1.

Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following :

1. Tyloses in vessels

2. closure of stomata

3. Flaccidity of bulliform cells

4. Shrinkage of air spaces in spongy mesophyll

2.

What triggers activation of protoxin to active Bt toxin of Bacillus thuringiensis in boll worm?

1. Acidic pH of stomach

2. Body temperature

3. Moist surface of midgut

4. Alkaline pH of gut

3.

Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus :

1. Mangifera Indica

2. Mangifera indica Car. Linn.

3. *Mangifera indica* Linn.

4. Mangifera indica

4.

Cells in G_0 phase:

1. terminate the cell cycle

2. exit the cell cycle

3. enter the cell cycle

4. suspend the cell cycle

5.

Phloem in gymnosperms lacks:

1. Bothe sieve tubes and companion cells

2. Albuminous cells and sieve cells

3. Sieve tubes only

4. Companion cells only

6.

Which of the following contraceptive methods do involve a role of hormone?

1. Pills, Emergency contraceptives, barrier methods

2. Lactational amenorrhea, Pills, Emergency contraceptives

3. Barrier method, Lactational amenorrhea, pills

4. CuT, Pills, Emergency contraceptives

7.

Which of the following statements is incorrect?

1. Yeasts have filamentous bodies with long thread-like hyphae

2. Morels and truffles are edible delicacies

3. Claviceps is a source of many alkaloids and LSD

4. Conidia are produced exogenously and ascopores endogenously

8.

It takes very long time for pineapple plants to produce flowers. Which combination of hormones can be applied to artificially induce flowering in pineapple plants throughout the year to increase yield?

1. Cytokinin and Abscisic acid

2. Auxin and Ethylene

3. Gibberellin and Cytokinin

4. Gibberellin and Abscisic acid

9.

Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by:

1. Phosphofructokinase

2. Aldolase

3. Hexokinase

4. Enolase

10.

Consider following features:

(a) Organ system level of organisation

(b) Bilateral symmetry

(c) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics.

1. Annelida, Mollusca and Chordata

2. Annelida, Arthropoda and Chordata

3. Annelida, Arthropoda and Mollusca

4. Arthropoda, Mollusca and Chordata

11.

Which of the following muscular disorders is inherited?

1. Botulism

2. Tetany

3. Muscular dystrophy

4. Myasthenia gravis

12.

The Earth Summit held in Rio de Janeiro in 1992 was called:

1. for immediate steps to discontinue use of CFCs that were damaging the ozone layer

2. to reduce CO_2 emissions and global warming

3. for conservation of biodiversity and sustainable utilization of its benefits

4. to asess threat posed to native species by invasive weed species

13.

Which of the following can be used as biocontrol agent in the treatment of plant disease?

1. Lactobacillus

2. Trichoderma

3. Chlorella

4. Anabaena

14.

Extrusion of second polar body from egg nucleus occurs:

1. simultaneously with first cleavage

2. after entry of sperm but before fertilization

3. after fertilization

4. before entry of sprm into ovum

15.

Xylem translocates:

1. Water, minerals salts, some nitrogen and hormones

2. Water only

3. Water and mineral salts only

4. Water, mineral and some organic nitrogen only

16.

The concept of "*Omnis cellula-e-cellula*" regarding cell division was first proposed by:

1. Aristotle

2. Rudolf Virchow

3. Theodore Schwann

4. Schleiden

17.

Which of the following glucose transporters is insulin-dependent?

1. GLUT IV

2. GLUT I

3. GLUT II

4. GLUT III

18.

Which of the following statements is correct?

1. Cornea consists of dense matrix of collagen and is the most sensitive portion of the eye.

2. Cornea is an external, transparent and protective proteinacious covering of the eye-ball

3. Cornea consists of dense connective tissue of elastin and can repair itself

4. Cornea is convex, transparent layer which is highly vascularised

19.

Match the following genes of Lac operon with their respective products :

(a)	i gene	(i)	β -galactosidase
(b)	Z gene	(ii)	Permease
(c)	A gene	(iii)	Repressor
(d)	Y gene	(iv)	transacetylase

Select the correct option

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

20.

Respiratory Quotient (RQ) value of tripalmitin is:

1. 0.09
2. 0.9
3. 0.7
4. 0.007

21.

Which of the following statements regarding mitochondria is incorrect ?

1. Mitochondrial matrix contains single circular DNA molecule and ribosomes
2. Outer membranes is permeable to monomers of carbohydrates, fats and proteins
3. Enzymes of electron transport are embedded in outer membrane
4. Inner membrane is convoluted with infoldings

22.

The shorter and longer arms of submetacentric chromosome are referred to as:

1. m-arm and n-arm respectively
2. s-arm and l-arm respectively
3. p-arm and q-arm respectively
4. q-arm and p-arm respectively

23.

Purines found both in DNA and RNA are:

1. Cytosine and thymine
2. Adenine and thymine
3. Adenine and guanine
4. Guanine and cytosine

24.

Which of these following methods is the most suitable for disposal of nuclear waste?

1. Bury the waste within rocks deep below the Earth's surface
2. Shoot the waste into space
3. Bury the waste under Antarctic ice-cover
4. Dump the waste within rocks under deep ocean

25.

The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in:

1. Bronchioles and Fallopian tubes
2. Bile duct and Bronchioles
3. Fallopian tubes and Pancreatic duct
4. Eustachian tube and salivary duct

26.

Variations caused by mutation, as proposed by Hugo de Vries, are:

1. small and directionless
2. random and directional
3. random and directionless
4. small and directional

27.

How does steroid hormone influence the cellular activities?

1. Using aquaporin channels as second messenger

2. Changing the permeability of the cell membrane

3. Binding the DNA and forming a gene-hormone complex

4. Activating cyclic AMP located on the cell membrane

28.

In Antirrhinum (Snapdragon), a red flower was crossed with a white flower and in F_1 generation, pink flowers were obtained. When pink flowers were selfed, the F_2 generation showed white, red and pink flowers. Choose the incorrect statement from the following:

1. Law of Segregation does not apply in this experiment

2. This experiment does not follow the Principle of Dominance

3. Pink colour in F_1 is due to incomplete dominance

4. Ratio of F_2 is 1/4(red):2/4(pink):1/4(white)

29.

Placentation, in which ovules develop on the inner wall of the ovary or in peripheral part, is:

1. Free central

2. basal

3. Axile

4. Parietal

30.

Select the correct group of biocontrol agents

1. Nostoc, Azospirillium, Nucleopolyhedrovirus

2. Bacillus thuringiensis. Tobacco mosaic virus, Aphids

3. Trichoderma, Baculovirus, Bacillus thuringiensis

4. Oscilatoria, Rhizobium, Trichoderma

31.

The correct sequence of phases in cell cycle is:

1. $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$

2. $M \rightarrow G_1 \rightarrow G_2 \rightarrow S$

3. $G_1 \rightarrow G_2 \rightarrow S \rightarrow M$

4. $S \rightarrow G_1 \rightarrow G_2 \rightarrow M$

32.

Which part of the brain is responsible for thermoregulation?

1. Medulla oblongata

2. Cerebrum

3. Hypothalamus

4. Corpus callosum

33.

Which one of the following is not a method of in situ conservation of biodiversity?

1. Sacred Grove

2. Biosphere Reserve

3. Wildlife Sanctuary

4. Botanical Garden

34.

Which of the following pairs of gases is mainly responsible for green house effect?

1. Carbon dioxide and methane

2. Ozone and Ammonia

3. Oxygen and Nitrogen

4. Nitrogen and Sulphur dioxide

35.

Persistent nucellus in the seed is known as :

1. Tegmen

2. Chalaza

3. Perisperm

4. Hilum

36.

Match the Column I and Column II

	Column-I		Column-II
(a)	P-waves	(i)	Depolarisation of ventricles
(b)	QRS complex	(ii)	Repolarisation of ventricles
(c)	T-wave	(iii)	Coronary ischemia
(d)	Reduction in the size of T-wave	(iv)	Depolarisation of artria
		(v)	Repolarisation of atria

Select the correct option

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

37.

Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement

1. The enzyme recognizes a specific palindromic nucleotide sequence in the DNA

2. The enzyme cuts DNA molecules at identified position within the DNA

3. The enzyme binds DNA at specific sites and cuts only one of the two strands

4. The enzyme cuts the sugar-phosphate backbone at specific sites on each strand

38.

Which of the following is true for Golden rice?

1. It has yellow grains, because of gene introduced from a primitive variety of rice

2. It is Vitamin A enriched, with a gene from daffodil

3. It is pest resistant, with a gene from Bacillus thuringiensis

4. It is drought tolerant, developed using Agrobacterium vector

39.

Match the Column-I with Column-II

	Column-I		Column-II
(a)	Saprophyte	(i)	Symbiotic association of fungi with plant roots
(b)	Parasite	(ii)	Decomposition of dead organic materials
(c)	Lichens	(iii)	Living on living plants or animals
(d)	Mycorrhiza	(iv)	Symbiotic association algae and fungi

Choose the correct answer from the options given below:

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

40.

What would be the heart rate of a person if the cardiac output is 5L, blood volume in the ventricles at the end of diastole is 100 mL and at the end of ventricular systole is 50 mL?

1. 125 beats per minute

2. 50 beats per minute

3. 75 beats per minute

4. 100 beats per minute

41.

Which of the following statements is incorrect?

1. Prions consist of abnormally folded proteins

2. Viroids lack a protein cost

3. Viruses are obligate parasites

4. Infective consituent in viruses is the protein coat

42.

Match the following structures with their respective location in organs:

(a)	Crypts of Lieberkuhn	(i)	Pancreas
(b)	Glisson's Capsule	(ii)	Duodenum
(c)	Islets of Langerhans	(iii)	Small intestine
(d)	Bruunner's Glands	(iv)	Liver

Select the correct option from the following:

(a) (b) (c) (d)

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

43.

Which of the following immune responses is responsible for rejection of kidney graft?

1. Cell mediated immune response

2. Auto-immune response

3. Humoral immune response

4. Inflammatory immune response

44.

Identify the cells whose secretion protects the lining of gastro-intestinal tract from various enzymes

1. Duodenal cells

2. Chief cells

3. Goblet cells

4. Oxyntic cells

45.

Under which of the following conditions will there be no change in the reading frame of the following mRNA?

5'AACAGCGGUGCUAUU 3'

1. Deletion of GGU from 7th, 8th and 9th positions

2. Insertion of G at 5th position

3. Deletion of G from 5th position

4. Insertion of A and G at 4th and 5th positions respectively

46.

Which of the following is a commercial blood cholesterol lowering agent?

1. Lipase

2. Cyclosporin A

3. Statin

4. Streptokinase

47.

Select the incorrect statement.

1. Human males have one of their sex-chromosome much shorter than the other.

2. Male fruit fly is heterogametic.

3. In male grasshoppers, 50% of sperms have no sex-chromosome.

4. In domesticated fowls, sex of progeny depends on the type of sperm rather than egg.

48.

Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?

1. 2700 mL

2. 1500 mL

3. 1700 mL

4. 2200 mL

49.

Select the correct sequence for transport of sperm cells in male reproductive system.

1. Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus

2. Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra

3. Seminiferous tubules → Rete testis → Vesa efferentia → Epididymus → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus

4. Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra

50.

Colostrum, the yellowish fluid, secreted by mother during the initial days of lactation is very essential to impart immunity to the newborn infants because it contains:

1. Immunoglobulin A

2. Natural killer cells

3. Monocytes

4. Macrophages

51.

In some plants, the female gamete develops into embryo without fertilization. This phenomenon is known as:

1. Parthenogenesis

2. Autogamy

3. Parthenocarpy

4. Syngamy

52.

Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.

1. Salmonella typhi/Widal test

2. Plasmodium vivax/UTI test

3. Streptococcus pneumoniae/Widal test

4. Salmonella typhi/Anthrone test

53.

Expressed Sequence Tags (ESTs) refers to:

1. Novel DNA sequence

2. Genes expressed as RNA

3. Polypeptide expression

4. DNA polymorphsim

54.

Match the following hormones with the respective disease:

(a)	Insulin	(i)	Addison's disease
(b)	Thyroxin	(ii)	Diabetes insipidus
(c)	Corticoids	(iii)	Acromegaly
(d)	Growth Hormone	(iv)	Goitre
		(v)	Diabetes mellitus

Select the correct option.

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

55.

Which of the following factors is responsible for the formation of concentrated urine?

1. Hydrostatic pressure during glomerular filtration.

2. Low levels of antidiuretic hormone.

3. Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.

4. Secretion of erythropoietin by Juxtaglomerular complex.

56.

Select the hormone-releasing Intra-Uterine Devices.

1. Lippes Loop, Multitoad 375

2. Vaults, LNG-20

3. Multiload 375, Progestasert

4. Progestasert, LNG-20

57.

Match the following organism with their respective characteristics:

(a) Pila (i) Flame cells

(b) Bombyx (ii) Comb plates

(c) Pleurobrachia (iii) Radula

(d) Taenia (iv) Malpighian tubules

Select the correct option from the following:

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

58.

Which of the following sexually transmitted diseases is not completely curable?

1. Chlamydiosis
2. Gonorrhoea
3. Genital warts
4. Genital herpes

59.

Drug called 'Heroin' is synthesized by:

1. nitration of morphine
2. methylation of morphine
3. acetylation of morphine
4. glycosylation of morphine

60.

What is the site of perception of photoperiod necessary for induction of flowering in plants?

1. Leaves
2. Lateral buds
3. Pulvinus
4. Shoot apex

61.

A gene locus has two alleles A, a. If the frequency of dominant allele A is 0.4, then what will be the frequency of homozygous dominant, heterozygous and homozygous recessive individuals in the population?

1. 0.16 (AA); 0.36 (Aa); 0.48 (aa)
2. 0.36 (AA); 0.48 (Aa); 0.16 (aa)
3. 0.16 (AA); 0.24 (Aa); 0.36 (aa)
4. 0.16 (AA); 0.48 (Aa); 0.36 (aa)

62.

What map unit (Centimorgan) is adopted in the construction of genetic maps?

1. A unit of distance between genes on chromosomes, representing 50% cross over.
2. A unit of distance between two expressed genes, representing 10% cross over.
3. A unit of distance between two expressed genes, representing 100% cross over.
4. A unit of distance between genes on chromosomes. representing 1% cross over.

63.

Concanavalin A is:

1. a pigment
2. an alkaloid
3. an essential oil
4. a lectin

64.

Pinus seed cannot germinate and establish without fungal association. This is because:

1. its seeds contain inhibitors that prevent germination.
2. its embryo is immature.
3. it has obligate association with mycorrhizae.
4. it has very hard seed coat.

65.

The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by:

1. Sutton Boveri
2. T.H. Morgan
3. Gregor J. Mendel
4. Alfred Sturtevant

66.

In a species, the weight of newborn ranges from 2 to 5 kg. 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weights from 2 to 2.5 kg or 4.5 kg to 5 kg die. Which type of selection process is taking place?

1. Cyclical selection

2. Directional selection

3. Stabilizing selection

4. Disruptive selection

67.

Match the hominids with their correct brain size:

(a) Homo habilis (i) 900 cc

(b) Homo neanderthalensis (ii) 1250 cc

(c) Homo erectus (iii) 650-800 cc

(d) Homo sapiens (iv) 1400 cc

Select the correct option.

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

68.

Select the correct option.

1. There are seven pairs of vertebrosternal, three pairs of vertebrochondral and two pairs of vertebral ribs.

2. 8^{th}, 9^{th} and 10^{th} pairs of ribs articulate directly with the sternum.

3. 11^{th} and 12^{th} pairs of ribs are connected to the sternum with the help of hyaline cartilage.

4. Each rid is a flat thin bone and all the ribs are connected dorsally to the thoracic vertebrae and ventrally to the sternum.

69.

What is the direction of movement of sugars in phloem?

1. Bi-directional

2. Non-multidirectional

3. Upward

4. Downward

70.

Polyblend, a fine powder of recycled modified plastic, has proved to be a good material for:

1. making tubes and pipes

2. making plastic sacks

3. use as a fertilizer

4. construction of roads

71.

Which of the following ecological pyramids is generally inverted?

1. Pyramid of biomass in a sea

2. Pyramid of numbers in grassland

3. Pyramid of energy

4. Pyramid of biomass in a forest

72.

Use of an artificial kidney during hemodialysis may result in:

(a) Nitrogenous waste build-up in the body

(b) Non-elimination of excess potassium ions

(c) Reduced absorption of calcium ions from gastro-intestinal tract

(d) Reduced RBC production

Which of the following options is the most appropriate ?

1. (a) and (d) are correct

2. (a) and (b) are correct

3. (b) and (c) are correct

4. (c) and (d) are correct

73.

Which of the following pair of organelles does not contain DNA?

1. Nuclear envelope and Mitochondria

2. Mitochondria and Lysosomes

3. Chloroplast and Vacuoles

4. Lysosomes and vacuoles

74.

Which of the following is the most important cause for animals and plants being driven to extinction?

1. Alien species invasion

2. Habitat loss and fragmentation

3. Drought and floods

4. Economic exploitation

75.

What is the fate of the male gametes discharged in the synergid?

1. One fuses with the egg and other fuses with central cell nuclei

2. One fuses with the egg other(s) degenerate (s) in the synergid

3. All fuse with the egg

4. One fuses with the egg other (s) fuse(s) with synergid nucleus

76.

Which of the following protocols did aim for reducing emission of chlorofluorocarbons into the atmosphere?

1. Geneva protocol

2. Montreal protocol

3. Kyoto protocol

4. Gothenburg protocol

77.

Due to increasingg air-borne allergens and pollutants, many people in urban areas are suffering from resipratory disorder causing wheezing due to:

1. reduction in the secretion of surfactants by pneumocytes

2. benign growth on mucous lining of nasal cavity

3. inflammation of bronchi and bronchioles

4. profileration of fibrous tissues and damage of the alveolar walls

78.

From evolutionary point of view, retention of the female gametophyte with developing young embryo on the parent sporophyte for some time, is first observed in :

1. Gymnosperms

2. Liverworts

3. Mosses

4. Pteridophytes

79.

What is the genetic disorder in which an individual has an overall masculine development gynaecomastia, and is sterile?

1. Down's syndrome

2. Turner's syndrome

3. Klinefelter's syndrome

4. Edward syndrome

80.

Which of the following features of genetic code does allow bacteria to produce human insulin by recombinant DNA technology?

1. Genetic code is specific

2. Genetic code is not ambiguous

3. Genetic code is redundant

4. Genetic code is nearly universal

81.

Match the following :

(a)	Lactobacillus	(i)	Cheese
(b)	Saccharomyces cerevisiae	(ii)	Curd
(c)	Aspergillus niger	(iii)	Citric Acid
(d)	Acetobacter aceti	(iv)	Bread
		(v)	Acetic acid

Select the correct option

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

82.

DNA precipitation out of a mixture of biomolecules can be achieved by treatment with:

1. Chilled chloroform

2. isopropanal

3. Chilled ethanol

4. Methanol at room temperature

83.

Thiobacillus is a group of bacteria helpful in carrying out:

1. Denitrification

2. Nitrogen fixation

3. Chemoautotrophic fixation

4. Nitrification

84.

Which of the following statements is not correct?

1. Lysosomes are formed by the process of packaging in the endoplasmic reticulum.

2. Lysosomes have numerous hydrolytic enzymes

3. The hydrolytic enzyme of lysosomes are active under acidic pH

4. Lysosomes are membrane bound structure.

85.

Select the incorrect statement

1. Inbreeding helps in the accumulation of superior genes and the elimination of undesirable genes

2. Inbreeding is essential homozygosity

3. Inbreeding is essential to evolve purelines in any animal

4. Inbreeding selects harmful recessive genes that reduce fertility and productivity

86.

Select the correct sequence of organs in the ailmentary canal of cockroach starting from mouth:

1. Pharynx → Oesophagus → Ileum → Crop → Gizzard → Colon → Rectum

2. Pharynx → Oesophagus → Crop → Gizzard → Ileum → Colon → Rectum

3. Pharynx → Oesophagus → Gizzard → Crop → Ileum → Colon → Rectum

4. Pharynx → Oesophagus → Gizzard → Ileum → Crop → Colon → Rectum

87.

Consider the following statements:

(A) Coenzyme or metal ion that is tightly bound to enzyme protein is called prosthetic group

(B) A complete catalytic enzyme with its bound prosthetic group is called apoenzyme

Select the correct option

1. (A) is false but (B) is true

2. Both (A) and (B) are true

3. (A) is true but (B) is false

4. Both (A) and (B) are false

88.

Which of the statements given below is not true about the formation of Annual Rings in trees?

1. Annual rings are not prominent in trees of temperate regions.

2. Annual rings are a combination of spring wood and autumn wood produced in a year.

3. Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively.

4. Activity of cambium depends upon variation in climate.

89.

Which one of the following statements regarding post-fertilization development in flowering plants is incorrect?

1. Ovules develop into embryo sac

2. Ovary develops into fruit

3. Zygote develops into embryo

4. Central cell develops into endosperm

90.

Which of the following equipments is essentially required for growing microbes on a large scale for industrial production of enzymes?

1. Bioreactor

2. BOD incubator

3. Sludge digester

4. Industrial oven

91.

For the cell reaction $2\,Fe^{3+}(aq)+2I^{-}(aq) \rightarrow 2\,Fe^{2+}(aq)+I_2(aq)$

$E^{\ominus}_{cell} = 0.24\ V$ at $298\ K$. The standard Gibbs energy ($\Delta, G^{\ominus}$) of the cell reaction is: [Given that Faraday constant F = 96500 C mol^{-1}]

1. $23.16\ kJ\ mol^{-1}$

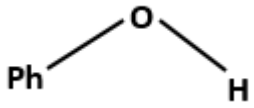
2. $-46.32\ kJ\ mol^{-1}$

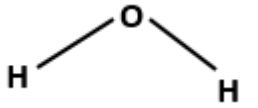
3. $-23.16\ kJ\ mol^{-1}$

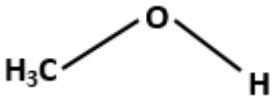
4. $46.32\ kJ\ mol^{-1}$

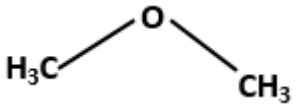
92.

The compound that is most difficult to protonate is:

1. 

2. 

3. 

4. 

93.

The manganate and permanganate ions are tetrahedral, due to:

1. The π-bonding involves overlap of d-orbitals of oxygen width d-orbitals of manganese

2. The π-bonding involves overlap of p-orbitals of oxygen with d-orbitals of manganese

3. There is no π-bonding

4. The π-bonding involves overlap of p-orbitals of oxygen with p-orbitals of manganese

94.

The correct order of the basic strength of methyl substituted amines in aqueous solution is:

1. $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$

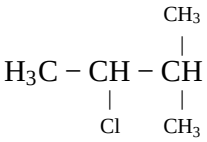
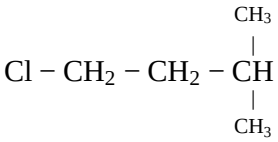
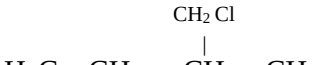
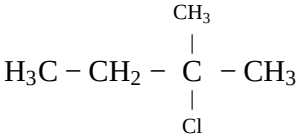
2. $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$

3. $(CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$

4. $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2$

95.

An alkene "A" on reaction with O_3 and $Zn - H_2O$ gives propanone and ethanal in equimolar ratio. Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is:

1. 
2. 
3. 
4. 

96.

For the second period elements the correct increasing order of first ionisation enthalpy is:

1. Li<Be<B<C<O<N<F<Ne
2. Li<Be<B<C<N<O<F<Ne
3. Li<B<Be<C<O<N<F<Ne
4. Li<B<Be<C<N<O<F<Ne

97.

A gas at 350 K and 15 bar has molar volume 20 percent smaller than that for an ideal gas under the same conditions. The correct option about the gas and its compressibility factor (Z) is:

1. Z<1 and repulsive forces are dominant
2. Z>1 and attractive forces are dominant
3. Z>1 and repulsive forces are dominant
4. Z<1 and attractive forces are dominant

98.

For a cell involving one electron $E^{\ominus}_{cell} = 0.59V$ at 298 K, the equilibrium constant for the cell reaction is: [Given that $\frac{2.303\ RT}{F} = 0.059\ V$ at T = 298 K]

1. 1.0×10^{30}
2. 1.0×10^{2}
3. 1.0×10^{5}
4. 1.0×10^{10}

99.

Which will make basic buffer:

1. 100 mL of 0.1 M HCl+100 mL of 0.1 M NaOH
2. 50 mL of 0.1 M NaOH+25 mL of 0.1 M CH_3COOH
3. 100 mL of 0.1 M CH_3COOH+100 mL of 0.1 M NaOH
4. 100 mL of 0.1 M HCl+200 mL of 0.1 M NH_4OH

100.

Which is the correct thermal stability order for H_2E(E = O, S, Se, Te and Po)?

1. $H_2Se < H_2Te < H_2Po < H_2O < H_2S$
2. $H_2S < H_2O < H_2Se < H_2Te < H_2\ Po$
3. $H_2O < H_2S < H_2Se < H_2Te < H_2\ Po$
4. $H_2Po < H_2Te < H_2Se < H_2S < H_2O$

101.

For an ideal solution, the correct option is:

1. $\Delta_{mix}\ G = 0$ at constant T and P
2. $\Delta_{mix}\ S = 0$ at constant T and P
3. $\Delta_{mix}\ V \neq 0$ at constant T and P
4. $\Delta_{mix}\ H = 0$ at constant T and P

102.

The biodegradable polymer is:

1. Buna-S
2. nylon-6, 6
3. nylon 2-nylon 6
4. nylon-6

103.

Enzymes that utilize ATP in phosphate transfer require an alkaline earth metal (M) as the cofactor. M is:

1. Sr
2. Be
3. Mg
4. Ca

104.

If the rate constant for a first order reaction is k, the time (t) required for the completion of 99% of the reaction is given by:

1. t=2.303/k
2. t=0.693/k
3. t=6.909/k
4. t=4.606/k

105.

Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory?

1. Be_2
2. O_2
3. N_2
4. C_2

106.

pH of a saturated solution of $Ca(OH)_2$ is 9. The solubility product (K_{sp}) of $Ca(OH)_2$ is:

1. 0.5×10^{-10}
2. 0.5×10^{-15}
3. 0.25×10^{-10}
4. 0.125×10^{-15}

107.

The mixture that forms maximum boiling azeotrope is:

1. Heptane+Octane
2. Water+Nitric acid
3. Ethanol +Water
4. Acetone+Carbon disulfide

108.

4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The correct option is:

1. 5f>6p>4d>5p
2. 5f>6p>5p>4d
3. 6p>5f>5p>4d
4. 6p>5f>4d>5p

109.

Which of the following is an amphoteric hydroxide?

1. $Be(OH)_2$
2. $Sr(OH)_2$
3. $Ca(OH)_2$
4. $Mg(OH)_2$

110.

Which of the following is incorrect statement?

1. SnF_4 is ionic in nature
2. PbF_4 is covalent in nature
3. $SiCl_4$ is easily hydrolysed
4. GeX_4 (X=F, Cl, Br, I) is more stable than GeX_2

111.

Under isothermal condition, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is: [Given that 1 L bar=100 J]

1. 30 J
2. -30 J
3. 5 kJ
4. 25 J

112.

The number of sigma (σ) and pi (π) bonds in pent-2-en-4-yne is:

1. 13 σ bonds and no π bond
2. 10 σ bonds and 3 π bonds
3. 8 σ bonds and 5 π bonds
4. 11 σ bonds and 2 π bonds

113.

Match the Xenon compounds in Coloumn-I with its structure in Column-II and assign the correct code:

	Column-I		Column-II
(a)	XeF_4	(i)	pyramidal
(b)	XeF_6	(ii)	square planar
(c)	$XeOF_4$	(iii)	distorted octahedral
(d)	XeO_3	(iv)	square pyramidal

Code:

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

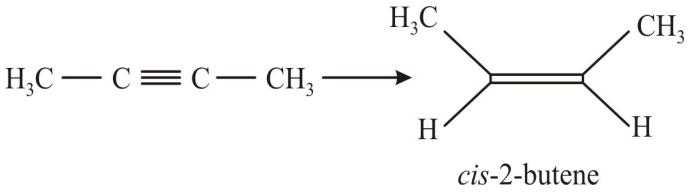
114.

In which case change in entropy is negative?

1. $2H(g) \rightarrow H_2(g)$
2. Evaporation of water
3. Expansion of a gas at constant temperature
4. Sublimation of solid to gas

115.

The most suitable reagent for the following conversion, is:

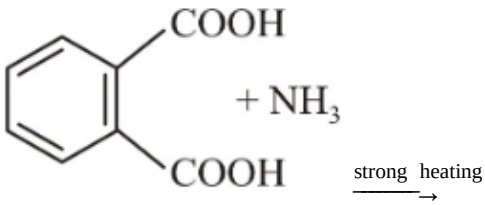


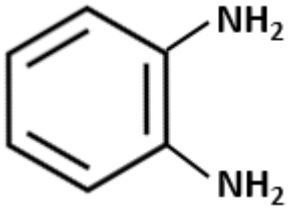
cis-2-butene

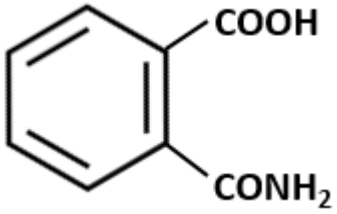
1. Hg^{2+}/H^+ , H_2O
2. Na/liquid NH_3
3. H_2, Pd/C, quinoline
4. Zn/HCl

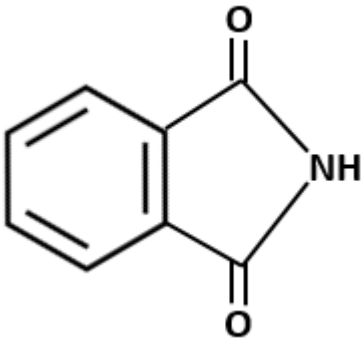
116.

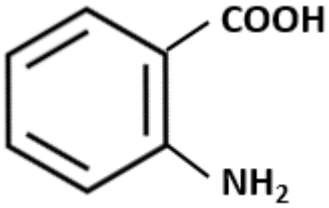
The major product of the following reaction is:



1. 

2. 

3. 

4. 

117.

Match the following:

(a) Pure nitrogen (i) Chlorine

(b) Haber process (ii) Sulphuric acid

(c) Contact process (iii) Ammonia

(d) Deacon's process (iv) Sodium azide or Barium azide

Which of the following is the correct option?

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

118.

Which of the following series of transitions in the spectrum of hydrogen atom falls in visible region?

1. Brackett series
2. Lyman series
3. Balmer series
4. Paschen series

119.

Among the following, the narrow spectrum antibiotic is:

1. chloramphenicol
2. penicillin G
3. ampicillin
4. amoxicillin

120.

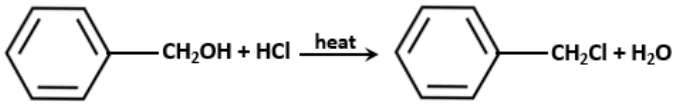
Which mixture of the solutions will lead to the formation of negatively charged colloidal $[AgI]I^-$ sol.?

1. 50 mL of 0.1 M $AgNO_3$ + 50 mL of 0.1 M KI
2. 50 mL of 1 M $AgNO_3$ + 50 mL of 1.5 M KI
3. 50 mL of 1 M $AgNO_3$ + 50 mL of 2 M KI
4. 50 mL of 2M $AgNO_3$ + 50 mL of 1.5 M KI

121.

Among the following, the reaction that proceeds through an electrophilic substitution, is:

1.



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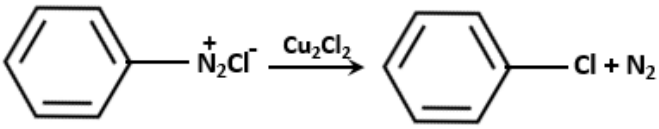

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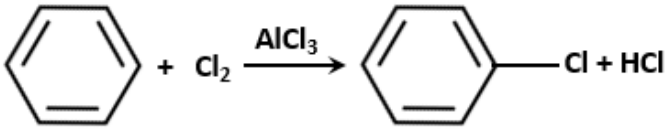
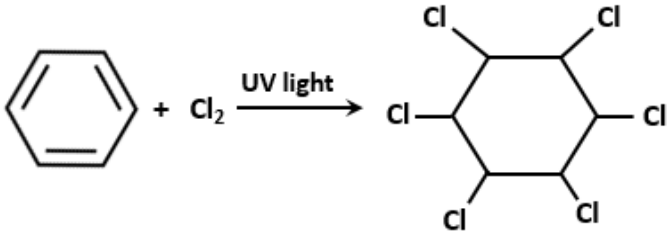
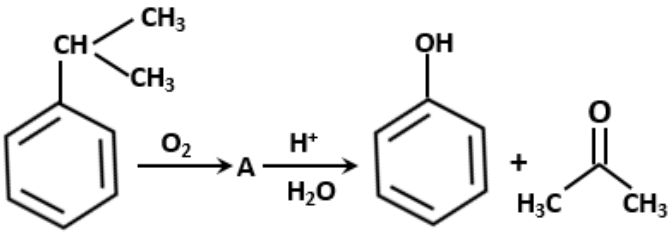


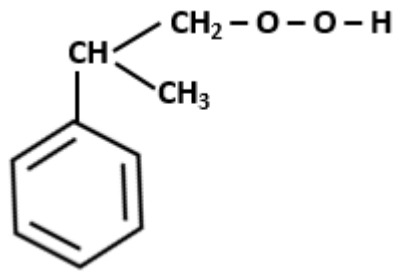
4.

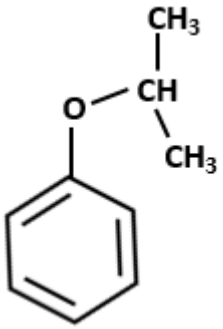


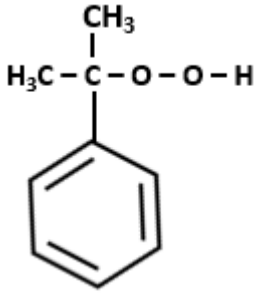
122.

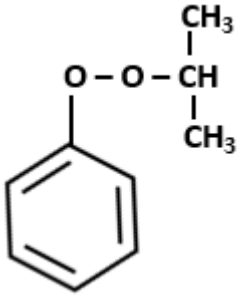
The structure of intermediate A in the following reaction is:



1. 

2. 

3. 

4. 

123.

What is the correct electronic configuration of the central atom in $K_4[Fe(CN)_6]$ based on crystal field theory?

1. $e^4\ t_2^2$
2. $t_{2g}^4\ e_g^2$
3. $t_{2g}^6\ e_g^0$
4. $e^3\ t_2^3$

124.

Among the following, the one that is not a green house gas is:

1. sulphur dioxide
2. nitrous oxide
3. methane
4. ozone

125.

Identify the incorrect statement related to PCl_5 from the following:

1. PCl_5 molecules is non-reactive
2. Three equatorial P − Cl bonds make an angle of 120° with each other
3. Two axial P − Cl bonds make an angle of 180° with each other
4. Axial P − Cl bonds are longer than equatorial P − Cl bonds

126.

Which one is malachite from the following?

1. $CuCO_3.Cu(OH)_2$
2. $CuFeS_2$
3. $Cu(OH)_2$
4. Fe_3O_4

127.

Which of the following species is not stable?

1. $[SiCl_6]^{2-}$
2. $[SiF_6]^{2-}$
3. $[GeCl_6]^{2-}$
4. $[Sn(OH)_6]^{2-}$

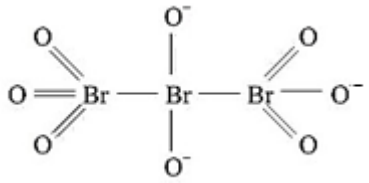
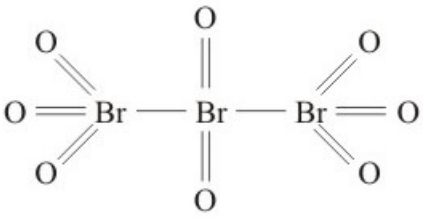
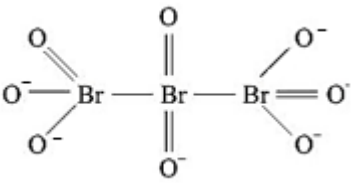
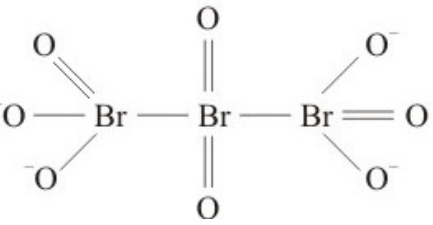
128.

A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. The formula of the compound is:

1. C_3A_4
2. C_2A_3
3. C_3A_2
4. C_4A_3

129.

The correct structure of tribromo octoxide is:

1. 
2. 
3. 
4. 

130.

The method used to remove temporary hardness of water is:

1. Synthetic resins method
2. Calgon's method
3. Clark's method
4. Ion-exchange method

131.

The non-essential amino acid among the following is:

1. lysine
2. valine
3. leucine
4. alanine

132.

The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is

1. 40
2. 10
3. 20
4. 30

133.

Which of the following reactions are disproportionation reaction?

(a) $2\,Cu^{+} \rightarrow Cu^{2+} + Cu^{0}$

(b) $3\,MnO_4^{2-} + 4H^{+} \rightarrow 2\,MnO_4^{-} + MnO_2 + 2H_2O$

(c) $2\,KMnO_4 \xrightarrow{\Delta} K_2\,MnO_4 + MnO_2 + O_2$

(d) $2\,MnO_4^{-} + 3\,Mn^{2+} + 2H_2O \rightarrow 5\,MnO_2 + 4H^{\oplus}$

Select the correct option from the following:

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

134.

For the chemical reaction $N_2(g)+3H_2(g) \rightleftharpoons 2\,NH_3(g)$ the correct option is:

1. $3\frac{d[H_2]}{dt} = 2\frac{d[NH_3]}{dt}$
2. $-\frac{1}{3}\frac{d[H_2]}{dt} = -\frac{1}{2}\frac{d[NH_3]}{dt}$
3. $-\frac{d[N_2]}{dt} = 2\frac{d[NH_3]}{dt}$
4. $-\frac{d[N_2]}{dt} = \frac{1}{2}\frac{d[NH_3]}{dt}$

135.

Conjugate base for Bronsted acids H_2O and HF are:

1. H_3O^+ and H_2F^+, respectively
2. OH^- and H_2F^+, respectively
3. H_3O^+ and F^-, respectively
4. OH^- and F^-, respectively

136.

The displacement of a particle executing simple harmonic motion is given by,

$y = A_0 + A \sin\omega t + B \cos\omega t$.

Then the amplitude of its oscillation is given by:

1. A + B
2. $A_0 + \sqrt{A^2 + B^2}$
3. $\sqrt{A^2 + B^2}$
4. $\sqrt{A_0^2 + (A + B)^2}$

137.

In which of the following devices, the eddy current effect is not used?

1. electric heater
2. induction furnace
3. magnetic braking in train
4. electromagnet

138.

The average velocity of a particle executing SHM in one complete vibration is:

1. zero
2. $\frac{A\omega}{2}$
3. $A\omega$
4. $\frac{A\omega^2}{2}$

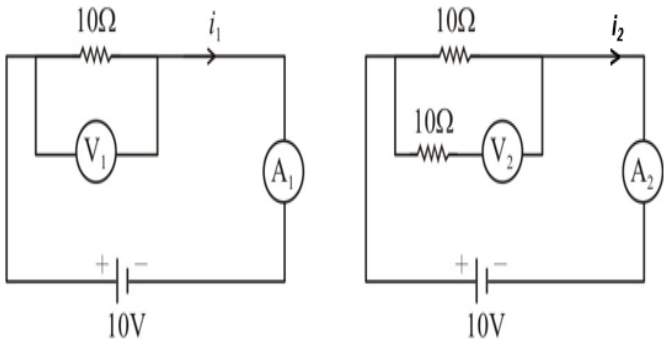
139.

The speed of a swimmer in still water is 20 m/s. The speed of river water is 10 m/s and is flowing due east. If he is standing on the south bank and wishes to cross the river along the shortest path, the angle at which he should make his stroke w.r.t north is given by:

1. 45° west of north
2. 30° west of north
3. 0° west of north
4. 60° west of north

140.

In the circuits shown below, the readings of the voltmeters and the ammeters will be:



1. $V_2 > V_1$ and $i_1 = i_2$
2. $V_2 = V_1$ and $i_1 > i_2$
3. $V_2 = V_1$ and $i_1 = i_2$
4. $V_2 > V_1$ and $i_1 > i_2$

141.

A copper rod of 88 cm and an aluminium rod of unknown length have an equal increase in their lengths independent of an increase in temperature. The length of the aluminium rod is : ($\alpha_{Cu} = 1.7 \times 10^{-5} K^{-1}$ and $\alpha_{Al} = 2.2 \times 10^{-5} K^{-1}$)

1. 68 cm
2. 6.8 cm
3. 113.9 cm
4. 88 cm

142.

The unit of thermal conductivity is:

1. W $m^{-1}K^{-1}$

2. J m K^{-1}

3. J $m^{-1}K^{-1}$

4. W m K^{-1}

143.

For a p-type semiconductor, which of the following statements is true?

1. Electrons are the majority carriers and pentavalent atoms are the dopants.

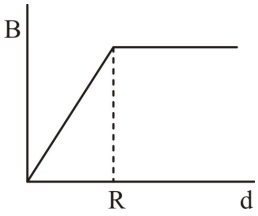
2. Electrons are the majority carriers and trivalent atoms are the dopants.

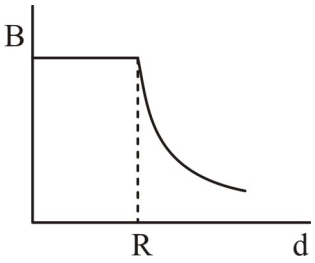
3. Holes are the majority carriers and trivalent atoms are the dopants.

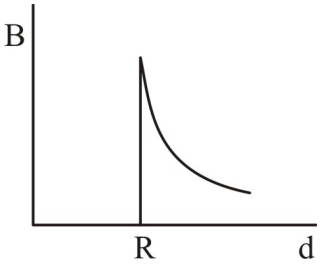
4. Holes are the majority carriers and pentavalent atoms are the dopants.

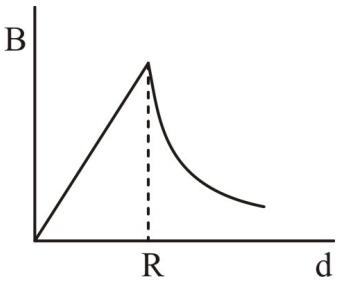
144.

A cylindrical conductor of radius R is carrying a constant current. The plot of the magnitude of the magnetic field, B with the distance d from the centre of the conductor is correctly represented by the figure:

1. 

2. 

3. 

4. 

145.

Body A of mass 4m moving with speed u collides with another body B of mass 2m, at rest. The collision is head-on and elastic in nature. After the collision the fraction of energy lost by the colliding body A is:

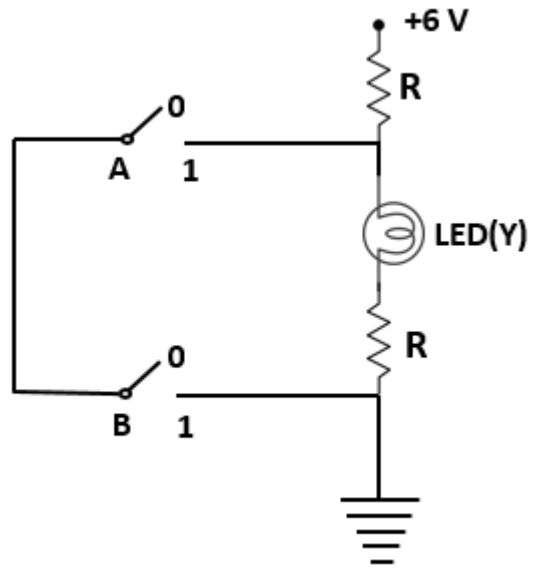
1. $\frac{5}{9}$

2. $\frac{1}{9}$

3. $\frac{8}{9}$

4. $\frac{4}{9}$

146.



The correct Boolean operation represented by the circuit diagram drawn is :

1. NOR

2. AND

3. OR

4. NAND

147.

When an object is shot from the bottom of a long smooth inclined plane kept at an angle of 60° with horizontal, it can travel a distance x_1 along the plane. But when the inclination is decreased to 30° and the same object is shot with the same velocity, it can travel x_2 distance. Then x_1: x_2 will be:

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

2. $1 : \sqrt{2}$

3. $\sqrt{2} : 1$

4. $1 : \sqrt{3}$

148.

The work done to raise a mass m from the surface of the earth to a height h, which is equal to the radius of the earth, is:

1. $\frac{3}{2}$mgR

2. mgR

3. 2mgR

4. $\frac{1}{2}$mgR

149.

The total energy of an electron in an atom in an orbit is -3.4eV. Its kinetic and potential energies are, respectively:

1. 3.4 eV, 3.4 eV

2. -3.4 eV, -3.4 eV

3. -3.4 eV, -6.8 eV

4. 3.4 eV, -6.8 eV

150.

In which of the following processes, heat is neither absorbed nor released by a system?

1. isochoric

2. isothermal

3. adiabatic

4. isobaric

151.

A hollow metal sphere of radius R is uniformly charged. The electric field due to the sphere at a distance r from the centre:

1. decreases as r increases for r < R and for r > R

2. increases as r increases for r < R and for r > R

3. zero as r increases for r < R, decreases as r increases for r > R

4. zero as r increases for r < R, increases as r increases for r > R

152.

Pick the wrong statement in the context with a rainbow.

1. Rainbow is a combined effect of dispersion, refraction, and reflection of sunlight.

2. When the light rays undergo two internal reflections in a water drop, a secondary rainbow is formed.

3. The order of colors is reversed in the secondary rainbow.

4. An observer can see a rainbow when his front is towards the sun.

153.

A small hole of an area of cross-section 2 mm^2 is present near the bottom of a fully filled open tank of height 2 m. Taking g= 10 m/s^2, the rate of flow of water through the open hole would be nearly:

1. 6.4×10^{-6} m^3/s

2. 12.6×10^{-6} m^3/s

3. 8.9×10^{-6} m^3/s

4. 2.23×10^{-6} m^3/s

154.

Which of the following acts as a circuit protection device?

1. fuse

2. conductor

3. inductor

4. switch

155.

Two point charges A and B, having charges +Q and -Q respectively. are placed at certain distance apart and force acting between them is F. If 25% charge of A is transferred to B, then force between the charges becomes:

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

2. F

3. $\frac{9F}{16}$

4. $\frac{16F}{9}$

156.

Which colour of the light has the longest wavelength?

1. violet

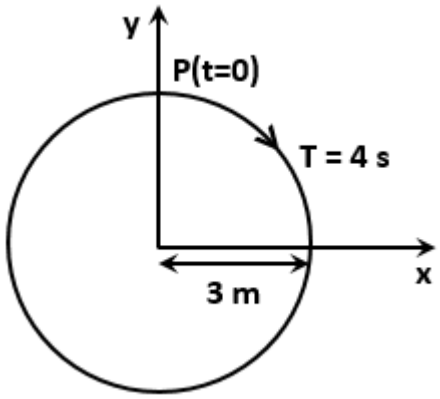
2. red

3. blue

4. green

157.

The radius of the circle, the period of revolution, initial position and sense of revolution are indicated in the figure.



y-projection of the radius vector of rotating particle P is:

1. $y(t)= 3 \cos(\frac{\pi t}{2})$, where y in m

2. $y(t)= -3 \cos 2\pi t$, where y in m

3. $y(t)= 4 \sin(\frac{\pi t}{2})$, where y in m

4. $y(t)= 3 \cos(\frac{3\pi t}{2})$, where y in m

158.

α-particle consists of:

1. 2 protons only

2. 2 protons and 2 neutrons only

3, 2 electrons, 2 protons, and 2 neutrons

4. 2 electrons and 4 protons only

159.

A solid cylinder of mass 2 kg and radius 4 cm is rotating about its axis at the rate of 3 rpm. The torque required to stop after 2π revolutions is:

1. 2×10^{6} N m

2. 2×10^{-6} N m

3. 2×10^{-3} N m

4. 12×10^{-4} N m

160.

In a double-slit experiment, when light of wavelength 400 nm was used, the angular width of the first minima formed on a screen placed 1 m away, was found to be 0.2 °. What will be the angular width of the first minima, if the entire experimental apparatus is immersed in water? (μ_{water} = 4/3)

1. 0.1°

2. 0.266°

3. 0.15°

4. 0.05°

161.

At a point A on the earth's surface the angle of dip, δ = +25°. At a point B on the earth's surface the angle of dip, δ = −25°. We can interpret that:

1. A and B are both located in the southern hemisphere.

2. A and B are both located in the northern hemisphere.

3. A is located in the southern hemisphere and B is located in the northern hemisphere.

4. A is located in the northern hemisphere and B is located in the southern hemisphere.

162.

A force F= 20+10y acts on a particle in the y-direction where F is in Newton and y in meter. Work done by this force to move the particle from y=0 to y= 1m is:

1. 20 J

2. 30 J

3. 5 J

4. 25 J

163.

When a block of mass M is suspended by a long wire of length L, the length of the wire becomes (L+l). The elastic potential energy stored in the extended wire is:

1. $\frac{1}{2}$MgL

2. Mgl

3. MgL

4. $\frac{1}{2}$Mgl

164.

A parallel plate capacitor of capacitance 20 μF is being charged by a voltage source whose potential is changing at the rate of 3 V/s. The conduction current through the connecting wires, and the displacement current through the plates of the capacitor, would be, respectively:

1. zero, zero

2. zero, 60μA

3. 60μA, 60μA

4. 60μA, zero

165.

A mass m is attached to a thin wire and whirled in a vertical circle. The wire is most likely to break when:

1. inclined at an angle of 60^0 from vertical

2. the mass is at the highest point

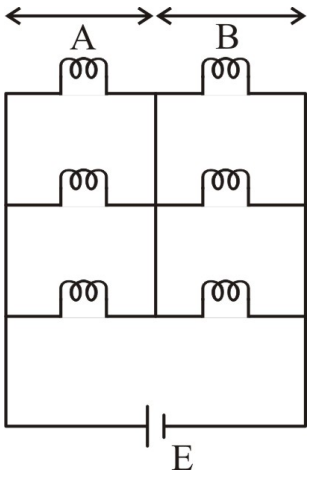
3. the wire is horizontal

4. the mass is at the lowest point.

166.

Six similar bulbs are connected as shown in the figure with a DC source of emf E and zero internal resistance.

The ratio of power consumption by the bulbs when (i) all are glowing and (ii) in the situation when two from section A and one from section B are glowing, will be:



1. 2: 1

2. 4: 9

3. 9: 4

4. 1: 2

167.

In total internal reflection when the angle of incidence is equal to the critical angle for the pair of media in contact, what will be angle of refraction?

1. 90°

2. 180°

3. 0°

4. equal to angle of incidence

168.

Two similar thin equi-convex lenses, of focal length f each, are kept coaxially in contact with each other such that the focal length of the combination is F_1. When the space between the two lenses is filled with glycerin which has the same refractive index ($\mu = 1.5$) as that of glass, then the equivalent focal length is F_2. The ratio $F_1 : F_2$ will be:

1. 3 : 4

2. 2 : 1

3. 1 : 2

4. 2 : 3

169.

Ionized hydrogen atoms and α-particles with same momenta enters perpendicular to a constant magnetic field, B. The ratio of their radii of their paths $r_H : r_\alpha$ will be:

1. 1 : 4

2. 2 : 1

3. 1 : 2

4. 4 : 1

170.

In an experiment, the percentage errors that occured in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4% respectively. Then the maximum percentage of error in the measurement of X, where $X = \frac{A^2B^{\frac{1}{2}}}{C^{\frac{1}{3}}D^3}$, will be:

1. 10%

2. $(\frac{3}{13})\%$

3. 16%

4. -10%

171.

A block of mass 10 kg is in contact against the inner wall of a hollow cylindrical drum of radius 1 m. The coefficient of friction between the block and the inner wall of the cylinder is 0.1. The minimum angular velocity needed for the cylinder which is vertical and rotating about its axis will be:
($g=10\ m/s^2$)

1. 10π rad/s

2. $\sqrt{10}\pi$ rad/s

3. $\frac{10}{2\pi}$ rad/s

4. 10 rad/s

172.

A 800 turn coil of effective area 0.05 m^2 is kept perpendicular to a magnetic field 5×10^{-5} T. When the plane of the coil is rotated by 90° around any of its coplanar axis in 0.1 s, the emf induced in the coil will be:

1. 0.02V

2. 2 V

3. 0.2 V

4. 2×10^{-3} V

173.

Two particles A and B are moving in uniform circular motion in concentric circles of radii r_A and r_B with speeds v_A and v_B respectively. Their time periods of rotation are same. The ratio of angular speed of A to that of B will be:

1. 1: 1

2. $r_A : r_B$

3. $v_A : v_B$

4. $r_B : r_A$

174.

A soap bubble, having a radius of 1 mm, is blown from a detergent solution having a surface tension of 2.5×10^{-2}N/m. The pressure inside the bubble equals at a point Z_0 below the free surface of the water in a container. Taking g= 10 m/s^2, density of water = $10^3 kg/m^3$, the value of Z_0 is:

1. 0.5 cm

2. 100 cm

3. 10 cm

4. 1 cm

175.

A body weighs 200 N on the surface of the earth. How much will it weigh halfway down to the centre of the earth?

1. 100 N

2. 150 N

3. 200 N

4. 250 N

176.

An electron is accelerated through a potential difference of 10,000 V. Its de-Broglie wavelength is, (nearly) : ($m_e = 9 \times 10^{-31}$kg)

1. 12.2 nm

2. 12.2×10^{-13}m

3. 12.2×10^{-12}m

4. 12.2×10^{-14}m

177.

Two parallel infinite line charges with linear charge densities $+\lambda$ C/m and $+\lambda$ C/m are placed at a distance R. Electric field mid-way between the two line charges is-

1. $\frac{\lambda}{2\pi\varepsilon_0 R}$ N/C

2. zero

3. $\frac{2\lambda}{\pi\varepsilon_0 R}$ N/C

4. $\frac{\lambda}{\pi\varepsilon_0 R}$ N/C

178.

An increase in temperature of a gas-filled in a container would lead to:

1. decrease in intermolecular distance

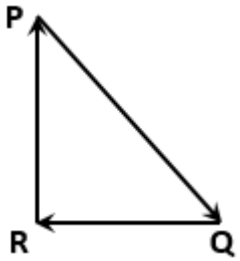
2. increase in its mass

3. increase in its kinetic energy

4. decrease in its pressure

179.

A particle moving with velocity $\vec{v}$ is acted by three forces shown by the vector triangle PQR. The velocity of the particle will:



1. change according to the smallest force $\vec{QR}$

2. increase

3. decrease

4. remain constant

180.

A disc of radius 2 m and mass 100 kg rolls on a horizontal floor. Its centre of mass has speed of 20 cm/s. How much work is needed to stop it?

1. 1 J

2. 3 J

3. 30 J

4. 2 J