

1. The condition where urea accumulates in blood is:
 1. Glycosuria
 2. Uremia
 3. Ketonuria
 4. Acidosis

2. Scapula is a large triangular flat bone situated in the dorsal part of the thorax between:
 1. the second and fifth ribs
 2. the second and seventh ribs
 3. the third and sixth ribs
 4. the third and eighth ribs

3. The neurotransmitter released by the nerve cell at the neuromuscular junction is:
 1. Acetylcholine
 2. Adrenaline
 3. Serotonin
 4. Dopamine

4. ACTH controls the secretion of:
 1. cortisol
 2. aldosterone
 3. epinephrine
 4. testosterone

5. Consider the following statements:
 - I. Proximal radioulnar joint is a type of ellipsoidal joint.
 - II. The first carpo-metacarpal joint is a saddle joint.
 - III. Gleno-humeral joint is a ball and socket joint.
 Which of the above statements are true
 1. I and II only
 2. I and III only
 3. II and III only
 4. I, II and III

6. Enzymes and electron carriers for the formation of cellular energy are present in the mitochondria at
 1. Outer membrane only.
 2. Inner membrane only.
 3. Both outer and inner membrane.
 4. Mitochondrial matrix only.

7. Which of the following plant hormones would most likely be found in high concentrations in a mature, slightly over-ripe fruit
 1. Cytokinin and ethylene.
 2. ABA and ethylene.
 3. GA and ABA.
 4. Auxin and cytokinin

8. The "sodium-potassium pump" pumps _____.
 1. sodium ions out and potassium ions in
 2. sodium ions in and potassium ions out
 3. sodium and potassium ions in
 4. sodium and potassium ions out

9. The iris _____.
 1. regulates light entrance through the pupil
 2. refracts light rays
 3. absorbs stray light rays
 4. contains receptors for sight

10. The sliding filament theory of muscle contraction involves
 1. calcium ions releasing ATP for energy
 2. calcium ions binding with troponin, which shifts tropomyosin and allows the myosin-binding sites on actin to be exposed
 3. neuromuscular junctions directly producing the movement of actin and myosin
 4. actin filaments moving the myosin filaments in each sarcomere

11. If insufficient PTH is produced, the blood calcium level drops, resulting in _____.
 1. reduced growth in childhood or parathyroid dwarfism
 2. tetany, where the body shakes from continuous muscle contraction
 3. osteoporosis

4. blood clotting

12.

Drinking alcohol causes diuresis because it inhibits the secretion of _____.

1. ANH
2. ADH
3. angiotensin
4. aldosterone

13.

The greater the number of blood vessels dilated, the _____.

1. higher the blood pressure
2. lower the blood pressure
3. faster the heartbeat
4. slower the heartbeat

14.

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.

15.

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 |

16.

“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.

17.

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

18.

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

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

19.

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

20.

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

21.

The choroid layer is thin over the posterior two-thirds of the eye ball, but it becomes thick in the anterior part to form the

1. Iris
2. Ciliary body
3. Pupil
4. Suspensory ligament

22.

Diabetes insipidus is due to

1. Hyposecretion of vasopressin (ADH)
2. Hypersecretion of insulin
3. Hypersecretion of vasopressin (ADH)
4. None

23.

If Henle's loop were absent from man nephron, which of the following is to be expected?

1. The urine will be more dilute
2. The urine will be more concentrated
3. There will be hardly any change in the quality and quantity of urine formed
4. There will be no urine formation

24.

The majority of water and salt filtered into Bowman's capsule is reabsorbed by

1. the brush border of the transport epithelia of the proximal tubule
2. diffusion from the descending limb of the loop of Henle into the hypertonic interstitial fluid of the medulla
3. active transport across the transport epithelium of the thick upper segment of the ascending limb of the loop of Henle
4. selective secretion and diffusion across the distal tubule

25.

A major difference in the mechanism of action between steroid and peptide hormones is that

1. steroid hormones mainly affect the synthesis of proteins, whereas peptide hormones mainly affect the activity of proteins already in the cell
2. target cells react more rapidly to steroid hormones than they do to peptide hormones
3. steroid hormones enter the nucleus, whereas peptide hormones stay in the cytoplasm
4. steroid hormones bind to a receptor protein, whereas peptide hormones bind to G protein

26.

Receptor sites for neurotransmitters are located on the

1. tips of axons
2. axon membranes in the regions of the nodes of Ranvier
3. postsynaptic membrane
4. presynaptic membrane

27.

The role of calcium in muscle contraction is

1. to break the cross-bridges as a cofactor in the hydrolysis of ATP
2. to bind with troponin, changing its shape so that the actin filament is exposed
3. to transmit the action potential across the neuromuscular junction
4. to spread the action potential through the T tubules

28.

Which of these sequences describes the correct path for light rays entering the human eye?

1. sclera, retina, choroid, lens, cornea
2. fovea centralis, pupil, aqueous humor, lens
3. cornea, pupil, lens, vitreous humor, retina
4. cornea, fovea centralis, lens, choroid, rods

29.

Vernalisation stimulates flowering in

1. Zamikand
2. Turmeric
3. Carrot
4. Ginger

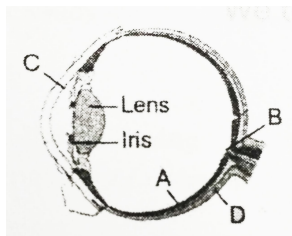
30.

The enzymes of Krebs cycle where $\text{NADH} + \text{H}^+$ are produced are

1. Isocitrate dehydrogenase succinate dehydrogenase and malic dehydrogenase.
2. Succinate thiokinase, succinate dehydrogenase and aconitase
3. Isocitrate dehydrogenase, α - ketoglutaric dehydrogenase, malic dehydrogenase
4. Isocitrate dehydrogenase, α - ketoglutaric dehydrogenase and succinate dehydrogenase.

31.

Parts A, B, C and D of the human eye are shown in the diagram. Select the option which gives correct identification along with its functions/characteristics



1. B - Blind spots - has only a few rods and cones.
2. C- Aqueous chamber - reflects the light which does not pass through the lens.
3. D- Choroid - its anterior part forms ciliary body.
4. A - retina - contains photo receptors - rods and cones.

32.

In which of the following part of the brain, the nerve impulses of sound are analyzed?

1. Visual cortex area
2. Olfactory cortex area
3. Auditory cortex area
4. Tactile cortex area

33.

Ethephon hastens the fruit ripening in tomatoes and apple and accelerates abscission in flowers and fruits. Above statement indicates that ethephon must release –

1. ABA
2. C_2H_4
3. IAA
4. GA_7

34.

Which statement concerning ATP synthesis is true?

1. ATP can be synthesized through substrate level phosphorylation, photophosphorylation and oxidative phosphorylation.
2. The proton-motive force is the establishment of proton gradients and electrochemical potentials across the inner membrane of mitochondria.
3. Proton-motive force is essential for back flow of H^+ from outer chamber of matrix of mitochondria through proton channel (F_0) of $F_0 - F_1$ particle to produce ATP.

4. All

35.

Which of the following can not be expected in the filtrate when it arrives to descending limb of Henle's loop?

- I. Albumin
- II. Glucose
- III. Urea
- IV. Amino acid

1. I, II, III & IV
2. I only
3. II, IV only
4. I, II & IV

36.

Which of the following is required for the breaking of cross bridge during muscle contraction?

1. ATP and Ca^{++}
2. ADP and Ca^{++}
3. Only Ca^{++}
4. ATP only

37.

Mark the incorrect match?

- | | | |
|----------------------|---|---|
| 1. Cerebral aqueduct | → | A canal passes through the mid brain, connecting 3rd ventricle to 4th ventricle of brain. |
| 2. Corpus callosum | → | Thick band of nerve fibres that divides the cerebral cortex lobes into left and right hemispheres |
| 3. Limbic system | → | The inner part of fore brain involved in the regulation of sexual behaviour |
| 4. Pons | → | Consist of fibre tracts that interconnect different regions of the brain. |

38.

Low intelligence quotient abnormal skin and deaf-mutism is related to

1. Low secretion of growth hormone.
2. Hypothyroidism.

3. Hyperparathyroidism.
4. Hypo secretion of adrenal cortex hormone

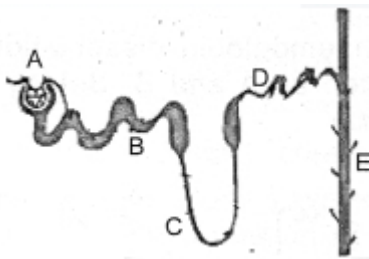
39. RQ of tripalmitin is

1. $\frac{6\text{CO}_2}{6\text{O}_2}$
2. $\frac{102\text{CO}_2}{145\text{O}_2}$
3. $\frac{2\text{CO}_2}{\text{Zero O}_2}$
4. $\frac{4\text{CO}_2}{10\text{O}_2}$

40. The phytohormone which promotes rapid internode elongation in deep water rice plant is

1. Gibberellins
2. Ethylene
3. Auxin
4. Cytokinin

41. In the accompanying diagram of a human nephron the functional parts are labelled as A,B,C,D,E



Study the diagram to answer the questions given
P : Active secretion of H⁺ and K⁺ into the filtrate occurs in which parts ?

Q : Conditional reabsorption of Na⁺ and water is a function of

R : Reabsorption of water is minimum in which segment ?

Choose the correct option.

- | S.No. | P | Q | R |
|-------|-------|---|---|
| 1. | B,D | C | E |
| 2. | A,B,C | C | E |
| 3. | D,E | D | C |
| 4. | A,D,E | E | C |

42. Select the correct matching of hormone its source of synthesis and function.

Hormone	Source	Function
1. Glucagon	b-cells of pancreas	Increase blood glucose levels
2. Vasopressin	Hypothalamus	Increase diuresis
3. ACTH	Anterior lobe of pituitary	Stimulates synthesis and secretion of glucocorticoids
4. LH	Hypothalamus	Stimulates gonadal activity

43. Which of the following is incorrect difference between rods and cones ?

	Rods	Cones
1.	Contain rhodopsin visual purple pigment	Contain iodopsin visual violet pigment
2.	Enable us to see black and white	Respond to red, green and blue lights
3.	Concentrated in the centre of retina	Evenly distributed all over retina
4.	Twilight vision	Daylight/Photopic vision

44. Which of the following is not correctly matched?
PGR Function

1. Auxin Flowering in mango.
2. ABA Dormancy of seed.
3. GA3 Breaking seed dormancy.
4. Ethylene Sprouting of potato.

45. During aerobic respiration hydrogen from the system is removed by?

1. O₂

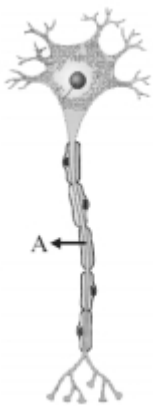
2. NADP
3. FMN
4. UQ

46.

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

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

47.



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.

48.

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

49.

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. Actine binding sites for actin on the actin filaments.

50.

Read the following statements and choose the option which is true for them.

Statement-I : During conversion of succinic acid to fumaric acid in Krebs cycle, one molecule of FAD is synthesized.

Statement-II : There are three steps in the Krebs cycle where CO₂ is released.

1. Only statement I is correct.
2. Only statement II is correct.
3. Both the statements I and II are correct.
4. Both the statements I and II are incorrect.

51.

In a flowering plant if auxins are not synthesizing, then effects which would most probably be seen in this plant are

- i. Dropping of fruits at early stage.
- ii. Inhibition in the growth of lateral buds.
- iii. Delayed abscission of older mature leaves.
- iv. Inhibition of cell division in cambium.

1. i, ii and iv

2. i, iii and iv

3. ii and iv only

4. i and iii only

52.

Urinary excretion is equivalent to

GF = Glomerular filtration.

TR = Tubular reabsorption.

TS = Tubular secretion.

1. GF + TR + TS
2. GF - (TR + TS)
3. GF - TR + TS
4. GF - TS + TR

53.

Select the mismatch

- | | | | |
|----|-----------------------|---|---|
| 1. | Scapula | - | Situated in between 2 nd to 7 th ribs |
| 2. | Ball and socket joint | - | Humerus and pectoral girdle |

3. Rib cage - Formed by vertebrae, ribs and sternum
4. Pelvic girdle - Articulates with thigh bone at pubic symphysis.

54.

Which of the following is/are controlled by the human brain ?

- Balance of the body
- Circadian rhythm of the body
- Human behaviour
- Functioning of heart and kidneys

- Only d
- a and d
- a,b and c
- a,b,c,d

55.

Which of the following symptom can not be expected, if there is tumour like growth in parathyroid glands?

- Tetany of muscle.
- Increase in Ca^{++} level deposition of bones.
- More tubular reabsorption of Ca^{++} from the nephric tubule.
- Both 1 and 2.

56.

Fate of pyruvate produced by glycolysis depends on cellular needs, it can enter

- Lactic acid fermentation
- Alcoholic fermentation
- Aerobic respiration
- All are correct

57.

Scala vestibuli and scala tympani are linked with middle ear at

- Oval window and round window, respectively
- Round window and oval window, respectively
- Oval window
- Round window

58.

Which of the following is incorrect with respect to parathyroid hormone (PTH)?

- Secretion of PTH is regulated by circulating levels of calcium ions

2. PTH acts on bones and stimulates the process of bone mineralisation

- PTH stimulates reabsorption of Ca^{+2} by renal tubules
- PTH increases absorption of Ca^{+2} from digested food

59.

Match the following joints with the bones involved:

Column-I		Column-II
(a) Gliding joint	(i)	Between carpal and metacarpal of thumb
(b) Hinge joint	(ii)	Between Atlas and Axis
(c) Pivot joint	(iii)	Between the Carpals
(d) Saddle joint	iv	Between Humerus and Ulna

Select the correct option from the following:

- (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
- (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
- (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
- (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

60.

The H-Zone in the skeletal muscle fibre is due to

- the central gap between actin filaments extending through myosin filaments in the A-band
- extension of myosin filaments in the central portion of the A-band
- the absence of myofibrils in the central portion of A-band
- the central gap between myosin filaments in the A-band

61.

Good vision depends on adequate intake of carotene rich food.

Select the best option from the following statements.

- Vitamin-A derivatives are formed from carotene.
- The photo pigments are embedded in the membrane discs of the inner segment.
- Retinal is a derivative of vitamin-A.
- Retinal is a light absorbing part of all the visual photo pigments.

- (I) and (II)
- (I), (III) and (IV)
- (I) and (III)

4. (II), (III) and (IV)

62.

The inner ear contains a complex system located above the cochlea called

(A) It is influenced by gravity and movements and help us in (B)

1. A - organ of corti, B - Hearing
2. A - organ of corti, B - Maintaining posture
3. A - Vestibular apparatus, B - maintaining posture
4. A - Macula, B - Hearing

63.

Match the following :-

Column A	Column B
(i) Auxin	(a) Brewing industry
(ii) Gibberlic Acid	(b) Xylem differentiation
(iii) Cytokinin	(c) Fruit ripening
(iv) Ethylene	(d) Overcome Apical dominance

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

64.

In TCA cycle the conversion of succinyl Co-A to succinic acid requires-

1. Acetyl Co-A + GTP + iP
2. FAD
3. Co-A + GTP + iP
4. GDP + iP

65.

Which of the following statement is wrong ?

1. The descending limb of loop of Henle is permeable to water
2. The ascending limb of loop of Henle is permeable

to salt

3. The descending limb of loop of Henle is permeable to electrolytes
4. The ascending limb of loop of Henle is impermeable to water

66.

Read the following statement carefully and choose how many of them are incorrect

- a. Afferent neuron transmits signal of CNS.
- b. The choroid layer is bluish color and is present over the posterior two-thirds of the eyeball.
- c. Olfactory bulbs are an extension of the hypothalamus
- d. Medulla oblongata have centre to control excretion, circulation, and gastric secretion.

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

67.

Excess of growth hormone in adult leads to ?

1. Gigantism
2. Acromegaly
3. Dwarfism
4. Cretinism

68.

The thylakoid membrane bears several $F_0 - F_1$ particle ATPase/ATP synthase. Which of the following is incorrect for these particles?

1. One of its part (F_0) is embedded in the membrane and forms a transmembrane channel that carries out facilitated diffusion of protons across the membrane
2. Its other part (F_1) protrudes out facing towards the stroma
3. The catalytic sites for ATP formation are located in F_1 part
4. F_1 is intrinsic protein

69.

During the process of micturition:-

1. Urinary bladder → Contracts
- Urethral sphincter → Contracts

2. Urinary bladder → Contracts
Urethral sphincter → Relaxes

3. Urinary bladder → Relaxes
Urethral sphincter → Contracts

4. Urinary bladder → relaxes
Urethral sphincter → Relaxes

70.

ATP is hydrolysed by:-

1. Myosin head
2. Myosin tail
3. Tropomyosin
4. Troponin

71.

Resting membrane of neuron is more permeable for:-

1. Na^+
2. K^+
3. Mg^{+2}
4. Ca^{+2}

72.

Which one is the example of synovial joint ?

1. Joints between skull bones
2. Pubic symphysis
3. Knee joint
4. Cartilaginous joint

73.

In the given four statements (a-d), select the options, which includes all the correct ones only:-

- (a) Fibula does not participate in knee joint formation.
- (b) Tarsal bones are much larger and stronger than carpal bones because they have to support and distribute body weight.
- (c) Scapula situated dorsally in thoracic region between 2nd and 7th rib.
- (d) Two half of the pelvis girdle meet dorsally to form the pubic symphysis containing fibrous cartilage.

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

74.

Which of the following is likely to develop goitre?

1. Thyroid gland that is producing too much parathormone
2. Circulating levels of thyrotropin are too low
3. There is an inadequate supply of iodine
4. The diet contains too much iodine

75.

Match the columns

Column I	Column II
(A) Myasthenia gravis prolonged blood	(i) Wild contractions for period due to $\downarrow\text{Ca}^{++}$ in
(B) Tetany junction paralysis	(ii) Affects neuromuscular and results in muscle
(C) Muscular dystrophy in	(iii) Increased uric acid levels blood and joints
(D) Gout	(iv) Degeneration of skeletal muscles

A B C D

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

76.

Vestibular Apparatus consists of

1. Crista only
2. Macula only
3. Crista and Macula
4. Crista, Macula and Cochlea

77.

Which of the following hormones are rapidly secreted during emergency situations, example during fight or fright?

1. Glucocorticoids
2. Catecholamines

3. Mineralocorticoids
4. Sex corticoids
- 78.
- Select the hormone that acts through intracellular receptors.
1. FSH
 2. LH
 3. Progesterone
 4. Insulin
- 79.
- Which of the given hormones is used to produce parthenocarpic or seedless banana and tomatoes?
1. Auxin
 2. Cytokinin
 3. Abscisic acid
 4. Kinetin
- 80.
- This hormone promotes loss of sodium and water in urine, thereby increasing urinary output. This hormone is released from
1. JG cells
 2. Liver
 3. Medulla
 4. Atrial walls of heart
- 81.
- Cytochrome c-oxidase complex contains
1. Cytochromes a and a₃ with two copper centres
 2. Cytochromes a and a₃ with single copper centre
 3. Cytochromes b and c₁ with two copper centres
 4. Cytochromes a and a₃ with two iron centres
- 82.
- Sebaceous gland secretion mainly contains
1. Amino acids and glucose
 2. Sterols and lactic acid
 3. NaCl and wax
 4. Sterols and hydrocarbons
- 83.

Read the following statements

(A) Depolarization of an axonal membrane is caused due to rise in stimulus-induced permeability to Na⁺ and its rapid influx into axoplasm.

(B) Diffusion of K⁺ outside the axonal membrane restores the resting potential of the membrane.

(C) Sodium potassium pump maintains active transport of 2Na⁺ outwards for 3K⁺ into axoplasm across resting membrane

Choose the option that represent correct statements only

1. A only
2. A and B
3. B and C
4. A and C

84.

Select the incorrect match w.r.t hormones and respective deficiency disease

1. PTH – Diabetes insipidus
2. Growth hormone – Dwarfism
3. Thyroid hormone – Cretinism
4. Adrenal cortex – Addison's disease hormones

85.

Adenine derivative hormone is

1. IAA
2. Gibberellins
3. ABA
4. Kinetin

86.

Micturition does not involve

1. Relaxation of urethral sphincter
2. Contraction of urinary bladder
3. Stretching of transitional epithelium of urinary bladder
4. Contraction of ureters

87.

Choose the correct statement.

1. In a resting muscle fibre, a subunit of troponin masks the active binding sites on myosin for actin filaments

2. The myosin monomer called meromyosin has a globular head which has binding sites for ATP and active sites for actin

3. A motor neuron along with the muscle fibres connected to it constitute motor-end plate

4. The Z-lines attached to A-bands are pulled inwards towards the H-zone causing shortening of sarcomere

88.

Read the following statements

Statement-A: The retina contains ganglion cells, bipolar cells and photoreceptor cells arranged in sequence from inside to outside.

Statement-B: Light induces potential difference in photoreceptor cells that generates action potential in bipolar cells through ganglion cells

Choose the correct option.

1. Only A is correct
2. Only B is correct
3. Both A and B are correct
4. Both A and B are incorrect

89.

Hypothalamus does not contain centre for controlling

1. Body temperature
2. Hunger
3. Respiration
4. Osmoregulation

90.

Bolting is induced by gibberellins in some plants like

1. Sugarcane
2. Pineapple
3. Cabbage
4. Rice

91.

Cyclopentadiene is much more acidic than cyclopentane. The reason is that :

1. Cyclopentadiene has conjugated double bonds
2. Cyclopentadiene has both sp^2 and sp^3 hybridized carbon atoms
3. Cyclopentadiene is a strain-free cyclic system
4. Cyclopentadienide ion, the conjugate base of

cyclopentadiene, is an aromatic species and hence has higher stability

92.

Which of the following compounds will not undergo Friedel-Craft's reaction easily?

1. Cumene
2. Xylene
3. Nitrobenzene
4. Toluene

93.

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

1. Chromatography
2. Crystallization
3. Steam distillation
4. Sublimation

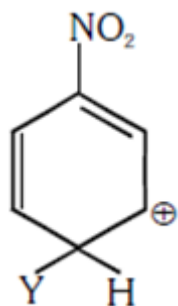
94.

The correct statement regarding electrophile is

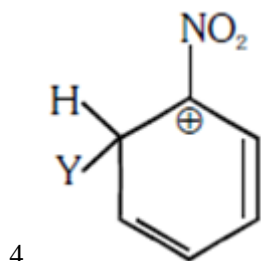
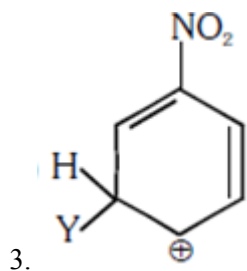
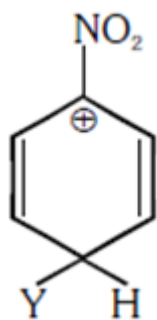
1. Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from another electrophile
2. Electrophiles are generally neutral species and can form a bond by accepting a pair of electrons from a nucleophile
3. Electrophile can be either neutral or positively charged species and can form a bond accepting a pair of electrons from a nucleophile
4. Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from a nucleophile

95.

Which of the following carbocations is expected to be most stable?



- 1.
- 2.



96.

Two possible stereo-structures of $\text{CH}_3\text{CHOH}\cdot\text{COOH}$, which are optically active, are called

1. Diastereomers
2. Atropisomers
3. Enantiomers
4. Mesomers

97.

Which one of the following is not a common component of Photochemical Smog?

1. Ozone
2. Acrolein
3. Peroxyacetyl nitrate
4. Chlorofluorocarbons

98.

In Kjeldahl's method for estimation of nitrogen present in the soil sample, ammonia evolved from 0.75g of sample neutralized 10ml. of 1M H_2SO_4 . The percentage of nitrogen in the soil is:

1. 37.33

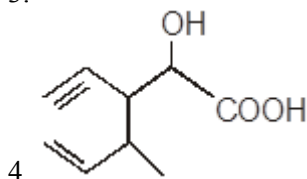
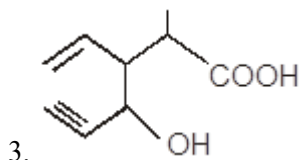
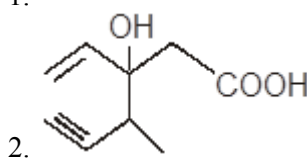
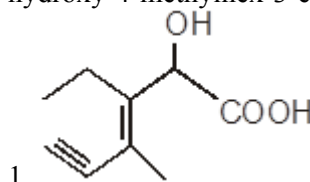
2. 45.33

3. 35.33

4. 43.33

99.

Structure of the compound whose IUPAC name is 3-Ethyl-2-hydroxy-4-methylhex-3-en-5-ynoic acid is :



100.

Considering the state of hybridization of carbon atoms, find out the molecules among the following which is linear.

1. $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$
2. $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{C} \equiv \text{CH}$
3. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
4. $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$

101.

The correct order of increasing bond length of C-H, C-O, C-C and C=C is

1. $\text{C} - \text{C} < \text{C} = \text{C} < \text{C} - \text{O} < \text{C} - \text{H}$
2. $\text{C} - \text{O} < \text{C} - \text{H} < \text{C} - \text{C} < \text{C} = \text{C}$
3. $\text{C} - \text{H} < \text{C} - \text{O} < \text{C} - \text{C} < \text{C} = \text{C}$
4. $\text{C} - \text{H} < \text{C} = \text{C} < \text{C} - \text{O} < \text{C} - \text{C}$

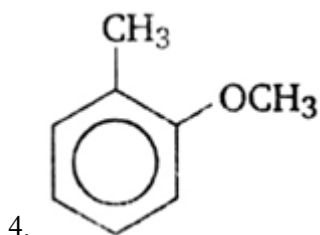
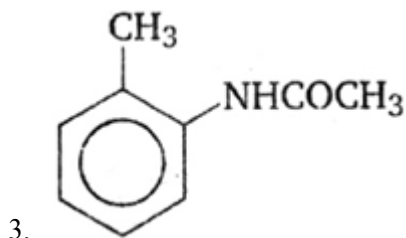
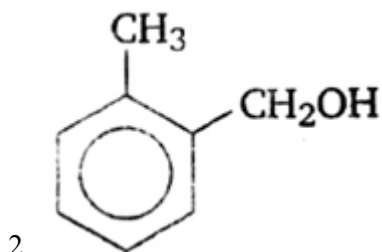
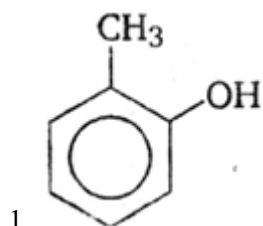
102.

The Lassaigne's extract is boiled with conc HNO_3 while testing for halogens. Because ..

1. help in the precipitation of AgCl
2. increases the solubility product of AgCl
3. increase the concentration of NO_3^- ions
4. decomposes Na_2S and NaCN , if formed

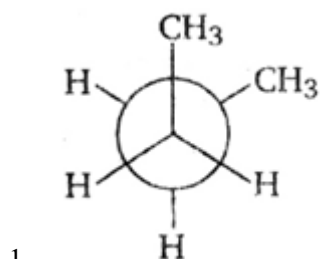
103.

Which one is most reactive towards electrophilic reagent?

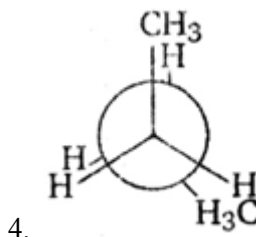
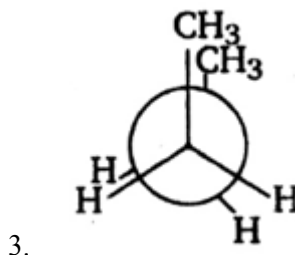
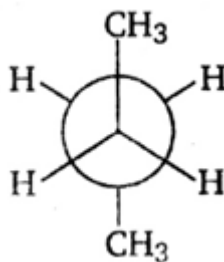


104.

In the following the most stable conformation of n-butane is

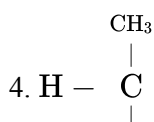
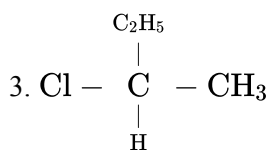
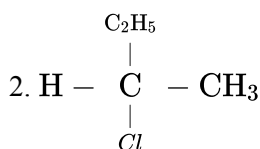
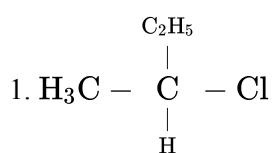


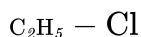
2.



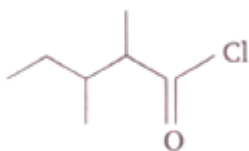
105.

$\text{CH}_3-\text{CHCl}-\text{CH}_2-\text{CH}_3$ has a chiral centre. Which one of the following represents its *R* configuration?





106.



The IUPAC name of is :

1. 3, 4-dimethylpentanoyl chloride
2. 1-chloro-1-oxo-2,2-dimethylpentane
3. 2-ethyl-3-methylbutanoyl chloride
4. 2, 3-dimethylpentanoyl chloride

107.

The R and S enantiomers of an optically active compound differ in

1. their optical rotation of plane-polarized light
2. their reactivity with chiral reagents
3. their solubility in achiral reagents
4. their melting points

108.

The number of primary amines of formula $C_4H_{11}N$ are

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

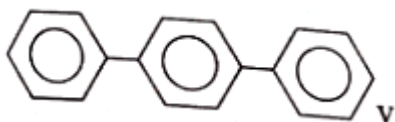
109.

An isomer of ethanol is

1. Methanol
2. Diethyl ether
3. Acetone
4. Dimethyl ether

110.

The correct IUPAC name of the compound is

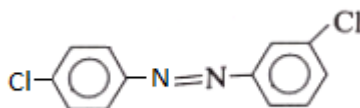


1. p-phenyl diphenyl
2. p-1-biphenyl benzene
3. 1,1',4',1''-terphenyl

4. terphenyl

111.

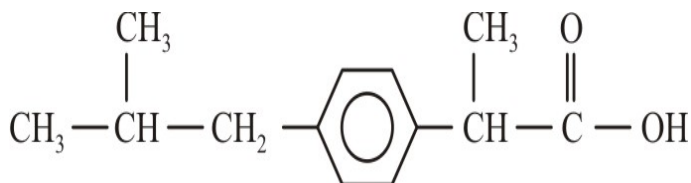
Assign the IUPAC name for the following compound.



1. 3, 4-dichlorobenzene
2. (4-chlorophenyl)(3-chlorophenyl) diazene
3. 3,4-bis (chlorophenyl) diazene
4. (3-chlorophenyl)(4-chlorophenyl)diazene

112.

Ibuprofen has the following structure, this compound shows



1. Geometrical isomerism
2. Optical isomerism
3. Tautomerism
4. both 1 and 2

113.

The enolic form of acetone contains

1. 9 sigma bonds, 1 pi bond, and 2 lone pair of electrons
2. 8 sigma bonds, 2 pi bond, and 2 lone pair of electrons
3. 10 sigma bonds, 1 pi bond, and 1 lone pair of electrons
4. 9 sigma bonds, 2 pi bond, and 1 lone pair of electrons

114.

The number of isomers for the compound with molecular formula $C_2BrClFI$ is

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

115.

Acidic hydrogen is present in

1. ethyne
2. ethene
3. benzene
4. ethane
116. Identify the reagent from the following list which can easily distinguish between 1-butyne and 2-butyne?
1. bromine, CCl_4
 2. H_2 , Lindlar catalyst
 3. dilute H_2SO_4 , HgSO_4
 4. ammonical cuprous chloride
117. In the presence of peroxide, and hydrogen chloride, and hydrogen fluoride do not undergo anti-Markovnikov's addition to alkenes because
1. both are highly ionic
 2. one is oxidizing and the other is reducing
 3. one of the steps is endothermic in both the cases
 4. all the steps are exothermic in both the cases
118. The reaction of propene with HOCl proceeds via the addition of
1. H^+ in the first step
 2. Cl^+ in the first step
 3. OH^- in the first step
 4. Cl^+ and OH^- in a single step
119. Which of the following gives propyne on hydrolysis?
1. Al_4C_3
 2. Mg_2C_3
 3. B_4C
 4. La_4C_3
120. The product(s) obtained via oxymercuration ($\text{HgSO}_4 + \text{H}_2\text{SO}_4$) of but-1-yne would give
1. $\text{CH}_3\text{CH}_2 - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_3$
 2. $\text{CH}_3\text{CH}_2\text{CH}_2 - \text{CHO}$
 3. $\text{CH}_3\text{CH}_2\text{CHO} + \text{HCHO}$
 4. $\text{CH}_3\text{CH}_2\text{COOH} + \text{HCOOH}$
121. Which of the following shows acidic character?
1. $\text{CH}_3 - \text{CH}_3$
 2. $\text{CH}_3 - \text{C} \equiv \text{CH}$
 3. $\text{CH}_2 = \text{CH}_2$
 4. $\text{CH}_3\text{C} \equiv \text{C} - \text{CH}_3$
122. Ethene and ethyne can be distinguished by
1. Br_2 water
 2. KMnO_4 solution
 3. cuprous chloride solution
 4. any of the above
123. Which among of the following alkyne will give an aldehyde on hydroboration oxidation reaction?
1. $\text{CH} \equiv \text{CH}$
 2. $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{C} - \text{H}$
 3. $\text{CH}_3 - \text{C} \equiv \text{C} - \text{H}$
 4. all of these
124. Which of the following on reaction with cyclohexanol gives best yield cyclohexene?
1. conc. H_3PO_4
 2. conc. HCl
 3. conc. HBr
 4. all of these
- 125.

How many structural and geometrical isomers are possible for dimethylcyclohexane?

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

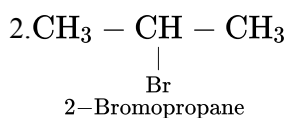
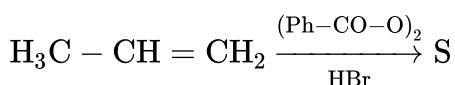
126.

On the addition of HBr to propane in the absence of peroxides, the first step involves the addition of

1. H^+
2. Br^-
3. H
4. Br

127.

Predict the major product(s) of the following reactions .



4. None

128.

What is the percentages of 1° monochlorinated product obtained from 2- methylbutane If The relative reactivity of 1° , and hydrogen's towards chlorination is 1 : 3.8 : 5 ?

1. % of 1° monochlorinated product = 41.7%
2. % of 1° monochlorinated product = 35.2
3. % of 1° monochlorinated product = 23.1
4. % of 1° monochlorinated product = 33.2

129.

What type of radicals that can be formed as intermediates during monochlorination of 2-methylpropane ?

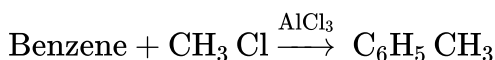
1. primary and tertiary
2. Two types of primary
3. primary and secondary
4. Two types of tertiary

130.

What is the IUPAC name of an unsaturated hydrocarbon 'A', which adds two molecules of H_2 and on reductive ozonolysis A gives butane-1, 4-dial, ethanal, and propanone?

1. 2-methylocta-2,6-diene
2. 2-methylocta-1,5-diene
3. 3-methylocta-2,6-diene
4. 2-methylocta-1,6-diene

131.

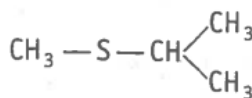
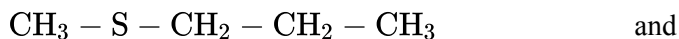


Which type of mechanism & intermediate involve in above reaction?

1. Aromatic electrophilic substitution & carbocation
2. Aromatic Nucleophilic substitution & carbanion
3. Aromatic free radical substitution & Free radical
4. Carbene based substitution reaction & Carbene

132.

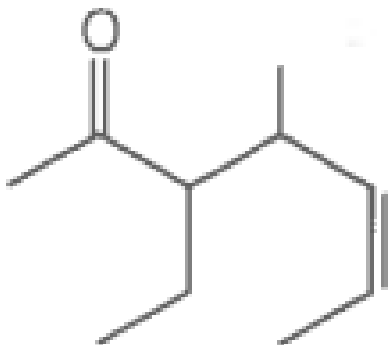
Which type of structural isomerism is shown by following compounds?



1. tautomer
2. positional isomer
3. Functional isomerism
4. Ring Chain isomerism

133.

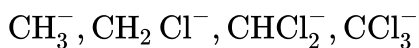
What is the IUPAC name of this compound ?



1. 3-ethyl-4-methylhept-5-en-2-one
2. 4-ethyl-4-methylhept-5-en-2-one
3. 4-ethyl-3-methylhept-5-en-2-one
4. 3-ethyl-3-methylhept-5-en-2-one

134.

Which is the most stable species in following given carbanion?



1. CCl_3^-
2. CH_3^-
3. CH_2Cl^-
4. CHCl_2^-

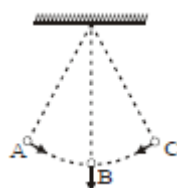
135.

Which gas that bring 50 % of green house effect responsible for global warming?

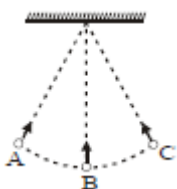
1. SO_2
2. SO_3
3. CO_2
4. Water vapour

136.

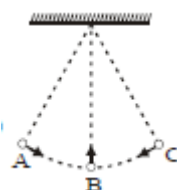
A simple pendulum of mass m swings about point B between extreme positions A and C. Net force acting on the bob at these three points is correctly shown by



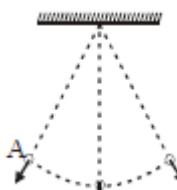
1.



2.



3.



4.

137.

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 is-

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

138.

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

139.

Two superposing waves are represented by the following equations :

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

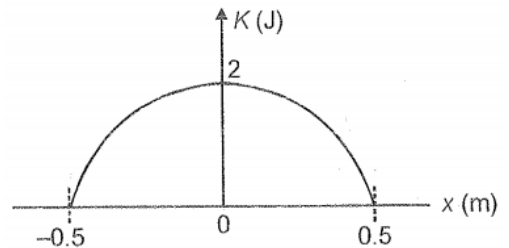
Ratio of intensities $\frac{I_{\max}}{I_{\min}}$ will be -

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

2. 30 J
3. 20 J
4. 40 J

144.

The kinetic energy (K) of a simple harmonic oscillator varies with displacement (x) as shown. The period of oscillation is (mass of oscillator is 1 kg)



1. $\frac{\pi}{2}$ sec
2. $\frac{1}{2}$ sec
3. π sec
4. 1 sec

145.

The equation of an SHM is given as $y=3\sin\omega t + 4\cos\omega t$ where y is in centimeters. The amplitude of the SHM is

1. 3 cm
2. 3.5 cm
3. 4 cm
4. 5 cm

146.

The equation of a SHM is given as $x = 5 \sin\left(4\pi t + \frac{\pi}{3}\right)$, where t is in seconds and x

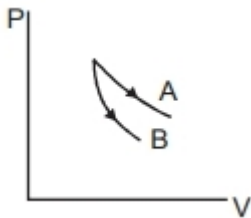
in meters. During a complete cycle, the average speed of the oscillator is

1. Zero
2. 10 m/s
3. 20 m/s
4. 40 m/s

147.

What is the period of oscillation of the block shown in the figure?

A and B are two adiabatic curves for two different gases. Then A and B corresponds to :



1. Ar and He respectively.
2. He and H_2 respectively.
3. O_2 and H_2 respectively.
4. H_2 and He respectively

141.

In an experiment with sonometer, a tuning fork of frequency 256 Hz resonates with a length of 25 cm and another tuning fork resonates with a length of 16 cm. Tension of the string remaining constant, the frequency of the second tuning fork is -

1. 163.84 Hz
2. 400 Hz
3. 320 Hz
4. 204.8 Hz

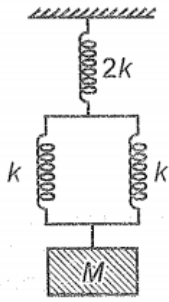
142.

If a particle in S.H.M. has time period 0.1 s and amplitude of 6 cm. Its maximum velocity is

1. 120π cm/s
2. 0.6π cm/s
3. π cm/s
4. 6 cm/s

143.

The potential energy U (in J) of a body executing S.H.M. is given by $U = 20 + 10(\sin^2 100\pi t)$, then the minimum potential energy of the body is



1. $2\pi\sqrt{\frac{M}{k}}$
2. $2\pi\sqrt{\frac{4M}{k}}$
3. $\pi\sqrt{\frac{M}{k}}$
4. $2\pi\sqrt{\frac{M}{2k}}$

148.

A particle is attached to a vertical spring and pulled down a distance 0.01 m below its mean position and released. If its initial acceleration is 0.16 m/s^2 then its time period in seconds will be

1. π
2. $\frac{\pi}{2}$
3. $\frac{\pi}{4}$
4. 2π

149.

The displacement of an object attached to a spring and executing simple harmonic motion is given by $x = 4\cos\pi t$ meter. The time at which the maximum magnitude of acceleration occurs first after the start is

1. 0.5 s
2. 1 s
3. 2 s
4. 1.5 s

150.

Two simple harmonic motions, $y_1 = a \sin \omega t$ and $y_2 = 2a \sin\left(\omega t + \frac{2\pi}{3}\right)$ are superimposed on a particle of mass m . The maximum kinetic energy of the particle is

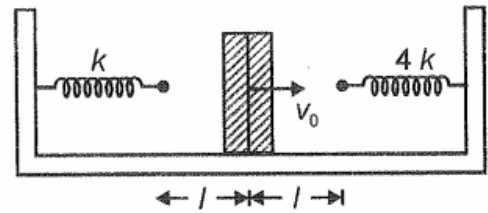
1. $\frac{1}{2}m\omega^2 a^2$
2. $\frac{5m\omega^2 a^2}{4}$

3. $\frac{3}{2}m\omega^2 a^2$

4. Zero

151.

All the surfaces are smooth and springs are ideal. If a block of mass m is given the velocity v_0 in the right direction, then the time period of the block shown in the figure is



1. $\frac{12l}{v_0}$

2. $\frac{2l}{v_0} + \frac{3\pi}{2}\sqrt{\frac{m}{k}}$

3. $\frac{4l}{v_0} + \frac{3\pi}{2}\sqrt{\frac{m}{k}}$

4. $\frac{1}{2}\pi\sqrt{\frac{m}{k}}$

152.

Which of the following is not true for damped oscillations with time period T and initial amplitude a ?

1. Angular frequency is slightly less than the natural frequency.
2. Force remains constant in time interval $t = 0$ to $t = \frac{T}{8}$.
3. If amplitude after time t is $\frac{a}{N}$, then the amplitude after time $2t$ is $\frac{a}{N^2}$.
4. Total mechanical energy is exponentially decreasing.

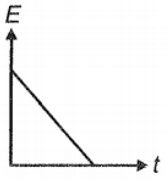
153.

In the spring pendulum, in the place of mass, a liquid is used. If liquid leaks out continuously, then the time period of a spring pendulum

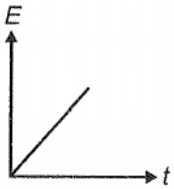
1. Decreases continuously
2. Increases continuously
3. First increased and then decreased
4. First decreased then increased

154.

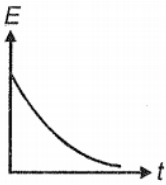
For damped oscillator graph between energy and time is



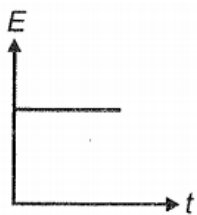
1.



2.



3.



4.

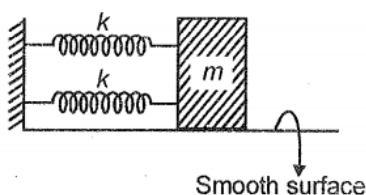
155.

Equation of simple harmonic motion is $x = a \sin \omega t$, then for which value of x , kinetic energy is equal to the potential energy?

1. $x = \pm a$
2. $x = \pm \frac{a}{2}$
3. $x = \pm \frac{a}{\sqrt{2}}$
4. $x = \pm \frac{\sqrt{3}a}{2}$

156.

Angular frequency of the given spring-mass system is ($k = 6000 \text{ N/s}$, $m = 30 \text{ kg}$)



1. $\frac{20}{\pi} \text{ rad/s}$
2. $\frac{10}{\pi} \text{ rad/s}$

3. 20 rad/s
4. 400 rad/s

157.

In the following questions, a statement of assertion (A) is followed by a statement of the reason (R).

1. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
2. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
3. If Assertion is a true statement but Reason is false, then mark (3).
4. if both Assertion and Reason are false statements, then mark (4).

A: When the angular amplitude of simple pendulum is large, then $T = 2\pi\sqrt{\frac{l}{g}}$ is not valid.

R: Time period of a simple pendulum depends on angular amplitude for large magnitude of angular displacement

158.

Standing waves can be produced

1. On a string clamped at both ends
2. On a string clamped at one end and other end is free
3. When a wave is reflected from a wall
4. In all of the above conditions

159.

A travelling wave pulse is given by $y = \frac{20}{4+(x+4t)^2}$ (m), then

1. The pulse is travelling along negative x axis
2. The speed of pulse is 4 m/s
3. The amplitude of pulse is 5 m
4. All of these

160.

A cylindrical tube open at both ends has a fundamental frequency f_0 in air. The tube is dipped vertically in water such that half of its length is inside water. The fundamental frequency of the air column now is

1. $\frac{3f_0}{4}$

2. f_0

3. $\frac{f_0}{2}$

4. $2f_0$

161.

The maximum possible wavelength in an open organ pipe of length l is

1. l

2. $2l$

3. $3l$

4. $4l$

162.

The equation of a stationary wave is given as $y = A \sin 0.5\pi t \cos(0.2\pi x)$, where t is in seconds and x in centimeters. Which of the following is correct?

1. Wavelength of the component waves is 10 cm

2. The separation between a node and nearest antinode is 2.5cm

3. Frequency of the component wave is 0.25 Hz

4. All of these

163.

The equation of a travelling wave is given as $y = A \sin(40\pi t - 0.2\pi x)$, where t is in seconds and x in metres. Then minimum distance between two particles oscillating in same phase is

1. 10 m

2. 5 m

3. 2 m

4. 1.5 m

164.

Two sound waves given by the equations $y = A \sin 122\pi t$ and $y = A \sin 128\pi t$ pass through a point simultaneously. The number of beats per second is

1. 6

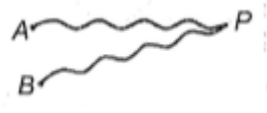
2. 5

3. 4

4. 3

165.

Two waves each of intensity i_0 and wavelength 0.2 m starts from sources A and B and meet at point P as shown in the figure. If $AP = 0.5$ m, $BP = 0.8$ m, then intensity at P is



1. $2i_0$

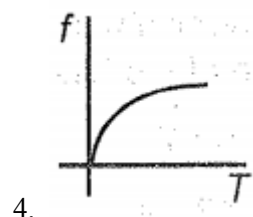
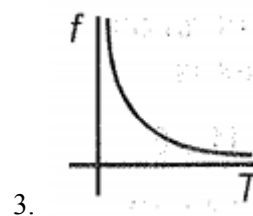
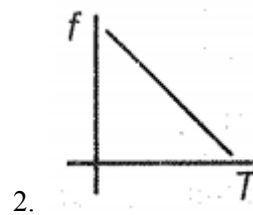
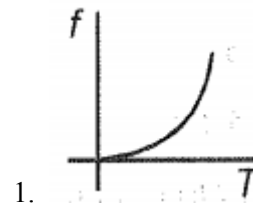
2. i_0

3. $i_0/2$

4. Zero

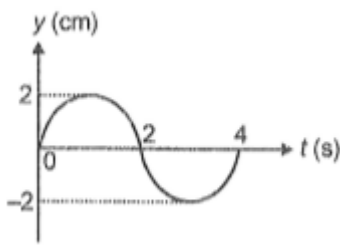
166.

The graph between fundamental frequency (f) and corresponding tension (T) in a sonometer wire is plotted is best represented by-



167.

Find the acceleration of particle at $t = \frac{8}{3}$ s from the graph between displacement (y) versus time (t).



1. $\frac{\sqrt{3}\pi^2}{4} \text{ cm/s}^2$
2. $-\frac{\sqrt{3}\pi^2}{4} \text{ cm/s}^2$
3. $-\pi^2 \text{ cm/s}^2$
4. Zero

168.

String of length l is fixed at one end and free at the other. If it resonates in different modes, then the ratio of frequencies are

1. 1:2:3:
2. 1:3:5:7:
3. 1:2:4:8:
4. 1:3:9:

169.

Sound wave is passed through a chamber. If the r.m.s speed of molecules of gas is v_1 and speed of sound is v_2 in the gas, then

1. $v_1=v_2$
2. $v_1>v_2$
3. $v_1<v_2$
4. $v_1 \leq v_2$

170.

When a gas in an open container is heated, the mean free path

1. Increases
2. Decreases
3. Remains the same
4. Any of the above depending on the molar mass

171.

The translational kinetic energy of oxygen molecules at room temperature is 60 J. Their rotational kinetic energy is

1. 40 J

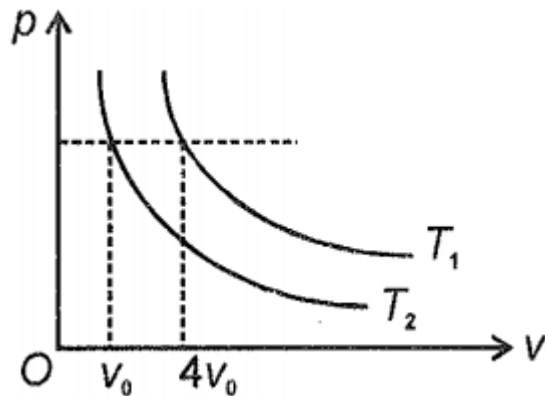
2. 60 J

3. 50 J

4. 20 J

172.

Two isotherms are drawn at temperatures T_1 and T_2 as shown. The ratio of mean speed at T_1 and T_2 is



1. 1 : 4

2. 1 : 2

3. 2 : 1

4. 4 : 1

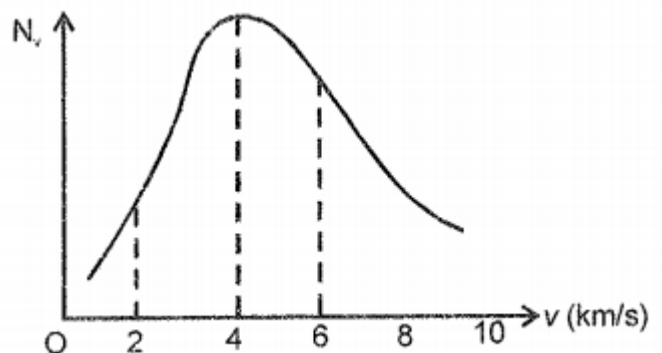
173.

Which of the following is true for the molar heat capacity of an ideal gas?

1. It cannot be negative
2. It has only two values (C_P and C_V)
3. It can have any value
4. It cannot be zero

174.

Maxwell's speed distribution graph is drawn as shown below. The most probable speed of the gas molecules is



1. 4 km/s

2. Between 3 km/s and 1 km/s
3. Any value between 2 km/s and 6 km/s
4. More than 4 km/s

175.

The amplitude of a simple harmonic oscillator is A and speed at the mean position is v_0 . The speed of the oscillator at the position $x = \frac{A}{\sqrt{3}}$ is

1. $\frac{2v_0}{\sqrt{3}}$
2. $\frac{\sqrt{2}v_0}{3}$
3. $\frac{2}{3}v_0$
4. $\frac{\sqrt{2}v_0}{\sqrt{3}}$

176.

Fundamental frequency of an open organ pipe is 200 Hz. If one end of the pipe is closed, its fundamental frequency becomes

1. 100 Hz
2. 200 Hz
3. 50 Hz
4. 400 Hz

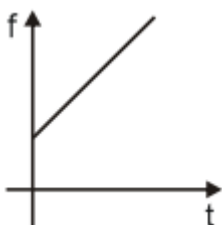
177.

If at a pressure of 10^6 dyne/cm², one gram of nitrogen occupies 2×10^4 c.c. volume, then the average energy of a nitrogen molecule in erg is:-

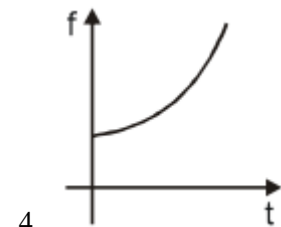
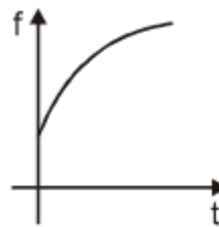
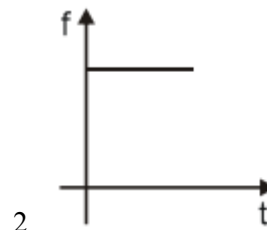
1. 14×10^{-13}
2. 10×10^{-12}
3. 10^6
4. 2×10^6

178.

An observer starts moving with uniform acceleration towards a stationary sound source of frequency f_0 . As the observer approaches the source, the apparent frequency f heard by the observer varies with time t as-

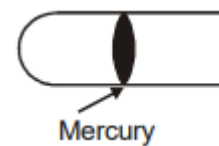


1.



179.

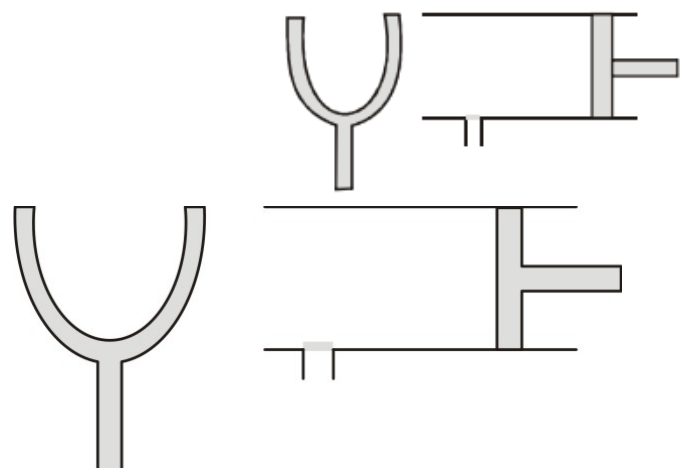
A uniform tube is shown in the figure which is open at one end and closed at the other. To enclose a column of air inside the tube, a pellet of mercury is introduced. If the length of air column at 27°C is 18 cm, at what temperature its length will be 21.6 cm?



1. 87°C
2. 91°C
3. 85°C
4. 97°C

180.

A vibrating tuning fork of frequency 1000 Hz is placed near the open end of a long cylindrical tube. The tube has a side opening and is also fitted with a movable reflecting piston. As the piston is moved through x distance, the intensity of sound changes from a maximum to a minimum for an observer at the side opening. If the speed of sound is 350 meters per second, then x is-



1. 35 cm
2. 17.5 cm
3. 8.75 cm
4. 10 cm

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