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Chemistry

Q. 1. The total number of atomic orbitals in fourth energy level of an atom is

(1) 4 (2) 8

(3) 16 (4) 32

Answer : (3)

Q. 2. Mole fraction of the solute in a 1.00 molal aqueous solution is

(1) 1.7700 (2) 0.1770

(3) 0.0177 (4) 0.0344

Answer : (3)

Solution:- Mole fraction of solute = 1/56.55 = 0.0177

Q. 3. By what factors does the average velocity of a gaseous molecule increase when the temperature (in Kelvin) is doubled?

(1) 1.4 (2) 2.0

(3) 2.8 (4) 4.0

Answer : (1)

Q. 4. Two gases A and B having the same volume diffuse through a porous partition in 20 and 10 seconds respectively. The molecular mass of A is 49 u. Molecular mass of B will be

(1) 25.00 u (2) 50.00 u

(3) 12.25 u (4) 6.50 u

Answer : (3)

Q. 5. The van't Hoff factor i for a compound which undergoes dissociation in one solvent and association in other solvent is respectively

(1) Greater than one and greater than one
(2) Less than one and greater than one

(3) Less than one and less than one
(4) Greater than one and less than one

Answer : (4)

Solution :- Fact

Q.6. A gaseous mixture was prepared by taking equal mole of CO and N2. If the total pressure of the mixture was found 1 atmosphere, the partial pressure of the nitrogen (N2) in the mixture is

(1) 1 atm (2) 0.5 atm

(3) 0.8 atm (4) 0.9 atm

Answer : (2)

Sol:- Fact

Q. 7. The freezing point depression constant for water is –1.86° cm -1 If 5.00 g Na_2SO_4 is dissolved in 45.0 g H_2O,the freezing point is changed by –3.82°C. Calculate the van't Hoff factor for Na_2SO_4

(1) 0.381 (2) 2.05

(3) 2.63 (4) 3.11

Answer : (3)

Q. 8. The energies E_1 and E_2 of two radiations are 25 eV and 50 eV respectively. The relation between their wavelengths i.e. l1 and l2 will be

(1) $\lambda 1 = 1/2\ \lambda 2$ (2) $\lambda 1 = \lambda 2$

(3) $\lambda 1 = 2\lambda 2$ (4) $\lambda 1 = 4\lambda 2$

Answer : (3)

Solution:- (3) $\lambda_1 = 2\lambda_2$

Q. 9. Standard electrode potential of three metals X, Y and Z are –1.2 V, +0.5 V and – 3.0 V respectively. The reducing power of these metals will be

(1) X > Y > Z (2) Y > Z > X

(3) Y > X > Z (4) Z > X > Y

Answer : (4)

Solution:- Z > X > Y; higher the reduction potential lesser the reducing power

Q. 10. Which one of the following statements for the order of a reaction is incorrect?

(1) Order of reaction is always whole number
(2) Order can be determined only experimentally
(3) Order is not influenced by stoichiometric coefficient of the reactants
(4) Order of reaction is sum of power to the concentration terms of reactants to express the rate of reaction

Answer : (1)

Q. 11. Enthalpy change for the reaction, $4H(g) \rightarrow 2H_2(g)$ is –869.6 kJ. The dissociation energy of H – H bond is

(1) +217.4 kJ (2) –434.8 kJ

(3) –869.6 kJ (4) +434.8 kJ

Answer : (4)

Solution:- The dissociation energy of H – H bond is 869.6/2 = 434.8 KJ

Q. 12. If n = 6, the correct sequence of filling of electrons will be

(1) ns → np(n -1)d → (n - 2)f (2) ns → n(n - 2)f → (n -1)d → np

(3) ns → (n -1)d → (n - 2)f → np (4) ns → (n - 2)f → np → (n -1)d

Answer : (2)

Solution:- Fact

Q. 13. Which of the following compounds has the lowest melting point?

(1) CaF_2 (2) $CaCl_2$

(3) $CaBr_2$ (4) CaI_2

Answer : (4)

Solution:- CaI_2 has lowest melting point

Q. 14. Which of the following pairs of metals is purified by van Arkel method?

(1) Ni and Fe (2) Ga and In

(3) Zr and Ti (4) Ag and Au

Answer : (3)

Solution:- Zr and Ti are purified by van Arkel method

Q. 15. The correct order of increasing bond length of C – H, C – O, C – C and C = C is

(1) C -H < C - O < C - C < C = C
(2) C -H < C = C < C -O < C - C
(3) C -C < C = C < C - O < C -H
(4) C -O < C - H < C - C < C = C

Answer : (2)

Q. 16. For the four successive transition elements (Cr, Mn, Fe and Co), the stability of + 2 oxidation state will be there in which of the following order?

(1) Cr > Mn > Co > Fe (2) Mn > Fe > Cr > Co

(3) Fe > Mn > Co > Cr (4) Co > Mn > Fe > Cr

(At. nos. Cr = 24, Mn = 25, Fe = 26, Co = 27)

Answer : 2

Solution:- On the basis of electrode potentials, the correct order is Mn > Fe > Cr > Co

Q. 17. Which of the following elements is present as the impurity to the maximum extent in the pig iron?

(1) Phosphorus (2) Manganese

(3) Carbon (4) Silicon

Answer : (3)

Q. 18. Which of the following is least likely to behave is Lewis base?

(1) OH^- (2) H_2O

(3) NH_3 (4) BF_3

Answer : (4)

Sol:- BF_3 is an electron deficient species.

Q. 19. Which one of the following is present as an active ingredient in bleaching powder for bleaching action?

(1) $CaCl_2$ (2) $CaOCl_2$

(3) $Ca(OCl)_2$ (4) CaO_2Cl

Answer : (3)

Q. 20. The complex, [Pt (Py) (lNH3) Br Cl] will have how many geometrical isomers?

(1) 2 (2) 3

(3) 4 (4) 0

Answer : (2)

Q. 21. Name the type of the structure of silicate in which one oxygen atom of is shared ?

(1) Three dimensional (2) Linear chain silicate

(3) Sheet silicate (4) Pyrosilicate

Answer : (4)

Q. 22. The complexes $[Co(NH_3)_6]$ $[Cr(CN)_6]$ and $[Cr(NH_3)_6]$ $[Co(CN)_6]$ are the examples of which type of isomerism?

(1) Geometrical isomerism (2) Linkage isomerism

(3) Ionization isomerism (4) Coordination isomerism

Answer(4)

Solution:- Co-ordination isomerism

Q. 23. Of the following which one is classified as polyester polymer?

(1) Nylon-66 (2) Terylene

(3) Backelite (4) Melamine

Answer : (2)

Solution:- Terylene is a polyester polymer because it is formed by the monomer units terephthalic acid and ethylene glycol

Q. 24. Considering the state of hybridization of carbon atoms, find out the molecule among the following which is linear?

(1) CH_3 —CH_2 —CH_2—CH_3 (2) CH_3—CH=CH—CH

(3) CH_3 —CºC — CH_3 (4) CH_2= CH—CH_2—CºCH

Answer: (3)

Q. 25. The Lassaigne's extract is boiled with conc. HNO3 while testing for halogens. By doing so it.

(1) Increase the concentration of ions
(2) Decomposes Na_2S and NaCN, if formed
(3) Helps in the precipitation of AgCl
(4) Increases the solubility product of AgCl

Answer: (2)

Q. 26. Clemmensen reduction of a ketone is carried out in the presence of which of the following?

(1) H_2 and Pt as catalyst (2) Glycol with KOH

(3) Zn-Hg with HCl (4) LiAlH4

Answer : (3)

Q. 27. Which one of the following is employed as Antithistamine?

(1) Omeprazole (2) Chloramphenicol

(3) Diphenyl hydramine (4) Norothindrone

Answer : (3)

Solution:-Diphenyl hydramine is employed as Antihistamine

Q. 28. Which one of the following statements is not true regarding (+) Lactose?

(1) (+) Lactose, $C_{12}H_{22}O_{11}$ contains 8-OH groups
(2) On hydrolysis (+) Lactose gives equal amount of D(+) glucose and D(+) galactose
(3) (+) Lactose is a b-glycoside formed by the union of a molecule of D(+) glucose and a molecule of D(+) galactose
(4) (+) Lactose is reducing sugar and does not exhibit mutarotation

Answer : (4)

Solution:- (+) lactose is a reducing sugar and it exhibit mutarotation

Q. 29. Which one of the following statement is no true?

(1) Oxides of sulphur, nitrogen and carbon are the most widespread air pollutant
(2) pH of drinking water should be between 5.5 – 9.5
(3) Concentration of DO below 6 ppm is good for the growth of fish
(4) Clean water would have a BOD value of less than 5 ppm

Answer : (3)

Biology

Q. 1. The "Eyes" of the potato tuber are

1. Axillary buds
2. Root buds
3. Flower buds
4. Shoot buds

Answer:- 1

Solution:- Axillary buds developing at nodes/notch/eyes.

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Q. 2. Organisms called Methanogens are most abundant in a

1. Hot spring
2. Sulphur rock
3. Cattle yard
4. Polluted stream

Answer:- 3

Solution:- Methanogens are archaebacteria abundant in cattle yard, and paddy fields.

Q. 3. Which one of the following have the highest number of species in nature?

1. Angiosperms
2. Fungi
3. Insects
4. Birds

Answer:- 3

Solution:- The largest phylum in animal kingdom is arthropoda, and the largest class is insecta with 7,50,000 species.

Q. 4. Archegoniophore is present in

1. Funaria
2. Marchantia
3. Chara
4. Adiantum

Answer:- 2

Solution:- Stalk bearing archegonial cluster at tip in Marchantia thallus

Q. 5. Compared with the gametophytes of the bryophytes the gametophytes of vascular plants tend to be

1. Smaller and to have smaller sex organs
2. Smaller but to have larger sex organs
3. Larger but to have smaller sex organs
4. Larger and to haver larger sex organs

Answer:- 1

Solution:- Gametophytes are reduced and few celled in all vascular plants.

Q. 6. The gametophyte is not an independent, free-living generation in

1. Pinus
2. Polytrichum
3. Adiantum
4. Marchantia

Answer:1

Solution:- In gymnosperms and angiosperms gametophytes are dependent on sporophyte.

Q. 7. Important site for formation of glycoproteins and glycolipids is

1. Lysosome
2. Vacuole
3. Golgi apparatus
4. Plastid

Answer:- 3

Solution:- Golgi complex performs glycosyl transferase activity for addition of glycans on lipids and proteins.

Q. 8.Peptide synthesis inside a cell takes place in

1. Ribosomes
2. Chloroplast
3. Mitochondria
4. Chromoplast

Answer:- 1

Solution:- Ribosomes are site of peptide bond formation.

Q. 9. In eubacteria, a cellular component that resembles eukaryotic cell is

1. Cell wall
2. Plasma membrane
3. Nucleus
4. Ribosomes

Answer:- 2

Solution:- Lipoprotein cell membrane is found in both but ribosomes are of different kinds.

Q. 10. Mutations can be induced with

1. Gamma radiations
2. Infra Red radiations
3. I A A
4. Ethylene

Answer:- 1

Solution:- Mutation can be induced with high energy radiations like UV rays, gamma rays, which cause change in the structure of DNA.

Q. 11. A collection of plants and seeds having diverse alleles of all the genes of a crop is called

1. Genome
2. Herbarium
3. Germplasm
4. Gene library

Answer:- 3

Solution:- Germplasm can be selected as seed or plantlets for their superior traits.

Q. 12. Which one of the following also acts as a catalyst in a bacterial cell?

1. 23 sr RNA
2. 5 sr RNA
3. sn RNA
4. hn RNA

Answer:- 1

Solution:- 23 S rRNA is catalytic RNA.

Q. 13. Which one of the following statements is correct?

1. Flower of tulip is a modified shoot
2. In tomato, fruit is a capsule
3. Seeds of orchids have oil-rich endosperms

4. Placentation in primose is basal

Answer:- 1

Solution:- Tomato — Berry, Orchid seed — no endosperm formation, Primrose — Free central placentation.

Q. 15. Nitrifying bacteria

1. Reduce nitrates to free nitrogen
2. Oxidize ammonia to nitrates
3. Convert free nitrogen to nitrogen compounds
4. Convert proteins into ammonia

Answer:- 2

Q. 16. The function of leghaemoglobin in the root nodules of legumes is

1. Expression of nif gene
2. Inhibition of nitrogenase activity
3. Oxygen removal
4. Nodule differentiation

Answer:- 3

Solution:- LHB is O_2 scavanger.

Q. 17. Which one of the following elements in plants is not remobilised?

1. Sulphur
2. Phosphorus
3. Calcium
4. Potassium

Answer: 3

Solution:- Calcium is not remobilised, as it is a structural component in cell.

Q. 18. A drupe develops in

1. Tomato
2. Mango
3. Wheat
4. Pea

Answer:- 2

Solution:- Tomato — Berry, Wheat — Caryopsis, Pea — Legume

Q. 19. Ground tissue includes

1. All tissues internal to endodermis
2. All tissues external to endodermis
3. All tissues except epidermis and vascular bundles
4. Epidermis and cortex

Answer:- 3

Solution:- Ground tissue system includes — cortex, endoderm, pericycle and pith.

Q. 20 . In land plants the guard cells differ from other epidermal cells in having

1. Chloroplasts
2. Cytoskeleton
3. Mitochondria
4. Endoplasmic reticulum

Answer: 1

Solution:- Guard cells are specialised chlorophyllous epidermal cells.

Q. 21. The ovary is half inferior in flowers of

1. Guava
2. Peach
3. Cucumber
4. Cotton

Answer:- 2

Solution:- Ovary is half inferior in perigynous flowers.

Q. 22. The cork cambium, cork and secondary cortex are collectively called

1. Phellem
2. Phelloderm
3. Phellogen
4. Periderm

Answer:- 4

Solution:- Phellem, phellogen and phelloderm are collectively called periderm.

Q. 23. Which one of the following is wrongly matched?

1. Cassia – Imbricate aestivation
2. Root pressure – Guttation
3. Puccinia – Smut
4. Root – Exarch protoxylem

Answer:- 3

Solution:- Puccinia — rust fungi.

Q 24. Flowers are Zygomorphic in

1. Datura
2. Mustard
3. Gulmohur
4. Tomato

Answer:- 3

Solution:- Datura, mustard and tomato have actinomorphic flowers.

Q. 25. CAM helps the plants in

1. Reproduction
2. Conserving water
3. Secondary growth
4. Disease resistance

Answer:- 2

Solution:- These are succulent plants with water storing cells.

Q. 26. Of the total incident solar radiation the proportion of PAR is

1. More than 80%
2. About 70%
3. About 60%
4. Less than 50%

Answer:- 4

Solution:- Plants capture 2-10% of PAR.

Q. 27. A prokaryotic autotrophic nitrogen fixing symbiont found in

1. Pisum
2. Alnus
3. Cycas
4. Cicer

Answer:- 3

Solution:- Anabaena cycadae is a BGA found in coralloid roots of Cycas

Q. 28. Nucellar polyembryony is reported in species of

1. Brassica
2. Citrus
3. Gossypium
4. Triticum

Answer:- 2

Solution:- Nucellus polyembryony is common in Citrus,mango and Opuntia.

Q. 29. Filiform apparatus is a characteristic feature of

1. Zygote
2. Suspensor
3. Egg
4. Synergid

Answer:- 4

Solution:- These are fingure like projections at micropylar end of synergids.

Q .30. What would be the number of chromosomes of the aleurone cells of a plant with 42 chromosomes in its roots tip cells?

1. 21
2. 42
3. 63
4. 84

Answer:- 3

Solution:- Aleurone is triploid and root tip is diploid.

Q .31. Wind pollination is common in

1. Orchids
2. Legumes
3. Lilies
4. Grasses

Answer:- 4

Solution:- Wind pollination is common in grasses and gymnosperms.

Q .32. In which one of the following pollination is autogamous?

1. Cleistogamy
2. Geitonogamy
3. Xenogamy
4. Chasmogamy

Answer:- 1

Solution:- Self pollination is favoured by cleistogamy.

Q .33. Mass of living matter at a trophic level in an area at any time is called

1. Standing state
2. Standing crop
3. Detritus
4. Humus

Answer:- 2

Solution:- Standing state represent all non-living matter in an area at a given time

Q .34. Which one of the following statements is wrong in case of Bhopal tragedy?

1. It took place in the night of December 2/3/1984
2. Methyl Isocyanate gas leakage took place
3. Thousands of human beings died
4. Radioactive fall out engulfed Bhopal

Answer:- 4

Solution:- It was not a tragedy related to radioactivity

Q. 35. Secondary sewage treatment is mainly a

1. Biological process
2. Physical process
3. Mechanical process
4. Chemical process

Answer:- 1

Solution:- Secondary sewage treatment involves aerobic and anaerobic microbes.

Q. 36. Eutrophication is often seen in

1. Mountains
2. Deserts
3. Fresh water lakes
4. Ocean

Answer:- 3

Solution:- It is process of enrichment of lakes by phosphates, nitrates etc.

Q. 37. Large Woody Vines are more commonly found in

1. Alpine forests
2. Temperate forests

3. Mangroves 4. Tropical rainforests

Answer:- 4

Solution:- Lianas and epiphytes are more common in tropical rain forest.

Q. 38. Which one of the following expanded forms of the followings acronyms is correct?

1. IUCN = International Union for Conservation of Nature and Natural Resources
2. IPCC = International Panel for Climate Change
3. UNEP = United Nations Environmental Policy
4. EPA = Environmental Pollution Agency

Answer:- 1

Solution:- IPCC — Intergovernmental Panel for Climate Change

Q. 39. Which one of the following statements is correct for secondary succession?

1. It is similar to primary succession except that it has a relatively fast pace
2. It begins on a bare rock
3. It occurs on a deforested site
4. It follows primary succession

Answer:- 3

Solution:- Secondary biotic succession occurs in abandoned farm lands, burned or cut forests and lands that have been flooded.

Q. 40. Which one of the following shows maximum genetic diversity in India?

1. Mango 2. Groundnut

3. Rice 4. Maize

Answer:- 3

Solution:- Rice has more than 50,000 genetically different strains, while mango has 1000 varieties in India.

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Q. 41. Which one of the following is not a biofertilizer?

1. Mycorrhiza
2. Agrobacterium
3. Rhizobium
4. Nostoc

Answer:- 2

Solution:- Agrobacteriumis a gene transfer agent.

Q. 42. Which one of the following acts as a physiological barrier to the entry of microorganisms in human body?

1. Skin
2. Epithelium of Urogenial tract
3. Tears
4. Monocytes

Answer:- 3

solution- Physiological barriers to the entry of micro-organisms in human body are tears in eyes, saliva in mouth and HCl in stomach.

Q. 43. Which one of the following helps in absorption of phosphorus from soil by plants?

1. Anabaena
2. Glomus
3. Rhizobium
4. Frankia

Answer:- 2

Solution:- Glomus is a endomycorrhiza for phosphorus absorption.

Q. 44. 'Himgiri' developed by hybridisation and selection for disease resistance against rust pathogens is a variety of

1. Wheat
2. Chilli
3. Maize
4. Sugarcane

Answer 1

Solution:- This variety is resistant against leaf and stripe rust, hill bunt.

Q. 45. Which of the followings is mainly produced by the activity of anaerobic bacteria on sewage?

1. Marsh gas
2. Laughing gas
3. Propane
4. Mustard gas

Answer:- 1

Solution:- It is by the activity of methanogens.

Q. 46. Agarose extracted from sea weeds finds use in

1. Gel electrophoresis
2. Spectrophotometry
3. Tissue culture
4. PCR

Answer: (1)

Solution:- Agarose extracted from sea weeds finds use in gel electrophoresis.

Q. 47. Maximum number of existing transgenic animals is of

1. Pig
2. Fish
3. Mice
4. Cow

Answer: (3)

Solution:- 95% of the existing transgenic animals are mice.

Q. 48. Continuous addition of sugars in 'fed batch' fermentation is done to

1. Degrade sewage
2. Produce methane
3. Obtain antibiotics
4. Purify enzymes

Answer: (4)

Solution:- Continuous addition of sugar in fed 'batch' fermentation is done to purify enzymes.

Q. 49. The process of RNA interference has been used in the development of plants

resistant to

1. Insects
2. Nematodes
3. Fungi
4. Viruses

Answer: (2)

Solution:- RNAi i.e., RNA interference is used in the development of plants resistant to nematode like Meloidegyne incognita.

Q. 50. "Jaya" and "Ratna" developed for green revolution in India are the varieties of

1. Bajra
2. Maize
3. Rice
4. Wheat

Answer: (3)

Solution:- aya and Ratna are released throughout the rice growing belts of India.

Q. 51. Which one of the following organisms is not an example of eukaryotic cells

1. Amoeba proteus
2. Paramecium caudatum
3. Paramecium caudatum
4. Euglena viridis

Answer: (3)

Solution:-E. coli is a prokaryotic bacterium.

Q. 52. Which one of the following animals is correctly matched with its particular

named taxonomic category?

1. Housefly - Musca, an order
2. Tiger - Tigris, the species
3. Cuttlefish - Mollusca, a class
4. Humans - Primata, the family

Answer: (2)

Solution:-The zoological name of tiger is Panthera tigris in which Panthera is genus and tigris is

species.

Q. 53. What will you look for to identify the sex of the following?

1. Male shark - Claspers borne on pelvic fins
2. Female Ascaris - Sharply curved posterior end
3. Male frog - A copulatory pad on the first digit of the hind limb
4. Female cockroach - Anal cerci

Answer: (1)
Solution:-In class chondrichthyes males possess claspers on the pelvic fins.

Q. 54. The ciliated columnar epithelial cells in humans are known to occur in

1. Fallopian tubes and urethra
2. Eustachian tube and stomach lining
3. Bronchioles and Fallopian tubes
4. Bile duct and oesophagus

Answer: (3)

Solution:-Ciliated columnar epithelium lines bronchioles and fallopian tubes.

Q. 55. Select the correct option with respect to mitosis

1. Chromosomes move to the spindle equator and get alingned along equatorial plate in metaphase
2. Chromatids separate but remain in the centre of the cell in anaphase
3. Chromatids start moving towards opposite poles in telophase
4. Golgi complex and endoplasmic reticulum are still visible at the end of prophase

Answer: (1)

Solution:- Chromatids show poleward movement in anaphase; golgi and ER disappears in late prophase.

Q. 56. What was the most significant trend in the evolution of modern man (Homo sapiens) from his ancestors?

1. Increasing brain capacity
2. Upright posture
3. Shortening of jaws
4. Binocular vision

Answer: (1)

Solution:- The most significant trend in the evolution of modern man (Homo sapiens) from the ancestors is increasing brain capacity.

Q. 57. Which one of the following conditions correctly describes the manner of determining the sex in the given example?

1. Homozygous sex chromosomes (XX) produce make in Drosophila
2. Homozygous sex chromosomes (ZZ) determine female sex in birds
3. XO type of sex chromosomes determine male sex in grasshopper
4. XO condition in humans as found in Turner Syndrome, determines female sex

Answer: (3)

Q. 58. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend?

1. Type A
2. Type B
3. Type AB
4. Type O

Answer: (4)

Solution:-The person with blood group O is said to universal donor, because in this, there are no antigens on the surface of RBC.

Q. 59. What are those structures that appear as 'beads-on-string' in the chromosomes

when viewed under electron microscope?

1. Base pairs
2. Genes
3. Nucleotides
4. Nucleosomes

Answer: (4)

Solution:-Nucleosome consist of octameric histone core wrapped by dsDNA

Q. 60. Which of the following is correctly stated as happens in the common cockroach?

1. The food is ground by mandibles an gizzard
2. Malpighian tubules are excretory organ projecting out from the colon
3. Oxygen is transported by haemoglobin blood
4. Nitrogenous excretory product is urea

Answer: (1)

Solution:-In cockroach the food is grinded by mandibles and gizzard. In insects there is no oxygen transporting pigment and nitrogenous excretory product is uric acid.

Q. 61. A large proportion of oxygen is left unused the human blood even after its uptake by the body tissues. This O_2

1. Helps in releasing more O_2 to the epithelium tissues
2. Acts as a reserve during muscular exercise
3. Raises the pCO_2 of blood to 75 mm of Hg
4. Is enough to keep oxyhaemoglobin saturation at 96%

Answer: (2)

Solution:-Our tissues are able to utilise only 25% of O_2 carried by arterial blood. Our venous blood is still 75% saturated with O_2. This O_2 acts as a reserve during muscular exercise.

Q. 62. Which one of the following enzymes carries on the initial step in the digestion of

milk in humans?

1. Trypsin
2. Pepsin
3. Rennin
4. Lipase

Answer: (2)

Solution:- In humans milk protein digesting enzyme in stomach is pepsin. In calves it is rennin. Rennin is also present in small amounts in human infants but not adults. Pepsin acts on water soluble caseinogen (milk protein) to form solubles 'casein'. This combines with calcium salts to form insoluble calcium paracaseinate, which gets readily digested enzymatically.

Q. 63. Which one of the following is not a part of a renal pyramid?

1. Loops of Henle
2. Peritubular capillaries
3. Convoluted tubules
4. Collecting ducts

Answer: (3)

Solution:- In Bowman's capsule PCT and DCT are in renal cortex, whereas, loops of Henle are in medullary pyramids.

Q. 64. One very special feature in the earthworm pheretima is that

1. It has a long dorsal tubular heart
2. Fertilisation of eggs occurs inside the body
3. The typhlosole greatly increases the effective absorption area of the digested food in the intestine
4. The S-shaped setae embedded in the integument are the defensive weapons used against the enemies

Answer: (3)

Solution:-In earthworm, mid dorsal villi typhlosole greatly increases the effective absorption area of the digested food in the intestine

Q. 65. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of

1. Tongue
2. Epiglottis
3. Diaphragm
4. Neck

Answer: (2)

Solution:-If a person suddenly starts coughing while swallowing food, it is due to improper movement of epiglottis. If the glottis is not properly closed some food can enter respiratory tract.

Q. 66. Arteries are best defined as the vessels which

1. Carry blood from one visceral organ to another visceral organ
2. Supply oxygenated blood to the different organs
3. Carry blood away from the heart to different organs
4. Break up into capillaries which reunite to form a vein

Answer: (3)

Solution:- Arteries are best defined as vessels which carry blood away from the heart to different organs.

Q. 67. 'Bundle of His' is a part of which one of the following organs in humans?

1. Pancreas
2. Brain
3. Heart
4. Kidney

Answer: (3)

Solution:- 'Bundle of His' is a part of conducting system of human heart.

Q. 68. The purplish red pigment rhodopsin contained in the rods type of photoreceptor

cells of the human eye, is a derivative of

1. Vitamin A
2. Vitamin B1
3. Vitamin C
4. Vitamin D

Answer: (1)

Solution:- Vitamin A is the precursor of the purplish red pigment rhodopsin contained in the rods (photoreceptor) cells of human eye.

Q. 69. Which one of the following plasma proteins is involved in the coagulation of blood?

1. Fibrinogen

2. An albumin
3. Serum amylase
4. A globulin

Answer: (1)

Solution:-Fibrinogen is a plasma protein involved in clotting of blood.

Q. 70. When a neuron is in resting state i.e. not conducting any impulse, the axonal membrane is

1. Comparatively more permeable to K+ ions and nearly impermeable to Na+ ions
2. Comparatively more permeable to Na+ ions and nearly impermeable to K+ ions
3. Equally permeable to both Na+ and K+ ions
4. Impermeable to both Na+ and K+ ions

Answer: (1)

Solution:- When a neuron is in resting state i.e., not conducting any impulse, the axonal membrane is comparatively more permeable to K+ ions and nearly impermeable to Na+ ions.

Q. 71. Which one of following correctly explains the function of a specific part of a human nephron?

1. Afferent arteriole : Carries the blood away from the glomerulus towards renal vein
2. Podocytes : Create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
3. Henle's loop : Most reabsorption of the major substances from the glomerular filtrate
4. Distal convoluted tubule: Reabsorption of K+ ions into the surrounding blood capillaries

Answer: (2)

Solution:-Podocytes are specialised squamous epithelial cells in the inner wall of Bowman's capsule. They give rise to foot like processes which form filtration slits for the filtration of blood into the Bowman's capsule.

Q. 72. Uricotelic mode of passing out nitrogenous wastes in found in

1. Insects and Amphibians
2. Reptiles and Birds
3. Birds and Annelids
4. Amphibians and Reptiles

Answer: (2)

Solutio:-Reptiles and birds are uricotelic.

Q. 73. Which one of the following statements is correct regarding blood

1. 190/110 mmHg may harm vital organs like brain and kidney
2. 130/90 mmHg is considered high and requires treatment
3. 100/55 mmHg is considered an ideal blood pressure
4. 105/50 mmHg makes one very active

Answer: (1)

Solution:- Hypertension occurs if the blood pressure is 190/110. This can harm the vital organs like brain and kidneys.

Q. 74. Which one of the following statements is correct with respect to kidney function regulation?

1. During summer when body loses lot of water by evaporation, the release of ADH is suppressed
2. When someone drinks lot of water, ADH release is suppressed
3. Exposure to cold temperature stimulates ADH release
4. An increase in glomerular blood flow stimulates formation of Angiotensin II

Answer: (2)

Solution:- When someone drinks lot of water which is not required by his body, the osmolarity of the blood will decrease. The decrease in osmolarity will inhibit the release of ADH. ADH not released DCT becomes less permeable to water, and excess of water is eliminated.

Q. 75. The testes in humans are situated outside the abdominal cavity inside a pouch called scrotum. The purpose served is for

1. Providing a secondary sexual feature for exhibiting the male sex
2. Maintaining the scrotal temperature lower than the internal body temperature
3. Escaping any possible compression by the visceral organs
4. Providing more space for the growth of epididymis

Answer: (2)

Solution:- The tests in humans are situated outside the abdominal cavity in scrotal sacs. This is because the temperature of scrotal sacs is 2.5°C lesser than internal body temperature.

Q.76. Which one of the following is the most widely accepted method of contraception in India, as at present?

1. IUDs' (Intra uterine devices)
2. Cervical caps
3. Tubectomy
4. Diaphragms

Answer: (1)

Solution:- The most widely accepted method of contraception in India is IUDs.

Q. 77. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from

1. Vagina to uterus
2. Testes to epididymis
3. Epididymis to vas deferens
4. Ovary to uterus

Answer: (2)

Solution:-The path of transport of gametes is Seminiferous tubules → rete testis → vasa efferentia → epididymis. So, if vasa efferentia are blocked the gametes from testes will not enter epididymis.

Q. 78. Medical Termination of Pregnancy (MTP) is considered safe up to how many weeks of pregnancy?

1. Six weeks
2. Eight weeks
3. Twelve weeks
4. Eighteen weeks

Answer: (3)

Solution:- MTPs are considered safe upto twelve weeks of pregnancy.

Q. 79. Which one of the following is categorised as a parasite in true sense?

1. The cuckoo (koel) lays its egg in crow's nest
2. The female Anopheles bites and sucks blood from humans

3. Human foetus developing inside the uterus draws nourishment from the mother
4. Head louse living on the human scalp as well as laying eggs on human hair

Answer: (4)

Solution:- Head louse living on the human scalp as well as laying eggs on human hair is a parasite in true sense. Female mosquito is not considered as a parasite, though it needs human blood for reproduction. Koel that lays in crow's nest is just a brood parasite.

Q. 80. What type of human population is represented by the following pyramid?

1. Expanding population
2. Vanishing population
3. Stable population
4. Declining population

Answer: (4)

Solution:- It is an Urn shaped pyramid with least number of pre-reproductive individuals.

Q. 81. Which one of the following statements for pyramid of energy is incorrect, whereas the remaining three are correct?

1. It is upright in shape
2. Its base is broad
3. It shows energy content of different trophic level organisms
4. It is inverted in shape

Answer: (4)

Solution:- It is never inverted.

Q. 82. Ethanol is commercially produced through a particular species of

1. Aspergillus
2. Aspergillus
3. Clostridium
4. Trichoderma

Answer: (2)

Solution:- Yeast species.

Q. 83. Consider the following four conditions (a - d) and select the correct pair of them as adaptation to environment in desert lizards.

The conditions

(a) Burrowing in soil to escape high temperature
(b) Losing heat rapidly from the body during high temperature
(c) Bask in sun when temperature is low
(d) Insulating body due to thick fatty dermis

1. (a), (b)
2. (c), (d)
3. (a), (c)
4. (b), (d)

Answer: (3)

Solution:-The adaptations in desert lizard are

(i) burrowing in soil to escape high temperature
(ii) bask in sun when temperature is low

Q. 84. Which one of the following pairs of gases are the major cause of "Greenhouse Effect"?

1. CO_2 and N_2O
2. CO_2 and O_3
3. CO_2 and CO
4. CFCs and SO_2

Answer: (1)

Solution:-CO_2, CH_4, N_2O and CFC are common green house gases.

Q. 85. Where will you look for the sporozoites of the malarial parasite?

1. Salivary glands of freshly moulted female Anopheles mosquito
2. Saliva of infected female Anophelesmosquito
3. Red blood corpuscles of humans suffering from malaria
4. Spleen of infected humans

Answer: (2)

Solution:- Sporozoites are the infective stage of malarial parasite. They present in the saliva of infected female Anophelesmosquito.

Q. 86. When two unrelated individuals or lines are corssed, the performance of F1 hybrid is often superior to both its parents. This phenomenon is called

1. Metamorphosis
2. Heterosis
3. Transformation
4. Spheing

Answer: (2)

Solution:- Heterosis is equivalent to hybrid vigour.

Q. 87. A certain patient is suspected to be suffering from Acquired Immuno Deficiency Syndrome. Which diagnostic technique will you recommend for its detection?

1. WIDAL
2. ELISA
3. MRI
4. Ultra sound

Answer: (2)

Solution:- ELISA is a diagnostic test for AIDS.

Q. 88. At which stage of HIV infection does one usually show symptoms of AIDS?

1. Within 15 days of sexual contact with an infected person
2. When the infecting retrovirus enters host cells
3. When viral DNA is produced by reverse transcriptase
4. When HIV replicates rapidly in helper T-lymphocytes and damages large number of these

Answer: (4)

Solution:-Symptoms of AIDs appear when there is depletion of helper T-cells.

Q. 89. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands. What is so special shown in it?

5' _____ GAATTC _____ 3'

3' _____CTTAAG _____ 5'

1. Palindromic sequence of base pairs
2. Replication completed
3. Deletion mutation
4. Start codon at the 5' end

Answer: (1)

Solution :- 5' _____ GAATTC _____ 3'

3' _____CTTAAG _____ 5' is the palindromic sequence, recognised by EcoRI.

Q.90. The most common substrate used in distilleries for the production of ethanol is

1. Molasses
2. Corn meal
3. Soya meal
4. Ground gram

Answer: (1)

Solution:- Molasses are used commonly in distilleries for ethanol production

Q. 91. An organism used as biofertilizer for raising soyabean crop is

1. Nostoc
2. Azotobacter
3. Azospirillum
4. Rhizobium

Answer: (4)

Solution: -Soyabean is a legume associated symbiotically with Rhizobium.

Q. 92. There is a restriction endonuclease called EcoRI. What does "co" part in it stand for?

1. coli
2. colon
3. coelom
4. coenzyme

Answer: (3)

Soluion:- In EcoRI, 'co' stands for coli (species of bacteria, from where it is obtained)

AIPMT 2011

Physics

Q. 1. A boy standing at the top of a tower of 20 m height drops a stone. Assuming g = $10ms^2$, the velocity with Which it hits the ground is

(1) 5.0 m/s (2) 10.0 m/s

(3) 20.0 m/s (4) 40.0 m/s

Answer : (3)

Q. 2. A person of mass 60 kg is inside a lift of mass 940 kg and presses the button one control panel. The lift starts moving upwards with an acceleration $1.0ms^{-2}$. If g = 10ms^(-2), the tension in the supporting cable is :

(1) 1200 N (2) 8600 N

(3) 9680 N (4) 11000 N

Answer (4)

Solution: T = (M + m) (g + a) = (940 + 60) (10 + 1) = 11000 N

Q. 3. A body projected vertically from the earth reaches a height equal to earth's radius before returning to the earth. The power exerted by the gravitational force is greatest

(1) At the instant just after the body is projected
(2) At the highest position of the body
(3) At the instant just before the body hits the earth
(4) It remains constant all through

Answer (3)

Q. 4. A particle moves in a circle of radius 5 cm with constant speed and time period 0.2π s. The acceleration of the particle is

(1) 5 m/s^2 (2) 15 m/s^2

(3) 25 m/s^2 (4) 36 m/s^2

Answer : (1)

Q.5. A body of mass M hits normally a rigid wall with velocity V and bounces back with the same velocity. The Impulse experienced by the body is

(1) Zero (2) MV

(3) 1.5 MV (4) 2 MV

Answer: (4)

Q.6. The potential energy of a system increases if work is done

(1) Upon the system by a conservative force
(2) Upon the system by a non-conservative force
(3) By the system against a conservative force
(4) By the system against a non-conservative force

Answer : (3)

Sol:- By definition

Q. 7. A body is moving with velocity 30 m/s towards east. After 10 seconds its velocity becomes 40 m/s towards north. The average acceleration of the body is

(1) 5 m/s^2 (2) 1 m/s^2

(3) 7 m/s^2 (4) 7 m/s^2

Answer : (1)

Q. 8. A missile is fired for maximum range with an initial velocity of 20 m/s. If g = 10m/s2 , the range of the missile is

(1) 20 m (2) 40 m

(3) 50 m (4) 60 m

Answer : (2)

Q. 9. A charge Q is enclosed by a Gaussian spherical surface of radius R. If the radius is doubled, then the outward electric flux will

(1) Be doubled (2) Increase four times

(3) Be reduced to half (4) Remain the same

Answer : (4)

Q. 10. A current of 2 A flows through a 2 Ω resistor when connected across a battery.The same battery supplies a current of 0.5 A when connected across a 9 Ω resistor. The internal resistance of the battery is

(1) 1 Ω (2) 0.5 Ω

(3) 1/3 Ω (4) 1/4 Ω

Answer: (3)

Q.11. The power obtained in a reactor using U235 disintegration is 1000 kW. The mass decay of U235 per hour is

(1) 1 microgram (2) 10 microgram

(3) 20 microgram (4) 40 microgram

Answer : (4)

Q. 12. There are four light-weight-rod samples, A, B, C, D separately suspended by threads. A bar magnet is slowly brought near each sample and the following observations are noted

(i) A is feebly repelled
(ii) B is feebly attracted
(iii) C is strongly attracted
(iv) D remains unaffected

Which one of the following is true?

(1) A is of a non-magnetic material (2) B is of a paramagnetic material

(3) C is of a diamagnetic material (4) D is of a ferromagnetic material

Answer:- (2)
Sol:- Diamagnetic will be feebly repelled. Paramagnetic will be feebly attracted.Ferromagnetic will be strongly attracted.

Q. 13. A uniform electric field and a uniform magnetic field are acting along the same direction in certain region. If an electron is projected in the region such that its velocity is pointed along direction of fields, then the electron

(1) Will turn towards left of direction of motion
(2) Will turn towards right of direction of motion
(3) Speed will decrease
(4) Speed will increase

Answer : (3)

Solution:- Real & apparent depth are explained on the basis of refraction only. TIR not involved here.

Q. 14. A biconvex lens has a radius of curvature of magnitude 20 cm. Which one of the following options describe best the image formed of an object of height 2 cm placed 30 cm from the lens?

(1) Real, inverted, height = 1 cm (2) Virtual, upright, height = 1 cm

(3) Virtual, upright, height = 0.5 cm (4) Real, inverted, height = 4 cm

Answer : (4)

Q. 15. In photoelectric emission process from a metal of work function 1.8 eV, the kinetic energy of most energetic electrons is 0.5 eV. The corresponding stoppingpotential is

(1) 2.3 V (2) 1.8 V

(3) 1.3 V (4) 0.5 V

Answer : (4)

Solution:- eV = KEmax

Q.16. Electrons used in an electron microscope are accelerated by a voltage of 25 kV. If the voltage is increased to 100 km then the de-Broglie wavelength associated with the electrons would

(1) Increase by 4 times (2) Increase by 2 times

(3) Decrease by 2 times (4) Decrease by 4 times

Answer : (3)

Q. 17. Light of two different frequencies whose photons have energies 1 eV and 2.5 eV respectively illuminate a metallic surface whose work function is 0.5 eV successively. Ratio of maximum speeds of emitted electrons will be

(1) 1: 5 (2) 1: 4

(3) 1: 2 (4) 1: 1

Answer : (3)

Q. 18. In the Davisson and Germer experiment, the velocity of electrons emitted from the electron gun can be increased by

(1) Decreasing the potential difference between the anode and filament
(2) Increasing the potential difference between the anode and filament
(3) Increasing the filament current
(4) Decreasing the filament current

Answer : (2)

Q.19. The half life of a radioactive isotope X is 50 years. It decays to another element Y which is stable. The two elements X and Y were found to be in the ratio of 1: 15 in a sample of a given rock. The age of the rock was estimated to be

(1) 100 years (2) 150 years

(3) 200 years (4) 250 years

Answer : (3)

Q. 20. Photoelectric emission occurs only when the incident light has more than a certain minimum

(1) Frequency (2) Power

(3) Wavelength (4) Intensity

Answer:- 1

Sol:- Concept of threshold frequency

Q. 21. Fusion reaction takes place at high temperature because

(1) Molecules break up at high temperature
(2) Nuclei break up at high temperature
(3) Atoms get ionised at high temperature
(4) Kinetic energy is high enough to overcome the coulomb repulsion between nuclei

Answer : (4)

Q.22. A transistor is operated in common emitter configuration at VC = 2 V such that a change in the base current from 100 mA to 300 mA produces a change in the collector current from 10 mA to 20 mA. The current gain is

(1) 25 (2) 50

(3) 75 (4) 100

Answer : (2)

Q.23. If a small amount of antimony is added to germanium crystal

(1) Its resistance is increased
(2) It becomes a p-type semiconductor
(3) The antimony becomes an acceptor atom
(4) There will be more free electrons than hole in the semiconductor

Answer : (4)

Sol:- Addition of antimony will make it an N-type semiconductor

Q.24. In forward biasing of the p-n junction

(1) The positive terminal of the battery in connected to p-side and the depletion region becomes thin
(2) The positive terminal of the battery is connected to p-side and the depletion region becomes thick
(3) The positive terminal of the battery is connected to n-side and the depletion region becomes thin
(4) The positive terminal of the battery is connected to n-side and the depletion region becomes thick

Answer : (1)