

# NEET 2023 Solutions Code G3

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## Physics Questions & Solutions

**Question 8.** The magnetic energy stored in an inductor of inductance  $4 \mu\text{H}$  carrying a current of  $2 \text{ A}$  is

- (1)  **$8 \mu\text{J}$**
- (2)  $4 \mu\text{J}$
- (3)  $4 \text{ mJ}$
- (4)  $8 \text{ mJ}$

**Answer (1)  $8 \mu\text{J}$**

**Solution.** Energy =  $\frac{1}{2}Li^2$   
 $= \frac{1}{2} \times 4 \times 10^{-6} \times 2^2$   
 $= 8 \times 10^{-6} \text{ J}$   
 $= 8 \mu\text{J}$

**Question 10 .** An ac source is connected to a capacitor  $C$ . Due to decrease in its operating frequency

- (1) Capacitive reactance remains constant
- (2) Capacitive reactance decreases
- (3) Displacement current increases
- (4) **Displacement current decreases**

**Answer (4) Displacement current decreases**

**Solution**  $X_C = \frac{1}{\omega C}$  Since  $\omega$  decreasing  $X_C$  will increase hence current will decrease also

conduction current = displacement current  
Therefore displacement current will decrease.

**Question 11.** The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are

- (1) **Random errors**
- (2) Instrumental errors
- (3) Personal errors
- (4) Least count errors

**Answer (1) Random errors**

**Solution.** The errors which cannot be associated with any systematic or constant cause are called random errors. These errors can arise due to unpredictable fluctuations in experimental conditions. e.g., random change in pressure, temperature, voltage supply etc.

**Question 12.** The angular acceleration of a body, moving along the circumference of a circle, is

- (1) **Along the axis of rotation**
- (2) Along the radius, away from center
- (3) Along the radius towards the center
- (4) Along the tangent to its position

**Answer (1) Along the axis of rotation**

**Solution.** Angular acceleration of a body, moving along the circumference of a circle is along the axis of rotation.

**Question 16.** A Carnot engine has an efficiency of 50% when its source is at a temperature  $327^{\circ}\text{C}$ . The temperature of the sink is

- (1)  $200^{\circ}\text{C}$
- (2)  $27^{\circ}\text{C}$

- (3) 15°C
- (4) 100°C

**Answer (2) 27°C**

**Solution** . The efficiency of Carnot engine,  $\% \eta = (1 - \frac{T_{sink}}{T_{source}} \times 100)$

$$T_{source} = 327^{\circ} C = 600K$$

$$50 = (1 - \frac{T_{sink}}{600})$$

$$\frac{1}{2} = 1 - \frac{T_{sink}}{600}$$

$T_{sink} = 300K$  , So the temperature of the sink is =  $327 - 300 = 27^{\circ} C$

**Question 17.** The net magnetic flux through any closed surface is

- (1) Negative
- (2) **Zero**
- (3) Positive
- (4) Infinity

**Answer (2) Zero**

**Solution**  $\oint B \cdot ds = 0$

Magnetic monopoles don't exist.

Hence net magnetic flux through any closed surface is zero.

**Question 18.** A full wave rectifier circuit consists of two p-n junction diodes, a center-tapped transformer, capacitor and a load resistance. Which of these components remove the ac ripple from the rectified output?

- (1) Load resistance
- (2) A centre-tapped transformer
- (3) p-n junction diodes
- (4) **Capacitor**

#### **Answer (4) Capacitor**

**Solution** . Capacitor removes the ac ripple from rectified output.

**Question 23.** The work functions of Caesium (Cs), Potassium (K) and Sodium (Na) are 2.14 eV, 2.30 eV and 2.75 eV respectively. If incident electromagnetic radiation has an incident energy of 2.20 eV, which of these photosensitive surfaces may emit photoelectrons?

- (1) Na only
- (2) **Cs only**
- (3) Both Na and K
- (4) K only

#### **Answer (2) Cs only**

**Solution.** Energy of incident radiation = 2.80 eV

Work function of Cs  $\rightarrow$  2.14 eV

Work function of K  $\rightarrow$  2.30 eV

Work function of Na  $\rightarrow$  2.75 eV

Since the work function of potassium and sodium are more than energy of incident radiation hence photons may be emitted from caesium.

**Question 30.** For Young's double slit experiment, two statements are given below:

Statement I : If screen is moved away from the plane of slits, angular separation of the fringes remains constant.

Statement II : If the monochromatic source is replaced by another monochromatic source of larger wavelength, the angular separation of fringes decreases.

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

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

**Answer (4) Statement I is true but Statement II is false.**

**Solution** . For YDSE, angular fringe width is given by  $\alpha = \frac{\gamma}{d}$  It does not depend on the distance of screen from the slit, so statement I is correct.

Angular fringe width  $\propto \lambda$

If  $\lambda \uparrow \rightarrow$  angular separation of fringes increases

So, statement I is true and statement II is false.

**Question 32.** Given below are two statements:

Statement I: Photovoltaic devices can convert optical radiation into electricity.

Statement II: Zener diode is designed to operate under reverse bias in breakdown region.

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

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

**Answer (2) Both Statement I and Statement II are correct**

**Solution** . Both Statements are correct.

I: Photovoltaic devices convert optical radiation into electricity.

II: Zener diode is designed to operate under reverse bias in breakdown region.

e.g., Zener diode as a voltage regulator.

**Question 33.** The venturi-meter works on

- (1) The principle of perpendicular axes
- (2) Huygen's principle
- (3) **Bernoulli's principle**
- (4) The principle of parallel axes

**Answer (3) Bernoulli's principle**

**Solution** . Venturi-meter works on the Bernoulli's principle

**Question 34.**  $\oint E \cdot dS = 0$  over a surface, then

- (1) The electric field inside the surface is necessarily uniform
- (2) **The number of flux lines entering the surface must be equal to the number of flux lines leaving it**
- (3) The magnitude of electric field on the surface is constant
- (4) All the charges must necessarily be inside the surface

**Answer (2) The number of flux lines entering the surface must be equal to the number of flux lines leaving it**

**Solution**  $\oint E \cdot dS = 0$  Net flux through the surface is zero. Therefore, the number of flux lines entering the surface must be equal to the number of flux lines leaving it.

## Chemistry Questions & Solutions

**Question 65.** Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : Helium is used to dilute oxygen in diving apparatus.

Reason R : Helium has high solubility in O<sub>2</sub>.

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

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

**Answer (3)**

**Solution** . • Helium is used as diluent for oxygen in modern diving apparatus because of its very low solubility in blood.

• Gases diffuses easily with each other.

**Question 70.** Select the correct statements from the following

- A. Atoms of all elements are composed of two fundamental particles.
- B. The mass of the electron is  $9.10939 \times 10^{-31}$  kg.
- C. All the isotopes of a given element show same chemical properties:
- D. Protons and electrons are collectively known as nucleons.
- E. Dalton's atomic theory, regarded the atom as an ultimate particles of matter

Choose the correct answer from the options given below

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

**Answer (1) B, C and E only**

**Solution.** • Atoms consist of three fundamental particles :

Electrons, protons and neutrons

- The mass of the electron is  $9.10939 \times 10^{-31}$  kg
- All the isotopes of a given element show same chemical properties.
- Protons and neutrons present in the nucleus are collectively called as nucleons.
- Dalton's atomic theory, regarded the atom as the ultimate particle of matter So, the correct statements are B, C, E only

**Question 72.** Some tranquilizers are listed below. Which one from the following belongs to barbiturates?

- (1) **Veronal**
- (2) Chlordiazepoxide
- (3) Meprobamate
- (4) Valium

**Answer (1) Veronal**

**Solution .** Veronal is the derivative of Barbituric acid and considered as barbiturate. Meprobamate, valium and chlordiazepoxide are other tranquilizers.

**Question 73.** Which of the following statements are NOT correct?

- A. Hydrogen is used to reduce heavy metal oxides to metals.
- B. Heavy water is used to study reaction mechanism.
- C. Hydrogen is used to make saturated fats from oils.
- D. The H–H bond dissociation enthalpy is lowest as compared to a single bond between two atoms of any elements.
- E. Hydrogen reduces oxides of metals that are more active than iron.

Choose the most appropriate answer from the options given below:

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

**Answer (4) D, E only**

**Solution.** Statement A, B, C are correct

(D) H – H bond dissociation energy is maximum as compared to single bond between two atom of any element.

(E) Hydrogen reduces oxides of metal that are less active than iron.



**Question 77.** Intermolecular forces are forces of attraction and repulsion between interacting particles that will include :

- A. dipole - dipole forces
- B. dipole - induced dipole forces
- C. hydrogen bonding
- D. covalent bonding
- E. dispersion forces

Choose the most appropriate answer from the options given below :

- (1) A, C, D, E are correct
- (2) B, C, D, E are correct
- (3) A, B, C, D are correct
- (4) A, B, C, E are correct

**Answer (4)**

**Solution.** Intermolecular forces are the forces of attraction and repulsion between interacting molecules. This term does not include covalent bonds as covalent bond holds atoms of a molecule together. Hence, dipole - dipole forces, dipole - induced dipole forces, hydrogen bonding and dispersion forces are intermolecular forces.

**Question 80.** Which one of the following statements is correct?

- (1) Mg plays roles in neuromuscular function and interneuronal transmission
- (2) **The daily requirement of Mg and Ca in the human body is estimated to be 0.2-0.3 g**
- (3) All enzymes that utilize ATP in phosphate transfer require Ca as the cofactor
- (4) The bone in human body is an inert and unchanging substance

**Answer (2) The daily requirement of Mg and Ca in the human body is estimated to be 0.2-0.3 g**

**Solution** . • All enzymes that utilize ATP in phosphate transfer require Mg as the cofactor.

- Bone in human body is not an inert and unchanging substance but is continuously being solubilised and redeposited.
- Ca plays important role in neuromuscular function, interneuronal transmission, cell membrane integrity and blood coagulation.
- The daily requirement of Mg and Ca in the human body is estimated to be 200 - 300 mg (0.2 - 0.3 g).

**Question85** Given below are two statements : one is labeled as Assertion A and the other is labeled as

Reason R :

Assertion A : A reaction can have zero activation energy.

Reasons R : The minimum extra amount of energy absorbed by reactant molecules so that their energy becomes equal to threshold value, is called activation energy.

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

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

**Answer (3)**

**Solution** . • Few reactions can have zero activation energy for example radical reactions.

- Activation energy is defined as the minimum amount of extra energy absorbed by reactants to achieve threshold energy.

Question 67. The element expected to form largest ion to achieve the nearest noble gas configuration is

- (1) Na

- (2) O
- (3) F
- (4) N

**Answer (4) N**

**Solution** . For isoelectronic species, as the charge on anion increases, ionic size increases So, N forms  $N^{3-}$  anion with largest ionic size

**Question 91.** Pumice stone is an example of

- (1) Foam
- (2) Sol
- (3) Gel
- (4) **Solid sol**

**Answer (4) Solid sol**

**Solution** . Pumice stone is a solid sol.

Dispersed phase : Gas

Dispersed medium : Solid

## Botany Questions & Solutions

**Question 102.** Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

- (1) Active Transport
- (2) Osmosis
- (3) Facilitated Diffusion
- (4) Passive Transport

### **Answer (1)**

**Solution.** Movement and accumulation of ions across a membrane against their concentration gradient can be explained by active transport. It uses energy to transport molecules from lower concentration to a higher Concentration.

**Question 103.** Upon exposure to UV radiation, DNA stained with ethidium bromide will show

- (1) **Bright orange color**
- (2) Bright red color
- (3) Bright blue color
- (4) Bright yellow color

### **Answer (1) Bright orange color**

**Solution.** Option (1) is the correct answer because in recombinant DNA technology the separated DNA fragments can be visualised only after staining the DNA with a substance known as ethidium bromide followed by exposure to U.V. radiation. You can see bright orange coloured bands of DNA in an ethidium bromide stained gel exposed to U.V. light.

**Question 104.** The thickness of ozone in a column of air in the atmosphere is measured in terms of :

- (1) Kilobase
- (2) Dobson units
- (3) Decibels
- (4) Decameter

### **Answer (2)**

**Solution.** The thickness of the ozone in a column of air from the ground to the top of the atmosphere is measured in terms of Dobson units (DU). Noise is measured in decibels.

**Question 106.** Spraying which of the following phytohormone on juvenile conifers helps hastening the maturity period, that leads to early seed production?

- (1) Absciscic Acid
- (2) Indole-3-butyric Acid
- (3) **Gibberellic Acid**
- (4) Zeatin

**Answer (3) Gibberellic Acid**

**Solution.** Spraying juvenile conifers with gibberellins (GAs) hastens the maturity period, thus leading to early seed production.

**Question 109.** Which micronutrient is required for splitting of water molecule during photosynthesis?

- (1) Copper
- (2) **Manganese**
- (3) Molybdenum
- (4) Magnesium

**Answer (2) Manganese**

**Solution.** Manganese plays a major role in the splitting of water to liberate oxygen during photosynthesis. Copper is essential for the overall metabolism in plants. Molybdenum is included in nitrogen metabolism. Magnesium activates several enzymes involved in photosynthesis and respiration.

**Question 110.** Given below are two statements : One is labeled as Assertion A and the other is labeled as Reason R :

Assertion A : ATP is used at two steps in glycolysis.

Reason R : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1, 6-diphosphate.

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

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

**Answer (2) Both A and R are true and R is the correct explanation of A.**

**Solution.** ATP in glycolysis is used at two steps of conversion that are

Glucose → Glucose-6-phosphate

Fructose-6-phosphate → Fructose-1, 6-bisphosphate

The reason for the utilization of ATP is for phosphorylation of the substrates.

**Question 112.** Given below are two statements : One labelled as Assertion A and the other labelled as Reason R:

Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.

Reason R : Protonema develops directly from spores produced in capsule.

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

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

**Answer (2) Both A and R are correct and R is the correct explanation of A**

**Solution .** The predominant stage of the life cycle of a moss is the gametophyte which consists of two stages. The first stage is the protonema stage, which develops directly from a spore. Capsule of the sporophyte

contains spore which gives rise to protonema. Thus, reason correctly explains the assertion.

**Question 113.** Which of the following stages of meiosis involves division of centromere?

- (1) Telophase
- (2) Metaphase I
- (3) Metaphase II
- (4) **Anaphase II**

**Answer (4) Anaphase II**

**Solution.** Splitting of centromere occurs during anaphase of mitosis or anaphase II of meiosis. During Metaphase I and II, chromosomes align at the equator. During telophase, chromosomes reach the respective poles.

**Question 115.** Expressed Sequence Tags (ESTs) refers to

- (1) Certain important expressed genes.
- (2) **All genes that are expressed as RNA.**
- (3) All genes that are expressed as proteins.
- (4) All genes whether expressed or unexpressed.

**Answer (2) All genes that are expressed as RNA.**

**Solution .** All the genes that are expressed as RNA are referred to as Expressed Sequence Tags (ESTs).

**Question 116.** Given below are two statements :

Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.

Statement II : Exarch condition is the most common feature of the root system.

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

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

**Answer (1) Statement I is incorrect but Statement II is true**

**Solution.** Endarch and exarch are the terms often used for describing the position of primary xylem in the plant body. Primary xylem is of two types protoxylem and metaxylem. On the basis of relative position of protoxylem and metaxylem in the organ the arrangement of primary xylem can be endarch or exarch. Exarch type of primary xylem is seen in roots. Therefore, Statement I is false and Statement II is true

**Question 117.** What is the function of tassels in the corn cob?

- (1) To protect seeds
- (2) To attract insects
- (3) **To trap pollen grains**
- (4) To disperse pollen grains

**Answer (3) To trap pollen grains**

**Solution.** Tassels in the com cob represents stigma and style which wave in the wind to trap pollen grains.

**Question 118.** The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?

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



### **Answer (3) Pachytene**

**Solution.** The process of recombination occurs at Pachytene stage of prophase I. This stage is characterized by the appearance of recombination nodules.

**Question 119.** The phenomenon of pleiotropism refers to

- (1) More than two genes affecting a single character
- (2) Presence of several alleles of a single gene controlling a single crossover
- (3) Presence of two alleles, each of the two genes controlling a single trait
- (4) **A single gene affecting multiple phenotypic expression**

**Answer (4) A single gene affecting multiple phenotypic expression**

**Solution.** When a single gene affects multiple phenotypic expression, the gene is called pleiotropic gene and the phenomenon is called pleiotropism.

**Question 121.** Cellulose does not form blue color with Iodine because

- (1) It breaks down when iodine reacts with it
- (2) It is a disaccharide
- (3) It is a helical molecule
- (4) **It does not contain complex helices and hence cannot hold iodine molecules**

**Answer (4) It does not contain complex helices and hence cannot hold iodine molecules**

**Solution.** Option (4) is the correct answer because cellulose does not contain complex helices and hence cannot hold iodine molecules.

Option (1), (2) and (3) are not correct as cellulose is a polysaccharide.

**Question 125.** Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species?

- (1) Co-extinctions
- (2) **Habitat loss and fragmentation**
- (3) Over exploitation for economic gain
- (4) Alien species invasions

**Answer (2) Habitat loss and fragmentation**

**Solution .** Habitat loss and fragmentation is the most important cause driving animals and plants to extinction.

**Question 127.** Unequivocal proof that DNA is the genetic material was first proposed by

- (1) Wilkins and Franklin
- (2) Frederick Griffith
- (3) **Alfred Hershey and Martha Chase**
- (4) Avery, Macleod and McCarthy

**Answer (3) Alfred Hershey and Martha Chase**

**Solution.** The unequivocal proof that DNA is the genetic material came from the experiment of Alfred Hershey and Martha Chase.

Avery, Macleoid and McCarty gave the biochemical characterisation of Transforming Principle. The transformation experiments by using Pneumococcus was conducted by Frederick Griffith. Wilkins and Franklin produced X-ray diffraction data of DNA

**Question 130.** Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.

- (1) Epiphylous and Dithecous anthers
- (2) **Diadelphous and Dithecous anthers**
- (3) Polyadelphous and epipetalous stamens
- (4) Monadelphous and Monothealous anthers

## **Answer (2) Diadelphous and Dithecous anthers**

**Solution.** Fabaceae → Diadelphous and dithecous anther.

Solanaceae → Polyandrous, epipetalous and dithecous anther.

Liliaceae → Polyandrous, epiphyllous and dithecous anther.

**Question 131.** In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as

- (1) Senescence
- (2) Differentiation
- (3) **Dedifferentiation**
- (4) Development

## **Answer (3) Dedifferentiation**

**Solution.** In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as dedifferentiation. Dedifferentiation is a phenomenon by which the living differentiated plant cells, that by now have lost the capacity to divide can regain the capacity of division under certain conditions.

**Question 133.** During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out

- (1) Polysaccharides
- (2) RNA
- (3) **DNA**
- (4) Histones

## **Answer (3) DNA**

**Solution.** Option (3) is the correct answer as, during isolation of the genetic material, purified DNA ultimately precipitates out after the addition of chilled ethanol.

Option (4) is not the answer as, proteins can be removed by treatment with proteases.

Option (2) is not the answer as RNA can be removed by treatment with ribonuclease.

**Question 135.** Axile placentation is observed in

(1) **China rose, Petunia and Lemon**

(2) Mustard, Cucumber and Primrose

(3) China rose, Beans and Lupin

(4) Tomato, Dianthus and Pea

**Answer (1) China rose, Petunia and Lemon**

**Solution.** China rose, Tomato, Petunia and Lemon show axile placentation. Dianthus and Primrose show free central placentation.

Pea, Lupin and Beans show marginal placentation. Cucumber and mustard show parietal placentation.

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## Zoology Questions & Solutions

**Question 152.** Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?

(1) HIV Infection

(2) Genital herpes

(3) **Gonorrhoea**

(4) Hepatitis-B

### Answer (3) Gonorrhoea

**Solution.** The correct answer is option (3) 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.

**Question 153.** Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.

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

### Answer (3)

**Solution.** Option (3) is the correct answer because numbat, spotted cuscus and flying phalanger are Australian marsupials exhibiting adaptive radiation.

Option (4) is incorrect because mole and flying squirrel are placental mammals.

Option (1) is incorrect because lemur and wolf are placental mammals.

Option (2) is incorrect because bobcat is a placental mammal.

**Question 157.** 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 false but Statement II is true.
- (2) Both Statement I and Statement II are true.
- (3) Both Statement I and Statement II are false.
- (4) Statement I is true but Statement II is false.

## Answer (2)

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

**Question 159.** 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 a short loop of Henle whereas cortical nephrons have a longer loop of Henle.

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

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

## Answer (4) A is true but R is false

**Solution.** The correct answer is option (4) 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.

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

List I

- A. Ringworm
- B. Filariasis
- C. Malaria

List II

- I. Haemophilus influenzae
- II. Trichophyton
- III. Wuchereria bancrofti

D. Pneumonia

IV. Plasmodium vivax

Choose the correct answer from the options given below:

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

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

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

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

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

**Solution.** Option (2) 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.

**Question 163.** 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-III, B-IV, C-I, D-II

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

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

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

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

**Solution.** The correct answer is option (2) 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.

**Question 169.** Match List I with List II with respect to human eye.

List I

List II

A. Fovea  
diameter of pupil.

I. Visible coloured portion of eye that regulates

B. Iris  
tissue.

II. External layer of eye formed of dense connective

C. Blind spot

III. Point of greatest visual acuity or resolution.

D. Sclera

photoreceptor cells are absent.

IV. Point where optic nerve leaves the eyeball and

Choose the correct answer from the options given below:

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

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

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

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

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

**Solution.** Option (2) is the correct answer because

(i) Fovea is the point of greatest visual acuity or resolution.

(ii) Iris is the visible coloured portion of the eye that regulates diameter of pupil.

(iii) Blind spot is the point where optic nerve leaves the eye-ball and photoreceptor cells are absent.

(iv) Sclera is the external layer of eye formed of dense connective tissue.

**Question 170.** 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 incorrect but Statement II is true.**

(2) Both Statement I and Statement II are true.

(3) Both Statement I and Statement II are false.



(4) Statement I is correct but Statement II is false.

**Answer (1) Statement I is incorrect but Statement II is true.**

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.

**Question 173.** Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

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

**Answer (3) Serum and Urine analysis**

**Solution.** The correct answer is option (3) 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

**Question175.** 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 false but R is true.**
- (2) Both A and R are true and R is the correct explanation of A.
- (3) Both A and R are true and R is NOT the correct explanation of A.
- (4) A is true but R is false.

**Answer (1) A is false but R is true.**

**Solution.** 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 syndrome, hemophilia, etc., to determine the survivability of the fetus. Amniocentesis is not a sex determination technique in India and is not a strategy of RCH.

**Question 178.** 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-IV, B-II, C-I, D-III
- (2) A-III, B-I, C-IV, D-II
- (3) A-III, B-IV, C-II, D-I
- (4) A-II, B-III, C-I, D-IV

**Answer (3)**

**Solution.** Option (3) is the correct answer because

- (i) Vasectomy is a surgical method of contraception
- (ii) Coitus interruptus is a natural method of contraception
- (iii) Cervical cap is a barrier method of contraception
- (iv) Saheli is an oral method of contraception which is a non-steroidal pill

**Question 180.** Which of the following is not a cloning vector?

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

### Answer (1) Probe

**Solution.** Option (1) is the 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 (2), (3) and (4) are not correct because YAC, BAC, pBR322 are vectors.

**Question 181.** Which of the following functions is carried out by cytoskeleton in a cell?

- (1) Transportation
- (2) Nuclear division
- (3) Protein synthesis
- (4) **Motility**

### Answer (4) Motility

**Solution.** 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.

**Question 183.** 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 false but R is true.
- (2) Both A and R are true and R is the correct explanation of A.
- (3) **Both A and R are true but R is NOT the correct explanation of A.**
- (4) A is true but R is false.

**Answer (3) Both A and R are true but R is NOT the correct explanation of A.**

**Solution.** Option (3) is the correct answer because both Assertion and Reason are true. Implantation is embedding of the blastocyst into the endometrium of the uterus. Correct explanation of the reason is that Corpus luteum secretes a large amount of progesterone which is essential for maintenance of endometrium of uterus. In absence of fertilization, the corpus luteum degenerates hence the decrease in the level of progesterone hormone will cause disintegration of endometrium leading to menstruation

**Question 185.** Which of the following statements are correct regarding female reproductive cycle?

- A. In non-primate mammals cyclical changes during reproduction are called oestrus cycle.
  - B. First menstrual cycle begins at puberty and is called menopause.
  - C. Lack of menstruation may be indicative of pregnancy.
  - D. Cyclic menstruation extends between menarche and menopause.
- Choose the most appropriate answer from the options given below.

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

**Answer (1) A, C and D only**

**Solution.** The correct answer is option

(1) 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.

In primates, cyclical changes during reproduction are called menstrual cycle.