NEET-UG EXAMINATION PAPER-2007

(Solved)

Time allowed : 3 hours | Maximum Marks : 800

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **200 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 200** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

Section A

Question 1.

Dimensions of resistance in an electrical circuit, in terms of dimension of mass [M], of length [L], of time [T] and of current [I], would be

[4 Marks]

(A) $[ML^2T^{-3}I^{-1}]$

(B) $[ML^2T^{-3}I^{-2}]$

(C) $[ML^2T^{-2}]$

(D) $[ML^2T^{-1}I^{-1}]$

Question 2.

A car moves from X to Y with a uniform speed v_u and returns to Y with a uniform speed v_d. The average speed for this round trip is

[4 Marks]

(A) $\sqrt{(v_u v_d)}$

(B) $(v_d v_u) / (v_d + v_u)$

(C) $2v_d v_u / (v_d + v_u)$

(D) $(v_u + v_d) / 2$

Question 3.

The position x of a particle with respect to time t along x-axis is given by $x = 9t^2 - t^3$ where x is in metres and t in second. What will be the position of this particle when it achieves maximum speed along the +ve x direction?

[4 Marks]

(A) 81m

(B) 54m

(C) 32m

(D) 24m

Question 4.

A particle moving along x-axis has acceleration f, at time t, given by $f = f_0 (1 - t/T)$, where f_0 and T are constants. The particle at t = 0 has zero velocity. In the time interval between t = 0 and the instant when f = 0, the particle's velocity (v_x) is

[4 Marks]

(A) $f_0 T^2$

(B) $(1/2) f_0 T^2$

(C) $(1/2) f_0 T$

(D) $f_0 T$

Question 5.

□□ and □□ are two vectors and θ is the angle between them, if | □□ x □□| = √3(□□ . □□), the value of θ is

[4 Marks]

(A) 60°

(B) 90°

(C) 30°

(D) 45°

Question 6.

A particle starting from the origin (0, 0) moves in the (x, y) plane. Its coordinates at a later time are (√3, 3). The path of the particle makes with the x-axis an angle of

[4 Marks]

(A) 60°

(B) 45°

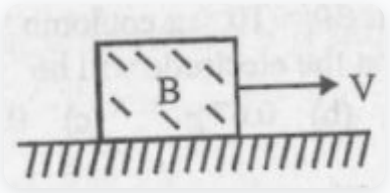
(C) 0°

(D) 30°

Question 7.

A block B is pushed momentarily along a horizontal surface with an initial velocity V. If μ is the coefficient of sliding friction between B and the surface, block B will come to rest after a time

[4 Marks]



(A) gμ/V

(B) g/V

(C) V/g

(D) V/(gμ)

Question 8.

A vertical spring with force constant k is fixed on a table. A ball of mass m at a height h above the free upper end of the spring falls vertically on the spring so that the spring is compressed by a distance d. The net work done in the process is

[4 Marks]

(A) $mg(h + d) - (1/2)kd^2$

(B) $mg(h - d) - (1/2)kd^2$

(C) $mg(h - d) + (1/2)kd^2$

(D) $mg(h + d) + (1/2)kd^2$

Question 9.

A wheel has angular acceleration of 3.0 rad/sec² and an initial angular speed of 2.00 rad/sec. In a time of 2 sec it has rotated through an angle (in radian) of

[4 Marks]

(A) 10

(B) 12

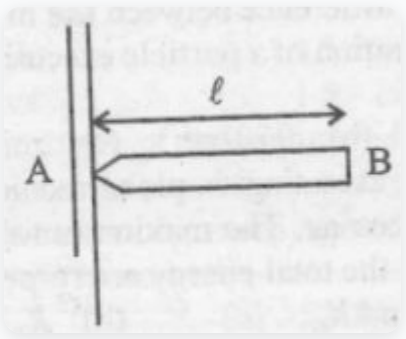
(C) 6

(D) 4

Question 10.

A uniform rod AB of length l, and mass m is free to rotate about point A. The rod is released from rest in the horizontal position. Given that the moment of inertia of the rod about A is $ml^2/3$, the initial angular acceleration of the rod will be

[4 Marks]



(A) mgl/2

(B) 2g/(3l)

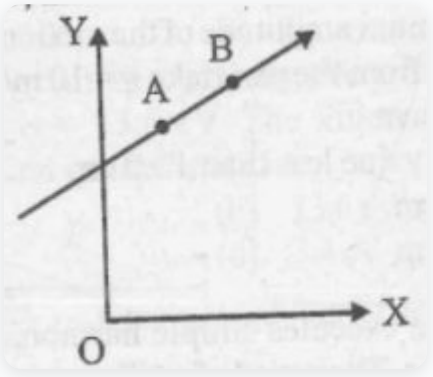
(C) 3g/(2l)

(D) (3/2)gl

Question 11.

A particle of mass m moves in the XY plane with a velocity v along the straight line AB. If the angular momentum of the particle with respect to origin O is L_A when it is at A and L_B when it is at B, then

[4 Marks]



(A) the relationship between L_A and L_B depends upon the slope of the line AB

(B) L_A > L_B

(C) L_A = L_B

(D) L_A < L_B

Question 12.

Two satellites of earth, S_1 and S_2 are moving in the same orbit. The mass of S_1 is four times the mass of S_2. Which one of the following statements is true?

[4 Marks]

(A) The potential energies of earth satellites in the two cases are equal.

(B) S_1 and S_2 are moving with the same speed.

(C) The kinetic energies of the two satellites are equal.

(D) The time period of S_1 is four times that of S_2.

Question 13.

If the cold junction of a thermo-couple is kept at 0°C and the hot junction is kept at T°C then the relation between neutral temperature (T_n) and temperature of inversion (T_i) is

[4 Marks]

(A) $T_n = 2T_i$

(B) $T_n = T_i - T$

(C) $T_n = T_i + T$

(D) $T_n = T_i / 2$

Question 14.

A black body is at 727°C. It emits energy at a rate which is proportional to

[4 Marks]

(A) $(727)^2$

(B) $(727)^4$

(C) $(1000)^2$

(D) $(1000)^4$

Question 15.

Assuming the sun to have a spherical outer surface of radius r, radiating like a black body at temperature t°C, the power received by a unit surface, (normal to the incident rays) at a distance R from the centre of the sun is

[4 Marks]

(A) $r^2 \sigma (t + 273)^4 / (4\pi R^2)$

(B) $16\pi^2 r^2 \sigma t^4 / R^2$

(C) $r^2 \sigma (t + 273)^4 / R^2$

(D) $4\pi r^2 \sigma t^4 / R^2$

Question 16.

An engine has an efficiency of 1/6. When the temperature of sink is reduced by 62°C, its efficiency is doubled. Temperature of the source is

[4 Marks]

(A) 37°C

(B) 62°C

(C) 99°C

(D) 124°C

Question 17.

The phase difference between the instantaneous velocity and acceleration of a particle executing simple harmonic motion is

[4 Marks]

(A) 0.707π

(B) π

(C) zero

(D) 0.5π

Question 18.

The particle executing simple harmonic motion has a kinetic energy $K_0 \cos^2 \omega t$. The maximum values of the potential energy and the total energy are respectively

[4 Marks]

(A) K_0 / 2 and K_0

(B) K_0 and 2K_0

(C) K_0 and K_0

(D) 0 and 2K_0

Question 19.

A mass of 2.0 kg is put on a flat pan attached to a vertical spring fixed on the ground as shown in the figure. The mass of the spring and the pan is negligible. When pressed slightly and released the mass

executes a simple harmonic motion. The spring constant is 200 N/m. What should be the minimum amplitude of the motion so that the mass gets detached from the pan (take g = 10 m/s^2)?

[4 Marks]



(A) any value less than 12.0 cm

(B) 8.0 cm

(C) 4.0 cm

(D) 10.0 cm

Question 20.

A particle executes simple harmonic oscillation with an amplitude a. The period of oscillation is T. The minimum time taken by the particle to travel half of the amplitude from the equilibrium position is

[4 Marks]

(A) T/8

(B) T/12

(C) T/2

(D) T/4

Question 21.

Three point charges +q, -q and +q are placed at points (x = 0, y = a, z = 0), (x = 0, y = 0, z = 0) and (x = a, y = 0, z = 0) respectively. The magnitude and direction of the electric dipole moment vector of this charge assembly are

[4 Marks]

(A) √2 qa along +ve x direction

(B) √2 qa along +ve y direction

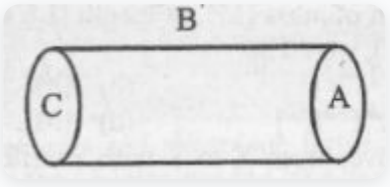
(C) qa along the line joining points (x = 0, y = 0, z = 0) and (x = a, y = a, z = 0)

(D) √2 qa along the line joining points (x = 0, y = 0, z = 0) and (x = a, y = a, z = 0)

Question 22.

A hollow cylinder has a charge q coulomb within it. If φ is the electric flux in units of voltmeter associated with the curved surface B, the flux linked with the plane surface A in units of voltmeter will be

[4 Marks]



(A) q / (2ε_0)

(B) φ / 3

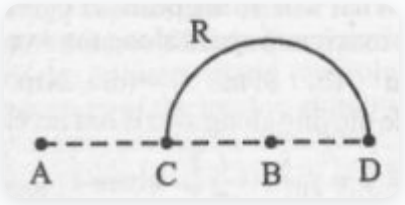
(C) q/ε_0 - φ

(D) (1/2) * (q/ε_0 - φ)

Question 23.

Charges +q and -q are placed at points A and B respectively which are a distance 2L apart, C is the midpoint between A and B. The work done in moving a charge +Q along the semicircle CRD is

[4 Marks]



(A) - qQ / (6π ε_0 L)

(B) qQ / (6π ε_0 L)

(C) qQ / (2π ε_0 L)

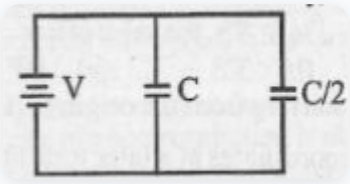
(D) qQ / (4π ε_0 L)

Question 24.

Two condensers, one of capacity C and other of capacity C/2 are connected to a V-volt battery, as shown.

The work done in charging fully both the condensers is

[4 Marks]



(A) (1/4) CV^2

(B) (3/4) CV^2

(C) (1/2) CV^2

(D) $2CV^2$

Question 25.

A steady current of 1.5 amp flows through a copper voltameter for 10 minutes. If the electrochemical equivalent of copper is 30×10^{-5} g coulomb^{-1}, the mass of copper deposited on the electrode will be

[4 Marks]

(A) 0.67 g

(B) 0.50 g

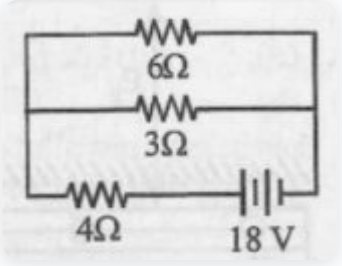
(C) 0.40 g

(D) 0.27 g

Question 26.

The total power dissipated in watts in the circuit shown here is

[4 Marks]



(A) 40

(B) 54

(C) 4

(D) 16

Question 27.

Three resistances P, Q, R each of 2Ω and an unknown resistance S form the four arms of a Wheatstone bridge circuit. When a resistance of 6Ω is connected in parallel to S the bridge gets balanced. What is the value of S?

[4 Marks]

(A) 3Ω

(B) 6Ω

(C) 2Ω

(D) 1Ω

Question 28.

A beam of electron passes undeflected through mutually perpendicular electric and magnetic fields. If the electric field is switched off, and the same magnetic field is maintained, the electrons move

[4 Marks]

(A) along a parabolic path

(B) in a circular orbit

(C) in an elliptical orbit

(D) along a straight line

Question 29.

In a mass spectrometer used for measuring the masses of ions, the ions are initially accelerated by an electric potential V and then made to describe semicircular path of radius R using a magnetic field B. If V and B are kept constant, the ratio (charge on the ion / mass of the ion) will be proportional to

[4 Marks]

(A) 1/R

(B) R

(C) $1/R^2$

(D) R^2

Question 30.

A charged particle (charge q) is moving in a circle of radius R with uniform speed v. The associated magnetic moment μ is given by

[4 Marks]

(A) qvR^2

(B) $qvR^2/2$

(C) qvR

(D) qvR/2

Question 31.

Under the influence of a uniform magnetic field a charged particle is moving in a circle of radius R with constant speed v. The time period of the motion

[4 Marks]

(A) depends on R and not on v

(B) depends on v and not on R

(C) depends on both R and v

(D) is independent of both R and v

Question 32.

The resistance of an ammeter is 13 Ω and its scale is graduated for a current upto 100 amps. After an additional shunt has been connected to this ammeter it becomes possible to measure currents upto 750 amperes by this meter. The value of shunt-resistance is

[4 Marks]

(A) 20 Ω

(B) 0.2 Ω

(C) 2 kΩ

(D) 2 Ω

Question 33.

Nickel shows ferromagnetic property at room temperature. If the temperature is increased beyond Curie temperature, then it will show

[4 Marks]

(A) anti ferromagnetism

(B) no magnetic property

(C) diamagnetism

(D) paramagnetism

Question 34.

What is the value of inductance L for which the current is maximum in a series LCR circuit with C = 10 μF and ω = 1000 s^{-1}?

[4 Marks]

(A) cannot be calculated unless R is known

(B) 1 mH

(C) 10 mH

(D) 100 mH

Question 35.

The primary and secondary coil of a transformer have 50 and 1500 turns respectively. If the magnetic flux φ linked with the primary coil is given by φ = φ_0 + 4t, where φ is in webers, t is time in seconds and φ_0 is a constant, the output voltage across the secondary coil is

[4 Marks]

(A) 30 volts

(B) 90 volts

(C) 120 volts

(D) 220 volts

Question 36.

A transformer is used to light a 100 W and 110 V lamp from a 220 V mains. If the main current is 0.5 amp, the efficiency of the transformer is approximately

[4 Marks]

(A) 90%

(B) 50%

(C) 10%

(D) 30%

Question 37.

The electric and magnetic field of an electro-magnetic wave are

[4 Marks]

(A) in opposite phase and perpendicular to each other

(B) in opposite phase and parallel to each other

(C) in phase and perpendicular to each other

(D) in phase and parallel to each other

Question 38.

The frequency of a light wave in a material is 2×10^{14} Hz and wavelength is 5000 Å. The refractive index of material will be

[4 Marks]

(A) 1.50

(B) 3.00

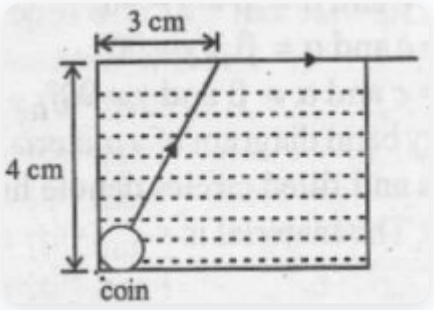
(C) 1.4

(D) 1.33

Question 39.

A small coin is resting on the bottom of a beaker filled with liquid. A ray of light from the coin travels upto the surface of the liquid and moves along its surface. How fast is the light travelling in the liquid?

[4 Marks]



(A) $1.8 * 10^8$ m/s

(B) $2.4 * 10^8$ m/s

(C) $3.0 * 10^8$ m/s

(D) $1.2 * 10^8$ m/s

Question 40.

Monochromatic light of frequency 6.0×10^{14} Hz is produced by a laser. The power emitted is 2×10^{-3} W. The number of photons emitted, on the average, by the sources per second is

[4 Marks]

(A) 5×10^{14}

(B) 5×10^{15}

(C) 5×10^{17}

(D) 5×10^{16}

Question 41.

Biological organisation starts with

[4 Marks]

(A) submicroscopic molecular level

(B) atomic level

(C) organismic level

(D) cellular level

Question 42.

The living organisms can be unexceptionally distinguished from the non-living things on the basis of their ability for

[4 Marks]

(A) growth and movement

(B) interaction with the environment and progressive evolution

(C) responsiveness to touch

(D) reproduction

Question 43.

ICBN stands for

[4 Marks]

(A) International Code of Botanical Nomenclature

(B) Indian Congress of Biological Names

(C) Indian Code of Botanical Nomenclature

(D) International congress of Biological Names

Question 44.

Which one of the following statements about mycoplasma is wrong?

[4 Marks]

(A) They are sensitive to penicillin

(B) They are also called PPLO

(C) They cause diseases in plants

(D) They are pleomorphic

Question 45.

Which one of the following is a slime mould?

[4 Marks]

(A) Anabaena

(B) Rhizopus

(C) Thiobacillus

(D) Physarum

Question 46.

Which pair of the following belongs to Basidiomycetes?

[4 Marks]

(A) birds nest fungi and puffballs

(B) Morchella and mushrooms

(C) puffballs and Claviceps

(D) peziza and stink horn

Question 47.

Ergot of rye is caused by species of of

[4 Marks]

(A) Claviceps

(B) Ustilago

(C) Phytophthora.

(D) Uncimula

Question 48.

If you are asked to classify the algae into distinct groups, which of the following characters you should choose?

[4 Marks]

(A) chemical composition of the cell wall

(B) types of pigments present in the cell

(C) structural organisation of thallus

(D) nature of stored food materials in the cell

Question 49.

Spore dissemination in some liverworts is aided by

[4 Marks]

(A) calyptra

(B) peristome teeth

(C) elaters

(D) indisium

Question 50.

In the prothallus of a vascular cryptogam, the antherozoids and eggs mature at different times. As a result

[4 Marks]

(A) there is no change in success rate of fertilization

(B) one can conclude that the plant is apomictic

(C) there is high degree of sterility

(D) self-fertilization is prevented

Question 51.

Flagellated male gametes are present in all the three of which one of the following sets?

[4 Marks]

(A) Riccia, Dryopteris and Cycas

(B) Zygema, Saprolegnia and Hydrilla

(C) Fucus, Marsilea and Calotropis

(D) Anthoceros, Funaria and Spirogyra

Question 52.

In gymnosperms, the pollen chamber represents

[4 Marks]

(A) a cell in the pollen grain in which the sperms are formed

(B) the microsporangium in which pollen grains develop

(C) an opening in the megagametophyte through which the pollen tube approaches the egg

(D) a cavity in the ovule in which pollen grains are stored after pollination

Question 53.

What is true about *Nereis*, scorpion, cockroach and silver fish?

[4 Marks]

(A) None of them is aquatic

(B) They all have jointed paired appendages

(C) They all possess dorsal heart

(D) They all belong to the same phylum

Question 54.

Which one of the following is a matching pair of a body feature and the animal possessing it?

[4 Marks]

(A) Pharyngeal gill slits absent in embryo — Chameleon

(B) ventral central nervous system — Leech

(C) Post-end tail — Octopus

(D) Ventral heart — Scorpion

Question 55.

Which of the following pairs are correctly matched?
Animals – Morphological features
(i) Crocodile – 4-chambered heart
(ii) Sea urchin – Parapodia
(iii) Obelia – Thecodont
(iv) Lemur – Thecodont

[4 Marks]

(A) only (i) and (iv)

(B) (i), (iii) and (iv)

(C) only (i) and (ii)

(D) (ii), (iii) and (iv)

Question 56.

Which of the following is a flowering plant with nodules containing filamentous nitrogen-fixing micro-organism

[4 Marks]

(A) Cicer arietinum

(B) Casuarina equisetifolia

(C) Cycas revoluta

(D) Crotalaria juncea

Question 57.

Passage cells are thin walled cells found in

[4 Marks]

(A) endodermis of roots facilitating rapid transport of water from cortex to pericycle

(B) central region of style through which the pollen tube grows towards the ovary

(C) testa of seeds to enable emergence of growing embryonic axis during seed germination

(D) phloem elements that are present as entry points for substance for transport to other plant parts

Question 58.

For a critical study of secondary growth in plants, which one of the following pairs is suitable?

[4 Marks]

(A) sugarcane and sunflower

(B) wheat and maize and herb sunflower

(C) deodar and fern

(D) teak and pine

Question 59.

In which one of the following preparations are you likely to come across cell junctions most frequently?

[4 Marks]

(A) Tendon

(B) Ciliated epithelium

(C) Thironocytes

(D) Hyaline cartilage

Question 60.

Select the wrong statement from the following

[4 Marks]

(A) Both chloroplasts and mitochondria contain an inner and an outer membrane

(B) Both chloroplasts and mitochondria contain DNA

(C) The chloroplasts are generally much larger than mitochondria

(D) Both chloroplasts and mitochondria have an internal compartment, the thylakoid space bounded by the thylakoid membrane

Question 61.

Which one of the following is not a constituent of cell membrane?

[4 Marks]

(A) proline

(B) glycolipids

(C) cholesterol.

(D) phospholipids

Question 62.

A 5 watt source emits monochromatic light of wavelength 5000 Å. When placed 0.5 m away, it liberates photoelectrons from a photosensitive metallic surface. When the source is moved to a distance of 1.0 m, the number of photoelectrons liberated will be reduced by a factor of

[4 Marks]

(A) 16

(B) 8

(C) 2

(D) 4

Question 63.

About 98 percent of the mass of every living organism is composed of just six elements including carbon, hydrogen, nitrogen, oxygen and

[4 Marks]

(A) magnesium and sodium

(B) sulphur and magnesium

(C) phosphorus and sulphur

(D) calcium and phosphorus

Question 64.

The total energy of electron in the ground state of hydrogen atom is -13.6 eV. The kinetic energy of an electron in the first excited state is

[4 Marks]

(A) 6.8 eV

(B) 13.6 eV

(C) 1.7 eV

(D) 3.4 eV

Question 65.

If the nucleus $^{27}_{13}$Al has nuclear radius of about 3.6 fm, then $^{125}_{32}$Te would have its radius approximately as

[4 Marks]

(A) 9.6 fm

(B) 4.8 fm

(C) 12.0 fm

(D) 6.0 fm

Question 66.

Two cells A and B are contiguous. Cell A has osmotic pressure 10 atm, turgor pressure 7 atm and diffusion pressure deficit 3 atm. Cell B has osmotic pressure 8 atm, turgor pressure 3 atm and diffusion pressure deficit 5 atm. The result will

[4 Marks]

(A) movement of water from Cell A to B.

(B) movement of water from cell B to A.

(C) no movement of water

(D) equilibrium between the two

Question 67.

A plant requires magnesium for

[4 Marks]

(A) chlorophyll synthesis

(B) protein synthesis

(C) cell wall development

(D) holding cells together.

Question 68.

A nucleus $^{A}_{Z}X$ has mass represented by M(A, Z). If M_p and M_n denote the mass of proton and neutron respectively and B.E. the binding energy in MeV, then

[4 Marks]

(A) B.E. = $M(A, Z) - ZM_p - (A - Z)M_n$

(B) B.E. = $[M(A, Z) - ZM_p - (A - Z)M_n]c^2$

(C) B.E. = $[ZM_p + ZM_n - M(A, Z)]c^2$

(D) B.E. = $[ZM_p + (A - Z)M_n - M(A, Z)]c^2$

Question 69.

Which one of the following elements is not an essential micronutrient for plant growth?

[4 Marks]

(A) Zn

(B) Cu

(C) Ca

(D) Mn

Question 70.

Two radioactive substances A and B have decay constants 5λ and λ respectively. At t = 0 they have the same number of nuclei. The ratio of number of nuclei of A to those of B will be $(1/e)^2$ after a time interval

[4 Marks]

(A) 2λ

(B) 1/(2λ)

(C) 1/(4λ)

(D) 4λ

Question 71.

In a radioactive decay process, the negatively charged emitted β-particles are

[4 Marks]

(A) the electrons produced as a result of the decay of neutrons inside the nucleus

(B) the electrons produced as a result of collisions between atoms

(C) the electrons orbiting around the nucleus

(D) the electrons present inside the nucleus

Question 72.

The first acceptor of electrons from an excited chlorophyll molecule of photosystem II is

[4 Marks]

(A) quinone

(B) cytochrome

(C) iron-sulphur protein

(D) ferredoxin

Question 73.

For a cubic crystal structure which one of the following relations indicating the cell characteristics is correct?

[4 Marks]

(A) $a \neq b \neq c$ and $\alpha = \beta = \gamma = 90°$

(B) $a = b = c$ and $\alpha \neq b \neq \gamma = 90°$

(C) $a \neq b \neq c$ and $\alpha \neq \beta$ and $\gamma \neq 90°$

(D) $a = b = c$ and $\alpha = \beta = \gamma = 90°$

Question 74.

The wavelength of light absorbed by Pr form of phytochrome is

[4 Marks]

(A) 680 nm

(B) 720 nm

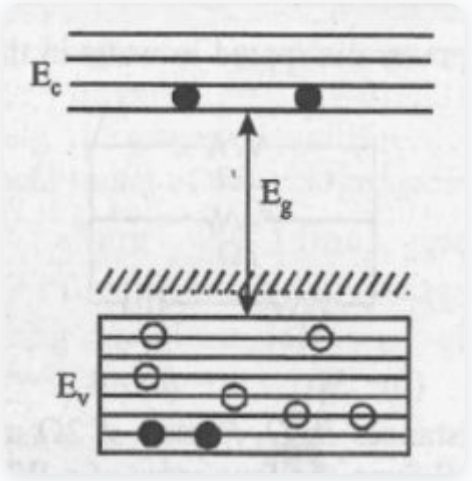
(C) 620 nm

(D) 640 nm

Question 75.

In the energy band diagram of a material shown below, the open circles and filled circles denote holes and electrons respectively. The material is

[4 Marks]



(A) an insulator

(B) a metal

(C) an n-type semiconductor

(D) a p-type semiconductor

Question 76.

A common emitter amplifier has a voltage gain of 50, an input impedance of 100 Ω and an output impedance of 200 Ω. The power gain of the amplifier is

[4 Marks]

(A) 50

(B) 1250

(C) 500

(D) 1000

Question 77.

In the leaves of C_4 plants, malic acid formation during CO_2 fixation occurs in the cells of

[4 Marks]

(A) mesophyll

(B) epidermis

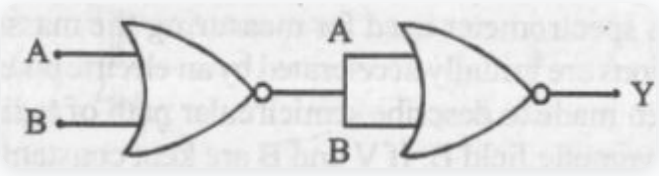
(C) bundle sheath

(D) phloem

Question 78.

In the following circuit, the output Y for all possible inputs A and B is expressed by the truth table

[4 Marks]



(A)

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

(B)

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

(C)

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

(D)

A	B	Y
0	1	1
0	1	1
1	0	1
1	1	0

Question 79.

The C_4 plants have photosynthetic efficiency more than C_3 plants because

[4 Marks]

(A) they have more chloroplasts

(B) the CO_2 efflux is not prevented

(C) the CO_2 compensation point is more

(D) CO_2 generated during photorespiration is trapped and recycled through PCP carboxylase

Question 80.

All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membrane in eukaryotes and in cytosol in prokaryotes. This enzyme is

[4 Marks]

(A) isocitrate dehydrogenase

(B) malate dehydrogenase

(C) succinate dehydrogenase

(D) lactate dehydrogenase

Question 81.

The overall goal of glycolysis, krebs cycle and the electron transport system is the formation of

[4 Marks]

(A) ATP in one large oxidation reaction

(B) sugars

(C) nucleic acids

(D) ATP in small stepwise units.

Question 82.

Opening of floral buds into flowers, is a type of

[4 Marks]

(A) autonomic movement of variation

(B) paratonic movement of growth

(C) autonomic movement of growth

(D) autonomic movement of locomotion.

Question 83.

Which one of the following pairs, is not correctly matched?

[4 Marks]

(A) Gibberellic acid - Leaf fall

(B) Cytokinin - Cell wall elongation

(C) Abscisic acid - Stomatal closure.

(D) IAA - Cell wall elongation

Question 84.

The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is

[4 Marks]

(A) 1

(B) 3/5

(C) 4/5

(D) 2/5

Question 85.

Identify the correct order of the size of the following:

[4 Marks]

(A) $Ca^{2+} < Ar < K^{+} < Cl^{-} < S^{2-}$

(B) $Ca^{2+} < K^{+} < Ar < S^{2-} < Cl^{-}$

(C) $Ar < Ca^{2+} < K^{+} < Cl^{-} < S^{2-}$

(D) $Ca^{2+} < K^{+} < Ar < Cl^{-} < S^{2-}$

Question 86.

An element, X has the following isotopic composition:

^{200}X : 90%

^{199}X : 8.0%

^{202}X : 2.0%

The weighted average atomic mass of the naturally occuring element X is closest to

[4 Marks]

(A) 200 amu

(B) 202 amu

(C) 199 amu

(D) 201 amu

Question 87.

In which of the following pairs, the two species are isostructural?

[4 Marks]

(A) SO_3^{2-} and NO_3^-

(B) BrO_3^- and XeO_3

(C) SF_4 and XeF_4

(D) BF_3 an NF_3

Question 88.

Concentrated aqueous sulphuric acid is 98% H_2SO_4 by mass and has a density of 1.80 g mL^{-1}. Volume of acid required to make one litre of 0.1M H_2SO_4 solution is

[4 Marks]

(A) 11.10 mL

(B) 5.55 mL

(C) 22.20 mL

(D) 16.65 mL

Question 89.

The correct order of C-O bond length among CO, CO_3^{2-}, CO_2 is

[4 Marks]

(A) $CO_3^{2-} < CO_2 < CO$

(B) $CO < CO_2 < CO_3^{2-}$

(C) $CO < CO_3^{2-} < CO_2$

(D) $CO_2 < CO_3^{2-} < CO$

Question 90.

Consider the following sets of quantum numbers:

Which of the following sets of quantum number is not possible?

[4 Marks]

	n	l	m	s
(i)	3	0	0	+1/2
(ii)	2	2	1	+1/2
(iii)	4	3	−2	−1/2
(iv)	1	0	−1	−1/2
(v)	3	2	3	+1/2

(A) (i), (ii), (iii) and (iv)

(B) (ii), (iv) and (v)

(C) (i) and (iii)

(D) (ii), (iii) and (iv)

Question 91.

Consider the following reactions:

Enthalpy of formation of H_2O (l) is

[4 Marks]

(i) $H^+(aq) + OH^-(aq) = H_2O(l)$, $\Delta H = -X_1 \text{ kJ mol}^{-1}$

(ii) $H_2(g) + \frac{1}{2}O_2(g) = H_2O(l)$, $\Delta H = -X_2 \text{ kJ mol}^{-1}$

(iii) $CO_2(g) + H_2(g) = CO(g) + H_2O$, $\Delta H = -X_3 \text{ kJ mol}^{-1}$

(iv) $C_2H_2(g) + \frac{5}{2}O_2(g) = 2CO_2(g) + H_2O(l)$' $\Delta H = +4X_4 \text{ kJ mol}^{-1}$

(A) $+X_1$ kJ mol^{-1}

(B) $+X_3$ kJ mol^{-1}

(C) $-X_2$ kJ mol^{-1}

(D) $-X_4$ kJ mol^{-1}

Question 92.

Which one of the following ionic species has the greatest proton affinity to form stable compound?

[4 Marks]

(A) NH_2^-

(B) F^-

(C) I^-

(D) HS^-

Question 93.

Which of the following electronic configuration of an atom has the lowest ionisation enthalpy?

[4 Marks]

(A) $1s^2\ 2s^2\ 2p^3$

(B) $1s^2\ 2s^2\ 2p^6$

(C) $1s^2\ 2s^2\ 2p^5$

(D) $1s^2\ 2s^2\ 2p^5\ 3s^1$

Question 94.

Given that bond energies of H - H and Cl - Cl are 430 kJ mol^{-1} and 240 kJ mol^{-1} respectively and ΔH_f for HCl is -90 kJ mol^{-1}, bond enthalpy of HCl is

[4 Marks]

(A) 380 kJ mol^{-1}

(B) 425 kJ mol^{-1}

(C) 290 kJ mol^{-1}

(D) 245 kJ mol^{-1}

Question 95.

The order of decreasing reactivity towards an electrophilic reagent, for the following would be

(i) benzene

(ii) toluene

(iii) chlorobenzene

(iv) phenol

[4 Marks]

(A) (ii) > (iv) > (i) > (iii)

(B) (iv) > (iii) > (ii) > (i)

(C) (iv) > (ii) > (i) > (iii)

(D) (i) > (ii) > (iii) > (iv)

Question 96.

The following equilibrium constants are given:

$N_2 + 3H_2 \rightleftharpoons 2NH_3$; K_1

$N_2 + O_2 \rightleftharpoons 2NO$; K_2

$H_2 + (1/2)O_2 \rightleftharpoons H_2O$; K_3

The equilibrium constant for the oxidation of 2 moles NH_3 by oxygen to give NO is

[4 Marks]

(A) $K_2 K_3^3 / K_1$

(B) $K_1 K_2 / K_3$

(C) $K_2^2 K_3 / K_1$

(D) $K_2 K_3^2 / K_1$

Question 97.

Calculate the pOH of a solution at 25°C that contains $1 * 10^{-10}$ M of hydronium ions, i.e. H_3O^+.

[4 Marks]

(A) 9.0000

(B) 1.000

(C) 4.000

(D) 7.000

Question 98.

A weak acid, HA, has a K_a of 1.00×10^{-5}. If 0.100 mol of this acid is dissolved in one litre of water, the percentage of acid dissociated at equilibrium is closest to

[4 Marks]

(A) 0.100%

(B) 99.0%

(C) 99.9%

(D) 1.00%

Question 99.

The fraction of total volume occupied by the atoms present in a simple cube is

[4 Marks]

(A) $\pi / (3\sqrt{2})$

(B) $\pi / (4\sqrt{2})$

(C) $\pi / 4$

(D) $\pi / 6$

Question 100.

The correct order of increasing thermal stability of K_2CO_3, $MgCO_3$, $CaCO_3$ and $BeCO_3$ is

[4 Marks]

(A) $BeCO_3 < MgCO_3 < K_2CO_3 < CaCO_3$

(B) $K_2CO_3 < MgCO_3 < CaCO_3 < BeCO_3$

(C) $BeCO_3 < MgCO_3 < CaCO_3 < K_2CO_3$

(D) $MgCO_3 < BeCO_3 < CaCO_3 < K_2CO_3$

Question 101.

If NaCl is doped with 10^{-4} mol % of $SrCl_2$, the concentration of cation vacancies will be ($N_A = 6.02 \times 10^{23}$ mol^{-1})

[4 Marks]

(A) $6.02 * 10^{15}$ mol^{-1}

(B) $6.02 * 10^{14}$ mol^{-1}

(C) $6.02 * 10^{17}$ mol^{-1}

(D) $6.02 * 10^{16}$ mol^{-1}

Question 102.

In which of the following the hydration energy is higher than the lattice energy?

[4 Marks]

(A) $MgSO_4$

(B) $RaSO_4$

(C) $BaSO_4$

(D) $SrSO_4$

Question 103.

0.5 molal aqueous solution of a weak acid (HX) is 20% ionised. If K_f for water is 1.86 K kg mol^{-1}, the lowering in freezing point of the solution is

[4 Marks]

(A) 0.56 K

(B) 1.12 K

(C) -1.12 K

(D) -0.56 K

Question 104.

Which of the compounds with molecular formula C_5H_{10} yields acetone on ozonolysis?

[4 Marks]

(A) 2-methyl-2-butene

(B) cyclopentane

(C) 2-methyl-1-butene

(D) 3-methyl-1-butene

Question 105.

The equilibrium constant of the reaction:

$Cu(s) + 2Ag^+(aq) \longrightarrow Cu^{2+}(aq) + 2Ag(s)$; $E° = 0.46$ V at 298 K is

[4 Marks]

(A) 2.4×10^{10}

(B) 4.0×10^{10}

(C) 4.0×10^{15}

(D) 2.0×10^{10}

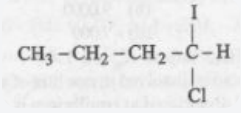
Question 106.

Predict the product C obtained in the following reaction of butyne-1.

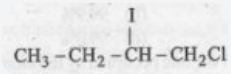
[4 Marks]

$$CH_3CH_2 - C \equiv CH + HCl \longrightarrow B \xrightarrow{HI} C$$

(A)



(B)



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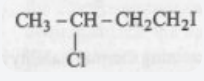
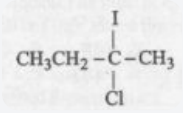


(D)



Question 107.

The efficiency of a fuel cell is given by

[4 Marks]

(A) ΔS / ΔG

(B) ΔH / ΔG

(C) ΔG / ΔH

(D) ΔG / ΔS

Question 108.

Sulphide ores of metals are usually concentrated by froth flotation process. Which one of the following sulphide ores offer an exception and concentrated by chemical leaching?

[4 Marks]

(A) Argentite

(B) Copper pyrite

(C) Galena

(D) Sphalerite

Question 109.

The reaction of hydrogen and iodine monochloride is given as:

$H_2(g) + 2ICl(g) \longrightarrow 2HCl(g) + I_2(g)$

The reaction is of first order with respect to $H_2(g)$ and ICl(g), following mechanisms were proposed.

Mechanism A:

$H_2(g) + 2ICl(g) \longrightarrow 2HCl(g) + I_2(g)$

Mechanism B:

$H_2(g) + ICl(g) \longrightarrow HI(g)$; slow

$HI(g) + ICl(g) \longrightarrow HCl(g) + I_2(g)$; fast

Which of the above mechanism(s) can be consistent with the given information about the reaction?

[4 Marks]

(A) B only

(B) A and B both

(C) neither A nor B

(D) A only

Question 110.

Which one of the following orders correctly represents the increasing acid strengths of the given acids?

[4 Marks]

(A) $HOCl < HOClO < HOClO_2 < HOClO_3$

(B) $HOClO < HOCl < HOClO_3 < HOClO_2$

(C) $HOClO_3 < HOClO_2 < HOClO < HOCl$

(D) $HOClO_2 < HOClO_3 < HOClO < HOCl$

Question 111.

In a first-order reaction A ⟶ B, if k is rate constant and initial concentration of the reactant A is 0.5 M, then the half-life is

[4 Marks]

(A) log 2 / k √0.5)

(B) 0.693 / 0.5k

(C) ln 2 / k

(D) log 2 / k

Question 112.

Which one of the following ions is the most stable in aqueous solution?

[4 Marks]

(A) Mn^{3+}

(B) Cr^{3+}

(C) V^{3+}

(D) Ti^{3+}

Question 113.

If 60% of a first order reaction was completed in 60 minutes, 50% of the same reaction would be completed in approximately (log 4 = 0.60, log 5 = 0.69)

[4 Marks]

(A) 45 minutes

(B) 50 minutes

(C) 60 minutes

(D) 40 minutes

Question 114.

Identify the incorrect statement among the following:

[4 Marks]

(A) Lanthanoid contraction is the accumulation of successive shrinkages.

(B) Shielding power of 4f electrons is quite weak.

(C) As a result of lanthanoid contraction, the properties of 4d series of the transition elements have no similarities with the 5d series of elements.

(D) There is a decrease in the radii of the atoms or ions as one proceeds from La to Lu.

Question 115.

The Langmuir adsorption isotherm is deduced using the assumption:

[4 Marks]

(A) the adsorption sites are equivalent in their ability to adsorb the particles

(B) the heat of adsorption varies with coverage

(C) the adsorbed molecules interact with each other

(D) the adsorption takes place in multilayers.

Question 116.

Which of the following will give a pair of enantiomorphs?

[4 Marks]

(A) $[Cr(NH_3)_6][Co(CN)_6]$

(B) $[Co(en)_2Cl_2]Cl$

(C) $[Pt(NH_3)_4][PtCl_6]$

(D) $[Co(NH_3)_4Cl_2]NO_2$. (en = $NH_2CH_2CH_2NH_2$)

Question 117.

Which of the following statements, about the advantage of roasting of sulphide ore before reduction is not true?

[4 Marks]

(A) The $\Delta G°_f$ of the sulphide is greater than those for CS_2 and H_2S.

(B) The $\Delta G°_f$ is negative for roasting of sulphide ore to oxide.

(C) Carbon and hydrogen are suitable reducing agents for metal sulphides.

(D) Roasting of the sulphide to the oxide is thermodynamically feasible.

Question 118.

The d electron configurations of Cr^{2+}, Mn^{2+}, Fe^{2+} and Ni^{2+} are $3d^4$, $3d^5$, $3d^6$ and $3d^8$ respectively. Which one of the following aqua complexes will exhibit the minimum paramagnetic behaviour?

(At. No. Cr = 24, Mn = 25, Fe = 26, Ni = 28)

[4 Marks]

(A) $[Mn(H_2O)_6]^{2+}$

(B) $[Cr(H_2O)_6]^{2+}$

(C) $[Fe(H_2O)_6]^{2+}$

(D) $[Ni(H_2O)_6]^{2+}$

Question 119.

If there is no rotation of plane polarised light by a compound in a specific solvent, though to be chiral, it may mean that

[4 Marks]

(A) the compound is certainly meso

(B) the compound is certainly achiral.

(C) there is no compound in the solvent

(D) the compound may be a racemic mixture

Question 120.

The product formed in Aldol condensation is

[4 Marks]

(A) A beta-hydroxy acid

(B) An alpha, beta unsaturated ester

(C) An alpha-hydroxy aldehyde or ketone

(D) A beta-hydroxy aldehyde or a beta-hydroxy ketone

Question 121.

CH_3 - CHCl - CH_2 - CH_3 has a chiral centre. Which one of the following represents its R-configuration?

[4 Marks]

(A)



(B)



(C)



(D)

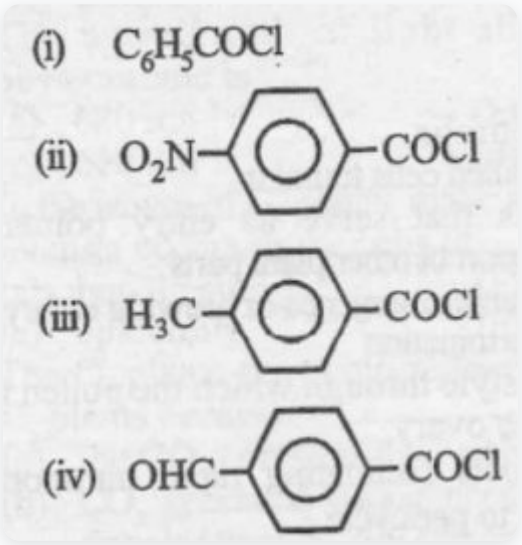


Question 122.

Consider the following compounds.

The correct decreasing order of their reactivity towards hydrolysis is

[4 Marks]



(A) (ii) > (iv) > (iii) > (i)

(B) (ii) > (iv) > (i) > (iii)

(C) (iv) > (ii) > (i) > (iii)

(D) (i) > (ii) > (iii) > (iv)

Question 123.

For (i) I^-, (ii) Cl^-, (iii) Br^-, the increasing order of nucleophilicity would be

[4 Marks]

(A) $Cl^- < Br^- < I^-$

(B) $I^- < Cl^- < Br^-$

(C) $Br^- < Cl^- < I^-$

(D) $I^- < Br^- < Cl^-$

Question 124.

Which of the following represents the correct order of the acidity in the given compounds?

[4 Marks]

(A) $FCH_2COOH > CH_3COOH > BrCH_2COOH > ClCH_2COOH$

(B) $BrCH_2COOH > ClCH_2COOH > FCH_2COOH > CH_3COOH$

(C) $CH_3COOH > BrCH_2COOH > ClCH_2COOH > FCH_2COOH$

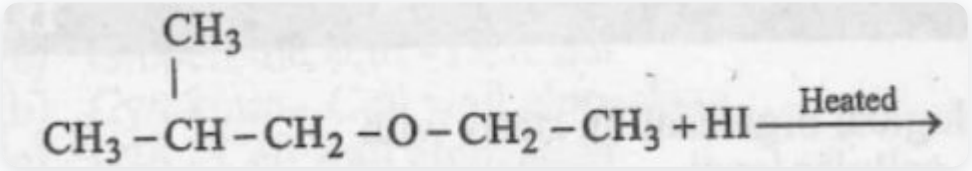
(D) $FCH_2COOH > ClCH_2COOH > BrCH_2COOH > CH_3COOH$

Question 125.

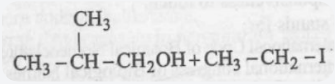
In the reaction:

Which of the following compounds will be formed?

[4 Marks]



(A)



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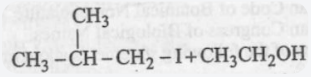
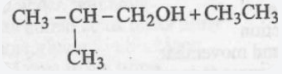


(C)



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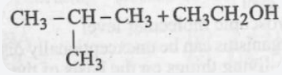


Question 126.

Which one of the following on reduction with lithium aluminium hydride yields a secondary amine?

[4 Marks]

(A) Nitroethane

(B) Methyl cyanide

(C) Acetamide

(D) Methyl isocyanide

Question 127.

Reduction of aldehydes and ketones into hydrocarbons using zinc amalgam and conc. HCl is called

[4 Marks]

(A) Clemmensen reduction

(B) Dow reduction

(C) Wolff-Kishner reduction

(D) Cope reduction

Question 128.

RNA and DNA are chiral molecules, their chirality is due to

[4 Marks]

(A) L-sugar component

(B) chiral phosphate ester units

(C) D-sugar component

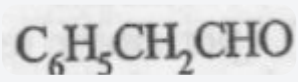
(D) chiral bases

Question 129.

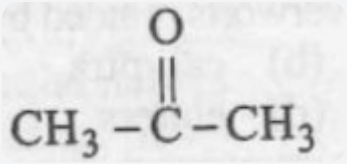
Which one of the following on treatment with 50% aqueous sodium hydroxide yields the corresponding alcohol and acid?

[4 Marks]

(A)



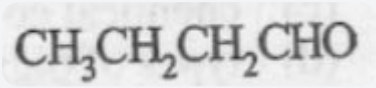
(B)



(C)



(D)



Question 130.

Which of the following is water-soluble?

[4 Marks]

(A) Vitamin E

(B) Vitamin K

(C) Vitamin B

(D) Vitamin A

Question 131.

Which one of the following polymers is prepared by condensation polymerisation?

[4 Marks]

(A) Teflon

(B) Natural rubber

(C) Styrene

(D) Nylon-6,6

Question 132.

Which one of the following anions is present in the chain structure of silicates?

[4 Marks]

(A) SiO_4^{4-}

(B) $Si_2O_7^{6-}$

(C) $(SiO_3^{2-})_n$

(D) $(Si_2O_5^{2-})_n$

Question 133.

Which of the following oxidation states are the most characteristic for lead and tin respectively?

[4 Marks]

(A) +2, +4

(B) +4, +4

(C) +2, +2

(D) +4, +2

Question 134.

“Foolish seedling” disease of rice led to the discovery of

[4 Marks]

(A) ABA

(B) GA

(C) IAA

(D) 2,4-D

Question 135.

A person who is one day hunger strike and is surviving only on water, will have

[4 Marks]

(A) less amino acids in his urine

(B) more glucose in his blood

(C) more sodium in his urine.

(D) less urea in his urine

Question 136.

Lysozyme that is present in perspiration, saliva and tears, destroys

[4 Marks]

(A) certain types of bacteria

(B) all viruses

(C) most virus-infected cells

(D) certain fungi

Question 137.

Which one of the following is a fat-soluble vitamin and its related deficiency disease?

[4 Marks]

(A) Retinol - Xerophthalmia

(B) Cobalamine - Beri-beri

(C) Calciferol - Pellagra

(D) Ascorbic acid - Scurvy.

Question 138.

A drop of each of the following, is placed separately on four slides. Which of them will not coagulate?

[4 Marks]

(A) Blood serum

(B) Blood plasma

(C) Sample from the thoracic duct of lymphatic system

(D) Whole blood from pulmonary vein

Question 139.

Which one of the following mammalian cells is not capable of metabolising glucose to carbon-dioxide aerobically?

[4 Marks]

(A) Unstriated muscle cells

(B) Liver cells

(C) White blood

(D) Red blood cells

Question 140.

In human body, which one of the following is anatomically correct?

[4 Marks]

(A) Floating ribs - 2 pairs

(B) Cranial nerves - 10 pairs

(C) Salivary glands - 1 pairs

(D) Collar bones - 3 pairs

Question 141.

During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric charge?

[4 Marks]

(A) First positive, then negative and continue to be positive

(B) First negative, then positive and continue to be positive

(C) First positive, then negative and again back to positive

(D) First negative, then positive and again back to negative.

Question 142.

Which one of the following pairs of structures distinguishes a nerve axon from other types of cells?

[4 Marks]

(A) Flagellum and medullary sheath

(B) Vacuoles and fibres

(C) Nucleus and mitochondria

(D) Perikaryon and dendrites.

Question 143.

Which of the following is an example of negative feedback loop in humans?

[4 Marks]

(A) Secretion of tears after falling of sand particles into the eye.

(B) Salivation of mouth at the sight of delicious food

(C) Constriction of skin blood vessels and contraction of skeletal muscles when it is too cold

(D) Secretion of sweat glands and constriction of skin blood vessels when it is too hot

Question 144.

Which part of ovary in mammals acts as an endocrine gland after ovulation?

[4 Marks]

(A) Stroma

(B) Germinal epithelium

(C) Vitelline membrane

(D) Graafian follicle.

Question 145.

A person is having problems with calcium and phosphorus metabolism in his body. Which one of following glands may not be functioning properly?

[4 Marks]

(A) Parotid

(B) Pancreas

(C) Thyroid

(D) Parathyroid

Question 146.

Feeling the tremors of an earthquake, a scared resident of seventh floor of a multistored building starts climbing down the stairs rapidly. Which hormone initiated this action ?

[4 Marks]

(A) adrenaline

(B) glucagone

(C) gastrin

(D) thyroxine

Question 147.

Which one of the following is surrounded by a callose wall?

[4 Marks]

(A) male gamete

(B) egg

(C) microspore mother cell

(D) pollen grain

Question 148.

Male gametes in angiosperms are formed by the division of

[4 Marks]

(A) generative cell

(B) microspore mother cell

(C) microspore.

(D) vegetative cell

Question 149.

Which one of the following pairs of plant structures has haploid number of chromosomes?

[4 Marks]

(A) Megaspore mother cell and antipodal cells

(B) Egg cell and antipodal cells

(C) Nucleus and antipodal cells

(D) Egg nucleus and secondary nucleus

Question 150.

In human female, menstruation can be deferred by the administration of

[4 Marks]

(A) combination of FSH and LH

(B) combination of estrogen and progesterone

(C) FSH only

(D) LH only

Question 151.

A common test to find the genotype of a hybrid is by

[4 Marks]

(A) crossing of one F_2 progeny with male parent

(B) crossing of one F_1 progeny with male parent.

(C) studying the sexual behaviour of F_1 progenies

(D) crossing of one F_2 progeny with female parent

Question 152.

Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRYY and rryy genotypes are hybridized, the F_2 segregation will show

[4 Marks]

(A) higher number of the recombinant types.

(B) higher number of the parental types

(C) segregation in the expected 9 : 3 : 3 : 1 ratio

(D) segregation in 3 : 1 ratio

Question 153.

In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation?

[4 Marks]

(A) 3 : 1

(B) 50 : 50

(C) 9 : 1

(D) 1 : 3

Question 154.

Inheritance of skin colour in humans is an example of

[4 Marks]

(A) point mutation

(B) polygenic inheritance

(C) codominance

(D) chromosomal aberration.

Question 155.

A human male produces sperms with the genotypes AB, Ab, aB, and ab pertaining to two diallelic characters in equal proportions. What is the corresponding genotype of this person?

[4 Marks]

(A) AaBB

(B) AABb

(C) AABB

(D) AaBb

Question 156.

The length of DNA molecule greatly exceeds the dimensions of the nucleus in eukaryotic cells. How is this DNA accommodated?

[4 Marks]

(A) DNase digestion

(B) super-coiling in nucleosomes

(C) through elimination of repetitive DNA

(D) deletion of non-essential genes.

Question 157.

A sequential expression of a set of human genes

[4 Marks]

(A) messenger RNA

(B) DNA sequence

(C) ribosome

(D) transfer RNA.

Question 158.

During transcription, RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle-like structure, what is it's DNA-binding sequence?

[4 Marks]

(A) CACC

(B) AATT

(C) TATA

(D) TTAA

Question 159.

The two polynucleotide chains in DNA are

[4 Marks]

(A) discontinuous

(B) semi-conservative

(C) antiparallel

(D) parallel.

Question 160.

Molecules basis of organ differentiation depends on the modulation in transcription by

[4 Marks]

(A) RNA polymerase.

(B) anticodon

(C) transcription factor

(D) ribosome

Question 161.

The okazaki fragments in DNA chain growth

[4 Marks]

(A) polymerize in the 3' - to - 5' direction and forms replication fork

(B) prove semi-conservative nature of DNA replication

(C) polymerize in the 5' - to - 3' direction and explain 3' - to - 5' DNA replication

(D) result in transcription.

Question 162.

one gene-one enzyme relationship was established for the first time in

[4 Marks]

(A) Neurospora crassa.

(B) Diplococcus pneumoniae

(C) Escherichia coli

(D) Salmonella typhimurium

Question 163.

When two species of different genealogy come to resemble each other as a result of adaptation, the phenomenon is termed

[4 Marks]

(A) microevolution

(B) co-evolution

(C) divergent evolution

(D) convergent evolution

Question 164.

Which one of the following statement is correct?

[4 Marks]

(A) Stem cells are specialized cells.

(B) Ontogeny repeats phylogeny

(C) All plant and animal cells are totipotent

(D) There is no evidence of the existence of gills during embryogenesis of mammals

Question 165.

The concept of chemical evolution is based on

[4 Marks]

(A) effect of solar radiation on chemicals

(B) interaction of water, air and clay under intense heat

(C) crystallization of chemicals.

(D) possible origin of life by combination of chemicals under suitable environmental conditions

Question 166.

The finches of Galapagos islands provide an evidence in favour of

[4 Marks]

(A) biogeographical evolution

(B) special creation.

(C) retrogressive evolution

(D) evolution due to mutation

Question 167.

What is common between parrot, platypus and kangaroo?

[4 Marks]

(A) Functional post-anal tail

(B) Toothless jaws

(C) Homeothermy

(D) Oviparity

Question 168.

What is common to whale, seal and shark?

[4 Marks]

(A) Thick subcutaneous fat

(B) Convergent evolution

(C) Homeothermy

(D) Seasonal migration.

Question 169.

Industrial melanism as observed in peppered moth proves that

[4 Marks]

(A) the lighter-form moth has no selective advantage either in polluted industrial area or non-polluted area

(B) the melanic form of the moth has no selective advantage over lighter form in industrial area

(C) melanism is a pollution-generated feature

(D) the true black melanic forms arise by a recurring random mutation.

Question 170.

Adaptive radiation refers to

[4 Marks]

(A) evolution of different species from a common ancestor

(B) migration of members of a species to different geographical areas

(C) power of adaptation in an individual to a variety of environments

(D) adaptations due to geographical isolation.

Question 171.

One of the important consequences of geographical isolation is

[4 Marks]

(A) preventing speciation

(B) speciation through reproductive isolation

(C) random creation of new species

(D) no change in the isolated fauna.

Question 172.

Among the human ancestors the brain size was more that 1000 cc in

[4 Marks]

(A) Homo erectus

(B) Ramapithecus

(C) Homo habilis

(D) Homo neanderthalensis

Question 173.

Select the correct statements from the following?

[4 Marks]

(A) Fitness is the end result of the ability to adapt and get selected by nature

(B) All mammals except whales and camels have seven cervical vertebrae

(C) Mutations are random and directional

(D) Darwinian variations are small and directionless.

Question 174.

If you suspect major deficiency of antibodies in a person to which of the following would you look for confirmatory evidence?

[4 Marks]

(A) fibrinogen in the plasma

(B) serum globulins

(C) haemocytes

(D) serum albumins

Question 175.

Increased asthmatic attacks in certain seasons are related to

[4 Marks]

(A) eating fruits preserved in tin containers

(B) inhalation of seasonal pollen

(C) hot and humid environment.

(D) low temperature

Question 176.

Which one of the following pair is mismatched?

[4 Marks]

(A) Pila globosa - pearl

(B) Apis indica - honey

(C) Bombyx mori - silk

(D) Kenia lacca - lac

Question 177.

Compared to a bull a bullock is docile because of

[4 Marks]

(A) higher levels of cortisone

(B) lower levels of blood testosterone

(C) lower levels of adrenaline/noradrenaline in its blood

(D) higher levels of thyroxine.

Question 178.

Which one of the following is a viral disease of poultry?

[4 Marks]

(A) Coryza

(B) New castle disease

(C) Pasteurellosis

(D) Salmonellosis.

Question 179.

Which one of the following is being utilized as a source of biodiesel in the Indian countryside?

[4 Marks]

(A) Sugarcane

(B) Pongamia

(C) Euphorbia

(D) Beetroot

Question 180.

In maize, hybrid vigour is exploited by

[4 Marks]

(A) crossing of two inbred parental lines

(B) bombarding the seeds with DNA.

(C) harvesting seeds from the most productive plants

(D) inducing mutations

Question 181.

Probiotics are

[4 Marks]

(A) new kind of food allergens

(B) cancer inducing microbes

(C) live microbial food supplement

(D) safe antibiotics

Question 182.

Which one of the following pairs is wrongly matched?

[4 Marks]

(A) Streptomyces - antibiotic

(B) Yeast - ethanol

(C) Methanogens - gobar gas

(D) Coliforms - vinegar

Question 183.

Ultrasound of how much frequency is beamed into human body for sonography ?

[4 Marks]

(A) 15 - 300 MHz

(B) 1 - 15 MHZ

(C) 45 - 70 MHZ

(D) 30 - 45 MHZ

Question 184.

Geometric representation of age structure is a characteristic of population.

[4 Marks]

(A) landscape

(B) biotic community.

(C) ecosystem

(D) population

Question 185.

The population of an insect species shown an explosive increase in numbers during rainy season followed by its disappearance at the end of the season. What does this show?

[4 Marks]

(A) S-shaped or sigmoid growth of this insect.

(B) The population of its predators increases enormously

(C) Its population growth curve is of J-type

(D) The food plants mature and die at the end of the rainy season

Question 186.

Two plants can be conclusively said to belong to the same species if they

[4 Marks]

(A) have more than 90 per cent similar genes

(B) look similar and possess identical secondary metabolites

(C) can reproduce freely with each other and form seeds.

(D) have same number of chromosomes

Question 187.

A high density of elephant population in an area can result in

[4 Marks]

(A) intra specific competition

(B) predation on one another

(C) inter specific competition

(D) mutualism.

Question 188.

Which one of the following ecosystem types has the highest annual net primary productivity?

[4 Marks]

(A) tropical deciduous forest

(B) temperate evergreen forest

(C) temperate deciduous forest

(D) tropical rain forest.

Question 189.

One of endangered species of Indian medicinal plants is that of

[4 Marks]

(A) Nepenthes

(B) Podophyllum

(C) Garlic

(D) Ocimum

Question 190.

Identify the odd combination of habitat and the particular animal concerned.

[4 Marks]

(A) Sunderbans - Bengal Tiger

(B) Periyar - Elephant

(C) Dachigam National park - Snow Leopard

(D) Rann of kutch - Wild Ass

Question 191.

Which one of the following pairs of organisms are exotic species introduced in India?

[4 Marks]

(A) Lantana camara, water hyacinth

(B) Water hyacinth, Prosopis cineria

(C) Nile perch, Ficus religiosa

(D) Ficus religiosa, Lantana camara

Question 192.

In a coal fired power plant electrostatic precipitators are installed to control emission of

[4 Marks]

(A) NO_x

(B) SPM

(C) CO

(D) SO_2

Question 193.

Which one of the following is not a bioindicator of water pollution?

[4 Marks]

(A) Blood-worms

(B) Stone flies

(C) Sludge-worms.

(D) Sewage fungus

Question 194.

Which one of the following statements is correct?

[4 Marks]

(A) Both Azotobacter and Rhizobium fix atmospheric nitrogen in root nodules of plants.

(B) Cyanobacteria such as Anabaena and Nostoc are important mobilisers of phosphates and for plant nutrition in soil

(C) Extensive use of chemical fertilizers may lead to eutrophication of nearby water bodies.

(D) At present it is not possible to grow maize without chemical fertilizers

Question 195.

If the mean and the median pertaining to a certain character of a population are of the same value, the following is most likely to occur:-

[4 Marks]

(A) A normal distribution

(B) A skewed curve

(C) a T-shaped curve

(D) A bi-modal distribution

Question 196.

In which one of the following the BOD (Biochemical Oxygen Demand) of sewage (S), distillery effluent (DE), paper mill effluent (PE) and sugar mill effluent (SE) have been arranged in ascending order?

[4 Marks]

(A) S < DE < PE < SE

(B) SE < S < PE < DE

(C) SE < PE < S < DE

(D) PE < S < SE < DE

Question 197.

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

[4 Marks]

(A) Peritubular capillaries

(B) Loops of Henle

(C) Convoluted tubules

(D) Collecting ducts

Question 198.

Arteries are best defined as the vessel which :

[4 Marks]

(A) supply oxygenated blood to the different organs

(B) carry blood from one visceral organ to another visceral organ

(C) carry blood away from the heart to different organs

(D) break up into capillaries which reunite to form a vein

Question 199.

Match the source gland with its respective hormone as well as the function

[4 Marks]

	Source Gland	Hormone	Function
(a)	Thyroid	Thyroxine	Regulates blood calcium level
(b)	Anterior pituitary	Oxytocin	Contraction of uterus muscles during child birth
(c)	Posterior pituitary	Vasopressin	Stimulates resorption of water in the distal tubules in the nephron
(d)	Corpus luteum	Estrogen	Supports pregnancy

(A) a

(B) c

(C) b

(D) d

Question 200.

What is common to whale, seal and shark?

[4 Marks]

(A) Convergent evolution

(B) Homoiothermy

(C) Seasonal migration.

(D) Thick subcutaneous fat