

Botany - Section A

1.

The useful purpose served by lactate fermentation is:

1. Make lactose available for gluconeogenesis
2. Production of additional ATP in anaerobic conditions
3. Regeneration of NAD⁺
4. Increased availability of oxygen for the skeletal muscle

2.

Genes which code for a pair of contrasting traits or slightly different forms of the same gene are known as:

1. Alleles
2. Loci
3. Cistrons
4. Introns

3.

The layers in the walls of the microsporangium that helps in the dehiscence of anther to release the pollen include:

- I. Epidermis
 - II. Endothecium
 - III. Middle layers
 - IV. Tapetum
1. I and II only
 2. I, II and III only
 3. II and III only
 4. I, II, III and IV

4.

Which of the following is not correct for “Snips”?

1. There are 1.4 million locations in human genome.
2. Where single base differences occur.
3. They shed light on chromosome structure, dynamics and evolution.
4. It promises to revolutionise the processes of finding chromosomal locations for disease associated sequences.

5.

In most prokaryotes, the transcription unit is:

1. Mono-cistronic
2. Poly-cistronic
3. Multi-cistronic
4. Uni-cistronic

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.

Which of the following have pigment similar to higher plants?

1. Group which causes red tide.
2. Group which is chief producer of ocean.
3. Group when deprived of light behaves as heterotroph.
4. Group where spore have cellulosic cell wall

9.

Sunlight is essential for photosynthesis is established by

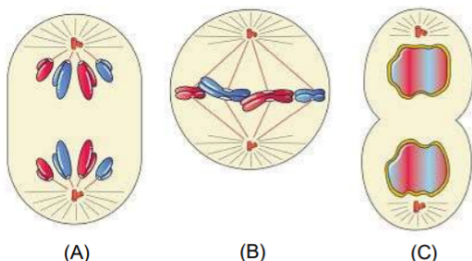
1. Jan Ingenhousz.
2. Robert Hill.
3. Emerson.
4. Julius Von Sach.

10. Which of the following is not related to family brassicaceae?
1. Parietal placentation.
 2. Variation in length of stamen.
 3. Alternate phyllotaxy.
 4. Perigynous.
11. Genes which are tightly linked on chromosome show :
1. Very low recombination
 2. High recombination
 3. Very low parental combination
 4. Clear cut independent assortment
12. The production of gametes by the parents the formation of zygotes, the F_1 and F_2 plants can be understood using
1. Pie diagram
 2. A pyramid diagram
 3. Punnett square
 4. Wenn diagram
13. What will be the direction of flow of water when a plant cell is placed in a Hypotonic solution?
1. Water will flow in both directions.
 2. Water will flow out of the cell.
 3. Water will flow into the cell.
 4. No flow of water in any direction.
14. Which of the following rRNAs acts as structural RNA as well as ribozyme in bacterial?
1. 5-8s rRNA
 2. 5S rRNA
 3. 18 S rRNA
 4. 23S rRNA
15. Which of the following statements is not correct?
1. Some reptiles have also been reported as pollinators in some plant species. ,
 2. Pollen grains of many species can germinate on the stigma of a flower, but only one pollen tube of the same species grows into the style.
 3. Insects that consume pollen or nectar without bringing about pollination are called pollen/ nectar robbers.
 4. Pollen germination and pollen tube growth are regulated by chemical components of pollen interacting with those of the pistil
16. Transfer of pollen grains from the anther to the stigma of another flower of the same plant.
1. Autogamy
 2. Cleistogamy
 3. Geitonogamy
 4. Xenogamy
17. Select the incorrect pair w.r.t. recent extinctions
1. Dodo - Mauritius
 2. Quagga - Africa
 3. Thylacine - Australia
 4. Steller's Sea Cow - Indonesia

18. Which of the following statement is correct for Deuteromycetes?
1. A large number of them are decomposers of litter, but do not help in mineral cycling
 2. Mycelium is septate and branched
 3. They may have three names, one for vegetative stage and two for asexual stage
 4. Common asexual spore is oidia
19. Photosynthetic organ originates from _____ meristem and arranged in _____ order.
1. Lateral, basipetal
 2. Root apical, acropetal
 3. Shoot apical, acropetal
 4. Intercalary, acropetal
20. behavioural means to cope environmental variations include
- 1 secretion of solid urine by a kangaroo rat
 - 2 increase in red blood cell production at high altitude
 - 3 desert lizard basks in the sunlight when temperature drops below the comfort zone
 - 4 leaves reduced to spines in opuntia
21. Chloroplast differs from mitochondria in
1. Having circular DNA and 70S ribosomes
 2. Phase of division or duplication during cell cycle
 3. Having porins in outer membrane
 4. Having enzymes for carbohydrate synthesis in stroma
22. In the STPs, biological process of microbial degradation of organic matter involves
- 1 Utilisation of activated sludge as inoculant produced in the physical process
 - 2 Mainly involves anaerobic breakdown of organic matter
 - 3 Masses of unicellular bacteria entangled in filamentous bacterial forms represent flocs
 - 4 BOD is greatly reduced by the microbial activity
23. Membrane-bound space present in plant cell and filled with water, sap and excretory substance is known as
1. Lysosome
 2. Endoplasmic reticulum
 3. Vacuole
 4. Cytoplasm
24. How many are associated with apoplastic movement of water?
1. Through cell wall
 2. Through intercellular space
 3. Through plasmodesmata
 - d. Through xylem
1. a, b, & d
 2. b, c & d
 3. a, c & d
 4. a, b & c

25.

The figures below shows 3 phases of mitosis select the option given correct identification together with the correct event ?



1. C- Telophase-Nuclear envelope assembles around the chromosome clusters
2. B- Anaphase-Segregation of homologous chromosomes.
3. A- Prophase-Chromosomes get fully condensed.
4. C- Metaphase-Condensation of chromatin to form chromosome

26.

At anaphase-II, sister chromatids move towards opposite poles of the cell by :

1. Contraction in spindle fibre attached to kinetochores
2. Shortening of microtubules attached to kinetochores
3. Lengthening of microtubules attached to kinetochores
4. Relaxation in spindle fibre attached to kinetochores

27.

The correct definition of the genus may be:-

1. Genus is an aggregate of distantly related species
2. Genus is a group of species present in a given area
3. Genus is an aggregate of closely related species
4. Genus is a group species present in a common habitat

28.

Biocontrol of crop pests is often based on which of the following interspecific interactions ?

1. Competition
2. Amensalism
3. Predation
4. Commensalism

29.

In dicot stems the vascular cambium ring is derived from

1. Intrafascicular cambium
2. Interfascicular cambium
3. Intrafascicular cambium & Interfascicular cambium
4. Pericycle

30.

During post-transcriptional modification of hnRNA, capping involves.

1. Addition of poly-A tail at 3' end
2. Addition of 7 mG cap at 5' end
3. Removal of introns
4. Addition of 7 mG cap at 3' end

31.

Sporophyte in bryophytes is

1. Parasitic on gametophyte
2. Formed by germination of meiospore
3. Specialized to produce gametes
4. Haploid phase

32.

_____ is a macronutrient.

1. Mo
2. Fe
3. Mg
4. Zn

33.

In cyclic photophosphorylation

1. There is production of ATP and NADPH_2
2. External source of electrons is required
3. The reaction center is P700
4. Splitting of water occurs

34.

Bacteria responsible for gobar gas formation are

1. Methanogens
2. Thermophilic
3. Ammonifying
4. Nitrifying

35.

Metaphase I is different from mitotic metaphase as in the later case

1. Two metaphasic plates are formed
2. Tetrads are arranged at the equator
3. Single metaphasic plate is formed
4. Homologous chromosomes get separated from each other

Botany - Section B

36.

Consider the following statements:

- I. Catalytic converters are fitted into automobiles for reducing emission of poisonous gases.
- II. They convert unburnt hydrocarbons to CO_2 and H_2O and CO and NO to CO_2 and N_2 respectively.
- III. Vehicles equipped with catalytic converter should use leaded petrol.

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

37.

Natural ageing of a lake by biological enrichment of its water is called

1. Biomagnification
2. Eutrophication
3. Algal blooms
4. Toxification

38.

The number of mitotic generations required to form a mature embryo sac from megaspore in most of the flowering plants is

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

39.

In a test cross, the plant expressing the dominant phenotype is crossed with the plant:

1. Which is heterozygous dominant
2. Which is heterozygous recessive
3. Which is homozygous recessive
4. Which is homozygous dominant

40.

Initially, how many biodiversity hot spots were identified globally?

1. 34
2. 25
3. 20
4. 30

41.

In hydrarch succession pioneer is phytoplankton and climax is forest (mesic). Given below is name of seral stages, arrange them in accordance with their appearance.

- A. Submerged free floating plants
- B. Reed – swamp stage
- C. Marsh meadow stage
- D. Submerged plant stage

E. Scrub stage
Option

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

42.

Find the odd one out about levels of biological organization:-

1. Biome
2. Community
3. Species
4. Population

43.

How many of the following can help in breaking seed dormancy?

1. Changing the environmental condition like light & temperature.
2. Application of GA_3 or nitrates.
3. Chilling condition.
4. All the above

44.

Statement - 1 : Respiration is amphibolic pathway.
Statement - 2 : Pure fat & pure protein can never be respiratory substrate.

Option :

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

45.

The incorrect statement for facilitated diffusion is

1. Special proteins help move substances across membranes without expenditure of energy.
2. Can cause net transport of molecules from a low to a high concentration
3. It is very specific, it allows cell to select substances for uptake.
4. Transport rate reaches a maximum when all of the protein transporters are being used

46.

According to the chemiosmotic hypothesis, there is a basic difference between respiration and photosynthesis. This is _____

1. In chloroplast, H^+ accumulation takes place in the lumen of thylakoid but in mitochondria, this takes place in perimitochondrial space.
2. Accumulation of H^+ in chloroplast takes place in matrix i.e., stroma and in mitochondria, this takes place in cristae.
3. In both the mitochondria and chloroplast the accumulation of H^+ takes place in inter-membranous space but with a high rate in mitochondria
4. Both 1 and 3 are correct.

47.

Kinetin (cytokinin) was first discovered as a breakdown products of

1. DNA
2. t-RNA
3. Spindle fibres
4. m-RNA

48.

The entire collection of plants/seeds having all the diverse alleles for all gene in a given crop is called :-

1. Hybrid vigour
2. Germplasm conservation
3. Somaclonal variation
4. Germplasm collection

49.

Select the incorrect match

1. Palade particle – Ribosome
2. Flagella – Cell movement
3. Centriole – Found in higher plants
4. Lysosome – Acid hydrolase

50.

Select the odd one w.r.t sexual reproduction.

1. Can be uniparental or biparental
2. Is slow
3. Is elaborate
4. Does not involve syngamy

Zoology - Section A

51.

There is a possibility of exposure of the maternal blood [of Rh -ve mother] to small amounts of Rh +ve blood from the fetus during the:

1. First trimester of any pregnancy
2. Third trimester of the second pregnancy only
3. Delivery of the child
4. There is no such possibility

52.

Pteropus is a/an:

1. Limbless amphibian
2. Extinct reptile that evolved into mammals
3. Bony fish that migrates from sea water to fresh water for breeding
4. Mammal with flight

53.

The neurotransmitter released by the nerve cell at the neuromuscular junction is:

1. Acetylcholine
2. Adrenaline
3. Serotonin
4. Dopamine

54.

Consider the following statements:

- I. The resting axonal membrane is nearly impermeable to sodium ions.
- II. Depolarization of the axonal membrane is due to influx of sodium ions.
- III. The size of the action potential, if produced, does not depend on the strength of the stimulus.

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

55.

In the 28 day human ovarian cycle, the duration of luteal phase is approximate?

- 1. 14 days
- 2. 28 days
- 3. 30 days
- 4. 5 days

56.

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

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

57.

The maximum volume of air that can be moved in and out during a single breath is called the _____.

- 1. vital capacity
- 2. tidal volume
- 3. residual volume
- 4. dead space

58.

The first recombinant DNA was constructed by linking an antibiotic resistant gene with the native plasmid of

- 1. Escherichia coli
- 2. Salmonella typhimurium
- 3. Clostridium butylicum
- 4. Acetobacter acetii

59.

In context of amniocentesis, which of the following statements is incorrect?

- 1. It is used for prenatal sex- determination
- 2. It can be used for detection of Down syndrome
- 3. It can be used for detection of cleft palate
- 4. It is usually done when a woman is between 14-16 weeks pregnant

60.

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 lack fibres.

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

2. (ii), (iv) only

3. (iv) only

4. (ii) only

61.

Cocaine, commonly called as coke or crack is obtained from

- 1. *Papaver somniferum*
- 2. *Erythroxylon*
- 3. *Cannabis sativa*
- 4. *Claviceps purpura*

62.

Three of the following pairs of the human skeletal parts are correctly matched with their respective inclusive skeletal category and one pair is not matched. Identify the non-matching pair

	Pairs of skeletal parts	Category
1.	Malleus and stapes	Ear ossicles
2.	Sternum and ribs	Axial skeleton
3.	Clavicle and glenoid cavity	Pelvic girdle
4.	Humerus and ulna	Appendicular skeleton

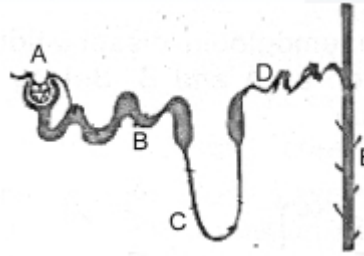
63.

Which of the following statement is not correct for normal ECG?

1. P-wave represents electrical excitation/depolarisation of atria
2. QRS complex represents the depolarisation of ventricle
3. By counting the QRS complexes that occur in a given period time, one can determine the heart beat rate of an individual
4. T wave represents the beginning of ventricular systole

64.

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

65.

Mark the correct match with the group and its characteristic?

1. Arthropoda → Compound eye and wings.
2. Mammalia → Viviparity.
3. Echinodermata → Calcareous endoskeleton.
4. Annelida → Fresh water and segmented body.

66.

Scala vestibuli and scala tympani are linked with middle ear at

1. Oval window and round window, respectively
2. Round window and oval window, respectively
3. Oval window
4. Round window

67. Match the following parts of a nephron with their function:
- | | |
|---|-------|
| (a) Descending limb of Henle's loop
Reabsorption of salts only | (i) |
| (b) Proximal convoluted tubule
Reabsorption of water only | (ii) |
| (c) Ascending limb of Henle's loop
Conditional reabsorption of sodium ions and water | (iii) |
| (d) Distal convoluted tubule
Reabsorption of ions, water and organic nutrients | (iv) |
- Select the correct option from the following:
- (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
 - (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
 - (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
 - (a)-(iv), (b)-(i), (c)-(iii), (d)-(ii)
68. "Ramachandran plot" is used to confirm the structure of
- RNA
 - Proteins
 - Triacylglycerides
 - DNA
69. A selectable marker is used to :
- help in eliminating the non transformants so that the transformants can be regenerated
 - identify the gene for a desired trait in an alien organism
 - select a suitable vector for transformation in a specific crop
 - mark a gene on a chromosome for isolation using restriction enzyme
70. In RNAi, the genes are silenced using :
- dsRNA
 - ssDNA
 - ssRNA
 - dsDNA
71. The enzyme that is not present in succus entericus is
- maltase
 - nucleases
 - nucleosidase
 - lipase
72. Which hormone causes dilation of blood vessels, increased oxygen consumption and gluconeogenesis ?
- ACTH
 - Insulin
 - Adrenalin
 - Glucagon
73. The phase of menstrual cycle in humans that last for 7-8 days is:
- follicular phase
 - ovulatory phase
 - luteal phase
 - menstruation
74. The secretory phase in the human menstrual cycle is also called
- Luteal phase and lasts for about 13 days.
 - Follicular phase and lasts for about 13 days.
 - Luteal phase and lasts for about 6 days.
 - Follicular phase and lasting for about 6 days.

75. Which one of the following biomolecules is correctly characterized?
1. Lecithin – a phosphorylated glyceride found in cell membrane
 2. Palmitic acid – an unsaturated fatty acid with 18 carbon atoms
 3. Adenylic acid – adenosine with a glucose and phosphate molecule
 4. Alanine amino acid – contains an amino group and an acidic group anywhere in the molecule
76. How many tropic hormones are secreted by pars distalis
1. Five
 2. Six
 3. Eight
 4. Ten
77. Given below some Assisted Reproductive Technologies (ART). Which of the following techniques are related with invitro fertilization (IVF) :-
- a. ZIFT
 - b. ICSI
 - c. AI
 - d. IUT
 - e. GIFT
1. a, b, c, e
 2. a, c, e
 3. a, b, d
 4. a, b, c, d, e
78. 'Chemosensitive Area' for regulation of respiration is present on ?
1. Medulla
 2. Pons
 3. Cerebrum
 4. Cerebellum
79. 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
80. Adult human has :-
1. Diphyodont and homodont dentition
 2. Thecodont homodont dentition
 3. Thecodont and monophyodont dentition
 4. Diphyodont and heterodont dentition
81. 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

Zoology - Section B

82.

In RNAi, which of the following molecules binds to and prevents translation of the specific mRNA?

1. dsDNA
2. ssDNA
3. ssRNA
4. dsRNA

83.

Choose the incorrect statement w.r.t cockroach

1. Haemocoel contains haemolymph which contains colourless plasma and haemocytes
2. Nervous system consists of segmentally arranged ganglia, six in thorax and nine in abdomen
3. Mushroom gland is present in 6th – 7th abdominal segment in male cockroach
4. Proventriculus has an outer layer of thick circular muscles and inner thick cuticle forming teeth

84.

Cells of immune system that do not provide innate immunity are

1. T-lymphocytes
2. Neutrophils
3. NK cells
4. Macrophages

85.

Cloaca, common chamber of alimentary canal, urinary and reproductive tract is **not** found in

1. Amphibians
2. Cartilaginous fishes
3. Birds
4. Bony fishes

86.

Most fossils are found in:

1. Granite
2. Sedimentary rocks
3. Lava flows
4. Black soil

87.

Vestibular apparatus is composed of

- I. Semi-circular canals.
 - II. Otolith organs.
 - III. Organ of Corti.
 - IV. Crista and macula.
1. I, II, III & IV
 2. I, II only
 3. IV only
 4. II only

88.

The stem cells which have potency to give rise to all tissues and organs are formed from

1. Trophoblast
2. Umbilical cord
3. Inner cell mass
4. Placenta

89.

Which of these pairs is mismatched?

1. slightly movable joint–vertebrae
2. hinge joint–hip
3. immovable joint–sutures in cranium
4. ball and socket joint–hip

90.

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

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

91.

Which of the following chordata is characterised with marine habitat, external fertilization and direct development?

1. Petromyzon.
2. Antedon.
3. Hippocampus.
4. Scolodion.

92.

The maximum volume of air a person can breathe in after a forced expiration is

- (A) Vital capacity
- (B) $ERV + TV + IRV$
- (C) $TLC - RV$
- (D) $ERV - RV$

1. (A) only
2. (A) & (B) only
3. (A), (B) & (C) only
4. (A), (B), (C) & (D)

93.

Which of the following statements is correct about the origin and evolution of men ?

1. Agriculture came around 50,000 years back.
2. The Dryopithecus and Ramapithecus primates existing 15 million years ago, walked like men.
3. Homo habilis probably ate meat.
4. Neanderthal men lived in Asia between 100000 and 40000 years back

94.

Study the given statements -

- i. A dehydration reaction (or condensation reaction) is the process in which water molecules are produced as a polymer is formed from monomers.
 - ii. The four main categories of macromolecules present in living systems are proteins, nucleic acids, carbohydrates, and lipids.
 - iii. Glucose is the main monosaccharide used by human cells for energy.
 - iv. The building blocks or monomers of nucleic acid molecules are called nucleosides.
- How many statements are correct-?

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

95.

Which of the following statements is not true w.r.t. mammary glands?

1. Contain glandular tissue and variable amount of fat tissues
2. Contain 15-20 mammary lobes containing clusters of cells called alveoli where cells of alveoli secrete milk
3. Several mammary ampullae combine to form mammary duct which is connected to the lactiferous duct
4. milk is sucked out through the lactiferous duct

96.

When recombinant DNA is inserted within the coding sequence of an enzyme β -galactosidase. This results in the following except

1. Insertional inactivation
2. Recombinant colonies do not produce any color
3. Inactivation of enzyme
4. Chromogenic substrate is converted into product by recombinant colonies

97.

Backbone of DNA is formed by :-

1. Sugar – Phosphate – Sugar
2. Nitrogen base – Phosphate – Sugar
3. Phosphate – Nitrogen base – Sugar
4. Base pairs

98.

Find out the correct match for the following table.

Column-I	Column-II	Column-III
(i) Pituitary gland	Growth hormone	Acromegaly
(ii) Thyroid gland Exophthalmic goitre	Thyroxine	
(iii) Pituitary gland mellitus	ADH	Diabetes

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

99.

Which of the following is an example of homologous organs?

1. Wings of butterfly and of birds
2. Eye of the Octopus and of mammals
3. Sweet potato and potato
4. Thorns of Bougainvillea and tendrils of Cucurbita

100.

Cow is administered with hormones having FSH like activity in

1. Hypophysation
2. MOET to cause super ovulation
3. Artificial insemination
4. MOET to inhibit follicular maturation

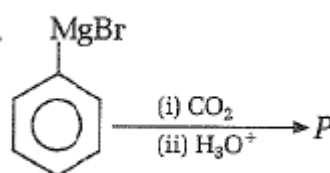
Chemistry - Section A

101.

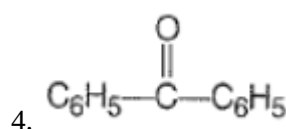
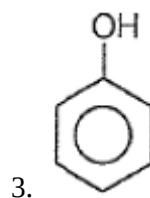
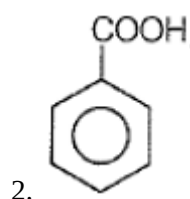
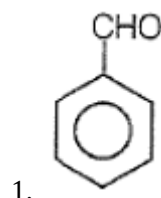
Which of the alkali metal chloride is having the highest m.p. ?

1. LiCl
2. NaCl
3. KCl
4. RbCl

102.



In the above reaction product, 'P' is



103.

An aqueous solution of hydrochloric acid -

1. Obeys Raoult's law
2. Shows negative deviations from Raoult's law
3. Shows positive deviations from Raoult's law
4. Obeys Henry's law at all compositions

104.

Standard electrode potential for $\text{Sn}^{4+} / \text{Sn}^{2+}$ couple is +0.15 V and that for the $\text{Cr}^{3+} / \text{Cr}$ couple is -0.74. These two couples in their standard state are connected to make a cell. The cell potential will be

1. + 0.89 V
2. + 0.18 V
3. + 1.83 V
4. + 1.199 V

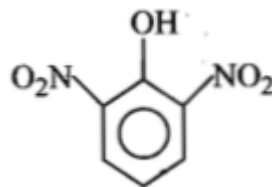
105.

$\text{Cr}_2\text{O}_7^{2-} + \text{X} \xrightarrow{\text{H}^+} \text{Cr}^{3+} + \text{H}_2\text{O} + \text{oxidized product of X}$, X in the above reaction cannot be

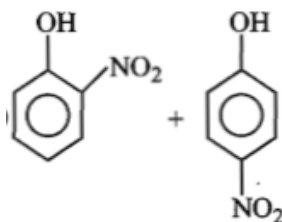
1. $\text{C}_2\text{O}_4^{2-}$
2. Fe^{2+}
3. SO_4^{2-}
4. S^{2-}

106.

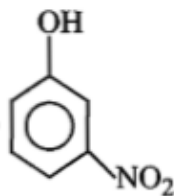
Phenol on treatment with dil. HNO_3 at room temperature gives:



1.



2.



3.

4. All

107.

Which species does not exist?

1. $(\text{SnCl}_6)^{2-}$
2. $(\text{GeCl}_6)^{2-}$
3. $(\text{CCl}_6)^{2-}$
4. $(\text{SiF}_6)^{2-}$

108.

In which of the following compounds, hydrogen exists in the atomic state -

1. Metallic hydrides
2. Ionic hydrides
3. Molecular hydrides
4. Water

109.

Standard enthalpy of vaporization $\Delta_{\text{vap}}H^0$ for water at 100°C is $40.66 \text{ KJ mol}^{-1}$. The internal energy of vaporization of water at 100°C (in kJ mol^{-1}) is (Assume water vapour to behave like an ideal gas).

1. $+37.56$
1. -43.76
3. $+43.76$
4. $+40.66$

110.

Conversion of cyclohexanol into cyclohexene is most effective in -

1. concentrated H_3PO_4
2. concentrated HCl
3. concentrated $\text{HCl} / \text{ZnCl}_2$
4. concentrated HBr

111.

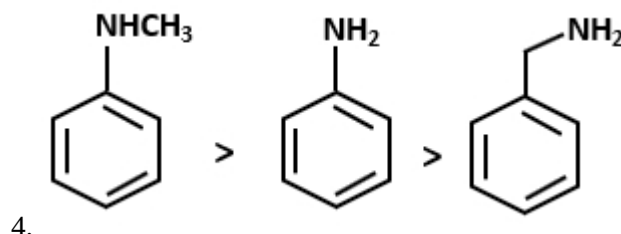
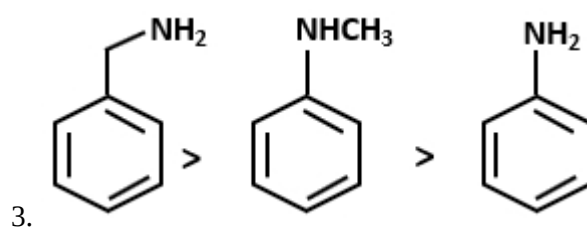
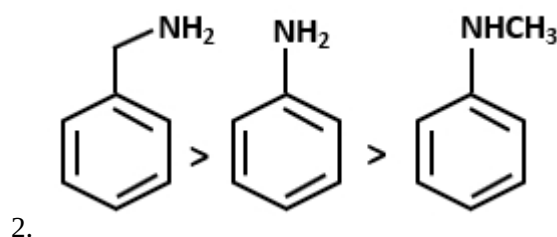
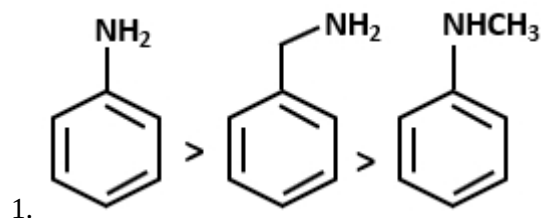
What is the structure of the compound, C_4H_8 , which when treated with $\text{H}_2\text{O} / \text{H}_2\text{SO}_4$ gives $\text{C}_4\text{H}_{10}\text{O}$ which is optically inactive?

1. $\text{CH}_3\text{CH}_2\text{CH} = \text{CH}_2$
2. $\text{CH}_3\text{CH} = \text{CHCH}_3$
3. $(\text{CH}_3)_2\text{C} = \text{CH}_2$



112.

The correct order of basic strength of the given compound is



113.

The strongest acid among the following is

1. CH_3COOH
2. $\text{C}_6\text{H}_5\text{COOH}$
3. $\text{C}_6\text{H}_5\text{OH}$
4. $\text{C}_2\text{H}_5\text{COOH}$

114. $\text{SO}_2 + \text{H}_2\text{S} \rightarrow \text{product}$. The final product is:
1. $\text{H}_2\text{O} + \text{S}$
 2. H_2SO_4
 3. H_2SO_3
 4. $\text{H}_2\text{S}_2\text{O}_3$
115. In a subshell, the number of radial nodes is two times of the number of angular nodes then minimum possible value of the principal quantum number (n) is [angular nodes are non-zero]
1. 1
 2. 2
 3. 3
 4. 4
116. The crystal field stabilization energy (CFSE) for $[\text{CoCl}_6]^{4-}$ is 18000 cm^{-1} , the CFSE for $[\text{CoCl}_4]^{2-}$ will be
1. 6000 cm^{-1}
 2. 16000 cm^{-1}
 3. 18000 cm^{-1}
 4. 8000 cm^{-1}
117. When 10 ml of 0.1 M acetic acid ($\text{pK}_a=5.0$) is titrated against 10 ml of 0.1 M ammonia solution ($\text{pK}_b=5.0$), the equivalence point occurs at pH
1. 9.0
 2. 6.0
 3. 5.0
 4. 7.0
118. The hybridizations of $[\text{Ni}(\text{CO})_4]$ and $[\text{Cr}(\text{H}_2\text{O})_6]^{+3}$ respectively, are
1. sp^3 and $\text{d}^3 \text{sp}^2$
 2. dsp^2 and $\text{d}^2 \text{sp}^3$
 3. sp^3 and $\text{d}^2 \text{sp}^3$
 4. dsp^2 and $\text{sp}^3 \text{d}^2$
119. A substance which gives a brick red flame and breaks down on heating giving oxygen and a brown gas is
1. Calcium carbonate
 2. Magnesium carbonate
 3. Calcium nitrate
 4. None of these
120. The standard reduction potential for $\text{Cu}^{2+} / \text{Cu}$ is 0.34 V. The reduction potential at pH =14 for the above couple ($K_{\text{sp}}[\text{Cu}(\text{OH})_2] = 1 \times 10^{-19}$) is
1. -0.22 V
 2. +0.22 V
 3. -0.34 V
 4. +0.34 V
121. In which of the following ion/molecule, the 'S' atom does not assume sp^3 hybridization?
1. SO_4^{2-}
 2. SF_4
 3. SF_2
 4. S_8

122.

In which series are the species listed in order of increasing size?

1. N, O, F
2. Na, Mg, K
3. Cr, Cr^{2+} , Cr^{3+}
4. Cl, Cl^- , S^{2-}

123.

The number of isomeric structures for $\text{C}_2\text{H}_7\text{N}$ would be:

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

124.

Which of the following hormones contains iodine?

- (1) Insulin
- (2) Testosterone
- (3) Adrenaline
- (4) Thyroxine

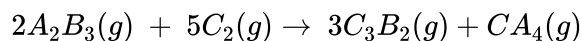
125.

The expression which gives $\frac{1}{4}$ th life 1^{st} order reaction is :-

1. $\frac{k}{2.303} \log \frac{4}{3}$
2. $\frac{2.303}{k} \log 3$
3. $\frac{2.303}{k} \log \frac{3}{4}$
4. $\frac{2.303}{k} \log \frac{4}{3}$

126.

In, a closed vessel 50 ml of A_2B_3 completely reacts with 200 ml of C_2 according to the following equation:

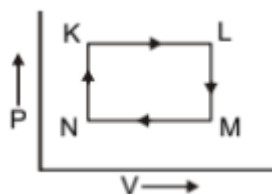


The composition of the gaseous mixture in the system will be:

1. 100 ml C_2 , 50 ml C_3B_2 , 50 ml CA_4
2. 25 ml C_2 , 75 ml C_3B_2 , 25 ml CA_4
3. 75 ml C_2 , 75 ml C_3B_2 , 25 ml CA_4
4. 10 ml C_2 , 25 ml C_3B_2 , 100 ml CA_4

127.

The pair of isochoric among the transformation of state is:



1. K to L and L to M
2. L to M and N to K
3. L to M and M to N
4. M to N and N to K

128.

Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules?

1. $\text{Cl}_2 > \text{Br}_2 > \text{F}_2 > \text{I}_2$
2. $\text{Br}_2 > \text{I}_2 > \text{F}_2 > \text{Cl}_2$
3. $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$
4. $\text{I}_2 > \text{Br}_2 > \text{Cl}_2 > \text{F}_2$

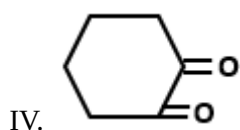
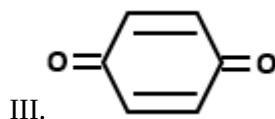
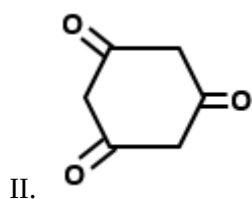
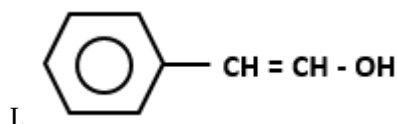
129.

A 200 mL flask having oxygen at 220 mm and a 300 mL flask having nitrogen at 100 mm are connected in such a way that O_2 and N_2 may combine in their volumes if temperature is kept constant. Find the total pressure of the gaseous mixture.

1. 158 mm
2. 138 mm
3. 148 mm
4. 168 mm

130.

Tautomerism is exhibited by



1. 1 and 2
2. 1, 3 and 4
3. 1, 2 and 4
4. 1, 2, 3 and 4

131.

The oxidation state of sodium in sodium amalgam is

1. -1
2. +1
3. +2
4. 0

132.

The reactivity order of halides for dehydrohalogenation is

1. $R-F > R-Cl > R-Br > R-I$
2. $R-I > R-Br > R-Cl > R-F$
3. $R-I > R-Cl > R-Br > R-F$
4. $R-F > R-I > R-Br > R-Cl$

133.

Following limiting molar conductivities are given as

$$\lambda_m^0(H_2SO_4) = x \text{ Scm}^2 \text{ mol}^{-1}$$

$$\lambda_m^0(K_2SO_4) = y \text{ Scm}^2 \text{ mol}^{-1}$$

$$\lambda_m^0(CH_3COOK) = z \text{ Scm}^2 \text{ mol}^{-1}$$

λ_m^0 (in $\text{Scm}^2 \text{ mol}^{-1}$) for CH_3COOH will be-

1. $x - y + 2z$
2. $x + y + z$
3. $x - y + z$
4. $\frac{(x-y)}{2} + z$

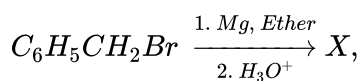
134.

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

135.

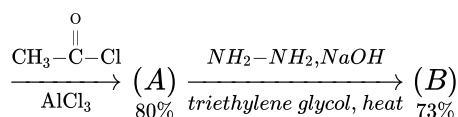
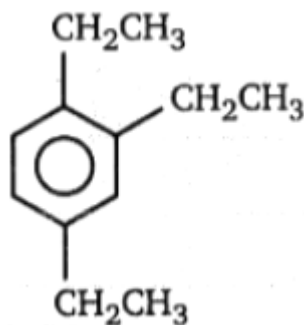
In the following reaction



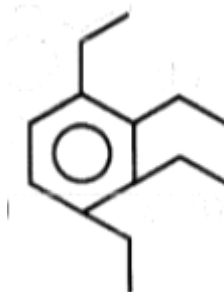
The product 'X' is -

1. $C_6H_5CH_2OH$
2. $C_6H_5CH_3$
3. $C_6H_5CH_2CH_2C_6H_5$
4. $C_6H_5CH_2OCH_2C_6H_5$

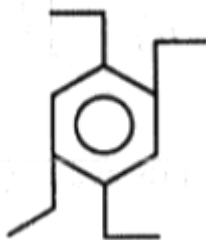
137.



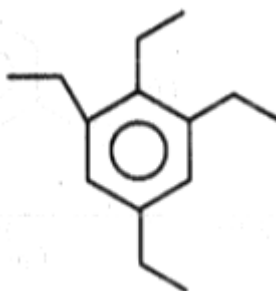
Product (B) is :



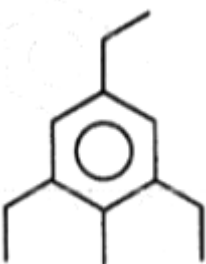
1.



2.



3.



4.

Chemistry - Section B

136.

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

1. 0.282
2. 0.0796
3. 0.0199
4. 1.99

138.

The pair of elements which on combination are most likely to form an ionic compound is :

1. Na and Ca
2. K and O_2
3. O_2 and Cl_2
4. Al and I_2

139.

A compound forms hcp structure. What is the total number of voids in 0.5 mol of it?

1. 9.033×10^{23}
2. 6.011×10^{23}
3. 5.023×10^{23}
4. 7.033×10^{23}

140.

If ΔH of a reaction is 100 kJ mol^{-1} , then the activation energy for forwarding reaction must be-

1. Greater than 100 kJ mol^{-1}
2. Less than 100 kJ mol^{-1}
3. Equal to 100 kJ mol^{-1}
4. None is correct

141.

Addition of non-metals like B and C to the interstitial sites of a transition metal does not result the metal

1. Of more ductability
2. Of less ductability
3. Less malleable
4. Of more hardness

142.

A solution of sucrose(molar mass = 342 g mol^{-1}) has been prepared by dissolving 68.5 g of sucrose in 1000 g of water. The freezing point of the solution obtained will be (k_f for water= $1.86 \text{ K kg mol}^{-1}$)

1. -0.372°C
2. -0.520°C
3. $+0.372^\circ\text{C}$
4. -0.570°C

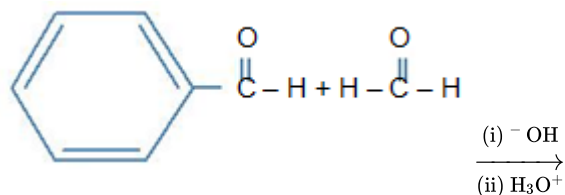
143.

Which of these is a hypnotic drug?

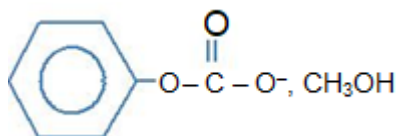
1. Metaldehyde
2. Acetaldehyde
3. Paraldehyde
4. None of these

144.

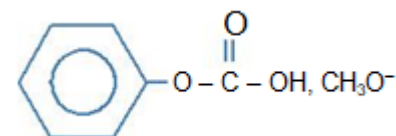
What are the products of the following crossed Cannizzaro reactions



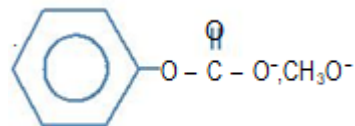
1.



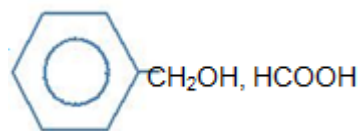
2.



3.



4.



145.

Which of the following polymer is addition as well as copolymer?

1. PHBV
2. PVC
3. Buna-S
4. Neoprene

146.

The chemical formula of 'laughing gas' is

1. NO
2. N₂O
3. N₂O₄
4. N₂O₅

147.

The depressant NaCN

1. Used to separate PbS from ZnS by forming a complex with PbS
2. Used to separate PbS from ZnS by forming a complex with ZnS
3. Used to form froth
3. Used as the collector

148.

The charge of As_2S_3 sol is due to the absorbed

1. H⁺
2. OH⁻
3. O⁻²
4. S⁻²

149.

Which of the following complex ions is diamagnetic in nature?

1. $[Ni(CN)_4]^{2-}$
2. $[CuCl_4]^{2-}$
3. $[CoF_6]^{3-}$
4. $[NiCl_4]^{2-}$

150.

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

Physics - Section A

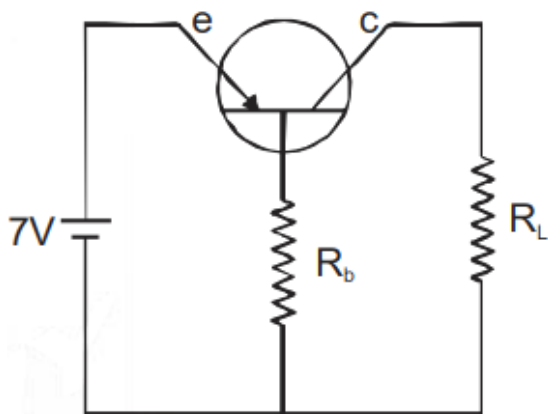
151.

A superconducting loop of radius R has self inductance L . A uniform and constant magnetic field B is applied perpendicular to the plane of the loop. Initially current in this loop is zero. The loop is rotated by 180° . The current in the loop after rotation is equal to-

1. Zero
2. $\frac{B\pi R^2}{L}$
3. $\frac{2B\pi R^2}{L}$
4. $\frac{B\pi R^2}{2L}$

152.

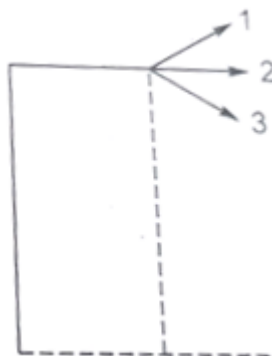
In the given transistor circuit, the base current is $35 \mu\text{A}$. The value of R_b is (Take $V_{BE} = 0$):-



1. $100 \text{ k}\Omega$
2. $200 \text{ k}\Omega$
3. $300 \text{ k}\Omega$
4. $400 \text{ k}\Omega$

153.

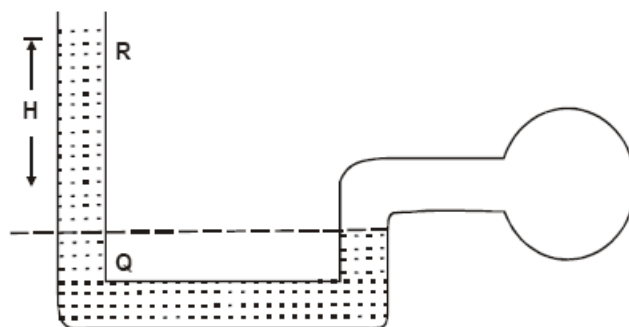
Three balls are thrown from the top of a building with equal speeds at different angles. When the balls strike the ground, their speeds are v_1, v_2 and v_3 respectively, then:



1. $v_1 > v_2 > v_3$
2. $v_3 > v_2 = v_1$
3. $v_1 = v_2 = v_3$
4. $v_1 < v_2 < v_3$

154.

A mercury-filled U-tube arrangement is connected to a bulb containing gas. Atmosphere pressure is $1.012 \times 10^5 \text{ Pa}$ and $H = 0.05 \text{ m}$. Gauge pressure at R is?



1. gauge pressure at R is nil
2. gauge pressure at R is $6.56 \times 10^3 \text{ Pa}$
3. gauge pressure at R is $1.08 \times 10^5 \text{ Pa}$
4. pressure at R, Q, and inside bulb are the same.

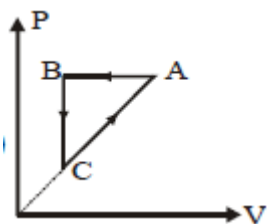
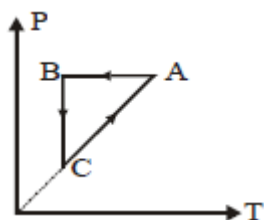
155.

At a pressure of 24×10^5 dyne/cm², the volume of O₂ is 10 litre and mass is 20g. The r.m.s velocity will be—

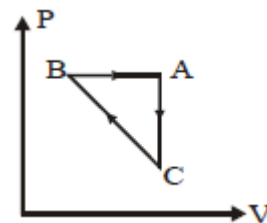
1. 800 m/s
2. 400 m/s
3. 600 m/s
4. Data is incomplete

156.

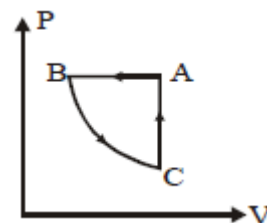
ABCA is a cyclic process. Its P-V graph would be—



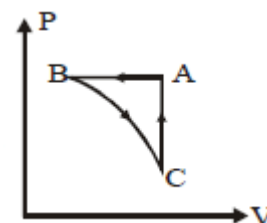
1.



2.



3.



4.

157.

When x amount of heat is given to a gas at constant pressure, it performs $\frac{x}{3}$ amount of work. The average number of degrees of freedom per molecule of the gas is—

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

158.

A fish is a little away below the surface of a lake. If the critical angle is 49° , then the fish could see things above the water surface within an angular range of θ° where,

1. $\theta = 49^\circ$
2. $\theta = 90^\circ$
3. $\theta = 98^\circ$
4. $\theta = 24\frac{1}{2}^\circ$

159.

In Young's double-slit experiment, the ratio of intensities of bright and dark fringes is 9. This means that

1. The intensities of individual sources are 5 and 4 units respectively
2. The intensities of individual sources are 4 and 1 units respectively
3. The ratio of their amplitudes is 3
4. The ratio of their amplitudes is 6

160.

The transition from the state $n = 3$ to $n = 1$ in a hydrogen-like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition from :

1. $4 \rightarrow 2$
2. $4 \rightarrow 3$
3. $2 \rightarrow 1$
4. $3 \rightarrow 2$

161.

A body takes 10 minutes to cool from 50°C to 40°C . If the temperature of the surroundings is 20°C , the temperature of body in the next 10 minutes is:

1. 39°C
2. 30°C
3. 34°C
4. 25°C

162.

The energy required to move a satellite of mass m from an orbit of radius $2R$ to $3R$ around earth of mass M is

1. $\frac{GMm}{12R}$
2. $\frac{GMm}{R}$
3. $\frac{GMm}{8R}$
4. $\frac{GMm}{2R}$

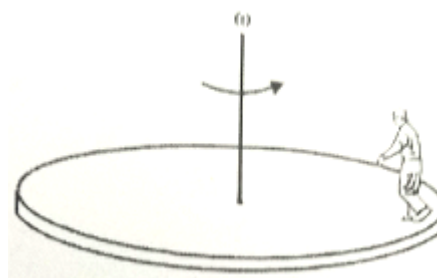
163.

A wave traveling along the x -axis is described by the equation $y(x, t) = 0.005 \cos(\alpha x - \beta t)$. If the wavelength and the time period of the wave are 0.08 m and 2.0 s , respectively, then α and β in appropriate units are :

1. $\alpha = 25.00 \pi, \beta = \pi$
2. $\alpha = \frac{0.08}{\pi}, \beta = \frac{2.0}{\pi}$
3. $\alpha = \frac{0.04}{\pi}, \beta = \frac{1.0}{\pi}$
4. $\alpha = 12.50 \pi, \beta = \frac{\pi}{2.0}$

164.

A child is standing on the edge of a merry-go-round that has the shape of a disk as shown in the figure. The mass of the child is 40 kilograms . The merry-go-round has a mass of 200 kilograms and a radius of 2.5 meters , and it is rotating with an angular velocity of $\omega = 2.0 \text{ radians per second}$. The child then walks slowly towards the center of the merry-go-round. When the child reaches the center, what is the angular velocity of the disc? (The size of the child can be neglected.)



1. 2.0 rad/s
2. 2.2 rad/s
3. 2.4 rad/s
4. 2.8 rad/s

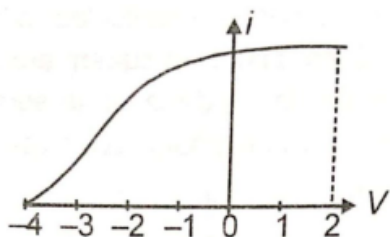
165.

A potential barrier of 0.50 V exists across a P-N junction. If the depletion region is $5.0 \times 10^{-7} \text{ m}$ wide, the intensity of the electric field in this region is

1. $1.0 \times 10^6 \text{ V/m}$
2. $1.0 \times 10^5 \text{ V/m}$
3. $2.0 \times 10^5 \text{ V/m}$
4. $2.0 \times 10^6 \text{ V/m}$

166.

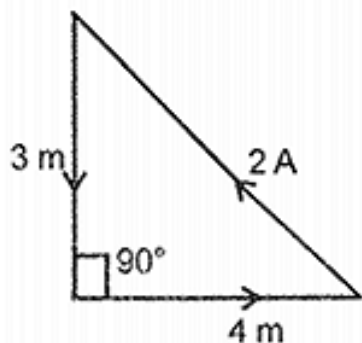
In the given graph of the photoelectric experiment, the maximum energy of emitted photoelectron will be:



1. 2 eV
2. 0 eV
3. 4 eV
4. 4 J

167.

What is the magnetic moment of the current loop shown below?



1. 24 Am^2
2. 12 Am^2
3. 6 Am^2
4. Zero

168.

A conducting wire stretched by 10%. The percentage change in its resistance is

1. 21% increases
2. 21% decreases
3. 10% increases
4. 9.09% increases

169.

The heat produced in a 1000 W heater in 4.2 minutes will be about

1. $4.2 \times 10^3 \text{ J}$
2. $2.52 \times 10^4 \text{ cal}$
3. $6 \times 10^4 \text{ cal}$
4. $4.2 \times 10^4 \text{ J}$

170.

In case of a compound microscope the image formed by the objective lens is

1. Virtual, erect and diminished
2. Real, erect and magnified
3. Virtual, inverted and enlarged
4. Real, inverted and enlarged

171.

If the kinetic energy of the electron doubles, its de-Broglie wavelength changes to the factor

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

172.

Raindrops are falling with speed v vertically down and a man is running on a horizontal road with speed u . The magnitude of the velocity of the raindrops with respect to the man is:

1. $v - u$
2. $v + u$
3. $\sqrt{\frac{v^2 + u^2}{2}}$
4. $\sqrt{v^2 + u^2}$

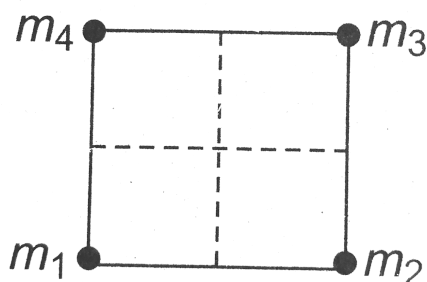
173.

For a dipole, $q = 2 \times 10^{-6} \text{ C}$ and $d = 0.01 \text{ m}$, if $E = 5 \times 10^5 \text{ N/C}$, then the maximum torque for this dipole is:-

1. $1 \times 10^{-3} \text{ Nm}^{-1}$
2. $10 \times 10^{-3} \text{ Nm}^{-1}$
3. $10 \times 10^{-3} \text{ Nm}$
4. $1 \times 10^{-2} \text{ Nm}^{-2}$

174.

Four particles of mass $m_1 = 2m$, $m_2 = 4m$, $m_3 = m$, and m_4 are placed at four corners of a square. What should be the value of m_4 so that the center of mass of all the four particles is exactly at the center of the square?



1. $2m$
2. $8m$
3. $6m$
4. None of these

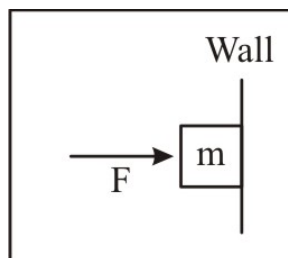
175.

If a particle has negative velocity and negative acceleration, its speed

1. increases
2. decreases
3. remains the same
4. zero

176.

An object of mass m is held against a vertical wall by applying horizontal force F as shown in the figure. The minimum value of the force F is:



1. Less than mg
2. Equal to mg
3. Greater than mg
4. Cannot determine

177.

A ball of mass 1 kg and another of mass 2 kg are dropped from a tall building whose height is 80 m . After, a fall of 40 m each towards Earth, their respective kinetic energies will be in the ratio of:

1. $\sqrt{2} : 1$
2. $1 : \sqrt{2}$
3. $2 : 1$
4. $1 : 2$

178.

If a wire is stretched to double of its original length, then the strain in the wire is

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

179.

The graph between volume and temperature in Charles' law is

1. an ellipse
2. a circle
3. a straight line
4. a parabola

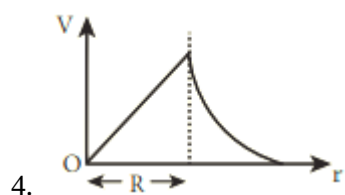
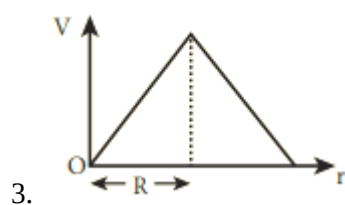
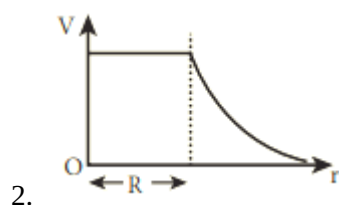
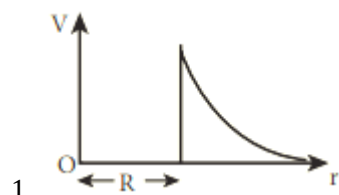
180.

In a simple harmonic oscillation, the graph of acceleration against displacement for one complete oscillation will be

1. an ellipse
2. a circle
3. a parabola
4. a straight line

181.

A thin conducting spherical shell of radius R has a charge Q which is uniformly distributed on its surface. The correct plot for electrostatic potential due to this spherical shell is:



182.

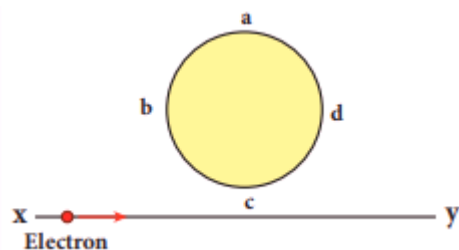
An electron moves in a straight line inside a charged parallel plate capacitor of uniform charge density σ . The time taken by the electron to cross length l in parallel plate capacitor undeflected when the plates of the capacitor are kept under a constant magnetic field of induction \vec{B} is:



1. $\epsilon_0 \frac{e l B}{\sigma}$
2. $\epsilon_0 \frac{l B}{\sigma l}$
3. $\epsilon_0 \frac{l B}{e \sigma}$
4. $\epsilon_0 \frac{l B}{\sigma}$

183.

An electron moves on a straight-line path XY as shown in the figure. The coil abcd is adjacent to the path of the electron. What will be the direction of current, if any, induced in the coil?



1. The current will reverse its direction as the electron goes past the coil
2. No current will be induced
3. abcd
4. adcb

184.

If $x = 10.0 \pm 0.1$ and $y = 10.0 \pm 0.1$, then $2x - 2y$ with consideration of significant figures is equal to

1. Zero
2. 0.0 ± 0.1
3. 0.0 ± 0.2
4. 0.0 ± 0.4

185.

A magnetic dipole is placed at right angles to the direction of lines of force of magnetic field B . If it is rotated through an angle of 180° , then the work done is-

1. $2MB$
2. MB
3. $-2MB$
4. Zero

Physics - Section B

186.

Assertion : An isolated system consists of two particles of equal masses $m=10$ gm and charges $q_1 = +1\mu\text{C}$ and $q_2 = -1\mu\text{C}$ as shown in figure. The initial separation of both charges is $l=1$ m. Both the charges are given initial velocities $v_1 = 1$ m/s and $v_2 = 2$ m/s towards right. Then the maximum separation between the charges is infinite.



Reason : The total energy (Kinetic energy + electrostatic potential energy) of given two particle system is positive and initial velocity of separation is positive.

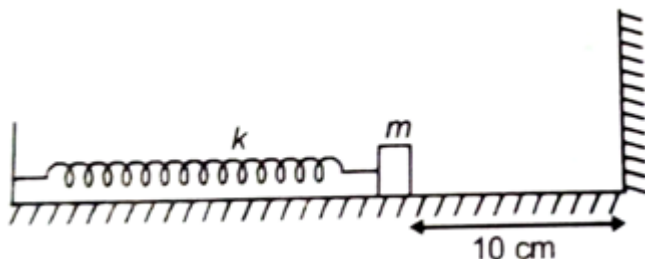
187.

Suppose a voltmeter of resistance 660Ω reads the voltage of a very old cell to be 1.32 volt while a potentiometer reads its voltage to be 1.44 volt. The internal resistance of the cell is:-

1. 30Ω
2. 60Ω
3. 6Ω
4. 0.6Ω

188.

A block of mass m is connected with a spring of spring constant k and placed on a smooth horizontal surface as shown in the figure. The block is then moved to compress the spring by $10\sqrt{2}$ cm and then released. The collision between block and the wall is elastic. The time period of oscillation is-



- (1) $\frac{3\pi}{4} \sqrt{\frac{m}{k}}$
- (2) $\frac{3\pi}{2} \sqrt{\frac{m}{k}}$
- (3) $\pi \sqrt{\frac{m}{k}}$
- (4) $\frac{\pi}{2} \sqrt{\frac{m}{k}}$

189.

A body of density 0.7 gm/cm^3 floats on a lake of water. The fraction of the body which is outside water is-

1. 30%
2. 70%
3. 25%
4. 50%

190.

In front of a mirror, a ball is projected at an acute angle θ with a horizontal toward the mirror as shown. The motion of the image of the ball w.r.t. the ball:



1. Must be a straight line and horizontal
2. Maybe a straight line depending on the value of θ
3. Is parabolic
4. is a straight line and vertical

191.

In modified Ampere's law, $\oint \vec{B} \cdot d\vec{l} = \mu_0 (i + i_d)$
 i and i_d are conduction current and displacement current respectively :

1. $i > i_d$
2. $i < i_d$
3. $i = i_d$
4. $i = \frac{i_d}{2}$

192.

An ammeter of resistance 20Ω measures upto 50 mA. The value of shunt required in parallel to measure current upto 5 A is nearly

1. 0.1Ω
2. 0.2Ω
3. 0.02Ω
4. 0.01Ω

193.

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

194.

If the half-life of a radioactive substance is 10 hours, then its mean life is:

1. 14.4 h
2. 7.2 h
3. 20 h
4. 6.93 h

195.

Two bullets are fired simultaneously horizontally and at different speeds from the same place. Which bullet will hit the ground first? (Air resistance is neglected)

1. The faster one
2. The slower one
3. Depends on masses
4. Both will reach simultaneously

196.

In an experiment, the height of an object measured by vernier callipers having the least count of 0.01 cm is found to be 5.72 cm. When no object is there between jaws of vernier callipers, the reading of the main scale is 0.1 cm and the reading of the vernier scale is 0.3 mm. Find the correct height of the object:

1. 5.72 cm
2. 5.59 cm
3. 5.85 cm
4. 5.69 cm

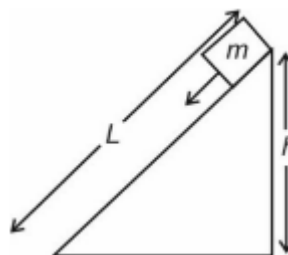
197.

A uniform block of mass m resting on a rough horizontal plane just starts moving when pulled by a string with a force of magnitude mg making an angle of 45° with the horizontal. Then the block will move if it is

1. pulled by a horizontal force of magnitude mg .
2. pulled by a force of magnitude mg making an angle of 30° with the horizontal.
3. pushed by a force of magnitude mg making an angle of 45° with the horizontal.
4. pulled by a force of magnitude mg making an angle of 60° with the horizontal.

198.

A body of mass m is released from the top of a fixed rough inclined plane as shown in the figure. If the frictional force has magnitude F , then the body will reach the bottom with a velocity: ($L = \sqrt{2}h$)



1. $\sqrt{2gh}$
2. $\sqrt{\frac{2Fh}{m}}$
3. $\sqrt{2gh + \frac{2Fh}{m}}$
4. $\sqrt{2gh - \frac{2\sqrt{2}Fh}{m}}$

199.

Two solid spheres each of mass M and radius $R/2$ are connected with a rod of mass M , connected to their surfaces normally, as shown in the figure. The moment of inertia of the system about an axis passing through the center of one of the spheres and perpendicular to the rod will be (center to center distance of the spheres is $2R$)



1. $\frac{317}{60}MR^2$
2. $\frac{1}{5}MR^2$
3. $\frac{2}{5}MR^2$
4. MR^2

200.

A boy standing on a stationary lift (open from above) throws a ball upwards with the maximum initial speed he can, equal to 49 m s^{-1} . How much time does the ball take to return to his hands?

1. 5 s
2. 10 s
3. 15 s
4. 7 s

[Fill OMR Sheet*](#)

*If above link doesn't work, please go to test link from where you got the pdf and fill OMR from there

[Click here](#) to start your free trial for a NEETprep course.