

1. Select the correct sequence of taxonomic categories of Mango in ascending order

1. Mangifera → Anacardiaceae → Dicotyledoneae → Sapindales → Angiospermae.

2. Mangifera → Anacardiaceae → Sapindales → Dicotyledoneae → Angiospermae.

3. Angiospermae → Dicotyledoneae → Sapindales → Anacardiaceae → Mangifera.

4. Angiospermae → Sapindales → Anacardiaceae → Dicotyledoneae → Mangifera.

2. Select incorrect statement w.r.t the following group of organisms and their characteristics

1.	Chrysophyte	-	Includes diatoms and desmids, Planktonic organism.
2.	Dinoflagellate	-	Mostly marine and photosynthetic, cell wall has stiff cellulosic plate on outer surface.
3.	Euglenoids	-	Majority of them are fresh water, cell wall is absent.
4.	Slime mould	-	Saprophytic motile spores with true walls

3. Chlamydomonas, Chlorella, Volvox, Ulothrix, Fucus, Dictyota, Polysiphonia, Gelidium, Acetabularia, Laminaria Out of these 10

organisms, how many organisms belong to the class chlorophyceae, phaeophyceae and rhodophyceae respectively?

1. 4, 3, 3

2. 4, 4, 2

3. 5, 3, 2

4. 6, 2, 2

4. Select incorrect option w.r.t. viral disease in both plant and animal

Plant disease Animal disease

1. Leaf rolling - Mumps

2. Yellowing - Herpes

3. Vein clearing - Influenza

4. Damping off - Diphtheria

5. Gametophyte of Bryophyte is

1. Green and vascular.

2. Independent, multicellular.

3. Dependent on sporophyte.

4. Foliose in nature.

6. According to R.H. Whittaker

Chlamydomonas and Chlorella will be kept under

1. Monera

2. Protista

3. Plantae

4. Both (b) & (c)

7. Select incorrect option w.r.t. given diagram



1. Heterosporous.
 2. Aquatic fern.
 3. Belongs to class Pteropsida.
 4. Gametophytic main plant body.
-
8. The leaf of Pinus is
 1. Needle shaped
 2. Compound leaf
 3. Having veinlets
 4. Non-cutinised
-
9. Some plant groups exhibit intermediate condition w.r.t life cycle pattern. Which characteristic will not be exhibited by such kind of plant?
 1. Haplodiplontic life cycle pattern.
 2. Both phases are multicellular and often free living.
 3. They can differ in dominant phase.
 4. Meiosis takes place in zygote
-
10. Select correct option w.r.t Rhizophora
 - (i) Grows in swampy area.
 - (ii) Pneumatophores are present for respiration.
 - (iii) Is halophyte.
 - (iv) Shows in-situ germination of seed.

1. All are correct.
2. All are correct except (iv).
3. All are correct except (i) & (iv).
4. All are correct except (i), (iii), & (iv).

11. Morels and Agaricus have edible fruiting bodies and belong to their respective class as.

1. Ascomycetes and Basidiomycetes.
2. Basidiomycetes and Ascomycetes.
3. Ascomycetes and Phycomycetes.
4. Basidiomycetes only

12. In gourds and watermelon, the tendrils are formed by the modification of

1. Extra axillary bud.
2. Axillary bud and leaf respectively.
3. Leaf and axillary bud respectively.
4. Leaf.

13. A pair of leaves arise at each node and lie opposite to each other as in

1. Calotropis, called opposite decussate phyllotaxy.
2. Guava, called opposite superimposed phyllotaxy.
3. Ocimum, called opposite phyllotaxy.
4. More than one option is correct.

14. Select incorrect option w.r.t. BGA and bacteria

1. Both are prokaryote.
2. BGA is not motile in any stage of life but bacteria can be.
3. Heterocyst are formed in few BGA for nitrogen fixation and it is not formed in bacteria.

4. BGA and bacteria both can be autotrophic and heterotrophic.
15. If the margins of sepals or petals overlap one another but not in particular direction, the aestivation is called
1. Imbricate
 2. Valvate
 3. Open
 4. Twisted

16. Which one is correct set of option w.r.t. Coconut?

1. Mesocarp – Sclerenchymatous fibre.
Endocarp – Sclereids.
Edible part – Endosperm.
Kind of fruit – Berry.
2. Mesocarp – Sclereids.
Endocarp – Sclerenchymatous fibre.
Edible part – Seed.
Kind of fruit – Drupe.
3. Mesocarp – Sclerenchymatous fibre.
Endocarp – Sclereids.
Edible part – Endosperm.
Kind of fruit – Drupe.
4. Mesocarp – Sclerenchymatous fibre.
Endocarp – Sclereids.
Edible part – Fruit.
Kind of fruit – Drupe

17. Pyruvic acid + CoA + NaD⁺ \xrightarrow{A} B + CO₂ + NADH⁺ + H⁺ in the above given reaction of respiration what can be placed at the place of A and B respectively?

1. Iron and Citric acid.
2. Magnesium and Citric acid.
3. Dehydrogenase and Acetyl CoA.
4. Iron and Acetyl CoA

18. Out of the following examples, how many are belonging to Fabaceae, Solanaceae, Liliaceae?

Aloe, Indigofera, Asparagus, Colchicum, Belladonna, Mulaithi

	Solanaceae	Liliaceae	Fabaceae
1.	3	2	1
2.	2	2	2
3.	2	1	3
4.	4	1	1

19. Select the incorrect statement w.r.t vessel

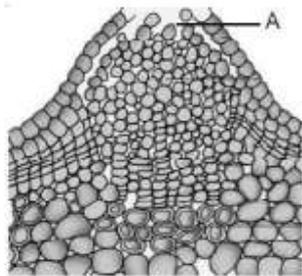
1. Devoid of protoplasm.
2. Lignified wall.
3. Long cylindrical tube like cells.
4. Presence of vessel is characteristic of gymnosperm.

20. Which is correct set of option w.r.t. the following?

1.	Dicot stem	-	Differentiated ground tissue.
	Monocot stem	-	Endarch xylem
	Dicot leaf	-	Isobilateral leaf.
	Monocot leaf	-	Dorsiventral leaf.
2.	Dicot stem	-	Scattered vascular bundle.
	Monocot stem	-	Arranged vascular bundle.
	Dicot leaf	-	Amphistomatic.
	Monocot leaf	-	Hypostomatic.
3.	Dicot stem		Endodermis is called starch sheath
	Monocot stem		Vascular bundle surrounded by sclerenchymatous sheath.

	Dicot leaf	Palisade and spongy parenchyma.
	Monocot leaf	Stomata present on both
4.	Dicot stem	Arranged vascular bundle.
	Monocot stem	Endodermis is called starch sheath
	Dicot leaf	Amphistomatatic.
	Monocot leaf	Palisade and spongy parenchyma.

21. In the given diagram, which is not related with (A) as indicated in diagram?

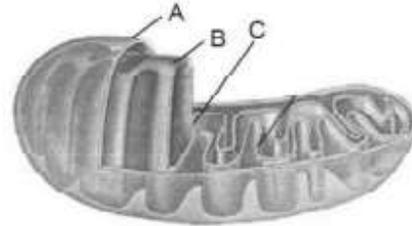


1. Complimentary cells.
2. Involved in exchange of gases.
3. Lens shaped opening called lenticels.
4. Found in herbaceous trees.

22. Which of the following statement is incorrect w.r.t. endomembranous system?

1. Found only in eukaryotes.
2. The organelle of this system function in coordinated manner.
3. It includes endoplasmic reticulum, golgi complex, lysosome and vacuole.
4. Found in that cell in which cyclosis is absent

23. Which is not a feature w.r.t. given diagram of mitochondria (as indicated in diagram)?



1. A → Continuous limiting boundary.
2. B → Forms number of folding called cisternae.
3. A & B → Both having own specific enzyme.
4. C → Site of Krebs' cycle.

24. The chromosome in which centromere is situated close to its end forming one extremely short and one very long arm, is

1. Telocentric
2. Submetacentric
3. Acrocentric
4. Metacentric

25. In which phase of mitosis, chromosomes are moved to spindle equator and get aligned at equatorial plate through spindle fibers to both poles, is

1. Prophase
2. Metaphase
3. Anaphase
4. Telophase

26. When a cell is viewed under the microscope, it does not show golgi complex, endoplasmic reticulum, nucleolus, nuclear

envelope in which stage of cell division?

1. Early prophase
2. Late prophase
3. Interphase
4. Telophase

27. These given statements are related with specific phase of meiosis, select the unrelated statement with the phase given below.

	Statement		Phase
1.	The homologous chromosome separate, while sister chromatids remain associated at their centromere	-	Anaphase I
2.	The bivalent chromosomes align on the equatorial plate	-	Metaphase I
3.	Cytokinesis follows resulting in the formation of tetrad of cells	-	Telophase I
4.	Terminalisation of chiasmata of prophase	-	Final stage

28. NADH synthesized in glycolysis of aerobic respiration is transferred into

1. Cytoplasm for oxidative phosphorylation.
2. Mitochondria for oxidative phosphorylation.
3. Mitochondria for photooxidation.
4. ETS for photooxidation.

29. By convention the water potential of pure water at standard temperatures, which is not under any pressure, is taken to be

1. 100 atm
2. Zero
3. More than 0 atm
4. Less than 0 atm

30. Which is correct w.r.t. osmotic pressure of cells when cells are in following stages?

	Turgid	Flaccid	Plasmolysed
1.	OP = TP	OP = DPD	OP < DPD
2.	OP = TP	OP > DPD	OP < DPD
3.	OP = 0	OP > 0	OP < 0
4.	OP = DPD	OP = TP	OP < TP

31. Symplastic movement of water in intracellular space of cell is aided by

1. Cyclosis
2. Golgi body
3. Plasmodesmata
4. Cell wall

32. Select the correct statement w.r.t given statements

1. Water transport is related with transpiration and guttation is related with stomata.
2. Transpiration is passive process but opening of stomata is active.
3. C₃ plants are twice efficient in photosynthesis as compared to C₄ plants

whereas C_3 plants are less efficient w.r.t transpiration than C_4 plants.

4. Minerals uptake is passive whereas water absorption is active.

33. Presence of oxygen is vital in aerobic respiration because

1. It drives the whole process by removing hydrogen from ETS.
2. Oxygen causes phosphorylation which is light stimulated.
3. Oxygen directly stimulates complex V to generate ATP.
4. Oxygen is initial electron acceptor.

34. Out of the following how many are micronutrient and macronutrient?

Cu, S, Ca, Zn, Mn, Mg, Cl, Fe, B

	Micronutrient	Macronutrient
1.	5	4
2.	6	3
3.	7	2
4.	4	5

35. Select the correct option w.r.t activator of element

1. Mg – Carboxylase
Zn – Rubisco
Fe – Nitrogenase
Mo – Catalase
2. Mg – Rubisco
Zn – Carboxylase
Fe – Catalase
Mo – Nitrogenase

3. Mg – Carboxylase
Zn – Rubisco
Fe – Catalase
Mo – Nitrogenase

4. Mg – Rubisco
Zn – Carboxylase
Fe – Nitrogenase
Mo – Catalase

36. Dark reaction of photosynthesis is driven by _____ and the product of first step of dark reaction undergoes _____

1. Light, phosphorylation.
2. Darkness, regeneration.
3. Products of light reaction, reduction.
4. Products of light reaction, carboxylation.

37. Stroma lamella in plastid lacks

1. PS II and PS I.
2. PS II and NADP reductase.
3. PS I and NAD reductase.
4. PS II only.

38. Chemiosmosis (related with respiration, photosynthesis ETS) does not require

1. Membrane, a proton pump.
2. ATP.
3. A proton gradient.
4. ATPase.

39. If there are 12 molecules of CO_2 to be fixed in photosynthesis, then how many turns of Calvin cycle and how many molecules of glucose will be synthesized respectively?

1. 9 turns, 2 molecules.
2. 12 turns, 1 molecule.
3. 6 turns, 1 molecule.
4. 12 turns, 2 molecules.

40. In aerobic respiration, release of redox equivalents as H-atom for the first time in mitochondrial matrix is catalysed by

1. PGAL dehydrogenase.
2. Isocitrate dehydrogenase.
3. Pyruvate dehydrogenase.
4. α KGA dehydrogenase.

41. Which hormone is derived from pigments in plants?

1. ABA
2. GA
3. C_2H_4
4. CK

42. A. _____ hormone is most widely used PGR in agriculture.

B. _____ hormone is related with Richmond Lang effect.

- | A | B |
|-------------|----|
| 1. Auxin | CK |
| 2. Auxin | GA |
| 3. Ethylene | CK |
| 4. ABA | CK |

43. The photoperiodic induction is not shown by plants when it is

1. Decapitated.
2. Defoliated.
3. Apical meristem is removed.
4. More than one option is correct.

44. What conditions are required for vernalisation in plants?

1. Low temperature, CO_2 .
2. Low temperature, O_2 , leaf.
3. Optimum temperature, O_2 .
4. Low temperature, O_2 .

45. Which statement is incorrect w.r.t photoperiodism in plants?

1. The site of perception of light/dark duration is cotyledons or embryo.
2. It depends on duration of light/dark.
3. Critical exposure of light/dark is required.
4. When there is no correlation between exposure to light duration and induction of flowering response, plants are called day neutral plants.

46. Animal's without excretory system, separate sexes, and calcareous endoskeleton are applicable for

1. Chaetopeura
2. Ophiura
3. Limulus
4. Spongilla

47. Which of the following structure is associated with locomotion ?

- (i) Parapodia.
- (ii) Water vascular system.
- (iii) Radula.
- (iv) Proboscis.

1. (i), (ii), (iii), (iv)
2. (i) only
3. (i), (ii) only
4. (i), (iii) only

48. Bony endoskeleton is present in

- (i) Pristis (ii) Hippocampus
(iii) Icthyophis (iv) Myxine

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

2. (ii), (iii) only

3. (ii) only

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

49. Blood is different from other connective tissue because

- (i) It is mesodermal in origin.
(ii) Blood cells do not form the composition of blood plasma or matrix.
(iii) It contains different kind of cells performing different function.
(iv) It lacks fibres.

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

2. (ii), (iv) only

3. (iv) only

4. (ii) only

50. Areolar connective tissue contains

- (i) Semi-fluid ground substance containing modified polysaccharide.
(ii) Fibroblast cells.
(iii) Mast cells.
(iv) Macrophages.

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

2. (ii), (iii), (iv) only

3. (i), (ii) only

4. (i) only

51. Mark the incorrect statement regarding the Malpighian tubule in cockroach?

1. It is present at the junction of midgut and hind gut.

2. It is lined by glandular and ciliated cells.

3. It absorbs uric acid from the haemolymph.

4. It about 100-150 in number and it thin yellow filamentous tubule

52. Which of the following feature is supposed to be most important as the evolutionary success of Arthropods?

1. Segmented body.
2. Hard chitinous exoskeleton.
3. Tube within tube body plan.
4. Presence of metathoracic wings.

53. Male reproductive system of cockroach consist of

1. Testis, Vas-deferens, Ejaculatory duct, Seminal Vesicle and Mushroom shaped gland.

2. Testis, Vas-deferens, Phallomere, Ejaculatory duct and Collateral gland.

3. Testis, Phallic gland, Vestibulum, Pseudopenis and Titillator.

4. Testis, Anal cercus, caudal style, Spermatheca and gonapophysis.

54. Among Inulin, Insulin, Lecithin, Heparin, Morphine and Chitin, Polymeric compounds are

1. 4

2. 3

3. 2

3. (i) only

4. 1

4. (i), (iii) only

55. In the DNA—

- (i) The two strands of DNA are antiparallel.
- (ii) The nitrogen bases are projected more or less perpendicular to this backbone but face inside.
- (iii) The back bone is formed by the sugar phosphate sugar chain.
- (iv) All the nitrogenous bases will be present in equimolar concentration.

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

2. (i), (iii) only

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

4. (i) only

56. During catalytic cycle of an enzyme—

- 1. Enzyme alter its shape to fit the substrate molecule.
- 2. Substrate alter its shape to get fit into the enzyme molecule.
- 3. Both enzyme and substrate changes its shape during transition state.
- 4. Enzyme and substrate are rigid molecular structure and it never changes its shape.

57. To make pancreatic enzyme in action, which of the following is required?

- (i) Enterokinase (ii) Bile
- (iii) Intrinsic factor (iv) HCl

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

2. (i), (ii) only

58. Mark the incorrect match

	Secretion	Composition
1.	Pancreatic juice	Amylases, lipases, Nucleases, procarboxypeptidases
2.	Bile	Bilirubin, bile salts, cholesterol, phospholipids.
3.	Succus entericus	Amylases, dipeptidases, lipases nucleosidases
4.	saliva	Amylases, Lysozyme, K ⁺ , HCO ₃ ⁻

59. How many statements are false from given information?

- (a) Ribozymes are enzyme made up of protein.
- (b) In every chemical reaction transition state energy is always greater than activation energy.
- (c) Co-factors are always proteinous in nature
- (d) Enzyme inhibition cannot be removed.
- (e) Enzyme action can be stopped at low temp.
- (f) Km value (Micheli's constant) is the specific concentration of substrate molecule.

1. 2

2. 3

3. 4

4. 5

60. If receptor molecule is removed from target organ for hormone action, the target organ will

1. Continue to respond but require higher concentration of hormone.
2. Continue to respond but in opposite way.
3. Continue to respond without any difference.
4. Not respond to hormone.

61. A patient of diabetes mellitus excretes glucose in urine even when he is kept on a carbohydrate free diet. It is because

1. Fats are catabolised to form glucose.
2. Glucose are synthesized in liver.
3. Glucose are discharged in blood stream from liver.
4. Glycogen from muscles are released in the blood stream

62. Given below is a table comparing the effects of sympathetic and parasympathetic nervous system for four features (1-4). Which one feature is correctly described?

	Features	Sympathetic nervous system	Parasympathetic system
1.	Salivary gland	Stimulates	Inhibits secretion
2.	Pupil of eye	Dilates	Constricts
3.	Heart rate	decreases	Increases
4.	Intestinal peristalsis	Stimulates	Inhibits

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3.	Heart rate	decreases	Increases
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63. A unique vascular connection exists between the digestive tract and liver. It transports all of the following to the liver except

1. Monosaccharides.
2. Amino acids.
3. Vitamins A and E.
4. Insulin

64. Congestive heart failure is often linked to

1. Congestion of lungs which commonly occur in asthmatics and smokers.
2. Damage of heart muscles by an inadequate blood supply.
3. Deposition of calcium, fat, cholesterol and fibrous tissues in the coronary arteries.
4. Blockage of AVN.

65. Erythroblastosis fetalis condition arises when a

1. Rh (+) female carries a Rh(-) foetus for the first time.
2. Rh (+) female carries a Rh(-) foetus for the second time.

3. Rh (-) female carries a Rh (+) foetus for the first time.

4. Rh (-) female carries a Rh (+) foetus for the second time

66. "This segment allows passage of small amounts of urea into the medullary interstitium to keep up the osmolarity". Which segment does the statement suggest?

1. Descending limb of Henle's loop.
2. Ascending limb of Henle's loop.
3. Collecting duct.
4. Proximal convoluted tubule.

67. Which of the following correctly explains the function of a specific part of human nephron?

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

68. Which of the following statements are true regarding association areas of brain?

- A. These are the largest areas of forebrain.
- B. These are involved in the regulation of sexual behaviour, expression of emotional reactions and motivation.

C. These are responsible for complex functions like intersensory association, memory and communication.

D. It is a part of cerebral cortex.

1. A & B
2. A, B & C
3. A, C & D
4. A & C

69. The following structures are found in an electrical synapse except

1. Gap junctions.
2. Pre-synaptic membrane.
3. Post synaptic membrane.
4. Synaptic vesicles.

70. What would happen if a threshold stimulus is applied to a nerve fibre?

1. Its permeability for Na^+ increases.
2. Its permeability for K^+ increases.
3. There is rapid efflux of K^+
4. There is rapid influx of Ca^{2+} .

71. Which part of the ear determines the pitch of the sound?

1. Reissner's membrane.
2. Basilar membrane.
3. Tectorial membrane.
4. Hair cells.

72. From the table choose the correct option regarding the hormones, the source gland I cells that secretes it and its target organ/cell.

	Hormone	Gland	Target
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1.	ADH	Pars nervosa	Renal pelvis
2.	LH	Pars distalis	Graafian follicles
3.	Calcitonin	Follicular cells of thyroid	Osteoclasts
4.	Cortisol	Zona glomerulosa	Bone marrow

73. The hormones from heart, kidney and gastrointestinal tract respectively are

1. ANF, Renin, Trypsin
2. ADH, Renin, GIP
3. ANF, Erythropoietin, CCK
4. GIP, CCK, Renin

74. Select the true statement(s)

- A. Growth factors are hormones secreted by several non-endocrine tissues.
- B. Estradiol is synthesised and secreted mainly by growing ovarian follicles.
- C. Catecholamines stimulate the breakdown of glycogen.
- D. Adrenal cortex secrete androgen like hormone.

1. B & C
2. A, C & D
3. A, B, C, D
4. B, C & D

75. During counter current mechanism, interstitial medullary concentration can be increased up to 4 times due to

- i. Active pumping of salts from the upper part of the ascending limb.

- ii. Passive diffusion of salts from the lower part of the ascending limb.
- iii. Passive diffusion of Na^+ and Cl^- from thick segment of the ascending limb.
- iv. Active secretion of Na^+ and Cl^- into the thin segment of the tubule

1. i, ii, iii & iv

2. i & ii

3. ii & iii

4. i only

76. Which of the following physiological changes is not associated with Renin-Angiotensin-Aldosterone system?

1. Increase in GFR.
2. Increase in blood pressure.
3. Increase in blood aldosterone level.
4. Increase in tubular secretion

77. Which of the following statements is not correct about ECG?

1. P wave represents atrial depolarisation.
2. QRS wave initiates ventricular contraction.
3. The end of T wave marks the end of ventricular systole.
4. Q wave marks the beginning of atrial systole.

78. How many statement is false regarding quite breathing?

- (i) Intrapulmonary pressure remains -ve during inspiration and expiration.
- (ii) Intrapleural pressure becomes +ve in expiration.

(iii) About 500 ml of fresh air enter the alveoli during each inspiration.

1. (i), (ii), (iii)
2. (i) only
3. (ii) only
4. (i), (ii) only

79. The term feedback refers to

1. The effect of substrate on the rate of enzymatic reaction.
2. The effect of end product on the rate of enzymatic reaction.
3. The effect of enzyme concentration on the rate of reaction.
4. The effect of external inhibitor on the rate of enzymatic reaction.

80. In a myosin molecule HMM (heavy meromyosin) is present in
(i) Globular head (ii) Short arm (iii) Myosin tail

1. (i), (ii), (iii)
2. (i) only
3. (i), (ii) only
4. (iii) only

81. Angiotensinogen is produced by

1. Juxtaglomerular cells
2. Liver
3. Macula densa

4. Lungs

82. Presence of albumin in urine usually occurs in

1. Diabetes mellitus
2. Pregnant women
3. Normal man
4. Bright's disease

83. Which of the following bone of the skull is not present in pair?

1. Temporal bone
2. Sphenoid bone
3. Zygomatic bone
4. Maxillary bone

84. How many polypeptide chains are present in one subunit of a myosin filament?

1. 2 heavy chains and 2 light chains.
2. 2 heavy chains and 4 light chains.
3. 4 heavy chains and 2 light chains.
4. 4 heavy chains and 4 light chains.

85. Breathing is best described as

1. Utilisation of O_2 by the cells for catabolic reaction.
2. Transport of gases by the blood.
3. The movement of air into and out of the lungs.
4. Diffusion of gases across alveolar membrane

86. Which of the following characteristics is not correct for squamous epithelium?

1. Made up of single thin layer of flattened cells.
2. Cells with irregular boundaries.
3. Free surface contains microvilli.
4. Involved in a function like forming diffusion boundary.

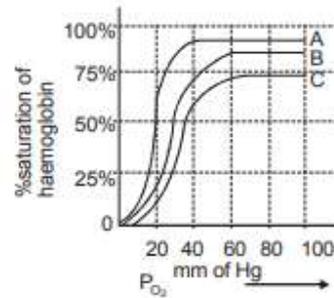
87. Mark the incorrect statement regarding compound epithelium?

1. Made up of more than one layer of cells.
2. Vital role in secretion and absorption.
3. Provide protection against chemical and mechanical stress.
4. It covers the moist surface of buccal

88. Which of the following component is not common in bones and cartilage?

1. Fibres
2. Lacunae
3. Intercellular matrix
4. Lamellae

89. In the given graph A, B and C are the three curves representing oxyhaemoglobin dissociation. If graph B represent the normal state with P_{CO_2} as 40 mm of Hg, then the graph A and C will be obtained respectively during :



1. A : P_{CO_2} as 20 mm of Hg, C : More pH.
2. A : High temperature, C : P_{CO_2} as 80 mm of Hg.
3. A : P_{CO_2} as 20 mm of Hg, C : More acidity.
4. A : P_{CO_2} as 80 mm of Hg, C : P_{CO_2} as 20 mm of Hg.

90. Which of the following statement is correct?

1. All the cells of heart are autorhythmic.
2. Only specialized cells of heart are autorhythmic.
3. Only cells of SA node and AV node are autorhythmic.
4. No cells of heart are autorhythmic.

91. Calculate the wavelength of the spectral line when the electron in the hydrogen atom undergoes a transition from fourth energy level to second energy level ?

1. 4.86 nm
2. 486 nm
3. 48.6 nm
4. 4860 nm

92. The wave number of the first line of Balmer series of hydrogen is 15200 cm^{-1} . The wave number of the corresponding line of Li^{2+} ion is-

1. 15200 cm^{-1}
2. 60800 cm^{-1}
3. 76000 cm^{-1}
4. 136800 cm^{-1}

93. The ionization energy of sodium is 495 kJ mol^{-1} . How much energy is needed to convert atoms present in 2.3 mg of sodium into sodium ions?

1. 4.95 J
2. 49.5 J
3. 495 J
4. 0.495 J

94. Which of the following has highest melting point -

1. NaCl
2. NaI
3. NaBr
4. NaF

95. What is not true about resonance?

1. The resonating structures are hypothetical
2. The unpaired electrons in various resonating structures are same
3. Hybrid structure is most energetic

4. Hybrid structure is least energetic

96. The order of strength of H-bonds is -

1. $\text{ClH} - \text{Cl} > \text{NH} - \text{N} > \text{OH} - \text{O} > \text{FH} - \text{F}$
2. $\text{ClH} - \text{Cl} < \text{NH} - \text{N} < \text{OH} - \text{O} < \text{FH} - \text{F}$
3. $\text{ClH} - \text{Cl} < \text{NH} - \text{N} > \text{OH} - \text{O} > \text{FH} - \text{F}$
4. $\text{ClH} - \text{Cl} < \text{NH} - \text{N} < \text{OH} - \text{O} > \text{FH} - \text{F}$

97. Which is steam volatile -

1. o-nitrophenol
2. Aniline
3. Glycerol
4. p-nitrophenol

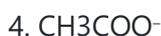
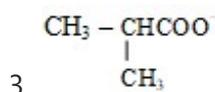
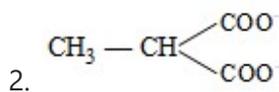
98. Every H_2O molecule is surrounded by maximum how many H_2O molecule -

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

99. In terms of polar character, which of the following order is correct?

1. $\text{NH}_3 < \text{H}_2\text{O} < \text{HF} < \text{H}_2\text{S}$
2. $\text{H}_2\text{S} < \text{NH}_3 < \text{H}_2\text{O} < \text{HF}$
3. $\text{H}_2\text{O} < \text{NH}_3 < \text{H}_2\text{S} < \text{HF}$
4. $\text{HF} < \text{H}_2\text{O} < \text{NH}_3 < \text{H}_2\text{S}$

100. During electrolysis which anion migrates towards anode so as to produce 2,3-dimethyl butane -



101. Reactivity of alkenes towards HX decreases in the order -

1. Butene > Propene > Ethene

2. Butene > Ethene > Propene

3. Ethene > Propene > Butene

4. None of these

102. For an endothermic reaction -

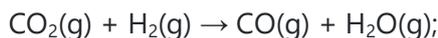
1. $H_R = H_P$

2. $H_R > H_P$

3. $H_R < H_P$

4. None

103. In the reaction



$$\Delta H = 2.8 \text{ kJ}$$

ΔH represents

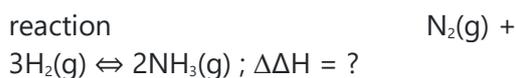
1. Heat of reaction

2. Heat of combustion

3. Heat of formation

4. Heat of solution

104. For the



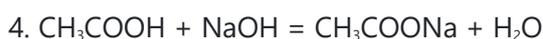
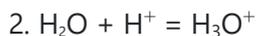
1. $\Delta E + 2RT$

2. $\Delta E - 2RT$

3. $\Delta E + RT$

4. $\Delta E - RT$

105. Heat of neutralisation of a strong acid by a strong base is equal to $\Delta\Delta H$ of -



106. If $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$,

$$\Delta H = -298.2 \text{ kJ mole}^{-1}$$



$$\Delta H = -98.7 \text{ kJmole}^{-1}$$



$$\Delta H = -130.2 \text{ kJ mole}^{-1}$$



$$\Delta H = -287.3 \text{ kJ mole}^{-1}$$

the enthalpy of formation of H_2SO_4 at 298 K will be–

1. – 814.4 kJ mole⁻¹
2. + 814.4 kJ mole⁻¹
3. – 650.3 kJ mole⁻¹
4. – 433.7 kJ mole⁻¹

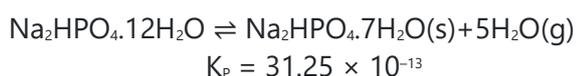
107. 2.1 g of Fe combines with S evolving 3.77 kJ. The heat of formation of FeS in kJ/mole is–

1. – 3.77
2. – 1.79
3. – 100.5
4. none of these

108. A 1 litre container contains 2 moles of PCl_5 initially. If at equilibrium, K_c is found to be 1, degree of dissociation of PCl_5 is -

1. 4
2. 3
3. 1/2
4. 50

109. Equilibrium constant for the following equilibrium is given at 0°C.



the pressure of water vapour is -

1. $1/5 \times 10^{-3}$ atm

$$2. 0.5 \times 10^{-3} \text{ atm}$$

$$3. 5 \times 10^{-2} \text{ atm}$$

$$4. 5 \times 10^{-3} \text{ atm}$$

110. The equilibrium constant for,

$2\text{H}_2\text{S}(g) \rightleftharpoons 2\text{H}_2(g) + \text{S}_2(g)$ is 0.0118 at 1200 K while the heat of dissociation is 597.4 kJ. The standard equilibrium constant of the reaction at 1300 K is -

1. 1.180
2. 11.80
3. 118.0
4. cannot be calculated from given data

111. Extent of a reaction can always be increased by increasing the temperature.

1. True
2. False
3. Can't say
4. None

112. In the preparation of quick lime from lime stone, the reaction is:



Experiments carried out between 850°C and 950°C led to set of K_p values fitting an empirical equation

$$\log K_p = 7.282 - 8500/T$$

where T is absolute temp. If the reaction is carried out in quite air, what temperature would be predicted from this equation for complete decomposition of the lime stone?

1. 1667.26 K
2. 1682.26 K
3. 1695.26 K
4. None of these

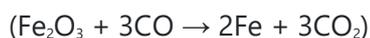
113. For the equilibrium



$K_p = 9 \text{ atm}^2$, at 40°C . A 5 litre contains 0.1 mole of $\text{LiCl} \cdot \text{NH}_3$. How many moles of NH_3 should be added to the flask at this temperature to drive the backward reaction for completion.

1. 0.78
2. 0.80
3. 0.85
4. None of these

114. The mass of oxygen that would be required to produce enough CO, which completely reduces 1.6 kg Fe_2O_3 (at. mass Fe = 56) is -



1. 240 gm
2. 480 gm
3. 720 gm
4. 960 gm

115. The hydrated salt $\text{Na}_2\text{SO}_4 \cdot n\text{H}_2\text{O}$, undergoes 55% loss in weight on heating and becomes anhydrous. The value of n will be

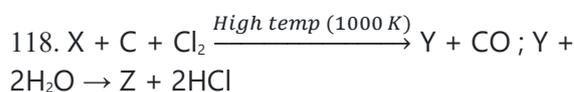
1. 5
2. 3
3. 7
4. 10

116. During the disproportionation of I_2 to Iodide and Iodate ions, the ratio of Iodate and Iodide ions formed in alkaline medium is -

1. 1 : 5
2. 5 : 1
3. 3 : 1
4. 1 : 3

117. Which of the following reaction in neither oxidation nor reduction?

1. $\text{CrO}_4^{2-} \rightarrow \text{Cr}_2\text{O}_7^{2-}$
2. $\text{Cr} \rightarrow \text{CrCl}_3$
3. $\text{Na} \rightarrow \text{Na}^+$
4. $2\text{S}_2\text{O}_3^{2-} \rightarrow \text{S}_4\text{O}_6^{2-}$



Compound Y is found in polymeric chain structure and is an electron deficient Molecule. Y must be -

1. BeO

2. BeCl_2

3. BeH_2

4. AlCl_3

119. MgBr_2 and MgI_2 are soluble in acetone because of -

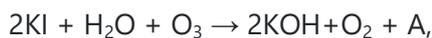
1. Their ionic nature

2. Their covalent nature

3. Their co-ordinate nature

4. None is correct

120. In the reaction,



the compound A is -

1. KIO_3

2. I_2O_5

3. HIO_3

4. I_2

121. Moist iodine reacts with ozone to form-

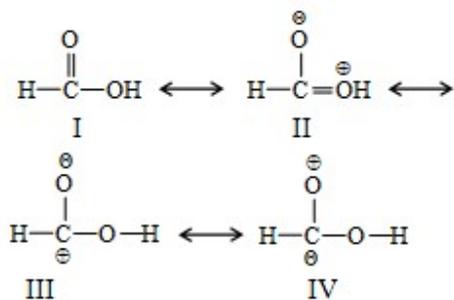
1. HI

2. I_2O_5

3. HIO_3

4. HIO_4

122. Formic acid is considered as a resonance hybrid of the four structure -



Which of the following order is correct for the stability of the four contributing structures?

1. $\text{I} > \text{II} > \text{III} > \text{IV}$

2. $\text{I} > \text{II} > \text{IV} > \text{III}$

3. $\text{I} < \text{III} < \text{II} < \text{IV}$

4. $\text{I} > \text{IV} > \text{III} > \text{II}$

123. Which of the following shows the correct order of decreasing acidity-

1. $\text{PhCO}_2\text{H} > \text{PhSO}_3\text{H} > \text{PhCH}_2\text{OH} > \text{PhOH}$

2. $\text{PhSO}_3\text{H} > \text{PhOH} > \text{PhCO}_2\text{H} > \text{PhCH}_2\text{OH}$

3. $\text{PhCO}_2\text{H} > \text{PhOH} > \text{PhCH}_2\text{OH} > \text{PhSO}_3\text{H}$

4. $\text{PhSO}_3\text{H} > \text{PhCO}_2\text{H} > \text{PhOH} > \text{PhCH}_2\text{OH}$

124. Arrange the following in correct order of acidic strength:

(I) $\text{CH}_3\text{-NO}_2$

(II) $\text{NO}_2\text{-CH}_2\text{-NO}_2$

(III) $\text{CH}_3\text{-CH}_2\text{-NO}_2$

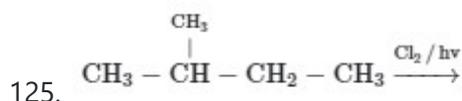
(IV) $\begin{array}{c} \text{NO}_2\text{-CH-NO}_2 \\ | \\ \text{NO}_2 \end{array}$

1. IV > II > I > III

2. IV > II > III > I

3. III > I > II > IV

4. III > I > IV > II



N (no. of isomers) $\xrightarrow{\text{Fractional Distillation}}$ (F), (N) and (F) are

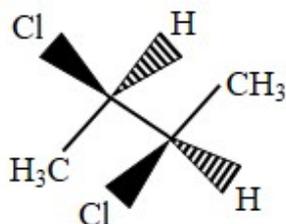
1. 6,4

2. 4,4

3. 6,6

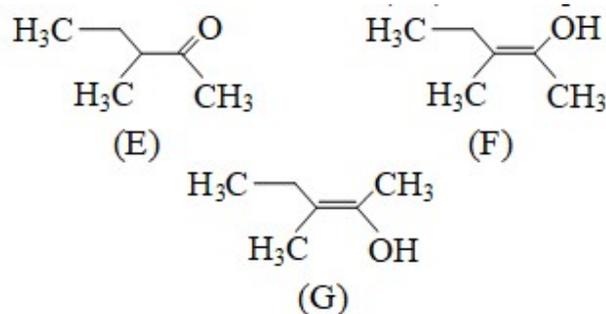
4. 3,3

126. The correct statement(s) about the compound given below is (are)



1. the compound is optically active
2. the compound possesses centre of symmetry
3. the compound possesses plane of symmetry
4. the compound possesses axis of symmetry

127. The correct statement(s) concerning the structures E, F and G is (are) -

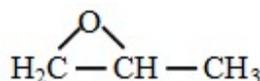


1. E, F and G are resonance structures
2. E, F and E, G are tautomers
3. F and G are geometrical isomers
4. F and G are diastereomers

128. The molecular formula of the first member of the family of alkenynes and its name is given by the set :

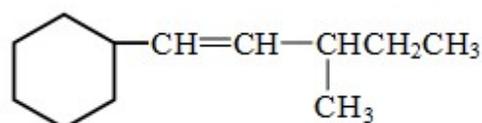
1. C₃H₂, allene
2. C₅H₆, 1-penten-3-yne
3. C₆H₈, 1-hexen-5-yne
4. C₄H₄, butenyne

129. The IUPAC name for the compound:



1. Propylene Oxide
2. 1, 2-Oxo propane
3. 1, 2-Epoxy propane
4. 1, 2-Propoxide

130. The IUPAC name of



1. 1-cyclohexyl-3-methyl-1-pentene
 2. 3-methyl-5-cyclohexyl-pent-ene
 3. 1-cyclohexyl-3-ethyl-but-1-ene
 4. 1-cyclohexyl-3,4-dimethyl-but-1-ene
131. The systematic name of
- $$\text{CH}_3 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{O} - \text{CH}_2 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \text{OH}$$
1. 1-acetoxy acetic acid
 2. 2-acetoxy ethanoic acid
 3. 2-ethanoyl oxyacetic acid
 4. 2-ethanoyl oxyethanoic acid
132. A gas is heated from 0°C to 100°C at 1.0 atm pressure. If the initial volume of the gas is 10.0 l, its final volume would be
1. 7.32 l
 2. 10.00 l
 3. 13.66 l
 4. 20.00 l
133. The ratio between the root square velocity of H₂ at 50 K and that of O₂ at 800 K, is -
1. 4
 2. 2
 3. 1
 4. 1/4
134. One mole of N₂O₄(g) at 300 K is kept in a closed container under one atmosphere. It is heated to 600 K when 20% by mass of N₂O₄ (g) decompress to NO₂ (g). The resultant pressure is
1. 1.2 atm
 2. 2.4 atm
 3. 2.0 atm
 4. 1.0 atm
135. At a temperature T K, the pressure of 4.0 g argon in a bulb is p. The bulb is put in a bath having temperature higher by 50 K than the first one. 0.8 g of argon gas and to be removed to maintain original pressure. The temperature T is equal to
1. 510 K
 2. 200 K
 3. 100 K
 4. 73 K
136. The M.K.S units of coefficient of viscosity is -
1. kg m⁻¹s⁻¹
 2. kg ms⁻²
 3. kg m²s⁻¹
 4. kg⁻¹m⁻¹s²
137. The SI unit of length is the meter. Suppose we adopt a new unit of length which equals to x meters. The area 1m² expressed in terms of the new unit has a magnitude -
1. x
 2. x²

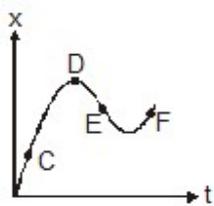
3. $1/x$

3. $\frac{3ba}{c}$

4. $1/x^2$

4. None

138. The displacement - time graph of a moving particle is shown below. The instantaneous velocity of the particle is negative at the point



1. C

2. D

3. E

4. F

139. A body starts from rest, the ratio of distances travelled by the body during 3rd and 4th seconds is:

1. $7/5$

2. $5/7$

3. $7/3$

4. $3/7$

140. A particle is projected from a horizontal plane (x-z plane) such that its velocity vector at time t is given by $\vec{V} = a\hat{i} + (b - ct)\hat{j}$. Its range on the horizontal plane is given by

1. $\frac{ba}{c}$

2. $\frac{2ba}{c}$

141. A ball is thrown from a point on ground at some angle of projection. At the same time a bird starts from a point directly above this point of projection at a height h horizontally with speed u. Given that in its flight ball just touches the bird at one point. Find the distance on ground where ball strikes

1. $2u\sqrt{\frac{h}{g}}$

2. $u\sqrt{\frac{2h}{g}}$

3. $2u\sqrt{\frac{2h}{g}}$

4. $u\sqrt{\frac{h}{g}}$

142. A ship is travelling due east at 10 km/h. A ship heading 30° east of north is always due north from the first ship. The speed of the second ship in km/h is

1. $20\sqrt{2}$

2. $20\sqrt{3/2}$

3. 20

4. $20/\sqrt{2}$

143. A particle is kept at rest at origin. Another particle starts from (5,0) with a velocity of $-4\hat{i} + 3\hat{j}$. Find their closest distance of approach.

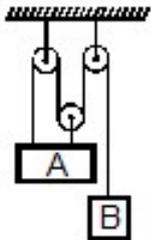
1. 3 m

2. 4 m

3. 5 m

4. 2 m

144. At a given instant, A is moving with velocity of 5 m/s upwards. What is velocity of B at this time?



1. 15 m/s ↓

2. 15 m/s ↑

3. 5 m/s ↓

4. 5 m/s ↑

145. A body of mass 5 kg is suspended by the strings making angles 60° and 30° with the horizontal



(a) $T_1 = 25 \text{ N}$

(b) $T_2 = 25 \text{ N}$

(c) $T_1 = 25\sqrt{3} \text{ N}$

(d) $T_2 = 25\sqrt{3} \text{ N}$

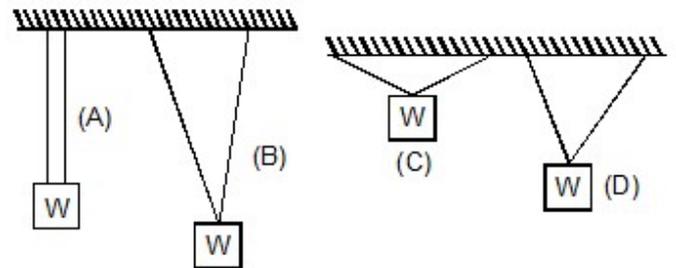
1. a,b

2. a,d

3. c,d

4. b,c

146. A weight can be hung in any of the following four ways by string of same type. In which case is the string most likely to break?



1. A

2. B

3. C

4. D

147. A particle of small mass m is joined to a very heavy body by a light string passing over a light pulley. Both bodies are free to move. The total downward force in the pulley is

1. mg

2. $2mg$

3. $4mg$

4. cannot be determined

148. A wheel is at rest. Its angular velocity increases uniformly and becomes 80 radian per second after 5 second. The total angular displacement is :

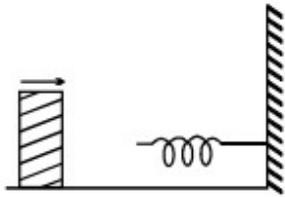
1. 800 rad

2. 400 rad

3. 200 rad

4. 100 rad

149. A 1.0 kg block collides with a horizontal weightless spring of force constant 2.75 Nm^{-1} as shown in figure. The block compresses the spring 4.0 m from the rest position. If the coefficient of kinetic friction between the block and horizontal surface is 0.25, the speed of the block at the instant of collision is



1. 0.4 ms^{-1}

2. 4 ms^{-1}

3. 0.8 ms^{-1}

4. 8 ms^{-1}

150. A car of mass 'm' is driven with acceleration 'a' along a straight level road against a constant external resistive force 'R'. When the velocity of the car is 'V', the rate at which the engine of the car is doing work will be:

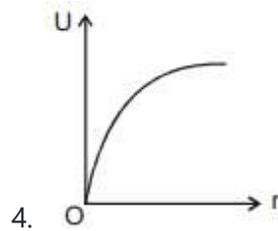
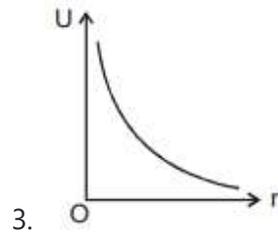
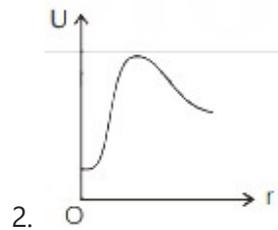
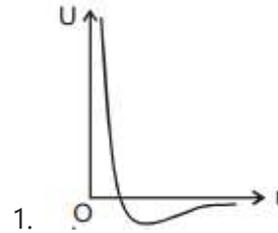
1. RV

2. maV

3. $(R + ma) V$

4. $(ma - R)V$

151. The diagrams represent the potential energy U of a function of the inter-atomic distance r. Which diagram corresponds to stable molecules found in nature.



152. The coordinates of the positions of particles of masses $m_1 = 7 \text{ gm}$, $m_2 = 4 \text{ gm}$, $m_3 = 10 \text{ gm}$ $r_1 = (\hat{i} + 5\hat{j} - 3\hat{k})$, $r_2 = (2\hat{i} + 5\hat{j} + 7\hat{k})$, $r_3 = (3\hat{i} + 3\hat{j} - \hat{k})$

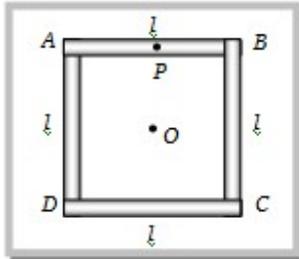
1. $(-\frac{15}{7}, \frac{85}{17}, \frac{1}{7}) \text{ cm}$

2. $(\frac{15}{7}, -\frac{85}{17}, \frac{1}{7}) \text{ cm}$

3. $(\frac{15}{7}, \frac{85}{21}, -\frac{1}{7}) \text{ cm}$

4. $(\frac{15}{7}, \frac{85}{21}, \frac{7}{3}) \text{ cm}$

153. Four thin rods of same mass M and same length l , form a square as shown in figure. Moment of inertia of this system about an axis through centre O and perpendicular to its plane is



1. $\frac{4}{3} MI^2$
2. $\frac{MI^2}{3}$
3. $\frac{MI^2}{6}$
4. $\frac{2}{3} MI^2$

154. A horizontal heavy uniform bar of weight W is supported at its ends by two men. At the instant, one of the men lets go off his end of the rod, the other feels the force on his hand changed to

1. W
2. $W/2$
3. $3W/4$
4. $W/4$

155. A thin circular ring of mass M and radius R is rotating about its axis with a constant angular velocity ω . Four objects each of mass m , are kept gently to the opposite ends of two perpendicular diameters of the ring. The angular velocity of the ring will be

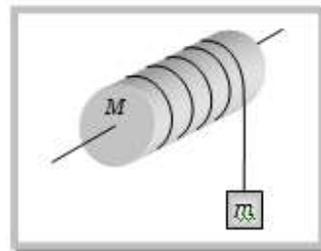
1. $\frac{M\omega}{M+4m}$
2. $\frac{(M+4m)\omega}{M}$
3. $\frac{(M-4m)\omega}{M+4m}$
4. $\frac{M\omega}{4m}$

156. Two discs of moment of inertia I_1 and I_2 and angular speeds ω_1 and ω_2 are rotating along collinear axes passing through their centre of mass and perpendicular to their plane. If the two are made to rotate together along the same axis the rotational KE of system will be

1. $\frac{I_1\omega_1 + I_2\omega_2}{2(I_1 + I_2)}$
2. $\frac{(I_1 + I_2)(\omega_1 + \omega_2)^2}{2}$
3. $\frac{(I_1\omega_1 + I_2\omega_2)^2}{2(I_1 + I_2)}$

4. None of these

157. In the following figure, a body of mass m is tied at one end of a light string and this string is wrapped around the solid cylinder of mass M and radius R . At the moment $t = 0$ the system starts moving. If the friction is negligible, angular velocity at any time t would be



1. $\frac{mgRt}{(M+m)}$

2. $\frac{2Mgt}{(M+2m)}$

3. $\frac{2mgt}{R(M-2m)}$

4. $\frac{2mgt}{R(M+2m)}$

158. The tidal waves in the sea are primarily due to

1. The gravitational effect of the moon on the earth
2. The gravitational effect of the sun on the earth
3. The gravitational effect of Venus on the earth
4. The atmospheric effect of the earth itself

159. If the radius of a planet is R and its density is ρ , the escape velocity from its surface will be

1. $v_e \propto \rho R$
2. $v_e \propto \sqrt{\rho} R$
3. $v_e \propto \sqrt{\rho}/R$
4. $v_e \propto 1/\sqrt{\rho} R$

160. If the compressibility of water is σ per unit atmospheric pressure, then the decrease in volume V due to P atmospheric pressure will be

1. $\sigma P/V$
2. σPV
3. σ/PV
4. $\sigma V/P$

161. A wire suspended vertically from one of its ends is stretched by attaching a weight of 200 N to the lower end. The weight stretches the wire by 1 mm. The elastic energy stored in the wire is

1. 0.2 J
2. 10 J
3. 20 J
4. 0.1 J

162. If pressure at half the depth of a lake is equal to $2/3$ pressure at the bottom of the lake then what is the depth of the lake

1. 10 m
2. 20 m
3. 60 m
4. 30 m

163. Three liquids of densities $d, 2d$ and $3d$ are mixed in equal proportions of weights. The relative density of the mixture is

1. $11d/7$
2. $18d/11$
3. $13d/9$
4. $23d/18$

164. An ice berg of density 900 Kg/m^3 is floating in water of density 1000 Kg/m^3 . The percentage of volume of ice-cube outside the water is -

1. 20%

2. 35%

3. 419 J

3. 10%

4. 24 J

4. 25%

165. Consider the following equation of Bernoulli's theorem.

$$P + \frac{1}{2}\rho V^2 + \rho gh = K(\text{constant})$$

The dimensions of K/P are same as that of which of the following

1. Thrust
2. Pressure
3. Angle
4. Viscosity

168. If the ratio of specific heat of a gas at constant pressure to that at constant volume is γ , the change in internal energy of a mass of gas, when the volume changes from V to $2V$ constant pressure p , is

1. $R/(\gamma-1)$
2. pV
3. $pV/(\gamma-1)$
4. $pV(\gamma-1)$

166. A metal rod of Young's modulus Y and coefficient of thermal expansion α is held at its two ends such that its length remains invariant. If its temperature is raised by $t^\circ\text{C}$, the linear stress developed in it is -

1. $\alpha t/Y$
2. $Y\alpha t$
3. $Y/\alpha t$
4. $1/Y\alpha t$

169. The isothermal bulk modulus of a perfect gas at normal pressure is

1. $1.013 \times 10^5 \text{ N/m}^2$
2. $1.013 \times 10^6 \text{ N/m}^2$
3. $1.013 \times 10^{-11} \text{ N/m}^2$
4. $1.013 \times 10^{11} \text{ N/m}^2$

167. In thermodynamic process, 200 Joules of heat is given to a gas and 100 Joules of work is also done on it. The change in internal energy of the gas is

1. 100 J
2. 300 J

170. A gas is being compressed adiabatically. The specific heat of the gas during compression is

1. Zero
2. Infinite
3. Finite but non-zero
4. Undefined

171. An ideal heat engine working between temperature T_1 and T_2 has an efficiency η , the

new efficiency if both the source and sink temperature are doubled, will be

1. $\eta/2$
2. η
3. 2η
4. 3η

172. Suppose ideal gas equation follows $VP^3 = \text{constant}$. Initial temperature and volume of the gas are T and V respectively. If gas expand to $27V$ then its temperature will become -

1. T
2. $9T$
3. $27T$
4. $T/9$

173. One mole of a monoatomic ideal gas is mixed with one mole of a diatomic ideal gas. The molar specific heat of the mixture at constant volume

1. 8
2. $3/2 R$
3. $2R$
4. $2.5 R$

174. The amplitude and the time period in a S.H.M. is 0.5 cm and 0.4 sec respectively. If the initial phase is $\pi/2$ radian, then the equation of S.H.M. will be

1. $y=0.5 \sin 5\pi t$

2. $y=0.5 \sin 4\pi t$

3. $y=0.5 \sin 2.5\pi t$

4. $y=0.5 \sin 5\pi t$

175. A particle executing simple harmonic motion with amplitude of 0.1 m . At a certain instant when its displacement is 0.02 m , its acceleration is 0.5 m/s^2 . The maximum velocity of the particle is (in m/s)

1. 0.01
2. 0.05
3. 0.5
4. 0.25

176. In simple harmonic motion, the ratio of acceleration of the particle to its displacement at any time is a measure of

1. Spring constant
2. Angular frequency
3. $(\text{Angular frequency})^2$
4. Restoring force

177. What is constant in S.H.M.?

1. Restoring force
2. Kinetic energy
3. Potential energy
4. Periodic time

178. In a sinusoidal wave, the time required for a particular point to move from maximum displacement to zero displacement is 0.170

second. The frequency of the wave is

1. 1.47 Hz
2. 0.36 Hz
3. 0.73 Hz
4. 2.94 Hz

179. Two waves are given by $y_1 = a \sin \omega t - kx$ and $y_2 = a \cos \omega t - kx$. The phase difference between the two waves is

1. $\pi/4$
2. π
3. $\pi/8$
4. $\pi/2$

180. The superposing waves are represented by the following equations:

$$y_1 = 5 \sin 2\pi(10t - 0.1x), \quad y_2 = 10 \sin 2\pi(10t - 0.1x)$$

Ratio of intensities I_{\max}/I_{\min} will be -

1. 1
2. 9
3. 4
4. 16