

1.

- Which of the following statement is incorrect?
1. Taxa can indicate categories at very different levels.
 2. Systematics takes into account evolutionary relationship between organisms.
 3. Modern taxonomy do not take into account ecological information about organisms.
 4. Each rank or taxon represents unit of classification.

2.

- All living organisms are? Except
1. Self replicating.
 2. Evolving and self regulating.
 3. Self conscious.
 4. Interactive System.

3.

- How many of the following can help in breaking seed dormancy?
1. Changing the environmental condition like light & temperature.
 2. Application of GA₃ or nitrates.
 3. Chilling condition.
 4. All the above

4.

- Which of the following is not correctly matched?

PGR	Function
1. Auxin	Flowering in mango.
2. ABA	Dormancy of seed.
3. GA ₃	Breaking seed dormancy.
4. Ethylene	Sprouting of potato.

5.

- Each pole receives half the chromosome number of the parent cell, is true for which stage?
1. Anaphase - II
 2. Anaphase - I
 3. Telophase-I
 4. Telophase-II

6.

- Most of the organelle duplication occurs during which phase?

1. G₁
2. G₂
3. S
4. M

7.

- It begins with the simultaneous splitting of the centromere of each chromosome, is true for which stage

of Cell division.

1. Anaphase-I
2. Anaphase-II
3. Anaphase
4. More than one

8.

Which of the following is not related to formation of bivalent?

1. Synapsis
2. Recombinase
3. Zygote
4. Synaptonemal complex

9.

Statement -1 : In animals mitotic cell division is only seen in the diploid somatic cells.

Statement-2 : In plants mitotic division takes place in both haploid & diploid cells.

Option :

1. Both statements are correct.
2. Only first statement is correct.
3. Only second statement is correct.
4. Both statements are incorrect.

10.

How many of the following statements are correct?

- (i) In plants each organ receiving some substances & giving out some others.
- (ii) Water channels are made up of eight different types of aquaporins.
- (iii) Water is often limiting factor for plant growth & productivity in both agricultural & Natural environments.
- (iv) Imbibition is also diffusion.

Option :

1. All the above
2. (i), (ii) & (iv)
3. (ii), (iii) & (iv)
4. (iii) & (iv)

11.

In xylem continuous chain of water is re-established, when it is broken, by

1. Guttation
2. Root pressure
3. Imbibition
4. Transpiration

12.

Which of the following is not true for three domain system?

1. Divides kingdom monera into two domains.
2. Third domain includes all eukaryotic organisms.

3. It resulted in six kingdom classifications.
4. It is not phylogenetic.
13. Archaebacteria differ from other bacteria on the basis of
1. Cell membrane structure.
2. Cell wall structure.
3. Presence of vacuole.
4. flagella structure.
14. Which of the following statement is not true for organism, which causes bloom of polluted water?
1. Can fix nitrogen.
2. Have chlorophyll 'a' similar to higher plants.
3. Locks flagella.
4. Only fresh water.
15. In case of protists sexual reproduction can be by
1. Cell fusion
2. Zygote formation
3. Triple fusion
4. Both (a) and (b)
16. Which of the following have pigment similar to higher plants?
1. Group which causes red tide.
2. Group which is chief producer of ocean.
3. Group when deprived of light behaves as heterotroph.
4. Group where spore have cellulosic cell wall
17. Which of the following fungus lacks dikaryophase?
1. Claviceps
2. Puccinia
3. Aspergillus
4. Trichoderma
18. Which of the following is not correctly matched?
1. Inert Crystals - Virus
2. Free RNA - Viroids
3. Normal protein - Prions
4. Symbionts - Lichen
19. Plants growing near nuclear testing site take up
1. Strontium.
2. Molybdenum.
3. Potassium.
4. Magnesium
- 20.
- Plant prefers to absorb nitrogen in form of nitrate from soil, then it is reduced to ammonia. This reduction to ammonia takes place in which part of plant
1. Root.
2. Leaf.
3. Stem.
4. Any
21. Cylindrical meristem is term used for?
1. Lateral meristem.
2. Promeristem.
3. Intercalary meristem.
4. Primary meristem.
22. Which of the following function can be performance by both parenchyma and collenchyma?
1. Storage.
2. Photosynthesis.
3. Secretion.
4. All.
23. Mark the incorrect match
1. Radial conduction of water – Ray parenchyma.
2. Water filled cavities – Maize stem.
3. Phloem parenchyma – Mainly in monocots.
4. Trichomes – Prevents water loss
24. Sunlight is essential for photosynthesis is established by
1. Jan Ingenhousz.
2. Robert Hill.
3. Emerson.
4. Julius Von Sach.
25. Why breakdown of proton gradient is essential during photosynthesis
1. It leads to production of NADPH.
2. It leads to production of O₂
3. It leads to production of ATP.
4. Both 1 and 3
26. The following processes occur during photosynthesis
(i) Reduction of carbon dioxide
(ii) The splitting of water
(iii) The synthesis of glucose
(iv) Release of oxygen

(v) Formation of ATP

Which one of the following combinations is correct for the light phase?

1. i, ii and iii
2. iii, iv and v
3. i, iii and iv
4. ii, iv and v

27.

During aerobic respiration hydrogen from the system is removed by?

1. O₂
2. NADP
3. FMN
4. UQ

28.

Mark the incorrect match

Aerobic	Anaerobic
1. Complete breakdown of glucose	- Partial breakdown.
2. Net gain 38 ATP	- Net gain 2 ATP.
3. Vigorously	- NADH oxidised slowly
4. CO ₂ released	- No CO ₂ released.

29.

Statement - 1 : Respiration is amphibolic pathway.

Statement - 2 : Pure fat & pure protein can never be respiratory substrate.

Option :

1. Only second statement is correct.
2. Both statements are correct.
3. Neither first nor second is correct.
4. Only first statement is correct

30.

How many of the following plants have stipulate leaf?

Tulip, Petunia, Lupin, Sweet pea, Indigofera, Sunhemp, Aloe, Ashwagandha

1. 6
2. 4
3. 7
4. 3

31.

In floral diagram a dot at the top of diagram represents

1. Position of ovary
2. Aestivation
3. Mother axis
4. Cohesion

32.

Which of the following is not related to family brassicaceae?

1. Parietal placentation.
2. Variation in length of stamen.
3. Alternate phyllotaxy.
4. Perigynous.

33.

Rachis represents?

1. Floral axis
2. Mid rib
3. Petiole
4. Pulvinus

34.

Which of the following character is not related to cucumber?

1. Tendrils develop from axillary bud.
2. Epigynous flower.
3. Ethylene is used for increasing production.
4. Teteradynamous condition.

35.

Aestivation is twisted in all, except

1. China rose
2. Pea
3. Cotton
4. Lady finger

36.

In mango & coconut fruit is drup, true for this is

1. It develop from monocarpellary ovary.
2. It develop from hypogynous ovary.
3. It is one seeded.
4. All of these

37.

Anisogamy is observed in

1. Eudorina
2. Volvox
3. Fucus
4. Kelps

38.

Mark the incorrect match

1. No embryo formation — Polysiphonia.
2. No reduction division in zygote— Polytrichum.
3. Vascular tissue present—Azolla.
4. Pollen directly lands on ovule—Wolffia.

39.

Secondary protonema of moss

1. Helps in propagation by fragmentation.
2. Helps in propagation by budding.
3. Have leafy stage as lateral bud.

4. All the above					
40.	(ii)	Hooks and suckers	Taenia	Annelida	
Mark the incorrect statement					
1. All the cell organelles perform different & specific function.	(iii)	Tube feet	Asterias Dentalium	Echinodermata	
2. Basal body of cilia & flagella in prokaryotes					
3. Endoplasmic reticulum helps in transport.					
4. Microbodies are present in both plants and animals.	(iv)	Comb plates	Pleurobrachia Aurelia	Ctenophora	
41.					
Centromere is situated close to its end in					
1. Telocentric chromosome.	1. (i) only				
2. Acrocentric chromosome.	2. (i) and (ii)				
3. Metacentric chromosome.	3. (iii) only				
4. Sub-metacentric chromosome	4. (ii) and (iii)				
42.					
In ribosome s-value provides indirect information about					
1. Size and density.	47.				
2. Size & volume.					
3. Volume and density.					
4. Mass and size					
43.					
Enzymes present inside the lysosome is active under					
1. Alkaline pH					
2. Acid pH					
3. Any pH					
4. Change in pH					
44.					
Which property of membrane is responsible for lateral movement of protein within overall bilayer?					
1. Fluidity					
2. Rigidity					
3. Semi permeability					
4. Hydrophilic					
45.					
Smooth endoplasmic reticulum performs all the functions, except					
1. Production of glycoprotein.					
2. Synthesis of lipid.					
3. Synthesis of glycogen.					
4. Synthesis of steroid hormones					
46.					
Find out the correct match from the following table:-					
Column-I	Column-II	Column-III			
(i) Radula	Rasping organ	Pila	Cyclostomes	Chondrichthyes	Osteichthyes
			(i) Marine		



1.



2.



3.



4.

Select the correct option in respect of characteristics of each group :-

Marine,
Fresh
water

Marine

(ii) Sucking mouth

Ventral mouth

Terminal mouth

(iii) 6-15 Pairs of Gills

5-7 Pairs of Gills

4 Pairs of Gills

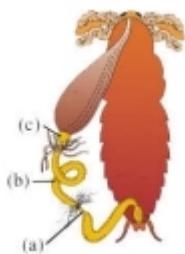
1. (i), (ii) are correct.
 2. (i), (iii), (iv) are correct.
 3. (ii), (iii) are correct.
 4. (ii), (iii), (iv) are correct.
- 49.

Which of the following epithelium their main function is to provide protection against chemical and mechanical stresses?

1. Simple epithelium.
2. Compound epithelium.
3. Columnar epithelium.
4. Cuboidal Epithelium

50.

Identify correctly matched (a), (b), (c)



1. Colon, Mesentron, Crop.
2. Ileum, Mesentron, Gizzard.
3. Ileum, Mesentron, Crop.
4. Colon, Mesentron, Gizzard.

51.

A list of different metabolites is given below in this list find out the number of primary & secondary metabolites, respectively & chooses the correct option:

Alkaloids, Abrin, Ricin, Carotenoids, Amino acids, Glucose, Fructose, Fatty acids, Thymine, Uracil, Lectins, Drugs.

1. Five and Six
2. Six and Six
3. Seven and five

4. Four and Eight

52.

Read the following statement (A-D) :-

- (a) Each protein is a polymer of amino acids.
- (b) A protein is a hetero polymer and not a homopolymer.
- (c) Dietary proteins are the source of essential amino acid.
- (d) Collagen is the most abundant protein in whole of the biosphere.

How many of the above statement are right ?

1. Three
2. One
3. Two
4. Four

53.

Which of the following part of nephron is not involved in tubular secretion?

1. Bowman's capsule.
2. PCT.
3. DCT.
4. Collecting Duct.

54.

Read the following statements :-

- (a) Human liver is the largest endocrine gland of body and having two lobes.
 - (b) Hepatic lobules are structural and functional unit of liver and contained hepatocytes which are arranged in chord like manner.
 - (c) Glisson's capsule is covering of each lobules and made up by connective tissue.
 - (d) Bile juice is formed and secreted by hepatocytes and is stored into liver sinusoid. Out of these which statements are correct and incorrect ?
1. Statements a and b are correct while c & d are incorrect.
 2. Statements a and d are correct while b & c are incorrect.
 3. Statements b & c are correct while a & d are incorrect.
 4. Statements b and d are correct while a & c are incorrect.

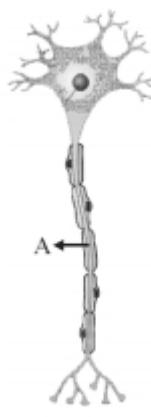
55.

Match the column I with column II :-

Column-I	Column-II
(i) Vomiting	(a) Inadequate enzyme secretion
(ii) Diarrhoea	(b) Irregular bowel movement
(iii) Constipation faecal discharge	(c) Increased liquidity of
(iv) Indigestion	(d) A feeling of nausea

1. (i)-a, (ii)-c, (iii)-b, (iv)-d
2. (i)-d, (ii)-b, (iii)-c, (iv)-a
3. (i)-d, (ii)-c, (iii)-b, (iv)-a
4. (i)-a, (ii)-b, (iii)-c, (iv)-d

56.



Which of the following statement is true for structure marked 'A' in the given figure?

1. In it centripetal conduction takes place.
2. Nissl's granules are present.
3. Present in non polar neuron.
4. Present in pseudounipolar neuron.

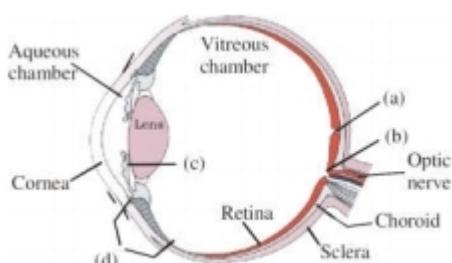
57.

How many hormones in the given list are not produced by anterior pituitary?

Prolactin(PRL), growth hormone(GH), Oxytocin, Thyroid stimulating hormone(TSH), vasopressin, somatostatin, Gonadotrophin releasing hormone(GnRH).

1. 6
2. 5
3. 4
4. 3

58.



For the given diagram which labelling and function is correctly matched/described?

1. (a) → Fovea → Rods are densely packed.
2. (b) → Blind spot → No image formed.
3. (c) → Choroid → Coloured part of the eye which regulates diameter of pupil.
4. (d) → Ciliary body → No role in accommodation

59.

Which of the following is not a correct combination of the hormone with its source organ and target organ :-

Hormone	Source organ	Target organ
1. Somatostatin	Hypothalamus	Adenohypophysis
2. FSH	Ovary	Uterus
3. TSH	Adenohypophysis	Thyroid
4. ACTH	Pituitary gland	Adrenal cortex

60.

Read all statements carefully and find out how many statements are correct ?

- (a) Neural system provides an organised network of point to point connection's for a quick co-ordination.
- (b) Impulse transmission across a chemical synapse is always faster than that across an electrical synapse.
- (c) Cerebral aqueduct passes through the mid-brain.
- (d) The hypothalamus contains centres which control respiration and gastric secretions.

1. One
2. Two
3. Three
4. Four

61.

Consider the following four statements (a-d) and select the option which includes all the correct :-

- (a) Coronary Artery disease, (CAD) often referred to as Atherosclerosis

- (b) Heart failure means when the heart muscle is suddenly damaged by an inadequate blood supply
 (c) High blood pressure leads to heart diseases and also affects vital organs like brain and kidney
 (d) Angina occurs due to conditions that affect the blood flow

Options :

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

62.

Which is not reabsorbed actively in nephron?

1. Glucose
2. Na^+
3. Amino acid
4. Nitrogenous wastes

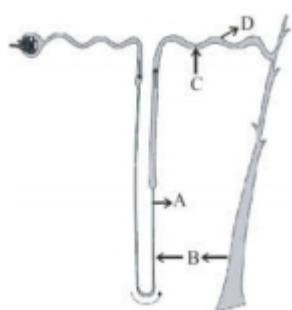
63.

Which of the following group of animals are ammonotelic in nature ?

1. Many bony fishes, amphibians, Insects.
2. Marine Fishes, amphibians, aquatic insects.
3. Mammals, birds, Reptiles.
4. Many bony fishes, aquatic amphibians, aquatic insects.

64.

Reabsorption and secretion of major substances at different parts of the Nephron are shown in the given figure. In this figure A, B, C, D are :-



1. HCO_3^- , Nutrients, Urea, NaCl .
2. NaCl , Urea, K^+ , HCO_3^-
3. NaCl , Urea, HCO_3^- , Ammonia.
4. H_2O , Urea, NaCl , HCO_3^-

65.

Trachea divides into two primary bronchi at the levels of :

1. 7th thoracic vertebrae in mid thoracic cavity.
2. 5th lumbar vertebrae in mid thoracic cavity.
3. 5th thoracic vertebrae in lower thoracic cavity.
4. 5th thoracic vertebrae in mid thoracic cavity.

66.

The state of heart when it is not pumping blood effectively enough to meet the needs of the body is called

1. CAD.
2. Atherosclerosis.
3. Angina.
4. Heart failure.

67.

In the rest state, a subunit of troponin masks :-

1. Active binding sites for actin on the myosin filaments.
2. Active binding sites for myosin on the myosin filaments.
3. Active binding sites for myosin on the actin filaments.
4. Actin binding sites for actin on the actin filaments.

68.

Contraction of muscle fibre takes place by the sliding of :-

1. Thin filaments over the actin filaments.
2. Thick filaments over the thin filaments.
3. Thin filaments over the thick filaments.
4. Thick filaments over the myosin filaments.

69.

How many vertebrochondral ribs are found in human?

1. 12 pairs.
2. 5 pairs.
3. 3 pairs.
4. 2 pairs.

70.

The condition which is favourable for dissociation of oxyhaemoglobin is :-

1. High PO_2
2. Low PCO_2 correct?
3. High H^+ conc.
4. Low temp

71.

Given below are four statements (a-d) regarding human blood circulatory system :

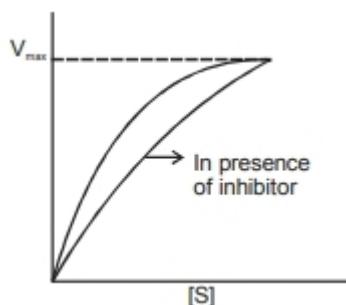
- (a) Arteries are thick-walled and have narrow lumen as compared to veins.
- (b) Angina is acute chest pain when the blood circulation to the brain is reduced.
- (c) Persons with blood group AB can donate blood to any person with any blood group under ABO system.
- (d) Calcium ions play a very important role in blood clotting.

Which two of the above statements are true?

1. a and b.
2. b and c.
3. c and d.
4. a and d.

72.

Which of the following statement is correct regarding the given graph?



1. Permanent binding of inhibitor with enzyme.
2. Km remains the same.
3. It represents inhibition of succinate dehydrogenase by malonate.
4. It represents inhibition of cytochrome oxidase by cyanide.

73.

Read the following statements (A-D) :-(A) A neural signal reaching the neural muscular junction releases adrenalin.(B) Many monomeric proteins called meromyosin constitute one thin filament.(C) A complex protein troponin is distributed atirregular intervals on the tropomyosin.(D) During shortening of muscle, the I-bands getreduced.How many of the above statements are true ?

1. Four
2. One
3. Three

4. Two

74.

Match the following :-

- | | |
|----------------------------|--|
| (i) Fibrous Joint | (a) Between two adjacent vertebrae. |
| (ii) Cartilagenous Joint | (b) Between humerus and pectoral girdle. |
| (iii) Pivot Joint | (c) Sutures. |
| (iv) Ball and Socket Joint | (d) Between atlas and axis. |

1. iv – (d), iii – (b), i – (c), ii – (a)
2. i – (a), ii – (c), iii – (d), iv – (b)
3. i – (c), ii – (a), iii – (d), iv – (b)
4. i – (a), ii – (d), iii – (b), iv – (c)

75.

Read the following statements :

- A. Mouth is located ventrally.
- B. Notochord is persistent throughout life.
- C. Gill slits are separate and with operculum.
- D. Air bladder are absent.



How many of the above statements are correct for given figure :

1. Four.
2. Three.
3. Two.
4. One

76.

Restoration of resting potential of the membrane at the site of excitation is achieved by :-

1. Diffusion of K⁺ outside the membrane.
2. Diffusion of Na⁺ outside the membrane.
3. Diffusion of K⁺ inside the membrane.
4. Diffusion of Na⁺ inside the membrane.

77.

If coastal cartilage is replaced by bones then

1. Volume of thoracis cage will not increased.
2. Volume of thoracic cage will not decreased.
3. Breathing will stop.
4. All the above statements are wrong.

78.

Glisson's capsule is associated with :

1. liver

2. pancreas

3. lungs

4. kidney

79.

Which of the following stage in cardiac cycle is of longest duration ?

1. Atrial systole.

2. Ventricle diastole.

3. Joint diastole.

4. Atrial diastole.

80.

Which of the following option gives correct categorisation of hormones according to their chemical nature :-

A

Steroid

B

Amino-acid derivative

C

Iodothyromines

1. Epinephrine,
nor-
epinephrine

Estradiol,
progesterone

Thyroxine

2. Estradiol,
progesterone

Epinephrine,
nor-
epinephrine

Thyroxine

3. Estradiol,
epinephrine

Nor-
epinephrine
progesterone

Thyroxine

4. Estradiol,
progesterone

Thyroxine

Epinephrine,
nor-
epinephrine

81.

Read the following four statements (a-d) and select the option which includes all correct ones only :-

(a) Exchange of O₂ and CO₂ at alveoli and tissue occur by active transport.

(b) Long exposure to industrial dust leads to inflammation leading to fibrosis and thus causing serious lung damage.

(c) EICM and IICM are muscles actively involved in normal and forced breathing respectively.

(d) Spirometer is unable to find out the functional residual capacity and total lung capacity.

1. b, c and d

2. b and d

3. a, b and d

4. a, b, c and d

82.

Which of the following is the example of connective tissue?

(i) Tendon

(ii) Ligament

(iii) Adipose tissue

(iv) Blood

(v) Lymph

1. (i), (ii), (iii), (iv), (v)

2. (i), (ii) only

3. (i), (ii), (iv) only

4. (i), (ii), (iii) only

83.

Which of the following is not a part of Autonomic neural system?

1. Brain.

2. Spinal cord.

3. Ganglion.

4. Skeletal Muscle

84.

The _____ integrates information received from the semicircular canals of the ear and the auditory system.

1. Cerebrum.

2. Cerebellum.

3. Medulla oblongata.

4. Thalamus.

85.

How many of these contain sensory hair cells?

Eustachian tube, utricle, saccule, Semicircular canals, scala media, scala vestibuli

1. 1

2. 3

3. 4

4. 2

86.

Similarity between Inulin, Lecithin and Insulin is -

1. All are polymeric compound.

2. All are natural polypeptides.

3. All contains C,H,O and N.

4. None of these.

87.

The most abundant chemical in living organisms is -

1. Water.
2. Protein.
3. Carbohydrate.
4. Nucleic acid.

88.

Hepatic portal system connect

1. Liver and heart.
2. Liver and Kidney.
3. Liver and digestive tract.
4. Liver and spleen.

89.

Intracellular flux of Ca^{++} is maximum in -

1. White muscle fiber.
2. Red muscle fiber.
3. Cardiac muscle fiber.
4. Smooth muscle fiber.

90.

Which of the following can alter respiratory mechanism?

1. Pneumotaxic centre in the pons region of the brain.
2. Chemosensitive area in the medulla.
3. Mid brain.
4. Both 1 and 2.

91.

HI was heated in a sealed tube at 440°C till the equilibrium was reached, HI was found to be 22 % decomposed. The equilibrium constant for dissociation is:

- | | |
|------------|------------|
| (a) 0.282 | (b) 0.0796 |
| (c) 0.0199 | (d) 1.99 |

92.

On the adding inert gas to the equilibrium $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$ at constant pressure. The degree of dissociation will :

- (1) Unchanged
- (2) Decreased
- (3) Increased
- (4) May be decrease or increase

93.

In the reaction, $\text{N}_2\text{O}_4 \rightleftharpoons 2\text{NO}_2$, α is that part of N_2O_4 which dissociates, then the number of moles at equilibrium will be:

1. $(1-\alpha)^2$

3. α

2. 3α

4. $1+\alpha$

94.

How many spectral lines are obtained in visible region when electron jumps from $n=5$ to $n=1$ hydrogen atom?

1. 3

2. 4

3. 6

4. 10

95.

Density ratio of O_2 and H_2 is 16 : 1. The ratio of their r.m.s. velocities will be [AIIMS 2000]

(1) 4 : 1

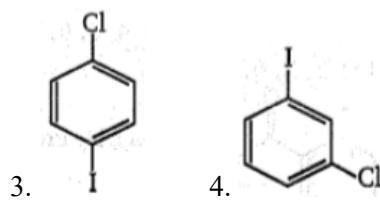
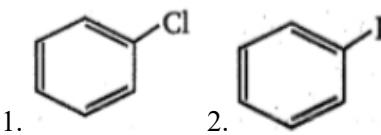
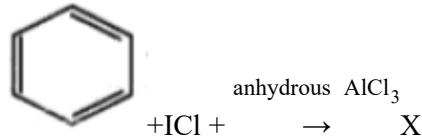
(2) 1 : 16

(3) 1 : 4

(4) 16 : 1

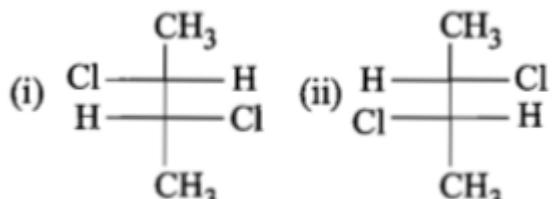
96.

The compound X in the reaction.



97.

If optical rotation produced by the compound (i) is $+52^\circ$ then that produced by the compound (ii) is:



The shape of XeF_3^+ is :

- (a) Trigonal planar
- (b) Pyramidal
- (c) Bent T-shape
- (d) See-saw

107.

The bond length of the S—O bond is maximum in which of the following compounds?

- (a) $SOCl_2$
- (b) $SOBr_2$
- (c) SOF_2
- (d) All have the same length

108.

Which species does not exist?

- (a) $(SnCl_6)^{2-}$
- (b) $(GeCl_6)^{2-}$
- (c) $(CCl_6)^{2-}$
- (d) $(SiCl_6)^{2-}$

109.

Bond angle between two hybrid orbitals is 105° . % S character orbital is:

- (a) between 30-31%
- (b) between 19-20%
- (c) between 25-26%
- (d) between 22-23%

110.



In piperidine hybridization:

- (a) sp
- (b) sp^2
- (c) sp^3

atom has

- (d) dsp^2

111.

In Wurtz reaction if we take CH_3Cl & C_2H_5Cl then product, will be-

- (A) Propane + Ethane
- (B) Propane
- (C) Propane + Ethane + Butane
- (D) Propane + Butane

112.

In the Solvay process of manufacture of sodium carbonate, the raw materials used are :

- (A) Aqueous $NaOH$, NH_3 and CO_2
- (B) Molten $NaOH$, NH_3 and CO
- (C) Brine $NaCl$, NH_3 and CO
- (D) Brine $NaCl$, NH_3 and CO_2

113.

Insoluble compound in acetic acid is-

- (A) Calcium oxide
- (B) Calcium carbonate
- (C) Calcium oxalate
- (D) Calcium hydroxide

114.

For $A \rightarrow B$,
 $\Delta H = 4 \text{ kcal mol}^{-1}$, $\Delta S = 10 \text{ cal mol}^{-1} K^{-1}$. Reaction is spontaneous when temperature can be :

- 1. 400 K
- 2. 300 K
- 3. 500 K
- 4. none is correct

115.

The lattice energy of $NaCl$ is -780 kJ mol^{-1} . The enthalpies of hydration of $Na^+(g)$ and $Cl^-(g)$ ions are -406 kJ mol^{-1} and -364 kJ mol^{-1} . The enthalpy of solution of $NaCl(s)$ is

1. 738 kJ mol^{-1}

2. 10 kJ mol^{-1}

3. -10 kJ mol^{-1}

4. -822 kJ mol^{-1}

116.

The most suitable method of separation of 1:1 mixture of ortho and para-nitrophenols is

- (a) sublimation
- (b) chromatography
- (c) crystallisation
- (d) steam distillation

117.

Which of the following thermodynamic quantities is an outcome of the second law of thermodynamics ?

- 1. Work
- 2. Enthalpy
- 3. Internal energy
- 4. Entropy

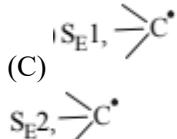
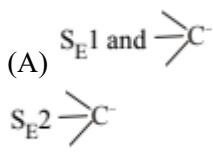
118.

The no. of isomeric sodium salt that will be required to obtain neopentane.

- | | |
|-------|-------|
| (A) 3 | (B) 1 |
| (C) 4 | (D) 6 |

119.

The type of reaction and intermediate of decarboxylation reaction are.-



120.

Equivalent weight of H_3PO_2 when it disproportionate into PH_3 and H_3PO_3 is:

1. M

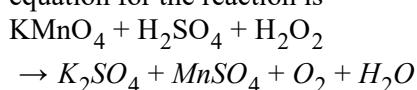
2. $M/2$

3. $M/4$

4. $3M/4$

121.

What volume of $\text{O}_2(\text{g})$ measured at 1 atm and 273 K will be formed by action of 100 mL of 0.5 N KMnO_4 on hydrogen peroxide in an acid solution? The skeleton equation for the reaction is



- 1. 0.12 litre
- 2. 0.028 litre
- 3. 0.56 litre
- 4. 1.12 litre

122.

The angular momentum of electrons in d orbital is equal to

- (a) $\sqrt{6} \text{ h}$
- (b) $\sqrt{2} \text{ h}$
- (c) $2\sqrt{3} \text{ h}$
- (d) 0 h

123.

The vapour density of a volume chloride of a metal is 95 and the specific heat of the metal is 0.13 cal/g. The equivalent mass of the metal will be:

- 1. 6
- 2. 12
- 3. 18
- 4. 24

124.

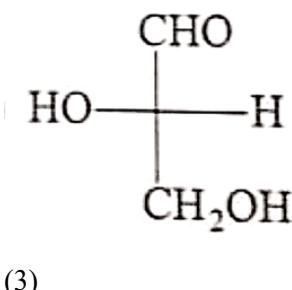
At what temperature will average speed of the molecules of the second member of the series C_nH_{2n} be the same of Cl_2 at 627°C ?

- 1. 259.4 K
- 2. 400 K
- 3. 532.4 K
- 4. None of these

125.

Orthoboric acid when heated to red hot gives:

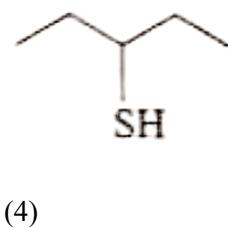
- (1) metaboric acid
- (2) pyroboric acid
- (3) boron and water
- (4) boric anhydride



126.

Litharge is not commonly used in:

- (1) manufacture of special glasses
- (2) glazing pottery
- (3) preparing paints
- (4) lead storage battery

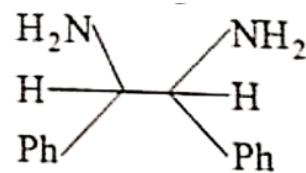


(4)

127.

Product formed on heating $\text{Pb}(\text{NO}_3)_2$ are:

- (1) PbO , N_2 , O_2
- (2) $\text{Pb}(\text{NO}_2)_2$, O_2
- (3) PbO , NO_2 , O_2
- (4) Pb , N_2 , O_2



128.

Which one of the following conformation of cyclohexane is chiral?

- (1) Boat
- (2) Twist
- (3) Rigid
- (4) Chair

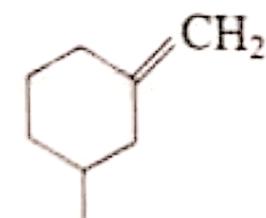
129.

Which of the following molecule will rotate the plane of plane polarised light?

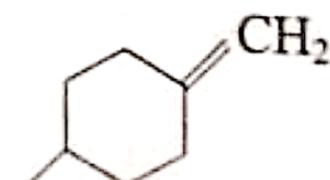
- (1)

The geometrical isomerism is shown by:

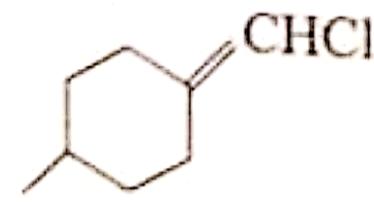
- (1)



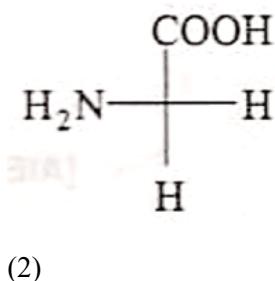
(2)

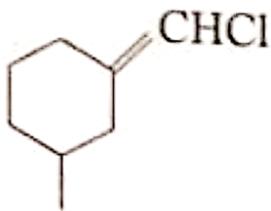


(3)



(4)





131.

Which will not react with acetylene?

- (1) NaOH
- (2) Na
- (3) HCl
- (4) Amm. AgNO_3

132.

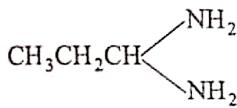
Acetylene on reacting with hypochlorous acid gives:

- (1) CH_3COCl
- (2) ClCH_2CHO
- (3) $\text{Cl}_2\text{CH. CHO}$
- (4) ClCH_2COOH

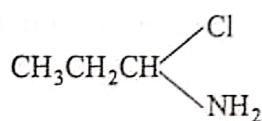
133.

When $\text{CH}_3\text{CH}_2\text{CHCl}_2$ is treated with NaNH_2 the product formed is:

- (1) $\text{CH}_3\text{CH} = \text{CH}_2$
- (2) $\text{CH}_3 - \text{C} \equiv \text{CH}$
- (3)



- (4)



134.

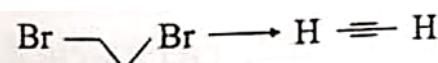
Which of the following reactions will yield 2, 2-dibromopropane?

- (1) $\text{CH}_3 - \text{CH} = \text{CH}_2 + \text{HBr} \rightarrow$
- (2) $\text{CH}_3 - \text{C} \equiv \text{CH} + \text{HBr} \rightarrow$
- (3) CH



135.

The reagent for the following conversion is/are



- (1) alc. KOH

- (2) alc. KOH followed by NaNH_2

- (3) aqueous KOH followed by NaNH_2

- (4) Zn/ CH_3OH

136.

In the relation $y = r\sin(\omega t - kx)$, the dimensional formula of ω/k are

$$(1) [M^0 L^0 T^0]$$

$$(2) [M^0 L^1 T^{-1}]$$

$$(3) [M^0 L^0 T^1]$$

$$(4) [M^0 L^1 T^0]$$

137.

The least count of a stop watch is 0.2 s. The time of 20 oscillations of a pendulum is measured to be 25 s. The percentage error in the measurement of time will be

- (1) 8%

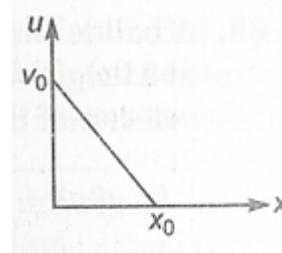
- (2) 1.8%

- (3) 0.8%

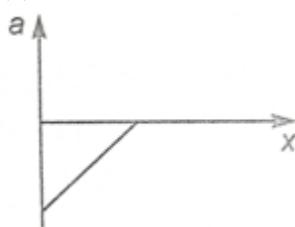
- (4) 0.1%

138.

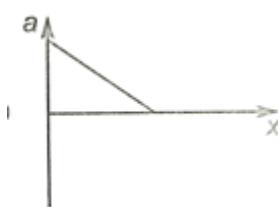
The given graph shows the variation of velocity with displacement. Which one of the graph given below correctly represents the variation of acceleration with displacement?



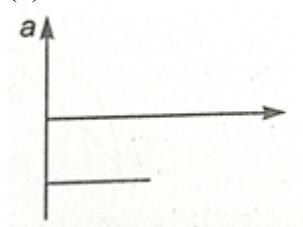
(1)



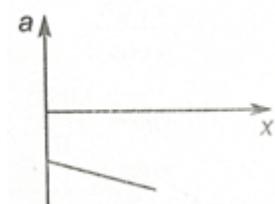
(2)



(3)

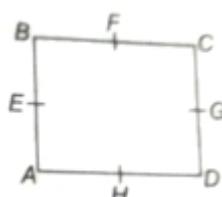


(4)



139.

In a rectangle ABCD (BC=2AB). The moment of inertia along which axis will be minimum?



(1) BC

(2) BD

(3) HF

(4) EG

140.

When a disc rotates with uniform angular velocity , which of the following is not true?

(1) The sense of rotation remains same

(2) The orientation of the axis of rotation remains same

(3) The speed of the rotation is non zero and remains same

(4) The angular acceleration is non -zero and remains same

141.

A bus moves over a straight level road with a constant acceleration a . A body in the bus drops a ball outside. The acceleration of the ball with respect to the bus and the earth are respectively

(1) a and g (2) $a + g$ and $g - a$ (3) $\sqrt{a^2 + g^2}$ and g (4) $\sqrt{a^2 + g^2}$ and a

142.

What torque will increase angular velocity of a solid disc of mass 16 kg and diameter 1 m from zero to 120 rpm in 8 s?

$$\left(1\right) \frac{\pi}{4} N \cdot m \quad \left(2\right) \frac{\pi}{2} N \cdot m \quad \left(3\right) \frac{\pi}{3} N \cdot m \quad \left(4\right) \pi N \cdot m$$

143.

A ball is dropped on the floor from a height of 10 m. It rebounds to a height of 2.5 m. If the ball is in contact with the floor for 0.01 s, the average acceleration during contact is nearly (Take $g = 10 \text{ ms}^{-2}$)

(1) $1500\sqrt{2} \text{ ms}^{-2}$ upwards(2) 1800 ms^{-2} downwards(3) $1500\sqrt{5} \text{ ms}^{-2}$ upwards(4) $1500\sqrt{2} \text{ ms}^{-2}$ downwards

144.

A boat is sent across a river with a velocity of 8 km/h. If the resultant velocity of boat is 10 km/h, then velocity of river is

(1) 10 km/h

(2) 8 km/h

(3) 6 km/h

(4) 4 km/h

145.

If $\vec{A} \cdot \vec{B} = 0$ and $\vec{A} \times \vec{B} = \vec{0}$, then \vec{A} and \vec{B} are -

- (1) perpendicular unit vectors
- (2) parallel unit vectors
- (3) parallel
- (4) perpendicular

146.

A force is inclined at 60° to the horizontal. If its rectangular component in the horizontal direction is 50 N, then magnitude of the force in the vertical direction is

- (1) 25 N
- (2) 75 N
- (3) 87 N
- (4) 100 N

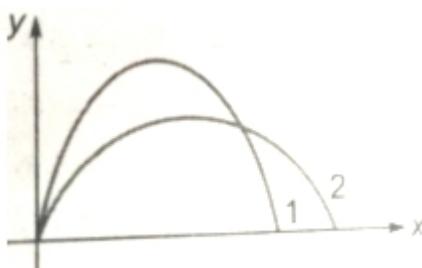
147.

What is the torque of the force $F = (2\hat{i} - 3\hat{j} + 4\hat{k})$ N acting at the point $r = (3\hat{i} + 2\hat{j} + 3\hat{k})$ M about the origin?

$$(1) -17\hat{i} + 6\hat{j} + 13\hat{k} \quad (2) -6\hat{i} + 6\hat{j} - 12\hat{k} \quad (3) 17\hat{i} - 6\hat{j} - 13\hat{k} \quad (4) 6\hat{i} - 6\hat{j} + 12\hat{k}$$

148.

Trajectories of two projectiles are shown in figure. Let T_1 and T_2 be the time periods and u_1 and u_2 their speeds of projection. Then,



- (1) $T_2 > T_1$
- (2) $T_1 > T_2$
- (3) $u_1 = u_2$
- (4) $u_1 < u_2$

149.

A cricketer can throw a ball to a maximum horizontal distance of 100 m. How much high above the ground can the cricketer throw the same ball?

- (1) 40 m
- (2) 45 m
- (3) 500 m
- (4) 50 m

150.

A car-wheel is rotated with uniform angular acceleration about its axis. Initially, its angular velocity is zero. It rotates through an angle θ_1 in the first 2 s, in the next 2 s,

it rotates through an additional angle θ_2 , the ratio of $\frac{\theta_2}{\theta_1}$ is

- (1) 1
- (2) 2
- (3) 3
- (4) 5

151.

A man of 80 kg mass is standing on the rim of a circular platform of mass 200 kg rotating about its axis. The mass of the platform with the man on it rotates at 12.0 rpm. If the man now moves to centre of the platform, the rotational speed would become

$$(1) 16.5 \text{ rpm}$$

- (2) 25.7 rpm
- (3) 32.3 rpm
- (4) 21.6 rpm

152.

A circular disc rolls down an inclined plane. The ratio of the rotational kinetic energy to total kinetic energy is

$$(1) \frac{1}{2} \quad (2) \frac{1}{3} \quad (3) \frac{2}{3} \quad (4) \frac{3}{4}$$

153.

A car of mass 2000 kg is moving with a speed of 10 m s^{-1} on a circular path of radius 20 m on a level road. What must be the frictional force between the car and the road so that the car does not slip?

- (1) 10^4 N
- (2) 10^3 N
- (3) 10^5 N

(4) $10^2 N$

154.

If the stretch in a spring of force constant k is doubled, find the ratio of final to initial force if the spring is stretched from y to $2y$.

(1) 1

(2) 2

(3) 3

(4) 4

155.

If a force of 250 N act on body, the momentum acquired is 125 kg-m/s. What is the period for which force acts on the body?

(1) 0.5 s

(2) 0.2 s

(3) 0.4 s

(4) 0.25

156.

A sphere is accelerated upward by a cord whose breaking strength is four times its weight. The maximum acceleration with which the sphere can move up without breaking the cord is

(1) g (2) $3g$ (3) $2g$ (4) $4g$

157.

If different planets have the same density but different radii then the acceleration due to gravity on the surface of the planet is related to the radius (R) of the planet as

$$(1) g \propto R^2$$

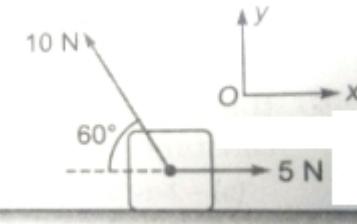
$$(2) g \propto R$$

$$(2) g \propto \frac{1}{R^2}$$

$$(4) g \propto \frac{1}{R}$$

158.

A block of mass $\sqrt{3} \text{ kg}$ rests on a horizontal frictionless xy-plane. What would be the acceleration of the block if it is subjected to two forces as shown in figure?

(1) 2.5 ms^{-2} (2) 5 ms^{-2} along y-axis(3) 10 ms^{-2} along x-axis(4) 15 ms^{-2} along y-axis

159.

A 1000 kg lift is supported by a cable that can support 2000 kg. The shortest distance in which the lift can be stopped when it is descending with a speed of 2.5 ms^{-1} is [Take $g = 10 \text{ ms}^{-2}$]

(1) 1 m

(2) 2 m

(3) $\frac{5}{32} \text{ m}$ (4) $\frac{5}{16} \text{ m}$

160.

A plate of mass M is placed on a horizontal frictionless surface and a body of mass m is placed on this plate. The coefficient of dynamic friction between this body and the plate is μ . If a force $2\mu mg$ is applied to the body of mass m along the horizontal, the acceleration of the plate will be

$$(1) \frac{\mu m}{M} g$$

$$(2) \frac{\mu m}{(M+m)} g$$

$$(3) \frac{2\mu m}{M} g$$

$$(4) \frac{2\mu m}{(M+m)} g$$

161.

If a man speeds up by 1 ms^{-1}

, his kinetic energy increases by 44%. His original speed in ms^{-1} is

- (1) 1
- (2) 2
- (3) 5
- (4) 4

162.

Out of following the only correct statement about satellites is

- (1) A satellite cannot move in a stable orbit in a plane passing through the earth's centre
- (2) Geostationary satellites are launched in the equatorial plane
- (3) We can use just one geostationary satellite for global communication around the globe
- (4) The speed of satellite increases with an increase in the radius of its orbit

163.

A bullet when fired at a target with velocity of 100ms^{-1} penetrates 1 m into it. If the bullet is fired at a similar target with a thickness 0.5 m, then it will emerge from it with a velocity of

- (1) $50\sqrt{2} \text{ m/s}$
- (2) $\frac{50}{\sqrt{2}} \text{ m/s}$
- (3) 50 m/s
- (4) 10 m/s

164.

A 0.5 kg ball is thrown up with an initial speed 14 ms^{-1} and reaches a maximum height of 8 m. How much energy is dissipated by air drag acting on the ball during the ascent?

- (1) 19.6 J
- (2) 4.9 J
- (3) 10 J
- (4) 9.8 J

165.

A body of mass m is accelerated uniformly from rest to a speed v in a time T . The instantaneous power delivered to the body as a function of time is given by

$$(1) \frac{1}{2} \frac{mv^2}{T^2} t^2$$

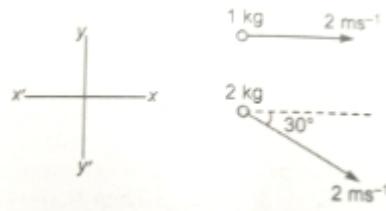
$$(2) \frac{1}{2} \frac{mv^2}{T^2} t$$

$$(3) \frac{mv^2}{T^2} t^2$$

$$(4) \frac{mv^2}{T^2} t$$

166.

Find the velocity of centre of the system shown in the figure.



$$(1) \left(\frac{2+2\sqrt{3}}{3} \right) \hat{i} - \frac{2}{3} \hat{j}$$

$$(2) 4 \hat{i}$$

$$(3) \left(\frac{2-2\sqrt{3}}{3} \right) \hat{i} - \frac{2}{3} \hat{j}$$

(4) None of these

167.

A 1 m long wire is stretched without tension at 30°C between two rigid supports. What strain will be produced in the wire if the temperature falls to 0°C (Given $\alpha = 12 \times 10^{-6} \text{ K}^{-1}$)

$$(1) 3.6 \times 10^{-5}$$

$$(2) 6.4 \times 10^{-5}$$

$$(3) 0.78$$

$$(4) 0.32$$

168.

If the compressibility of water is σ per unit atmospheric pressure, then the decrease in volume (V) due to atmospheric pressure p will be

(1) $\sigma p/V$

γ^{-1}

(2) σpV

173.

(3) σ/pV

An engine has an efficiency of $1/3$. The amount of work this engine can perform per kilocalorie of heat input is

(4) $\sigma V/p$

(1) 1400 cal

169.

(2) 700 cal

Two capillary tubes of radii 0.2 cm and 0.4 cm are dipped in the same liquid. The ratio of heights through which liquid will rise in the tubes is

(3) 700 J

(1) 1 : 2

(4) 1400 J

(2) 2 : 1

174.

(3) 1 : 4

The surface area of air bubble increases four times when it rises from bottom to top of a water tank where the temperature is uniform. If the atmospheric pressure is 10 m of water, the depth of the water in the tank is

(4) 4 : 1

(1) 30m

170.

(2) 40m

What should be the lengths of a steel and copper rod at $0^\circ C$ so that the length of the steel rod is 5 cm longer than the copper rod at any temperature?

(3) 70m

$$\alpha_{(Steel)} = 1.1 \times 10^{-5} {}^\circ C^{-1} \quad \alpha_{(Copper)} = 1.7 \times 10^{-5} {}^\circ C^{-1}$$

(4) 80m

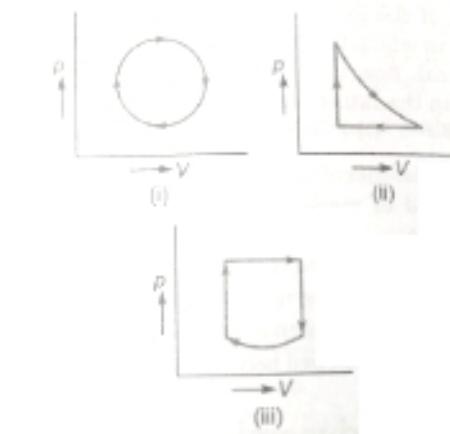
(1) 14.17 cm; 9.17 cm

175.

(2) 9.17 cm; 14.17 cm

What is the nature of change in internal energy in the following three thermodynamic processes shown in figure?

(3) 28.34 cm; 18.34 cm



(4) 14.17 cm; 18.34 cm

171.

The temperature of a black body is increased by 50%, then the percentage of increase of radiation is approximately

(1) 100%

(2) ΔU is positive in all the three cases

(2) 25%

(3) ΔU is negative in all the three cases

(3) 400%

(4) ΔU is positive for (i), negative for (ii), zero for (iii)

(4) 500%

(4) ΔU = 0, in all the cases

172.

For a gas, if the ratio of specific heats at constant pressure and constant volume is γ , then the value of degree of freedom is

$$(1) \frac{\gamma+1}{\gamma-1}$$

(1) ΔU is positive in all the three cases

$$(2) \frac{\gamma-1}{\gamma+1}$$

(2) ΔU is negative in all the three cases

$$(3) \frac{(\gamma-1)}{2}$$

(3) ΔU is positive for (i), negative for (ii), zero for (iii)

$$(4) 2$$

(4) ΔU = 0, in all the cases

176.

A block is resting on a piston which is moving vertically with SHM of period 1.0 s. At what amplitude of motion will the block and piston separate?

(1) 0.2 m

- (2) 0.25 m
- (3) 0.3 m
- (4) 0.35 m

177.

When the displacement is half of the amplitude, then what fraction of the total energy of a simple harmonic oscillator is kinetic?

- (1) 2/7
- (2) 3/4
- (3) 2/9
- (4) 5/7

178.

A beaker containing water is balanced on the pan of a common balance. A solid of specific gravity 1 and mass 5 g is tied to the arm of the balance and immersed in water contained in the beaker. The scale pan with the beaker

- (1) goes down
- (2) goes up
- (3) remains unchanged
- (4) none of these

179.

A 1000 Hz sound wave in air strikes the surface of a lake and penetrates into water. If speed of sound in water is 1500 ms^{-1} , the frequency and wavelength of waves in water are

- (1) 1500 Hz, 1 m
- (2) 1000 Hz, 1.5 m
- (3) 1000 Hz, 1 m
- (4) 1500 Hz, 1.5 m

180.

A stretched string of length l fixed at both ends vibrating in ' n ' loops can sustain stationary waves of wavelength λ given by -

- (1) $\lambda = 2ln$
- (2) $\lambda = 2l/n$
- (3) $\lambda = l^2/2n$
- (4) $\lambda = n^2/2l$

Fill OMR Sheet

