DATE: 21/06/2026

Test Booklet Code

80

SUSHRUT

Aakash
Medical | IIT-JEE | Foundations

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Sector-18, Udyog Vihar, Gurugram, Haryana - 122015.

Answers & Solutions for NEET (UG)-2026 (Re-Examination)

Time : 3 hrs. 15 min.

M.M. : 720

Important Instructions:

1. The test is of **3 hours 15 minutes** duration and the Test Booklet contains **180** multiple choice questions (Four options with a single correct answer) from **Physics, Chemistry & Biology (Botany** and **Zoology).**
2. Each question carries **4 marks**. For each correct response, the candidate will get **4 marks**. For each incorrect response, **1 mark** will be deducted from the total scores. The maximum marks are **720**.
3. Use **Blue / Black Ball Point Pen only** for writing particulars on this page / marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate **must handover the Answer Sheet (original & office copy) to the Invigilator** before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The **CODE** for this Booklet is **80**.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
8. Each candidate must show on-demand his/her Admit Card to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the **Test Booklet** and **Answer Sheet** shall be detached under any circumstances.
13. The candidates will write the Correct Test Booklet Code as given in the Test Booklet / Answer Sheet in the Attendance Sheet.

BIOLOGY

91. The number of vertebrae in a human is _____.

(1) 12 (2) 26

(3) 206 (4) 7

Answer (2)

Sol. The number of vertebrae in adult human is 26.

92. Which one of the following statements is **incorrect**?

(1) α-cells of pancreas secrete insulin

(2) Glucagon stimulates glycogenolysis

(3) β-cells of pancreas secrete insulin

(4) α-cells of pancreas secrete glucagon

Answer (1)

Sol. The two main types of cells in the Islet of Langerhans are called α-cells and β-cells.

The α-cells secrete a hormone called glucagon, while the β-cells secrete insulin.

Glucagon stimulates glycogenolysis while insulin stimulates glycogenesis.

93. Given below are two statements:

Statement I : The class name Reptilia refers to creeping or crawling mode of locomotion.

Statement II : All organisms belonging to Reptilia have three chambered heart.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (2)

Sol. The class Reptilia refers to their creeping or crawling mode of locomotion. Heart is usually three-chambered, but four-chambered in crocodiles.

So, All organisms belonging to class Reptilia does not possess three chambered heart.

94. Which of the following statements related to pituitary gland are **correct**?

(a) It is divided anatomically into adenohypophysis and neurohypophysis

(b) It secretes follicle stimulating hormone

(c) It secretes melanocyte stimulating hormone

(d) It does not secrete prolactin

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

(1) (a), (b) and (c) only (2) (c) and (d) only

(3) (b) and (c) only (4) (a) and (b) only

Answer (1)

Sol. Adenohypophysis of pituitary gland also secrets prolactin.

95. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Starch	I.	Fights infection
B.	Antibody	II.	Energy storage
C.	Concanavalin A	III.	Glucose transport
D.	Glut-4	IV.	Lectin

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

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

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

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

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

Answer (1)

Sol. Starch → Energy storage

Antibody → Fights infection

Concanavalin A → Lectin

Glut-4 → Glucose transport

96. In water, frogs respire using _____.

(1) buccal cavity

(2) lungs

(3) trachea

(4) skin

Answer (4)

Sol. Frogs respire on land and in water by different methods. In water, skin acts as aquatic respiratory organ (cutaneous respiration). Dissolved oxygen in the water is exchanged through the skin by diffusion. On land, the buccal cavity, skin and lungs act as the respiratory organs.

97. Match **List-I** with **List-II.**

	List-I		**List-II**
A.	Cristae	I.	Flat membrane sacs in stroma of chloroplast
B.	Cisternae	II.	Infoldings in mitochondria
C.	Thylakoids	III.	Cell membrane
D.	Phospholipid	IV.	Disc shaped sacs in the Golgi apparatus

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

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

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

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

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

Answer (1)

Sol. Following are the correct matches:

A.	Cristae	II.	Infoldings in mitochondria
B.	Cisternae	IV.	Disc shaped sacs in the Golgi apparatus
C.	Thylakoids	I.	Flat membrane sacs in stroma of chloroplast
D.	Phospholipid	III.	Cell membrane

98. Phyllotaxy is the pattern of arrangement of _____.

(1) flowers

(2) fruits

(3) sepals

(4) leaves

Answer (4)

Sol. Phyllotaxy is the pattern of arrangement of leaves on the stem.

99. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Spherical	I.	Vibrio
B.	Rod	II.	Cocci
C.	Comma	III.	Spirilla
D.	Spirillum	IV.	Bacilli

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

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

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

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

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

Answer (3)

Sol. Bacteria are grouped under four categories based on their shape :

Spherical → Coccus

Rod-shaped → Bacillus

Comma-shaped → Vibrium

Spiral → Spirillum

100. Arrange the following elements in descending order of their contribution to percentage weight of the human body.

(a) Oxygen

(b) Carbon

(c) Hydrogen

(d) Nitrogen

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

(1) (c), (a), (b), (d) (2) (b), (c), (d), (a)

(3) (b), (a), (c), (d) (4) (a), (b), (c), (d)

Answer (4)

Sol. The arrangement of elements in descending order of their contribution to percentage weight of the human body is

Oxygen (65%) → Carbon (18.5%) → Hydrogen (9.5%) → Nitrogen (3.3%)

101. Length of the stem at time 0 is 20 cm. The arithmetic growth rate is 30 cm per day. What is the length of the stem at the end of the 7^{th} day?

(1) 170 cm

(2) 230 cm

(3) 460 cm

(4) 50 cm

Answer (2)

Sol. Arithmetic growth can be expressed as :

$L_t = L_0 + rt$ [where, L_t = length at time 't', L_0 = Length at time 'zero', r = growth rate]

$L_{7th\ day} \Rightarrow 20 + 30 \times 7$

$\Rightarrow 20 + 210$

$\Rightarrow 230$ cm

The length of the stem at the end of 7^{th} day is 230 cm.

102. Given below are two statements:

Statement I: In gymnosperms, the male and female gametophytes remain within the sporangia.

Statement II: In gymnosperms, seeds are not covered.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (4)

Sol. In gymnosperm, the male and female gametophytes do not have an independent free-living existence. They remain within sporangia, retained on the sporophyte.

In gymnosperms the ovules are not enclosed by any ovary wall and remain exposed, both before and after fertilisation. The seeds that develop post fertilisation, are not covered, i.e., naked.

103. Smooth endoplasmic reticulum _____ .

(1) is the major site for the synthesis of lipids

(2) is actively involved in protein synthesis

(3) is a site for the synthesis of carbohydrates

(4) has ribosomes attached to its surface

Answer (1)

Sol. The Smooth Endoplasmic Reticulum (SER) is responsible for synthesis of lipids as well as steroidal hormones. It is not associated with ribosomes and hence appears smooth.

Rough endoplasmic reticulum is actively involved in protein synthesis. Carbohydrate synthesis occurs in chloroplasts.

104. Which of the following is **not** a characteristic of chordates?

(1) Central nervous system is dorsal

(2) Absence of gills

(3) Presence of post anal part (tail)

(4) Presence of notochord

Answer (2)

Sol. The members of phylum Chordata shows following features at any stage of life.

(1) Presence of notochord

(2) Pharynx perforated by gill slits

(3) Dorsal, hollow and single central nervous system

(4) Ventral heart

(5) A post-anal tail

Gill slits are absent in non-chordates.

105. How many molecules of pyruvic acid are produced at the end of glycolysis from 206 molecules of glucose?

(1) 309 (2) 103

(3) 412 (4) 206

Answer (3)

Sol. Two molecules of pyruvic acid are formed at the end of glycolysis from one molecule of glucose.

From 206 molecules of glucose, 412 molecules of pyruvic acid are formed.

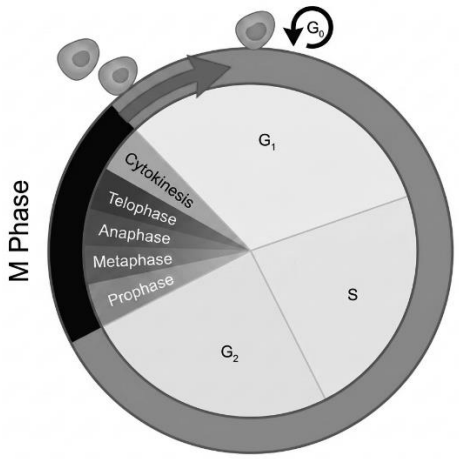
106. The correct sequence of adult cell cycle phases is _____.

(1) G1-M-G2-S (2) G1-S-G2-M

(3) S-M-G2-G1 (4) G1-G2-S-M

Answer (2)

Sol. Gap1 phase is the first phase of interphase. After Gap1 phase, synthesis phase starts in which DNA replicates, then Gap2 phase occur and finally cell cycle ends with M phase (mitosis).



107. Which of the following represents the correct sequence of arrangement of bones in the lower limb of humans?

(1) Patella-femur-tibia-tarsal

(2) Femur-patella-tibia-tarsal

(3) Femur-tarsal-patella-tibia

(4) Femur-tibia-patella-tarsal

Answer (2)

Sol. Each hindlimb consists of 30 bones.

- The bones of the lower limb is femur (thigh bone), A cup shaped bone called patella cover the knee ventrally (knee cap), tibia and fibula, tarsals (ankle bones), metatarsals and phalanges.
- So, the correct sequence of arrangement of bones in the lower limb of humans will be Femur - patella - tibia -tarsal.

108. Cell theory was formulated by _____.

(1) Robert Brown

(2) Singer and Nicolson

(3) Antonie Von Leeuwenhoek

(4) Schleiden and Schwann

Answer (4)

Sol. Cell theory was formulated by Schleiden and Schwann.

109. Given below are two statements :

Statement I : Chromosomes are fully condensed at the end of prophase I.

Statement II : Meiosis I resembles mitosis.

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

(1) Both **Statement I** and **Statement II** are false

(2) **Statement I** is correct, but **Statement II** is false

(3) **Statement I** is incorrect, but **Statement II** is true

(4) Both **Statement I** and **Statement II** are true

Answer (2)

Sol. The final stage of meiotic prophase-I is diakinesis. So, at the end of prophase-I the chromosomes are fully condensed and the meiotic spindle is assembled to prepare the homologous chromosomes for separation. So, Statement I is correct.

Meiosis II resembles mitosis as it is an equational division.

110. Which of the following statements regarding photorespiration are correct?

(a) Do not occur in C3 plants

(b) CO_2 is consumed and O_2 is generated

(c) Phosphoglycolate is formed

(d) No synthesis of ATP and NADPH

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

(1) (c) and (d) only

(2) (b) and (d) only

(3) (a) and (b) only

(4) (a) and (d) only

Answer (1)

Sol.
- Photorespiration can occur in C3 plants.
- In photorespiration, O_2 is consumed and CO_2 is released.
- Phosphoglycolate is formed as the initial product.
- There is no synthesis of ATP and NADPH in photorespiration.

111. Which of the following are characteristics of prokaryotic cells?

(a) Ribosomes are made of 50S and 30S subunits

(b) They can have plasmids

(c) They contain mesosome

(d) They have peroxisomes

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

(1) (a) and (c) only

(2) (a), (c) and (d) only

(3) (a), (b) and (c) only

(4) (b) and (c) only

Answer (3)

Sol. The following are characteristics of prokaryotic cells.

- Ribosomes are made of 50S and 30S subunits (70S Ribosomes)
- They can have plasmids (Extra chromosomal DNA)
- They contain mesosome (Infoldings of plasma membrane)
- They do not possess membrane bound organelles such as peroxisomes.

112. The number of action potentials generated by sino-atrial node (SAN) in a healthy human is _____ per minute.

(1) 70 – 75

(2) 100 – 110

(3) 120 - 140

(4) 28 - 30

Answer (1)

Sol. The number of action potentials generated by sino-atrial node (SAN) in a healthy human is 70 – 75 per minute.

113. Endomembrane system includes _____.

(1) endoplasmic reticulum, chloroplast, peroxisomes and vacuole

(2) mitochondria, chloroplast, peroxisomes and vacuole

(3) Golgi complex, chloroplast, peroxisomes and vacuole

(4) endoplasmic reticulum, Golgi complex, lysosomes and vacuole

Answer (4)

Sol. Endomembrane system includes organelles whose functions are coordinated. It includes total four organelles, namely Endoplasmic reticulum, Golgi body, vacuole and lysosomes.

114. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Family	I.	Sapindales
B.	Genus	II.	Dicotyledonae
C.	Class	III.	Anacardiaceae
D.	Phylum	IV.	Angiospermae
E.	Order	V.	*Mangifera*

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

(1) A-II, B-I, C-III, D-IV, E-V

(2) A-II, B-III, C-V, D-I, E-IV

(3) A-III, B-V, C-II, D-IV, E-I

(4) A-I, B-V, C-II, D-IV, E-III

Answer (3*) (Conceptual errata)

Sol. *Mangifera* represents Genus, Anacardiaceae represents family, Sapindales represents order, Dicotyledonae represents class, Phylum Angiospermae [correct should be division]

115. Which of the following plant growth regulators promotes internode elongation prior to flowering in cabbage?

(1) Gibberellin

(2) Indole butyric acid

(3) Ethephon

(4) Abscisic acid

Answer (1)

Sol. Gibberellin promotes internode elongation prior to flowering in cabbage.

116. The plastid that stores xanthophyll is known as _____.

(1) chromoplast
(2) aleuroplast
(3) amyloplast
(4) chloroplast

Answer (1)

Sol. The plastid that stores xanthophyll is known as chromoplast.

117. Photorespiration reaction catalyzed by RuBisCo is shown below:

$RuBP + O_2 \rightarrow 3\text{-Phosphoglycerate} + X.$

Identify "X" from the given options:

(1) 2-Phosphoglycolate
(2) Oxaloacetate
(3) Malate
(4) Phosphoenolpyruvate

Answer (1)

Sol. During the process of photorespiration, RuBP binds with O_2 and RuBP instead of being converted to 2 molecules of PGA, forms one molecule each of phosphoglycerate and phosphoglycolate.

Hence, in the given reaction, the "X" is 2-phosphoglycolate.

118. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Marginal placentation	I.	*Argemone*
B.	Axile placentation	II.	Tomato
C.	Parietal placentation	III.	*Primrose*
D.	Free central placentation	IV.	Pea

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

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

Answer (3)

Sol. Marginal placentation – Pea
Axile placentation – Tomato
Parietal placentation – *Argemone*
Free central placentation – *Primrose*

119. Which of the following are characteristic features of Solanaceae family?

(a) Flowers are bisexual and actinomorphic
(b) Calyx have five sepals and are united
(c) Androecium have five stamens and are epipetalous
(d) Ovary is inferior

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

(1) (d) only

(2) (a) and (b) only

(3) (b), (c) and (d) only

(4) (a), (b) and (c) only

Answer (4)

Sol. In Solanaceae family, flowers are bisexual and actinomorphic. Calyx include five sepals that are united. Androecium include five stamens and it is epipetalous. Ovary is superior.

120. Which pigment has absorption peak at 700 nm in the photosynthetic reaction centre PS I (P700)?

(1) Chlorophyll a

(2) Xanthophylls

(3) Carotenoids

(4) Chlorophyll b

Answer (1)

Sol. In PSI, the reaction centre chlorophyll *a* has an absorption peak at 700 nm and hence, is called P_{700}.

121. Mitochondrial inner membrane encloses _____ .

(1) cytosol

(2) mucus

(3) aqueous humor

(4) matrix

Answer (4)

Sol. Mitochondrial inner membrane encloses matrix.

122. Which of the following statements is **incorrect**?

(1) Blood clot consists of fibrins

(2) Fibrin is produced from fibrinogen

(3) Fibrinogen is produced from fibrin

(4) Blood coagulates in response to an injury

Answer (3)

Sol. Fibrins are formed by the conversion of inactive fibrinogen in the plasma by the enzyme thrombin.

123. Symbiotic association between fungi and algae are called _____.

(1) sponges

(2) mycorrhiza

(3) chrysophytes

(4) lichens

Answer (4)

Sol. Lichens are symbiotic associations *i.e.* mutually useful associations, between algae and fungi. Mycorrhiza are associations between fungi and roots of higher plants.

124. Which of the following is **not** a part of human central neural system?

(1) Dura mater

(2) Pia mater

(3) Pericardium

(4) Arachnoid

Answer (3)

Sol. Pericardium is a double walled membranous bag that protects the heart.

Arachnoid, dura mater and pia mater are meninges, which cover the brain inside the skull.

125. Which of the following plant growth regulators is used as herbicide?

(1) Kinetin

(2) Abscisic acid

(3) Gibberellin

(4) 2, 4-D

Answer (4)

Sol. 2, 4-D is an artificial auxin, which is widely used as herbicide.

126. How many turns of Calvin cycle are required for the formation of three molecules of glucose?

(1) 3

(2) 1

(3) 18

(4) 6

Answer (3)

Sol. To make one molecule of glucose 6 turns of the cycle are required.

Therefore, for the formation of three molecules of glucose, $6 \times 3 = 18$, turns of Calvin cycle are required.

127. Arrange the following taxonomic categories in ascending order.

(a) Genus

(b) Class

(c) Order

(d) Phylum

(e) Family

(f) Kingdom

(g) Species

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

(1) (a), (c), (d), (g), (f), (b), (e)

(2) (g), (c), (d), (b), (e), (a), (f)

(3) (f), (c), (b), (g), (d), (e), (a)

(4) (g), (a), (e), (c), (b), (d), (f)

Answer (4)

Sol. The following is the arrangement of taxonomic categories in ascending order.

Species (g), Genus (a), Family (e), Order (c), Class (b), Phylum (d), Kingdom (f).

128. In frogs, the number of pairs of cranial nerves arising from the brain are _____.

(1) 9 (2) 10

(3) 12 (4) 6

Answer (2)

Sol. In frogs, there are ten pairs of cranial nerves arising from the brain.

129. Select the correct sequence of experiments that led to a gradual understanding of photosynthesis in green plants.

(1) Role of air → release of oxygen → production of glucose → absorption spectra of chlorophyll a and b

(2) Release of oxygen → production of glucose → absorption spectra of chlorophyll a and b → role of air

(3) Production of glucose → role of air → release of oxygen → absorption spectra of chlorophyll a and b

(4) Absorption spectra of chlorophyll a and b → production of glucose → release of oxygen → role of air

Answer (1)

Sol. Following is the appropriate sequence of experiments that led to a gradual understanding of photosynthesis in green plants.

Role of air in Glucose (Joseph Priestley's bell jar experiment) 1770

↓

Release of oxygen (Jan Ingenhousz's experiment using aquatic plant)

↓

Production of Glucose (Julius Von Sach's experiment) 1854

↓

Absorption spectra of chlorophyll a and b (T.W. Engelmann's experiment)

130. Sphenopsida class belongs to _____.

(1) angiosperms (2) gymnosperms

(3) pteridophytes (4) bryophytes

Answer (3)

Sol. Sphenopsida class belongs to pteridophytes.

131. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Fusion of protoplasms between gametes	I.	Meiosis
B.	Fusion of two nuclei	II.	Plasmogamy
C.	Generation of haploid spores	III.	Karyogamy

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

(1) A-II, B-I, C-III (2) A-III, B-II, C-I

(3) A-I, B-III, C-II (4) A-II, B-III, C-I

Answer (4)

Sol. Karyogamy involve fusion of two nuclei.

Plasmogamy is fusion of protoplasm.

Meiosis leads to the production of haploid spores.

132. Which of the following is **not** a prokaryote?

(1) Blue green algae

(2) Mycoplasma

(3) Fungi

(4) Bacteria

Answer (3)

Sol. The prokaryotic cells are represented by bacteria, blue-green algae, Mycoplasma and PPLO. Fungi are eukaryotic organisms.

133. Given below are two statements :

Statement I : When any plane passing through the central axis of the body divides the organism into two identical halves, it is called radial symmetry.

Statement II : In phylum Echinodermata, both adults and larvae are radially symmetrical.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (2)

Sol. When any plane passing through the central axis of the body divides the organism into two identical halves, it is called radial symmetry. The members of the phylum Echinodermata exhibits radial or bilateral symmetry depending on the stage.

Adult echinoderms are radially symmetrical while larval echinoderms are bilaterally symmetrical.

134. Genus represents _____.

(1) a population of plants and animals

(2) a group of closely related species

(3) a group of closely related families

(4) an individual plant or animal

Answer (2)

Sol. Genus comprises a group of related species which has more characters in common in comparison to species of other genera.

135. Mad cow disease is caused by _____.

(1) viroids

(2) *Aspergillus sp.*

(3) *Mycoplasma sp.*

(4) prions

Answer (4)

Sol. Mad cow disease is caused by prions.

136. The opening between the right atrium and the right ventricle is guarded by _____.

(1) tricuspid valve

(2) semilunar valve

(3) sino-atrial node

(4) bicuspid valve

Answer (1)

Sol. The opening between the right atrium and the right ventricle is guarded by a valve formed of three muscular flaps or cusps, called the tricuspid valve.

A bicuspid/mitral valve guards the opening between the left atrium and the left ventricle.

The openings of the right and the left ventricles into the pulmonary artery and the aorta, respectively, are provided with the semilunar valves.

137. The inactive form of Bt toxin is converted to the active form in the insect gut _____

(1) due to acidic pH

(2) by proteases

(3) by nucleases

(4) due to alkaline pH

Answer (4)

Sol. Bt toxin protein exists as inactive protoxins, but once an insect ingests the inactive toxin, it is converted into an active form of toxin due to the alkaline pH of the gut which solubilises the crystals.

138. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Transformation	I.	Restriction enzyme
B.	Cloning site	II.	Transfer DNA to host bacteria
C.	Selection	III.	Replication
D.	Ori	IV.	Antibiotic

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

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

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

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

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

Answer (4)

Sol.

- Transformation – Transfer of DNA to the host bacteria
- Cloning site – It is a segment of DNA within a plasmid vector that contains multiple unique recognition sequences for restriction enzymes.
- Selection – Antibiotics help in the selection of recombinants.

Ori – Specific DNA sequence where the host cell's replication machinery begins duplicating the plasmid.

139. How many theca are present in each lobe of a typical bilobed angiosperm anther?

(1) 6 (2) 8

(3) 12 (4) 2

Answer (4)

Sol. A typical anther is bilobed with each lobe having two theca i.e. they are dithecous.

140. Which of the following hormone is **not** secreted by human placenta?

(1) Estrogen (2) Progesterone

(3) LH (4) hCG

Answer (3)

Sol. The placenta acts as a temporary endocrine gland during pregnancy, secreting several vital hormones essential for fetal development and maintenance of pregnancy.

Several hormones produced by placenta are human chorionic gonadotropin (hCG), human placental lactogen (hPL), estrogen, progestogens, etc.

Luteinizing hormone (LH) is secreted by anterior pituitary.

141. Sperm motility is due to _____.

(1) ciliary movement (2) amoeboid movement

(3) muscular movement (4) flagellar movement

Answer (4)

Sol. Sperm travels across the fallopian tube *via* flagellar movement.

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

Assertion A : In an experiment, Mendel observed that the F1 progeny plants are all tall and none are dwarf.

Reason R : Stem height is a contrasting trait, with tall being dominant and dwarf being recessive.

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

(1) Both **A** and **R** are correct but **R** is not the correct explanation of **A**

(2) **A** is correct but **R** is not correct

(3) **A** is not correct but **R** is correct

(4) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer (4)

Sol. Mendel crossed tall and dwarf plants and observed that all the F_1 progeny plants are tall.

The trait 'T' or tall is said to be dominant over the other allele 't' or 'dwarf' trait.

It is thus due to this dominance of one trait over the other that all the F_1 are tall.

143. During PCR, primers bind to the DNA strands in the _____step.

(1) extension (2) annealing

(3) ligation (4) denaturation

Answer (2)

Sol. PCR involves three steps, *i.e.* denaturation, annealing and extension.

During PCR, primers bind to the DNA strands in the annealing step.

144. Which of the following plant produces non-albuminous seeds?

(1) Maize

(2) Barley

(3) Pea

(4) Wheat

Answer (3)

Sol.

Non-albuminous seeds have no residual endosperm as it is completely consumed during embryo development. E.g. Pea.

Wheat, maize and barley are the examples of albuminous seeds.

145. For a person with blood group 'O', which of the following is **not** a possible combination of parents' blood group genotypes?

(1) Father : I^Ai and Mother : I^Ai

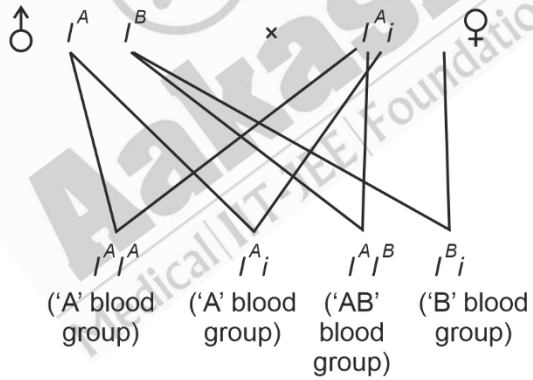
(2) Father : I^Bi and Mother : I^Bi

(3) Father : I^AI^B and Mother : I^Ai

(4) Father : I^Ai and Mother : I^Bi

Answer (3)

Sol. When I^A and I^B are present together they both express their own type of sugars.



This combination of parent blood group are not possible for a person with blood group 'O'.

For a child to have type 'O' blood, both biological parents must carry the recessive 'O' allele and pass it down.

146. Which of the following is used as a clot buster?

(1) Penicillin

(2) Cyclosporin A

(3) Statins

(4) Streptokinase

Answer (4)

Sol. Streptokinase produced by the bacterium *Streptococcus* and modified by genetic engineering is used as a 'clot-buster' for removing clots from the blood vessels of patients who have undergone myocardial infarction leading to heart attack.

147. Arrange the following in descending order of number of species in the Amazonian rain forest.

(a) Plants

(b) Birds

(c) Fishes

(d) Invertebrates

(e) Mammals

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

(1) (d) > (a) > (c) > (b) > (e)

(2) (e) > (b) > (a) > (c) > (d)

(3) (b) > (a) > (d) > (c) > (e)

(4) (c) > (b) > (d) > (e) > (a)

Answer (1)

Sol. The Amazonian rain forest is home to more than 40,000 species of plants, 3,000 of fishes, 1300 of birds, 427 of mammals, 378 of reptiles and of more than 1,25,000 invertebrates.

Hence the correct decreasing order would be

(d) > (a) > (c) > (b) > (e)

148. Given below are two statements :

Statement I : Plasmids are autonomously replicating DNA.

Statement II : Plasmids are extrachromosomal DNA.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (4)

Sol. Plasmids are used as cloning vectors in genetic engineering.

- Plasmids are autonomously replicating circular extra chromosomal DNA.
- They have ability to replicate within bacterial cells independent of the control of its chromosomal DNA

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

Assertion A : Forelimbs of human and bats are homologous.

Reason R : Forelimbs of humans and bats have similar anatomical structure.

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

(1) Both **A** and **R** are true, but **R** is not the correct explanation of **A**

(2) **A** is true but **R** is false

(3) **A** is false but **R** is true

(4) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer (4)

Sol. Forelimbs of bats and humans share similarities in the pattern of bone arrangement.

Though their forelimbs perform different functions, they have similar anatomical structure, as all of them have humerus, radius, ulna, carpals, metacarpals and phalanges in their forelimbs.

Hence, in these animals, the same structure developed along different directions due to adaptation to different needs. This is divergent evolution, and these structures are homologous.

150. Which of the following statements about the reabsorption process in Henle's loop are **correct**?

(a) The descending limb of Henle's loop is permeable to water but almost impermeable to electrolytes.

(b) Urine gets concentrated in Henle's loop.

(c) Reabsorption of Na^+ and water takes place in Henle's loop.

(d) Active or passive transport of electrolytes occurs in the ascending limb of Henle's loop.

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

(1) (b), (c) and (d) only (2) (a), (b) and (c) only

(3) (a), (b) and (d) only (4) (a) and (b) only

Answer (*)

Sol. None of the given options are correct

151. Which of the following are secondary lymphoid organs?

(a) Bone marrow (b) Tonsils

(c) Spleen (d) Thymus

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

(1) (b) and (c) only (2) (b) and (d) only

(3) (a) and (d) only (4) (a) and (b) only

Answer (1)

Sol. Bone marrow and thymus are primary lymphoid organs while tonsils, spleen are secondary lymphoid organs.

152. Which of the following is the **correct** order of arrangement of vertebrate column from the head to toe?

(1) Sacrum, lumbar vertebra, thoracic vertebra, cervical vertebra

(2) Cervical vertebra, lumbar vertebra, thoracic vertebra, sacrum

(3) Cervical vertebra, thoracic vertebra, lumbar vertebra, sacrum

(4) Cervical vertebra, thoracic vertebra, sacrum, lumbar vertebra

Answer (3)

Sol. The vertebral column is formed by 26 serially arranged units called vertebrae and is dorsally placed.

The vertebral column is differentiated into cervical (7), thoracic (12), lumbar (5), sacral (1-fused) and coccygeal (1-fused) regions starting from the skull.

So, the correct sequence will be : Cervical, thoracic, lumbar, sacrum and coccyx.

153. If the diploid chromosome number of typical angiosperm is 36, what would be the chromosome number in its endosperm?

(1) 36 (2) 54

(3) 72 (4) 18

Answer (2)

Sol. The endosperm is triploid, if the diploid chromosome number of typical angiosperm is 36

i.e. $2n = 36$ then $n = 18$

So, $3n = n + n + n$

$= 18 + 18 + 18$

$= 54$

154. Sponges exchange O_2 with CO_2 by _____.

(1) moist cuticle

(2) tracheal tubes

(3) gills

(4) simple diffusion over their entire body surfaces

Answer (4)

Sol. Mechanisms of breathing vary among different groups of animals depending mainly on their habitats and levels of organisation.

Lower invertebrates like sponges, coelenterates, flatworms, *etc.*, exchange O_2 with CO_2 by simple diffusion over their entire body surfaces. Earthworms use their moist cuticle and insects have a network of tubes (tracheal tubes) to transport atmospheric air within the body.

Gills are used by most of the aquatic arthropods and molluscs.

155. Which of the following disease is **not** sexually transmitted?

(1) Tuberculosis (2) Gonorrhoea

(3) Genital warts (4) Syphilis

Answer (1)

Sol. Genital warts, syphilis and gonorrhoea are sexually transmitted diseases.

Genital warts is caused by Human papilloma virus.

Syphilis is caused by *Treponema pallidum*.

Gonorrhoea is caused by *Neisseria gonorrhoeae*.

Tuberculosis is caused by *Mycobacterium tuberculosis*.

This disease spreads through air.

156. Which of the following in female gametophyte of an angiosperm helps in guiding the pollen tube for fertilizing the eggs?

(1) Synergids (2) Central cells

(3) Polar nucleus (4) Antipodals

Answer (1)

Sol. Synergids guide the entry of pollen tube for fertilizing the eggs, in a typical angiospermic embryo sac.

157. Match **List-I** with **List-II**.

List-I	**List-II**
(A) Excess growth hormone	(I) Reabsorption of water and electrolytes in kidney
(B) Luteinizing hormone	(II) Contraction of uterus during child birth
(C) Vasopressin	(III) Acromegaly
(D) Oxytocin	(IV) Ovulation

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

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

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

Answer (1)

Sol. Excess growth hormone → Acromegaly

Luteinizing hormone → Ovulation

Vasopressin → Reabsorption of water and electrolytes in kidneys

Oxytocin → Contraction of uterus during child birth.

158. The covering of ovum at ovulation is _____.

(1) zona radiata

(2) zona pellucida

(3) chorion

(4) endometrium

Answer (2)

Sol. The Graafian follicle ruptures to release the secondary oocyte (ovum) from the ovary by the process called ovulation.

The secondary oocyte forms a membrane called zona pellucida surrounding it.

Endometrium is the innermost layer of uterine wall.

Chorion is the outermost extraembryonic membrane that surrounds the embryo.

159. Match **List-I** with **List-II**.

	List-I		**List-II**
A.	Both species are harmed	I.	Predation
B.	One species is harmed and the other is benefited	II.	Mutualism
C.	Both species are benefited	III.	Competition
D.	One is benefited while the other has no effect	IV.	Commensalism

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

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

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

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

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

Answer (3)

Sol. Both species are harmed in competition.

One species is harmed and the other is benefited in predation.

Both species are benefited in mutualism.

One species is benefited while the other has no effect in commensalism.

160. Which of the following structure is **not** a part of the male reproductive system?

(1) Epididymis

(2) Vasa efferentia

(3) Infundibulum

(4) Rete testis

Answer (3)

Sol. The male sex accessory ducts include rete testis, vasa efferentia, epididymis and vas deferens.

The oviducts, uterus and vagina constitute the female accessory ducts.

Infundibulum is the part of oviduct.

161. Which of the following are primary consumers in a food chain?

(1) Predators

(2) Herbivores

(3) Carnivores

(4) Parasites

Answer (2)

Sol. Primary consumers in a food chain are the herbivores.

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

Assertion A : Abingdon tortoise in Galapagos islands became extinct within a decade after goats were introduced.

Reason R : Goats were more efficient at browsing than Abingdon tortoise.

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

(1) Both **A** and **R** are correct but **R** is not the correct explanation of **A**

(2) **A** is correct but **R** is not correct

(3) **A** is not correct but **R** is correct

(4) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer (4)

Sol. Abingdon tortoise in Galapagos islands became extinct within a decade after goats were introduced on the island, apparently due to the greater browsing efficiency of the goats.

163. Which of the following statements about *lac*-operon is **correct**?

(1) Lactose activates repressor to bind to the operator

(2) Genes *i*, *z*, *y* and *a* share single common promoter

(3) Galactose can act as an inducer of lac operon

(4) Gene *i* is constitutively expressed

Answer (4)

Sol. Galactose cannot act as an inducer of *lac* operon. Gene *i* is constitutively expressed in *lac* operon. Repressor binds to the operator when the lactose is not available. Genes *z*, *y* and *a* are structural genes and have a different promoter than that of the *i* gene.

164. Which of the following statements is **correct** about *Plasmodium*?

(1) Reproduces sexually in RBCs

(2) Gametocytes develop in mosquito gut

(3) Fertilization takes place in mosquito gut

(4) Reproduces sexually in liver cells

Answer (3)

Sol. *Plasmodium* reproduces asexually in liver cells. *Plasmodium* parasite reproduce asexually in red blood cells, bursting the RBCs and causing cycles of fever and other symptoms. Released parasites infect new red blood cell. Female *anopheles* mosquito takes up gametocytes with blood meal.

Fertilization and development take place in the mosquito's gut.

Sexual stages of *plasmodium* (gametocytes) develop in RBC.

165. A population of diploid organisms is at Hardy-Weinberg equilibrium. If the frequency of allele A is 0.1, the frequency of AA is _____.

(1) 0.02 (2) 0.10

(3) 0.99 (4) 0.01

Answer (4)

Sol. The frequency of allele A(p) = 0.1

As per the Hardy–Weinberg equilibrium,

Frequency of AA = $p^2 = (0.1)^2 = 0.01$

166. Adaptive radiation in placental mammals and Australian Marsupials leading to similarity between distant species is an example of _____.

(1) convergent evolution (2) founder effect

(3) genetic drift (4) divergent evolution

Answer (1)

Sol. When more than one adaptive radiation appeared to have occurred in an isolated geographical area (representing different habitats), one can call this convergent evolution.

Placental mammals in Australia also exhibit adaptive radiation in evolving into varieties of such placental mammals each of which appears to be 'similar' to a corresponding marsupial.

167. Colostrum, secreted by mother during initial days of lactation, is abundant in _____.

(1) IgM (2) IgA

(3) IgD (4) IgG

Answer (2)

Sol. Colostrum, secreted by the mother during the initial days of lactation, is abundant in IgA antibody.

IgG antibody passes through the placenta and provides natural passive immunity.

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

Assertion A : In recombinant DNA technology, lysozyme is used for disrupting bacterial cells while cellulase is for plant cells.

Reason R : Isolation of genetic material needs disruption of cells.

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

(1) Both **A** and **R** are correct but **R** is not the correct explanation of **A**

(2) **A** is correct but **R** is not correct

(3) **A** is not correct but **R** is correct

(4) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer (4)

Sol. Since, the DNA is enclosed within the membranes, we have to break the cell open to release DNA along with other macromolecules such as RNA, proteins, polysaccharides and also lipids. This can be achieved by treating the bacterial cells/plant or animal tissue with enzymes such as lysozyme (bacteria), cellulase (plant cells), chitinase (fungus).

169. Given below are two statements:

Statement I : Ovulation is caused by LH surge leading to rupture of Graafian follicles.

Statement II : Graafian follicle remaining after ovulation transform into corpus luteum and secretes large amount of estrogen.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (2)

Sol. Rapid secretion of LH leading to its maximum level during the mid-cycle called LH surge induces rupture of Graafian follicle and thereby the release of ovum (ovulation).

The remaining parts of the Graafian follicle transform as the corpus luteum, which secretes large amounts of progesterone.

170. Natural selection can lead to _____.

(a) stabilisation

(b) genetic drift

(c) directional change

(d) disruption

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

(1) (a), (c) and (d) only

(2) (a), (b), (c) and (d)

(3) (a) and (c) only

(4) (a) only

Answer (1)

Sol. Natural selection can lead to stabilization, directional change or disruption. Natural selection is a process in which heritable variations enabling better survival enabled to reproduce and leave greater number of progeny. A critical analysis makes us believe that variation due to mutation or recombination during gametogenesis, or due to gene flow or genetic drift results in changed frequency of genes and alleles in future generation.

171. The method of directly of injecting a sperm into ovum in assisted reproductive technology is called :

(1) Zygote intra fallopian transfer (ZIFT)

(2) Intra cytoplasmic sperm injection (ICSI)

(3) Embryo transfer (ET)

(4) Gamete intra fallopian transfer (GIFT)

Answer (2)

Sol. Intra cytoplasmic sperm injection (ICSI) is a procedure to form an embryo in the laboratory in which a sperm is directly injected into the ovum.

ZIFT (Zygote intra fallopian transfer) involves transfer of the zygote or early embryos with upto 8 blastomeres into the fallopian tube.

GIFT (Gamete intra fallopian transfer) involves transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce one, but can provide suitable environment for fertilisation and further development.

172. Which of the following is used as an effective sedative and painkiller for treating post-surgery patients?

(1) Antibiotics

(2) Morphine

(3) Anti-retroviral drugs

(4) Interferon

Answer (2)

Sol. Morphine is a very effective sedative and painkiller and is very useful in patients who have undergone surgery.

Interferon belongs to cytokine barrier of innate immunity.

Antibiotics are used for restricting the growth of bacteria.

173. Given below are two statements :

Statement I : Down's syndrome is caused by the absence of one of the X-chromosomes.

Statement II : Turner's syndrome is caused by the presence of an additional copy of the chromosomes.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (1)

Sol. The cause of genetic disorder-Down's syndrome is the presence of an additional copy of the chromosome number 21 (Trisomy 21).

The cause of genetic disorder-Turner's syndrome is the absence of one of the X-chromosomes; *i.e.* 45 with X0.

174. Which of the following is **not** evidence for evolution?

(1) Paleontological evidence from fossil records

(2) Embryological support for evolution as proposed by Ernst Heckel

(3) Divergent evolution of anatomical structures such as forelimbs

(4) Convergent evolution of traits like wings of birds and butterflies

Answer (2/4*)

Sol. Divergent evolution of anatomical structures, such as forelimbs, indicate homology.

Homology indicates common ancestry and acts as the evidence of evolution.

When same structure develops along different directions due to adaptation to different needs, they are called homologous structures.

Convergent evolution does not act as the evidence for evolution, because species can develop similar features without a common ancestor.

Fossils are remains of hard parts of life-forms found in rocks.

A study of fossils in different sedimentary layers indicates the geological period in which they existed.

Embryological support for evolution was proposed by Ernst Heckel based upon the observation of certain features during embryonic stage common to all vertebrates that are absent in adult. But later, this proposal was disapproved on careful study performed by Karl Ernst von Baer.

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

Assertion A : The logistic growth model of populations is considered more realistic than the exponential growth model.

Reason R : Resources are finite.

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

(1) Both **A** and **R** are correct but **R** is not the correct explanation of **A**

(2) **A** is correct but **R** is not correct

(3) **A** is not correct but **R** is correct

(4) Both **A** and **R** are correct and **R** is the correct explanation of **A**

Answer (4)

Sol. The logistic growth model of populations is considered more realistic than the exponential growth model because resources are limited/finite in nature.

176. Given below are two statements :

Statement I : Modern *Homo sapiens* arose in Australia and moved across continents.

Statement II : *Homo sapiens* arose around 75000 to 10000 years ago.

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

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

Answer (3)

Sol. *Homo sapiens* arose in Africa and moved across continents and developed into distinct races.

During ice age, between 75,000 – 10,000 years ago, modern *Homo sapiens* arose.

177. Consider a population of 10 million cells. Given the per-capita birth rate of 0.002 (per unit time) and the per-capita death rate of 0.002 (per unit time), the expected number of cells after 10 generations is _____.

(1) 5 million

(2) 10 million

(3) 100 million

(4) 1 million

Answer (2)

Sol. The per-capita birth rate of bacteria is 0.002.

The per-capita death rate of bacteria is 0.002.

The population dynamic equation is

$$\frac{dN}{dt} = (b - d)N$$

Since $r = (b - d) = 0.002 - 0.002 = 0$

$$\frac{dN}{dt} = 0$$

So, the population remains constant at all times. Thus, even after 10 generations, the expected number of cells will be 10 million.

178. Which of the following statements are **Correct ?**

(a) Energy flow from producers to consumers is unidirectional

(b) Energy pyramid can never be inverted

(c) Transfer of energy follows the 1% law

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

(1) (a) and (b) only

(2) (a) and (c) only

(3) (b) and (c) only

(4) (a), (b) and (c)

Answer (1)

Sol. Energy flow is unidirectional. First plants capture solar energy and then, food is transferred from the producers to decomposers.

Pyramid of energy is always upright. It can never be inverted, because when energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

The transfer of energy follows 10 per cent law – only 10 per cent of the energy is transferred to each trophic level from the lower trophic level.

179. Muscle contraction is initiated by a signal sent by the central nervous system by the release of _____ .

(1) acetyl coenzyme A

(2) cyclic guanine monophosphate

(3) cyclic adenine monophosphate

(4) acetyl choline

Answer (4)

Sol. Muscle contraction is initiated by a signal sent by the central nervous system (CNS) *via* a motor neuron.

The junction between a motor neuron and the sarcolemma of the muscle fibre is called the neuromuscular junction or motor-end plate. A neural signal reaching this junction releases a neurotransmitter (Acetylcholine) which generates an action potential in the sarcolemma.

180. Which of the following enzymes synthesizes precursor mRNA?

(1) RNA polymerase II

(2) RNA polymerase III

(3) DNA polymerase

(4) RNA polymerase I

Answer (1)

Sol. The **RNA** polymerase II transcribes precursor of **mRNA,** the heterogeneous nuclear RNA (hnRNA)

❑❑❑