

186. Select the correct statements with reference to chordates.

- A. Presence of a mid-dorsal, solid and double nerve cord.
- B. Presence of closed circulatory system.
- C. Presence of paired pharyngeal gill slits.
- D. Presence of dorsal heart
- E. Triploblastic pseudocoelomate animals.

Choose the **correct** answer from the options given below:

- (1) B, D and E only
- (2) C, D and E only
- (3) A, C and D only
- (4) B and C only

Answer (4)

Sol. Option (4) is the correct answer because statements B and C only are correct. Option (1), (2) and (3) are not correct. The chordate characters are presence of closed circulatory system and presence of pharyngeal gill slits. Nerve cord is dorsal, hollow and single. Heart is ventral. They are triploblastic and coelomate.

187. Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows 5'AUCGAUCGAUCGAUCGAUCG AUCG 3'?
- (1) 5' ATCGATCGATCGATCGATCGATCG 3'
 - (2) 3' ATCGATCGATCGATCGATCGATCG 5'
 - (3) 5' UAGCUAGCUAGCUAGCUAGCUAGCUAGC 3'
 - (4) 3' UAGCUAGCUAGCUAGCUAGCUAGCUAGC 5'

Answer (1)

Sol. The sequence of coding strand is same as RNA except thymine at the place of uracil.

Template strand → 3'-TAGCTAGCTAGCTAGCTAGCTAGCTAGC-5'

Coding strand → 5'-ATCGATCGATCG ATCGATCGATCGATCG-3'

↓ Transcription

mRNA → 5' AUCGAUCGAUCGAUCGAUCG AUCG 3'

188. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are:
- (1) Brain stem and epithalamus
 - (2) Corpus callosum and thalamus
 - (3) Limbic system and hypothalamus
 - (4) Corpora quadrigemina and hippocampus

Answer (3)

Sol. Option (3) is the correct answer because limbic system along with hypothalamus regulate the sexual behaviour, expression of excitement, pleasure, rage, fear, etc.

Option (1), (2) and (4) are not correct because corpora quadrigemina is a part of the midbrain and consists of four round swellings. Corpus callosum is a tract of nerve fibres that connects right and left cerebral hemispheres. Thalamus is a major coordinating centre in the forebrain for sensory and motor signalling. Midbrain, pons and medulla oblongata together form the brain stem.

189. Which of the following statements are correct?
- A. An excessive loss of body fluid from the body switches off osmoreceptors.
 - B. ADH facilitates water reabsorption to prevent diuresis.
 - C. ANF causes vasodilation.
 - D. ADH causes increase in blood pressure.
 - E. ADH is responsible for decrease in GFR.

Choose the **correct** answer from the options given below:

- (1) A, B and E only
- (2) C, D and E only
- (3) A and B only
- (4) B, C and D only

Answer (4)

Sol. Option (4) is the correct answer because statements B, C and D are true statements. ADH facilitates water reabsorption from DCT of nephron to prevent diuresis, which causes increase in blood pressure. ANF which is secreted by the heart is a vasodilator.

Options (1), (2) and (3) are not correct because statements A and E are false. Excessive loss of body fluid from the body switches on the osmoreceptors.

190. Which of the following statements are correct?
- A. Basophils are most abundant cells of the total WBCs
 - B. Basophils secrete histamine, serotonin and heparin
 - C. Basophils are involved in inflammatory response
 - D. Basophils have kidney shaped nucleus
 - E. Basophils are agranulocytes

Choose the **correct** answer from the options given below:

- | | |
|------------------|------------------|
| (1) B and C only | (2) A and B only |
| (3) D and E only | (4) C and E only |

Answer (1)

Sol. Option (1) is the answer because, basophils secrete histamine, serotonin, heparin *etc.* and are involved in inflammatory response.

Option (4) is not the answer because, basophils are granulocytes.

Option (2) is not the answer because, neutrophils are the most abundant cells (60–65%) of the total WBCs whereas basophils are least (0.5–1%) abundant of all WBCs.

Option (3) is not the answer because, monocytes have a kidney-shaped nucleus.

191. Which of the following are NOT under the control of thyroid hormone?
- A. Maintenance of water and electrolyte balance
 - B. Regulation of basal metabolic rate
 - C. Normal rhythm of sleep-wake cycle
 - D. Development of immune system
 - E. Support the process of RBCs formation

Choose the **correct** answer from the options given below:

- | | |
|------------------|------------------|
| (1) C and D only | (2) D and E only |
| (3) A and D only | (4) B and C only |

Answer (1)

Sol. Option (1) is the correct answer because thyroid hormones play an important role in the regulation of basal metabolic rate, maintenance of water and electrolyte balance and support the process of RBCs formation, whereas this hormone is not involved in regulating normal rhythm of sleep-wake cycle and development of immune system.

192. Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

- | | |
|---|-----------------------------|
| (1) Presence of sclerites | (2) Presence of anal cerci |
| (3) Dark brown body colour and anal cerci | (4) Presence of anal styles |

Answer (4)

Sol. Option (4) is the correct answer because anal styles are present in male cockroaches and absent in female cockroaches.

Option (1), (2) and (3) are not the correct answers because sclerites, anal cerci and dark brown body colour are common features of both male and female cockroaches.

193. Which one of the following is NOT an advantage of inbreeding?

- (1) Elimination of less desirable genes and accumulation of superior genes takes place due to it.
- (2) It decreases the productivity of inbred population, after continuous inbreeding.
- (3) It decreases homozygosity.
- (4) It exposes harmful recessive genes but are eliminated by selection.

Answer (2)

Sol. Option (2) is the correct answer because decreasing the productivity of inbred population is not an advantage of inbreeding.
Options (4) and (1) are not the answers because they are the advantages of inbreeding.
Option (3) is an incorrect statement.

194. The unique mammalian characteristics are:
- (1) hairs, pinna and indirect development
 - (2) pinna, monocondylic skull and mammary glands
 - (3) hairs, tympanic membrane and mammary glands
 - (4) hairs, pinna and mammary glands

Answer (4)

Sol. Option (4) is correct answer because presence of hairs, pinna and mammary glands are unique features of mammals.

Options (1), (2) and (3) are not correct because, monocondylic skull is present in reptiles and aves whereas mammals have dicondylic skull. Tympanic membrane is present in amphibians also, so it is not considered as unique feature.

Indirect development is not seen in mammals.

195. Select the correct statements.
- A. Tetrad formation is seen during Leptotene.
 - B. During Anaphase, the centromeres split and chromatids separate.
 - C. Terminalization takes place during Pachytene.
 - D. Nucleolus, Golgi complex and ER are reformed during Telophase.
 - E. Crossing over takes place between sister chromatids of homologous chromosome.

Choose the **correct** answer from the options given below:

- (1) A, C and E only
- (2) B and E only
- (3) A and C only
- (4) B and D only

Answer (4)

Sol. • Tetrad formation is seen during zygotene stage

- During Anaphase, the centromeres split and chromatids separate.
- Terminalisation of chiasmata takes place during diakinesis.
- Nucleolus, golgi complex and ER are reformed during telophase.
- Crossing over takes place between non-sister chromatids of homologous chromosomes.

196. Given below are two statements:

Statement I : During G_0 phase of cell cycle, the cell is metabolically inactive.

Statement II : The centrosome undergoes duplication during S phase of interphase.

In the light of the above statements, choose the **most appropriate** answer from the options given below:

- (1) **Statement I** is correct but **Statement II** is incorrect.
- (2) **Statement I** is incorrect but **Statement II** is correct.
- (3) Both **Statement I** and **Statement II** are correct
- (4) Both **Statement I** and **Statement II** are incorrect.

Answer (2)

Sol. Cells in the G_0 stage remain metabolically active but no longer proliferate unless called on to do so depending on the requirement of the organism.

In animal cells, during the S-phase, DNA replication begins in the nucleus, and the centrosome duplicates in the cytoplasm.

197. Which of the following statements are correct regarding skeletal muscle?
- Muscle bundles are held together by collagenous connective tissue layer called fascicle.
 - Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.
 - Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.
 - M line is considered as functional unit of contraction called sarcomere.

Choose the **most appropriate** answer from the options given below:

- A, C and D only
- C and D only
- A, B and C only
- B and C only

Answer (4)

Sol. Option (4) is the correct answer because statements B and C are only correct statements while A and D are incorrect statements.

Muscle bundles are held together by collagenous connective tissue layer called fascia. Muscle bundles are called fascicles. The portion of the myofibril between two successive 'Z' lines is considered as functional unit of contraction called sarcomere.

198. Match **List I** with **List II**.

List I

- Logistic growth
- Exponential growth
- Expanding age pyramid
- Stable age pyramid

List II

- Unlimited resource availability condition
- Limited resource availability condition
- The percent individuals of pre-reproductive age is largest followed by reproductive and post reproductive age groups
- The percent individuals of pre-reproductives and reproductive age group are same

Choose the **correct** answer from the options given below:

- A-II, B-IV, C-I, D-III
- A-II, B-IV, C-III, D-I
- A-II, B-I, C-III, D-IV
- A-II, B-III, C-I, D-IV

Answer (3)

Sol. Logistic growth occurs when there is limited resource availability condition.

Exponential growth occurs when there is unlimited resource availability condition.

Expanding age pyramid reflects growing population where the percent individuals of pre-reproductive age is largest followed by reproductive and post-reproductive age groups.

Stable age pyramid shows stable population where the percent individuals of pre-reproductive and reproductive age group are same.

199. Match **List I** with **List II**.

List I

- Mast cells
- Inner surface of bronchiole
- Blood
- Tubular parts of nephron

List II

- Ciliated epithelium
- Areolar connective tissue
- Cuboidal epithelium
- Specialised connective tissue

Choose the **correct** answer from the options give below:

- A-II, B-I, C-IV, D-III
- A-III, B-IV, C-II, D-I
- A-I, B-II, C-IV, D-III
- A-II, B-III, C-I, D-IV

Answer (1)

Sol. Option (1) is the correct answer because,

- Areolar connective tissue contains fibroblasts (cells that produce and secrete fibres), macrophages and mast cells.
- Inner surface of bronchioles is lined by ciliated epithelium.
- Blood is a specialised connective tissue.
- Tubular parts of nephron are lined by cuboidal epithelium.

200. In cockroach, excretion is brought about by-

- A. Phallic gland
- B. Urecose gland
- C. Nephrocytes
- D. Fat body
- E. Collateral glands

Choose the **correct** answer from the options given below :

- (1) B, C and D only
- (2) B and D only
- (3) A and E only
- (4) A, B and E only

Answer (1)

Sol. Option (1) is the answer because,

In cockroach, excretion is brought about by Malpighian tubules, fat body, nephrocytes and urecose glands.

Urecose glands are present in male cockroach of some species. They synthesise uric acid. Nephrocytes are large, colourless, ovoid, binucleate cells attached to the dorsal diaphragm in the body cavity. Fat body accumulates, produces and stores uric acid.

Phallic gland is the structure of male reproductive system of cockroach and it secretes the outer layer of spermatophore. Collateral gland is the structure of female reproductive system of cockroach and it secretes the hard egg-case or ootheca around fertilised eggs.

