NEET 2023 Solutions Code E3

Physics Questions & Solutions

Question 1. The temperature of a gas is –50°C. To what temperature the gas should be heated so that the rms speed is increased by 3 times?

(1) 669°C
(2) **3295°C**
(3) 3097 K
(4) 223 K

Answer (2) 3295°C

Question 2. An ac source is connected to a capacitor C. Due to decrease in its operating frequency
(1) Capacitive reactance decreases
(2) Displacement current increases
(3) **Limbic system and hypothalamus**
(4) Capacitive reactance remains constant
Answer (3) Limbic system and hypothalamus

Solution . $X_c = \frac{1}{\omega c}$
Since ω decreasing X_c will increases hence current will decreases also
conduction current = displacement current
Therefore displacement current will decrease.

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

Answer (1) 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 4. Resistance of a carbon resistor determined from colour codes is (22000 ± 5%) Ω. The colour of third band must be
(1) Red
(2) Green
(3) **Orange**
(4) Yellow

Answer (3) Orange

13. A full wave rectifier circuit consists of two p-n junction diodes, a centre-tapped transformer, capacitor and a load resistance. Which of these components remove the ac ripple from the rectified output?
(1) A centre-tapped transformer
(2) p-n junction diodes
(3) **Capacitor**
(4) Load resistance

Answer (3) Capacitor

Solution . Capacitor removes the ac ripple from rectified output

Question 15. The ratio of frequencies of fundamental harmonic produced by an open pipe to that of closed pipe having the same length is
(1) 1 : 2
(2) **2 : 1**
(3) 1 : 3
(4) 3 : 1

Answer (2) 2: 1

Question 17. A metal wire has mass (0.4 ± 0.002) g, radius (0.3 ± 0.001) mm and length (5 ± 0.02) cm. The maximum possible percentage error in the measurement of density will nearly be
(1) 1.2%
(2) 1.3%
(3) **1.6%**
(4) 1.4

Answer (3) 1.6 %

Question 18. 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) Both Statement I and Statement II are true.
(2) Both Statement I and Statement II are false.
(3) **Statement I is true but Statement II is false.**
(4) Statement I is false but Statement II is true.

Answer (3) Statement I is true but Statement II is false.

Question 19. The angular acceleration of a body, moving along the circumference of a circle, is
(1) Along the radius, away from centre
(2) Along the radius towards the centre
(3) Along the tangent to its position
(4) **Along the axis of rotation**

Answer (4) 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 22. A football player is moving southward and suddenly turns eastward with the same speed to avoid an opponent. The force that acts on the player while turning is
(1) Along eastward
(2) Along northward
(3) **Along north-east**
(4) Along south-west

Answer (3) Along north-east

Question 23. The venturi-meter works on
(1) Huygen's principle
(2) **Bernoulli's principle**
(3) The principle of parallel axes
(4) The principle of perpendicular axes

Answer (2) Bernoulli's principle

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

Question 26. 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) **Cs only**
(2) Both Na and K
(3) K only
(4) Na only

Answer (1) Cs only

Solution . Energy of incident radiation = 2.80 eV Work function of Cs → 2.14 eV Work function of K → 2.30 eV Work function of Na → 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 29. The potential energy of a long spring when stretched by 2 cm is U. If the spring is stretched by 8 cm, potential energy stored in it will be
(1) 2 U
(2) 4 U
(3) 8 U
(4) **16 U**

Answer (4) 16 U

Question 33. In hydrogen spectrum, the shortest wavelength in the Balmer series is λ. The shortest wavelength in the Bracket series is
(1) 2λ
(2) **4λ**
(3) 9λ
(4) 16λ

Answer (2) 4λ

Question 39. 10 resistors, each of resistance R are connected in series to a battery of emf E and negligible internal resistance. Then those are connected in parallel to the same battery, the current is increased n times. The value of n is
(1) 10
(2) **100**
(3) 1
(4) 1000

Answer (2) 100

Question 44. A bullet from a gun is fired on a rectangular wooden block with velocity u. When bullet travels 24 cm through the block along its length horizontally, velocity of bullet becomes u/3 . Then it further penetrates into the block in the same direction before coming to rest exactly at the other end of the block. The total length of the block is
(1) **27 cm**
(2) 24 cm
(3) 28 cm
(4) 30 cm

Answer (1) 27cm

Chemistry Questions & Solutions

Question 52. 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) B, C, D, E are correct
(2) A, B, C, D are correct
(3) **A, B, C, E are correct**
(4) A, C, D, E are correct
Answer (3) A, B, C, E are correct

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 56. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R : Assertion A : Metallic sodium dissolves in liquid ammonia giving a deep blue solution, which is paramagnetic. Reason R : The deep blue solution is due to the formation of amide. In the light of the above statements, choose the correct answer from the options given below :
(1) Both A and R are true and R is the correct explanation of A
(2) Both A and R are true but R is NOT the correct explanation of A
(3) **A is true but R is false**
(4) A is false but R is true

Answer (3) A is true but R is false

Question 57. Homoleptic complex from the following complexes is
(1) **Potassium trioxalatoaluminate (III)**
(2) Diamminechloridonitrito-N-platinum (II)
(3) Pentaamminecarbonatocobalt (III) chloride
(4) Triamminetriaquachromium (III) chloride

Answer (1) Potassium trioxalatoaluminate (III)

Solution . Complexes in which a metal is bound to only one kind of donor groups are called as homoleptic complexes Potassium trioxalatoaluminate (III) K3[Al(ox)3] It is a homoleptic complex

Question58. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : In equation rG = –nFEcell' value of rG depends on n.
Reasons R : Ecell is an intensive property and rG is an extensive property.
In the light of the above statements, choose the correct answer from the options given below

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

Solution. The value of rG depends on n value as per the equation rG = –nFEcell Where E is the emf of the cell and nF is the amount of charge passed. So, assertion statement is correct Ecell is an intensive property while rG is an extensive thermodynamic property So, reason is correct but not explaining the assertion

Question64. Amongst the given options which of the following molecules/ ion acts as a Lewis acid?
(1) NH3
(2) H2O
(3) **BF3**
(4) OH–

Answer (3)BF3

Question68. Which one is an example of heterogenous catalysis?
(1) Oxidation of sulphur dioxide into sulphur trioxide in the presence of oxides of nitrogen

(2) Hydrolysis of sugar catalysed by H+ ions
(3) Decomposition of ozone in presence of nitrogen monoxide
(4) **Combination between dinitrogen and dihydrogen to form ammonia in the presence of finely divided iron**

Answer (4)Combination between dinitrogen and dihydrogen to form ammonia in the presence of finely divided iron

Question 74. Given below are two statements :
Statement I : A unit formed by the attachment of a base to 1 position of sugar is known as nucleoside.
Statement II : When nucleoside is linked to phosphorous acid at 5-position of sugar moiety, we get nucleotide. In the light of the above statements, choose the correct answer from the options given below :

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

Answer (3)Statement I is true but Statement II is false

Question 75. 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 O2. In the light of the above statements, choose the correct answer from the options given below

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

Answer (2) Both A and R are true and R is NOT the correct explanation of A

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 78. A compound is formed by two elements A and B. The element B forms cubic close packed structure and atoms of A occupy 1/3 of tetrahedral voids. If the formula of the compound is AxBy, then the value of x + y is in option

(1) **5**
(2) 4
(3) 3
(4) 2

Answer (1) 5

Question 79. Amongst the following the total number of species NOT having eight electrons around central atom in its outermost shell, is NH_3, $AlCl_3$, $BeCl_2$, CCl_4, PCl_5 :

(1) **3**
(2) 2
(3) 4
(4) 1

Answer (1) 3

Question 80. 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) B, C, D, E only
(2) B, D only
(3) **D, E only**
(4) A, B, C only

Answer (3) 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.

Question81. Given below are two statements : one is labelled as Assertion A and the other is labelled 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) Both A and R are true and R is the correct explanation of A
(2) **Both A and R are true and R is NOT the correct explanation of A**
(3) A is true but R is false
(4) A is false but R is true
Answer (2) Both A and R are true and R is NOT the correct explanation of A

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.

Question82. Some tranquilizers are listed below. Which one from the following belongs to barbiturates?
(1) Chlordiazepoxide

(2) Meprobamate
(3) Valium
(4) **Veronal**

Answer (4) Veronal
Solution . Veronal is the derivative of Barbituric acid and considered as barbiturate. Meprobamate, valium and chlordiazepoxide are other tranquilizers.

Question 83. 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 × 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) A, B and C only
(2) C, D and E only
(3) A and E only
(4) **B, C and E only**

Answer (4)B, C and E only

Solution. Atoms consist of three fundamental particles : Electrons, protons and neutrons The mass of the electron is 9.10939 × 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 89. Given below are two statements :
Statement I : The nutrient deficient water bodies lead to eutrophication
Statement II : Eutrophication leads to decrease in the level of oxygen in the

water bodies. In the light of the above statements, choose the correct answer from the options given below:
(1) Both Statement I and Statement II are true.
(2) Both Statement I and Statement II are false.
(3) Statement I is correct but Statement II is false.
(4) **Statement I is incorrect but Statement II is true.**

Answer (4) Statement I is incorrect but Statement II is true.
Solution. Nutrient enriched water bodies support a dense plant population, which kills animal life by depriving it of oxygen and results in subsequent loss of biodiversity. This process is called as eutrophication.
Question 99. What fraction of one edge centred octahedral void lies in one unit cell of fcc?
(1) 1/2
(2) 1/3
(3) **1/4**
(4) 1/12
Answer (3) 1/4

Solution. The total number of octahedral voids in FCC are four Octahedral voids in FCC = Edge centres + Body centre The contribution of edge centre = 1/4 Fraction of one edge centred octahedral void in one unit cell of FCC = ¼

Botany Questions & Solutions

Question101. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by
(1) Osmosis
(2) Facilitated Diffusion
(3) Passive Transport
(4) **Active Transport**

Answer (4)Active Transport

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.

Question102. Given below are two statements : One is labelled as Assertion A and the other is labelled 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) **Both A and R are true and R is the correct explanation of A.**
(2) Both A and R are true but R is NOT the correct explanation of A.
(3) A is true but R is false.
(4) A is false but R is true.

Answer (1) 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 of the utilisation of ATP is for phosphorylation the substrates.

Question103. Among eukaryotes, replication of DNA takes place in :
(1) M phase
(2) **S phase**
(3) G1 phase
(4) G2 phase

Answer (2)S phase

Solution. Replication of DNA takes place in S-phase of cell cycle in eukaryotes. Most of the cell organelles duplicate in G1 phase.

Question 104. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :
Assertion A : Late wood has fewer xylary elements with narrow vessels.
Reason R : Cambium is less active in winters. In the light of the above statements, choose the correct answer from the options given below :
(1) Both A and R are true and R is the correct explanation of A
(2) Both A and R are true but R is NOT the correct explanation of A
(3) A is true but R is false
(4) A is false but R is true

Answer (1)

Solution. In winter, the cambium is less active and forms fewer xylary elements that have narrow vessels, and this wood is called autumn wood or late wood.

Question105. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?
(1) Zygotene
(2) Pachytene
(3) Diplotene
(4) Diakinesis

Answer (2)

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

Question 106. Unequivocal proof that DNA is the genetic material was first proposed by
(1) Frederick Griffith
(2) Alfred Hershey and Martha Chase
(3) Avery, Macleoid and McCarthy
(4) Wilkins and Franklin

Answer (2)

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.

Question107. 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) Both A and R are correct and R is the correct explanation of A
(2) Both A and R are correct but R is NOT the correct explanation of A
(3) A is correct but R is not correct
(4) A is not correct but R is correct

Answer (1)

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

Question108. In gene gun method used to introduce alien DNA into host cells, microparticles of _____ metal are used.
(1) Copper
(2) Zinc
(3) Tungsten or gold
(4) Silver

Answer (3)
Solution. Option (3) is the correct answer because in gene gun method, microparticles of tungsten or gold are used. Gold or tungsten are inert in nature so they do not alter the chemical composition of cells.

Question109. Axile placentation is observed in
(1) Mustard, Cucumber and Primrose
(2) China rose, Beans and Lupin
(3) Tomato, Dianthus and Pea
(4) China rose, Petunia and Lemon

Answer (4)

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.

Question110. In the equation GPP R NPP − = GPP is Gross Primary Productivity NPP is Net Primary Productivity R here is _____.

(1) Photosynthetically active radiation

(2) Respiratory quotient
(3) Respiratory loss
(4) Reproductive allocation

Answer (3)

Solution. A considerable amount of GPP is utilised by plants in respiration. Gross primary productivity minus respiration losses (R), is the net primary productivity. So R = Respiratory loss

Question111. In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as
(1) Differentiation
(2) Dedifferentiation
(3) Development
(4) Senescence

Answer (2)

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.

Question112. What is the role of RNA polymerase III in the process of transcription in Eukaryotes?
(1) Transcription of rRNAs (28S, 18S and 5.8S)
(2) Transcription of tRNA, 5S rRNA and snRNA
(3) Transcription of precursor of mRNA
(4) Transcription of only snRNAs

Answer (2)

Solution. In eukaryotes there are three major types of RNA polymerases. RNA polymerase I transcribes : 5.8S, 18S, 28S rRNAs RNA polymerase II transcribes : hnRNAs (precurssor of mRNA) RNA polymerase III transcribes : tRNAs, ScRNA, 5S rRNA and snRNA

Question113. Upon exposure to UV radiation, DNA stained with ethidium bromide will show
(1) Bright red colour
(2) Bright blue colour
(3) Bright yellow colour
(4) Bright orange colour
Answer (4)
Solution. Option (4) 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.

Question114. The thickness of ozone in a column of air in the atmosphere is measured in terms of :
(1) Dobson units
(2) Decibels
(3) Decameter
(4) Kilobase

Answer (1)

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.

Question115. Which hormone promotes internode/petiole elongation in deep water rice?

(1) GA3
(2) Kinetin
(3) Ethylene
(4) 2, 4-D

Answer (3)

Solution. Ethylene promotes rapid internode/petiole elongation in deep water rice plants.

Question116. In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :
(1) Synergids, Primary endosperm nucleus and zygote
(2) Antipodals, synergids, and primary endosperm nucleus
(3) Synergids, Zygote and Primary endosperm nucleus
(4) Synergids, antipodals and Polar nuclei

Answer (3)

Solution. Synergids are the cells of gametophyte and hence these are haploid Zygote is formed by fusion of two gametes and thus it is diploid. Primary endosperm nucleus is formed by the fusion of diploid secondary nucleus with a male gamete. Therefore, it is triploid.

Question117. Cellulose does not form blue colour with Iodine because
(1) It is a disaccharide
(2) It is a helical molecule
(3) It does not contain complex helices and hence cannot hold iodine molecules
(4) It breaks down when iodine reacts with it

Answer (3)

Solution. Option (3) is the correct answer because cellulose does not contain complex helices and hence cannot hold iodine molecules. Option (1), (2) and (4) are not correct as cellulose is a polysaccharide.

Question118. Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species?
(1) Habitat loss and fragmentation
(2) Over exploitation for economic gain
(3) Alien species invasions
(4) Co-extinctions

Answer (1)

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

Question119. Identify the pair of heterosporous pteridophytes among the following :
(1) Lycopodium and Selaginella
(2) Selaginella and Salvinia
(3) Psilotum and Salvinia
(4) Equisetum and Salvinia

Answer (2)

Solution. Selaginella and Salvinia are heterosporous pteridophytes. They produces two different kind of spores. Psilotum, Lycopodium and Equisetum are homosporous pteridophytes.

Question120. 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) Diadelphous and Dithecous anthers
(2) Polyadelphous and epipetalous stamens
(3) Monoadelphous and Monothecous anthers

(4) Epiphyllous and Dithecous anthers

Answer (1)

Solution. Fabaceae → Diadelphous and dithecous anther. Solanaceae → Polyandrous, epipetalous and dithecous anther. Liliaceae → Polyandrous, epiphyllous and dithecous anther.

Question121. The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year

(1) 1985
(2) 1992
(3) 1986
(4) 2002

Answer (2)

Solution. The historic convention on Biological Diversity, "The Earth Summit" was held in Rio de Janeiro in the year 1992. It called upon all nations to take appropriate measures for conservation of biodiversity and sustainable utilisation of its benefits.

Zoology Questions & Solutions

Question152. Which of the following functions is carried out by cytoskeleton in a cell?
(1) Nuclear division
(2) Protein synthesis
(3)Motility
(4) Transportation

Answer (3)

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.

Question154. 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) Both A and R are true and R is the correct explanation of A.
(2) Both A and R are true and R is NOT the correct explanation of A.
(3)A is true but R is false.
(4) A is false but R is true.

Answer (4)

Solution Assertion A is true because amniocentesis for sex determination is indeed used as one of the strategies in some contexts. Reason R is also true, as banning amniocentesis checks can potentially contribute to an increase in female foeticide. However, R is not the direct or sole explanation of A. The problem of female foeticide involves complex social, cultural, and economic factors. Therefore, the correct answer is (2) Both A and R are true and R is NOT the correct explanation of A.

Question157. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?
(1) Recombinant DNA Technology
(2) Serum and Urine analysis
(3)Polymerase Chain Reaction (PCR) technique

(4) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique

Answer (2)

Solution. The correct answer is option (2) 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.

Question159. Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.
(1) Tasmanian wolf, Bobcat, Marsupial mole
(2) Numbat, Spotted cuscus, Flying phalanger
(3)Mole, Flying squirrel, Tasmanian tiger cat
(4) Lemur, Anteater, Wolf

Answer (2)

Solution. Option (2) is the correct answer because numbat, spotted cuscus and flying phalanger are Australian marsupials exhibiting adaptive radiation. Option (3) is incorrect because mole and flying squirrel are placental mammals. Option (4) is incorrect because lemur and wolf are placental mammals. Option (1) is incorrect because bobcat is a placental mammal**.**

Question 162. Vital capacity of lung is _____.
(1) IRV + ERV
(2) IRV + ERV + TV + RV
(3)IRV + ERV + TV RV
(4) IRV + ERV + TV

Answer (4)

Solution. Option (4) 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

Question164. Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?
(1) Genital herpes
(2) Gonorrhea
(3)Hepatitis-B
(4) HIV Infection
Answer (2)

Solution. The correct answer is option (2) 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.

Question168. Which of the following is not a cloning vector?
(1) BAC
(2) YAC
(3)pBR322
(4) Probe

Answer (4)

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

Question170. 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 and D only
(2) A and B only A,
(3)B and C only
(4) A, C and D only

Answer (4)

Solution. The correct answer is option (4) 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.

Question172. 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 a nucleosome. In the light of the above statements, choose the correct answer from the options given below:
(1) Both Statement I and Statement II are true.
(2) Both Statement I and Statement II are false.
(3)Statement I is correct but Statement II is false.
(4) Statement I is incorrect but Statement II is true.

Answer (4)

Solution 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.

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

Answer (2)
Solution. Option (2) 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.

Question176. 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) Both A and R are true and R is the correct explanation of A.
(2) Both A and R are true but R is NOT the correct explanation of A.
(3)A is true but R is false.
(4) A is false but R is true.

Answer (3)

Solution. The correct answer is option (3) 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.

Question184. Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by
(1) Sphincter of Oddi
(2) Ileo-caecal valve
(3)Gastro-oesophageal sphincter
(4) Pyloric sphincter
Answer (2)

Solution. Option (2) is the correct answer because the undigested food (feces) enters into the caecum of the large intestine through the ileo-caecal valve, which prevents the backflow of the fecal matter. Option (3) is not the answer because a muscular sphincter i.e., the gastro-oesophageal sphincter regulates the opening of esophagus into the stomach. Option (4) is not the answer because pyloric sphincter regulates the opening in between stomach and duodenum. Option (1) is not the answer because the opening of common hepato-pancreatic duct is guarded by sphincter of Oddi

Question188. 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) A, C and D only
(2) B and C only B,
(3)D and E only
(4) C, D and E only

Answer (2)

Solution. Option (2) is the correct answer because statements B and C only are correct. Option (1), (3) and (4) 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

Question189. 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 and C only
(2) **B and D only A,**
(3) C and E only
(4) B and E only

Answer (2) B and D only A,

Solution. 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 homologus chromosomes.

Question190. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are:
(1) **Limbic system and hypothalamus**
(2) Corpora quadrigemina and hippocampus
(3)Brain stem and epithalamus
(4) Corpus callosum and thalamus

Answer (1) Limbic system and hypothalamus

Solution. Option (1) is the correct answer because limbic system along with hypothalamus regulate the sexual behaviour, expression of excitement, pleasure, rage, fear, etc. Option (2), (3) 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.

Question191. Which one of the following is NOT an advantage of inbreeding?
(1) It decreases homozygosity.
(2) It exposes harmful recessive genes but are eliminated by selection.
(3)Elimination of less desirable genes and accumulation of superior genes takes place due to it.
(4) **It decreases the productivity of inbred population, after continuous inbreeding.**

Answer (4) It decreases the productivity of inbred population, after continuous inbreeding.

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