NEET 2020 Exam (Covid Re-exam)

1.

Which of the following is incorrect about Cyanobacteria?

1. They are photoautotrophs
2. They lack heterocysts
3. They often form blooms in polluted water bodies
4. They have chlorophyll A similar to green plants

2.

Phycoerythrin is the major pigment in :

1. Red algae
2. Blue-green algae
3. Green algae
4. Brown algae

3.

Which of the following statements is incorrect about gymnosperms?

1. They are heterosporous
2. Male and female gametophytes are free-living
3. Most of them have narrow leaves with thick cuticle
4. Their seeds are not covered

4.

Male and female gametophytes do not have an independent free-living existence in:-

1. Pteridophytes
2. Algae
3. Angiosperms
4. Bryophytes

5.

Which of the following options does correctly represent the characteristic features of phylum Annelida?

1. Triploblastic, unsegmented body, and bilaterally symmetrical.
2. Triploblastic, a segmented body, and bilaterally symmetrical.
3. Triploblastic, flattened body, and acoelomate condition.
4. Diploblastic, mostly marine and radially symmetrical.

6.

Match the following group of organisms with their respective distinctive characteristics and select the correct option :

	Organisms	Characteristics
(a)	Platyhelminthes	Cylindrical body with no segmentation
(b)	Echinoderms	Warm blooded animals with direct development
(c)	Hemichordates	Bilateral symmetry with incomplete digestive system
(d)	Aves	Radial symmetry with indirect development

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

7.

Match the following columns and select the correct option :

Column - I	Column - II
(a) Aptenodytes	(i) Flying fox
(b) Pteropus	(ii) Angel fish
(c) Pterophyllum	(iii)Lamprey
(d) Petromyzon	(iv)Penguin

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

8.

All vertebrates are chordates but all chordates are not vertebrates, why?

1. Notochord is replaced by a vertebral column in adult of some chordates.

2. Ventral hollow nerve cord remains throughout life in some chordates.

3. All chordates possess a vertebral column.

4. All chordates possess notochord throughout their life.

9.

Correct position of floral parts over thalamus in the mustard plant is :

1. Gynoecium occupies the highest position, while the other parts are situated below it.

2. Margin of the thalamus grows upward, enclosing the ovary completely, and other parts arise below the ovary.

3. Gynoecium is present in the center and other parts cover it partially.

4. Gynoecium is situated in the center, and other parts of the flower are located at the rim of the thalamus, at the same level.

10.

Which of the following is the correct floral formula of Liliaceae?

1. $\% \, ♀ \, C_{1+2+(2)} \; A_{(9)+1} \; \underline{G}_{1}$

2. $\oplus \, ♂ \, ♀ \, K_{(5)} \; \widehat{C_{(5)} \; A_{5}} \; \underline{G}_{(2)}$

3. $\mathrm{Br} \oplus ♀ \; \widehat{P_{(3+3)} \; A_{3+3}} \; G_{(3)}$

4. $\oplus \, ♀ \, K_{(5)} \; \widehat{C_{(5)} \; A_{5}} \; \underline{G}_{(2)}$

11.

Identify the correct features of Mango and Coconut fruits.

(i) In both fruit is a drupe
(ii) Endocarp is edible in both
(iii) Mesocarp in Coconut is fibrous, and in Mango, it is fleshy
(iv) In both, the fruit develops from the monocarpellary ovary

Select the correct option from below :

(1) (i), (iii) and (iv) only

(2) (i), (ii) and (iii) only

(3) (i) and (iv) only

(4) (i) and (ii) only

12.

Large, empty colorless cells of the adaxial epidermis along the veins of grass leaves are

1. Lenticels

2. Guard cells

3. Bundle sheath cells

4. Bulliform cells

13.

Which of the following statements about cork cambium is incorrect?

1. It forms a secondary cortex on its outside

2. It forms a part of periderm

3. It is responsible for the formation of lenticels

4. It is a couple of layers thick

14.

In cockroach, identify the parts of the foregut in correct sequence:-

1. Mouth → Oesophagus → Pharynx → Crop → Gizzard

2. Mouth → Crop → Pharynx → Oesophagus → Gizzard

3. Mouth → Gizzard → Crop → Pharynx → Oesophagus

4. Mouth → Pharynx → Oesophagus → Crop → Gizzard

15.

Match the following columns with reference to cockroach and select the correct option :

Column - I	**Column - II**
(a) Grinding of	(i) Hepatic caeca the food particles
(b) Secrete gastric	(ii) 10th segment juice
(c) 10 pairs	(iii) Proventriculus
(d) Anal cerci	(iv) Spiracles
	(v) Alary muscles

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

2. (a)-(iv), (b)-(iii), (c)-(v), (d)-(ii)

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

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

16.

Select the incorrectly matched pair from the following:

1. Chondrocytes - Smooth muscle cells
2. Neurons - Nerve cells
3. Fibroblast - Areolar tissue
4. Osteocytes - Bone cells

17.

Inclusion bodies of blue-green, purple, and green photosynthetic bacteria are :

1. Contractile vacuoles
2. Gas vacuoles
3. Centrioles
4. Microtubules

18.

The biosynthesis of ribosomal RNA occurs in :

1. Ribosomes
2. Golgi apparatus
3. Microbodies
4. Nucleolus

19.

The size of Pleuropneumonia - like Organism (PPLO) is :

1. 0.02 μm
2. 1-2 μm
3. 10-20 μm
4. 0.1 μm

20.

Match the following columns and select the correct option :

Column - I	**Column - II**
(a) Smooth reticulum	(i) Protein synthesis endoplasmic
(b) Rough reticulum	(ii) Lipid synthesis endoplasmic
(c) Golgi complex	(iii) Glycosylation
(d) Centriole	(iv) Spindle formation

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

21.

Identify the statement which is incorrect.

1. Sulphur is an integral part of cysteine.
2. Glycine is an example of lipids.
3. Lecithin contains a phosphorus atom in its structure.
4. Tyrosine possesses an aromatic ring in its structure.

22.

Match the following :

(a) Aquaporin (i) Amide

(b) Asparagine (ii) Polysaccharide

(c) Abscisic acid (iii) Polypeptide

(d) Chitin (iv) Carotenoids

Select the correct option :

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

23.

Attachment of spindle fibers to kinetochores of chromosomes becomes evident in :

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

24.

In a mitotic cycle, the correct sequence of phases is

1. S, G_1, G_2, M
2. G_1, S, G_2, M
3. M, G_1, G_2, S
4. G_1, G_2, S, M

25.

During Meiosis 1, in which stage synapsis takes place?

1. Pachytene

2. Zygotene

3. Diplotene

4. Leptotene

26.

Match the following events that occur in their respective phases of cell cycle and select the correct option :

(a) G 1 phase (i) Cell grows and organelle duplication

(b) S phase (ii) DNA replication and chromosome duplication

(c) G 2 phase (iii) Cytoplasmic growth

(d) Metaphase in M-phase (iv) Alignment of chromosomes

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

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

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

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

27.

Select the incorrect statement.

1. Transport of molecules in phloem can be bidirectional.

2. The movement of minerals in the xylem is unidirectional.

3. Unloading of sucrose at the sink does not involve the utilization of ATP.

4. Elements most easily mobilized in plants from one region to another are phosphorus, sulfur, nitrogen, and potassium.

28.

In Glycine max, the product of biological nitrogen fixation is transported from the root nodules to other parts as:

1. Ammonia

2. Glutamate

3. Nitrates

4. Ureides

29.

Which of the following elements helps in maintaining the structure of ribosomes?

1. Magnesium

2. Zinc

3. Copper

4. Molybdenum

30.

During non-cyclic photophosphorylation, when electrons are lost from the reaction center at PS II, what is the source which replaces these electrons?

1. Oxygen

2. Water

3. Carbon dioxide

4. Light

31.

Which of the following statements is incorrect?

1. RuBisCO is a bifunctional enzyme

2. In C4 plants, the site of RuBisCO activity is mesophyll cell

3. The substrate molecule for RuBisCO activity is a 5-carbon compound

4. RuBisCO action requires ATP and NADPH

32.

Pyruvate dehydrogenase activity during aerobic respiration requires :-

1. Calcium

2. Iron

3. Cobalt

4. Magnesium

33.

Who coined the term 'Kinetin'?

1. Skoog and Miller

2. Darwin

3. Went

4. Kurosawa

34.

Inhibitory substances in dormant seeds cannot be removed by subjecting seeds to:

1. Gibberellic acid

2. Nitrate

3. Ascorbic acid

4. Chilling conditions

35.

Match the following concerning the activity/function and the phytohormone involved :-

(a) Fruit ripener (i) Abscisic acid

(b) Herbicide (ii) GA 3

(c) Bolting agent (iii) 2, 4-D

(d) Stress hormone (iv) Ethephon

Select the correct option from following :-

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

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

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

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

36.

The intrinsic factor that helps in the absorption of vitamin B_{12} is secreted by-

1. Goblet cells

2. Hepatic cells

3. Oxyntic cells

4. Chief cells

37.

The proteolytic enzyme rennin is found in :

1. Intestinal juice

2. Bile juice

3. Gastric juice

4. Pancreatic juice

38.

The Total Lung Capacity (TLC) is the total volume of air accommodated in the lungs at the end of forced inspiration. This includes :

1. RV; IC (Inspiratory Capacity); EC (Expiratory Capacity); and ERV

2. RV; ERV; IC and EC

3. RV; ERV; VC (Vital Capacity) and FRC (Functional Residual Capacity)

4. RV (Residual Volume); ERV (Expiratory Reserve Volume); TV (Tidal Volume); and IRV (Inspiratory Reserve Volume

39.

Match the following columns and select the correct option :

Column - I	Column - II
(a) Pneumotaxic Centre	(i) Alveoli
(b) O_2 Dissociation curve	(ii) Pons region of the brain
(c) Carbonic Anhydrase	(iii) Haemoglobin
(d) Primary site of exchange of gases	(iv) R.B.C.

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

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

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

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

40.

Which of the following is associated with a decrease in cardiac output?

1. Sympathetic nerves

2. Parasympathetic neural signals

3. Pneumotaxic center

4. Adrenal medullary hormones

41.

Which of the following conditions causes erythroblastosis fetalis?

1. Mother Rh^{+ve} and fetus Rh^{-ve}

2. Mother Rh^{-ve} and fetus Rh^{+ve}

3. Both mother and fetus Rh^{-ve}

4. Both mother and fetus Rh^{+ve}

42.

The increase in osmolarity from outer to inner medullary interstitium is maintained due to :

(i) Close proximity between Henle's loop and vasa recta

(ii) Counter current mechanism

(iii) Selective secretion of $HCO\ 3^{-}$ and hydrogen ions in PCT

(iv) Higher blood pressure in glomerular capillaries

1. Only (ii)

2. (iii) and (iv)

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

4. (i) and (ii)

43.

Select the correct statement :

1. Atrial Natriuretic Factor increases the blood pressure.

2. Angiotensin II is a powerful vasodilator.

3. Counter current pattern of blood flow is not observed in vasa recta.

4. Reduction in Glomerular Filtration Rate activates JG cells to release renin.

44.

Match the following columns and select the correct option

Column - I	Column - II
(a) Gout	(i) Decreased levels of estrogen
(b) Osteoporosis	(ii) Low Ca^{++} ions in the blood
(c) Tetany	(iii) Accumulation of uric acid crystals
(d) Muscular dystrophy	(iv) Autoimmune disorder
	(v) Genetic disorder

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

2. (a)-(iii), (b)-(i), (c)-(ii), (d)-(v)

3. (a)-(iv), .(b)-(v), (c)-(i), (d)-(ii)

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

45.

Match the following columns and select the correct option :

Column - I	Column - II
(a) Rods and cones photoreceptor cells	(i) Absence of Cones
(b) Blind Spot	(ii) Cones are densely packed
(c) Fovea	(iii) Photoreceptor cells
(d) Iris	(iv) Visible coloured portion of the eye

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

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

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

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

46.

Match the following columns and select the correct option:-

Column-I	Column-II
(a) Pituitary hormone	(i) Steroid
(b) Epinephrine	(ii) Neuropeptides
(c) Endorphins	(iii) Peptides, proteins
(d) Cortisol	(iv) Biogenic amines

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

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

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

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

47.

Hormones stored and released from neurohypophysis are:-

1. Thyroid-stimulating hormone and Oxytocin

2. Oxytocin and Vasopressin

3. Follicle-stimulating hormone and leutinizing hormone

4. Prolactin and Vasopressin

48.

Vegetative propagule in Agave is as :

1. Rhizome

2. Bulbil

3. Offset

4. Eye

49.

In some plants, the thalamus contributes to fruit formation. Such fruits are termed as

1. False fruits

2. Aggregate fruits

3. True fruits

4. Parthenocarpic fruit

50.

Which of the following is incorrect for wind-pollinated plants?

1. Well exposed stamens and stigma

2. Many ovules in each ovary

3. Flowers are small and not brightly colored

4. Pollen grains are light and non-sticky

51.

In human beings, at the end of 12 weeks (first trimester) of pregnancy, the following is observed:

1. Eyelids and eyelashes are formed

2. Most of the major organ systems are formed

3. The head is covered with fine hair

4. Movement of the fetus

52.

Select the correct option of haploid cells from the following groups :

1. Primary oocyte, Secondary oocyte, Spermatid

2. Secondary spermatocyte, First polar body, Ovum

3. Spermatogonia, Primary spermatocyte, Spermatid

4. Primary spermatocyte, Secondary spermatocyte, Second polar body

53.

Match the following columns and select the correct option :

Column - I	Column - II
(a) Ovary	(i) Human chorionic Gonadotropin
(b) Placenta	(ii) Estrogen & Progesterone
(c) Corpus luteum	(iii) Androgens
(d) Leydig cells	(iv) Progesterone only

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

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

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

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

54.

Progestogens alone or in combination with estrogens can be used as a contraceptive in the form of -

1. Implants only

2. Injections only

3. Pills, injections and implants

4. Pills only

55.

Chromosomal theory of inheritance was proposed by :

1. Sutton and Boveri

2. Bateson and Punnet

3. T. H. Morgan

4. Watson and Crick

56.

The number of contrasting characters studied by Mendel for his experiments was :

1. 14

2. 4

3. 2

4. 7

57.

The best example for pleiotropy is:-

1. Skin color

2. Phenylketonuria

3. Colour Blindness

4. ABO Blood group

58.

The term 'Nuclein' for the genetic material was used by :

1. Franklin

2. Meischer

3. Chargaff

4. Mendel

59.

In the polynucleotide chain of DNA, a nitrogenous base is linked to the –OH of:

1. 2'C pentose sugar

2. 3'C pentose sugar

3. 5'C pentose sugar

4. 1'C pentose sugar

60.

E.coli has only 4.6×10^6 base pairs and completes the process of replication within 18 minutes; then the average rate of polymerization is approximate-

1. 2000 base pairs/second

2. 3000 base pairs/second

3. 4000 base pairs/second

4. 1000 base pairs/second

61.

Which is the basis of genetic mapping of the human genome as well as DNA fingerprinting ?

1. Polymorphism in the DNA sequence
2. Single nucleotide polymorphism
3. Polymorphism in hnRNA sequence
4. Polymorphism in the RNA sequence

62.

Embryological support for evolution was proposed by

1. Ernst Heckel
2. Karl Ernst von Baer
3. Charles Darwin
4. Alfred Wallace

63.

After about how many years of the formation of the earth, life appeared on this planet?

1. 500 billion years
2. 50 million years
3. 500 million years
4. 50 billion years

64.

The phenomenon of the evolution of different species in a given geographical area starting from a point and spreading to other habitats is called:-

1. Saltation
2. Co-evolution
3. Natural selection
4. Adaptive radiation

65.

A Hominid fossil discovered in Java in 1891, now extinct, having a cranial capacity of about 900 ccs was:

1. Homo erectus
2. Neanderthal man
3. Homo sapiens
4. Australopithecus

66.

For the commercial and industrial production of Citric Acid, which of the following microbes is used?

1. Aspergillus niger
2. Lactobacillus sp
3. Saccharomyces cerevisiae
4. Clostridium bretylium

67.

Match the following columns and select the correct option:-

	Column - I		**Column -II**
a)	Dragonflies	(i)	Biocontrol agents of several plant pathogens
b)	Bacillus thuringiensis	(ii)	Get rid of Aphids and mosquitoes
c)	Glomus	(iii)	Narrow spectrum insecticidal applications
d)	Baculoviruses	(iv)	Biocontrol agents of lepidopteran plant pests
		(v)	Absorb phosphorus from soil

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

68.

Cyclosporin A, used as an immuno suppression agent, is produced from

1. Monascus purpureus
2. Saccharomyces cerevisiae
3. Penicillium notatum
4. Trichoderma polysporum

69.

Inbreeding depression is -

1. Reduced motility and immunity due to close inbreeding

2. Decreased productivity due to mating of superior male and inferior female

3. Decrease in body mass of progeny due to continued close inbreeding

4. Reduced fertility and productivity due to continued close inbreeding

70.

Which of the following STDs are not curable?

1. Genital herpes, Hepatitis B, HIV infection

2. Chlamydiasis, Syphilis, Genital warts

3. HIV, Gonorrhoea, Trichomoniasis

4. Gonorrhoea, Trichomoniasis, Hepatitis B

71.

Match the following columns and select the correct option :

Column - I	Column - II
(i) Typhoid	(a) Haemophilus influenzae
(ii) Malaria	(b) Wuchereria bancrofti
(iii) Pneumonia	(c) Plasmodium vivax
(iv) Filariasis	(d) Salmonella typhi

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

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

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

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

72.

The yellowish fluid "colostrum" secreted by mammary glands of the mother during the initial days of lactation has abundant antibodies (IgA) to protect the infant. This type of immunity is called as :

1. Passive immunity

2. Active immunity

3. Acquired immunity

4. Autoimmunity

73.

First discovered restriction endonuclease that always cuts DNA molecule at a particular point by recognizing a specific sequence of six base pairs is:

1. EcoR1

2. Adenosine deaminase

3. Thermostable DNA polymerase

4. Hind II

74.

In recombinant DNA technology antibiotics are used :

1. to keep medium bacteria-free

2. to detect alien DNA

3. to impart disease-resistance to the host plant

4. as selectable markers

75.

Match the following techniques or instruments with their usage :

(a) Bioreactor	(i) Separation of DNA fragments
(b) Electrophoresis	(ii) Production of large quantities of products
(c) PCR	(iii) Detection of pathogen, based on antigen - antibody reaction
(d) ELISA	(iv) Amplification of nucleic acids

Select the correct option from following:

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

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

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

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

76.

In a mixture, DNA fragments are separated by-

1. Bioprocess engineering

2. Restriction digestion

3. Electrophoresis

4. Polymerase chain reaction

77.

Spooling is :-

1. Amplification of DNA

2. Cutting of separated DNA bands from the agarose gel

3. Transfer of separated DNA fragments to synthetic membranes

4. Collection of isolated DNA

78.

Select the correct statement from the following :

1. Gel electrophoresis is used for the amplification of a DNA segment.

2. The polymerase enzyme joins the gene of interest and the vector DNA.

3. Restriction enzyme digestions are performed by incubating purified DNA molecules with the restriction enzymes of optimum conditions.

4. PCR is used for isolation and separation of genes of interest.

79.

RNA interference is used for which of the following purposes in the field of biotechnology?

1. to develop a plant tolerant to abiotic stresses

2. to develop a pest-resistant plant against infestation by nematode

3. to enhance the mineral usage by the plant

4. to reduce post-harvest losses

80.

The laws and rules to prevent unauthorized exploitation of bio-resources are termed as -

1. Biopatenting

2. Bioethics

3. Bioengineering

4. Biopiracy

81.

Match the items in Column-I with those in Column-II :

Column I	Column II
(a) Herbivores-Plants	(i) Commensalism
(b) Mycorrhiza-Plants	(ii) Mutualism
(c) Sheep-Cattle	(iii) Predation
(d) Orchid-Tree	(iv) Competition

Select the correct option from following :

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

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

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

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

82.

The impact of immigration on population density is:-

1. Negative

2. Both positive and negative

3. Neutralized by natality

4. Positive

83.

Which of the following statements is incorrect?

1. Biomass decreases from first to fourth trophic level

2. Energy content gradually increases from first to fourth trophic level

3. Number of individuals decreases from first trophic level to fourth trophic level

4. Energy content gradually decreases from first to fourth trophic level

84.

Which of the following statements is incorrect regarding the phosphorus cycle?

1. Phosphates are the major form of phosphorus reservoir

2. Phosphorus solubilizing bacteria facilitate the release of phosphorus from organic remains

3. There is the appreciable respiratory release of phosphorus into the atmosphere

4. It is a sedimentary cycle

85.

The rate of decomposition is faster in the ecosystem due to the following factors EXCEPT:-

1. Detritus rich in sugars

2. Warm and moist environment

3. Presence of aerobic soil microbes

4. Detritus richer in lignin and chitin

86.

According to Alexander von Humboldt :

1. Species richness decreases with increasing area of exploration

2. Species richness increases with the increasing area, but only up to limit

3. There is no relationship between species richness

and area explored.

4. Species richness goes on increasing with increasing area of exploration

87.

In the following, in each set, a conservation approach and an example of a method of conservation are given

(a) In situ conservation - Biosphere Reserve

(b) Ex situ conservation - Sacred groves

(c) In situ conservation - Seed bank

(d) Ex situ conservation - Cryopreservation `

Select the option with the correct match of approach and method :

1. (a) and (c)

2. (a) and (d)

3. (b) and (d)

4. (a) and (b)

88.

A species that was introduced for ornamentation but has become a troublesome weed in India :

1. Parthenium hysterophorus

2. Eichhornia crassipes

3. Prosopis juliflora

4. Trapa Spinosa

89.

Air (Prevention and Control of Pollution) Act was amended in 1987 to include among pollutants

1. Vehicular exhaust

2. Allergy causing pollen

3. Noise

4. Particulates of size 2.5 micrometer or below

90.

According to the Central Pollution Control Board [CPCB] what size (in diameter) of particulate is responsible for causing greater harm to human health?

1. 3.5 micrometers

2. 2.5 micrometers

3. 4.0 micrometers

4. 3.0 micrometers

91.

Which of the following statement is NOT true about acid rain ?

(1) It is due to reaction of SO_2, NO_2 and CO_2 with rain water

(2) Causes no damage to monuments like Taj Mahal.

(3) It is harmful to plants.

(4) Its pH is less than 5.6

92.

The oxidation number of the underlined atom in the following species

(1) $Cu_2\underline{O}$ is -1

(2) $\underline{Cl}O_3^-$ is +5

(3) $K_2\underline{Cr}_2O_7$ is +6

(4) $HA\underline{u}Cl_4$ is +3

Identify the incorrect option.

93.

Reaction of propanamide with ethanolic sodium hydroxide and bromine will give

(1) Ethylamine

(2) Methylamine

(3) Propylamine

(4) Aniline

94.

A liquid compound (x) can be purified by steam distillation only if it is

(1) Steam volatile, immiscible with water

(2) Not steam volatile, miscible with water

(3) Steam volatile, miscible with water

(4) Not steam volatile, immiscible with water

95.

Among the compounds shown below which one revealed a linear structure ?

(1) NO_2

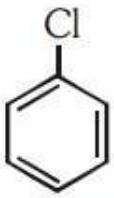
(2) HOCl

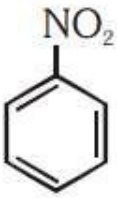
(3) O_3

(4) N_2O

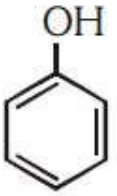
96.

Which of the following compound is most reactive in electrophilic aromatic substitution ?

(1) 

(2) 

(3) 

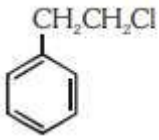
(4) 

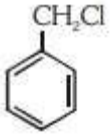
97.

Which of the following will NOT undergo S_N1 reaction with $\overline{O}H$?

(1) $CH_2 = CH - CH_2Cl$

(2) $(CH_3)_3CCl$

(3) 

(4) 

98.

Which of the following is not true about chloramphenicol ?

(1) It inhibits the growth of only grampositive bacteria.

(2) It is a broad spectrum antibiotic.

(3) It is not bactericidal.

(4) It is bacteriostatic.

99.

Which of the following statement is correct about Bakelite ?

(1) It is a cross linked polymer.

(2) It is an addition polymer.

(3) It is a branched chain polymer.

(4) It is a linear polymer.

100.

If for a certain reaction $\Delta_r H$ is 30 kJ mol^{-1} at 450 K,the value of $\Delta_r S$ (in JK^{-1} mol^{-1}) for which the samereaction will be spontaneous at the same temperature is

(1) 70

(2) –33

(3) 33

(4) -70

101.

Match the element in column I with that in column II.

Column-I	Column-II
(a) Copper	(i) Non-metal
(b) Fluorine	(ii) Transition metal
(c) Silicon	(iii) Lanthanoid
(d) Cerium	(iv) Metalloid

Identify the correct match :

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

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

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

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

102.

Which of the following is a free radical substitution reaction ?

(1) Benzene with $Br_2/AlCl_3$

(2) Acetylene with HBr

(3) Methane with Br_2/hv

(4) Propene with $HBr/(C_6H_5COO)_2$

103.

The reaction of concentrated sulphuric acid with carbohydrates ($C_{12}H_{22}O_{11}$) is an example of

(1) Dehydration

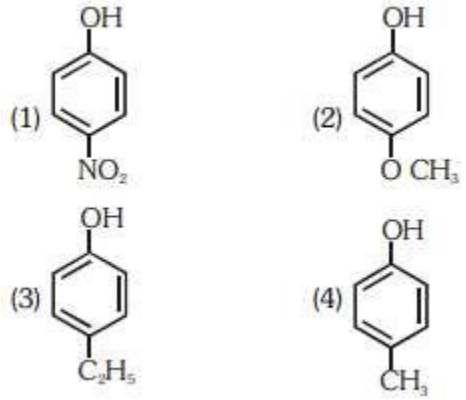
(2) Oxidation

(3) Reduction

(4) Sulphonation

104.

Which of the following substituted phenols is the strongest acid?



105.

Match the compounds of Xe in column I with the molecular structure in column II.

Column-I	Column-II
(a) XeF_2	(i) Square planar
(b) XeF_4	(ii) Linear
(c) XeO_3	(iii) Square pyramidal
(d) $XeOF_4$	(iv) Pyramidal

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

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

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

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

106.

The half-life for a zero order reaction having 0.02 M initial concentration of reactant is 100 s. The rate constant (in mol L^{-1} s^{-1}) for the reaction is

(1) 1.0×10^{-4}

(2) 2.0×10^{-4}

(3) 2.0×10^{-3}

(4) 1.0×10^{-2}

107.

Identify the incorrect statement from the following:

(1) Zirconium and Hafnium have identical radii of 160 pm and 159 pm, respectively as a consequence of lanthanoid contraction.

(2) Lanthanoids reveal only +3 oxidation state.

(3) The lanthanoid ions other than the f^0 type and the f^{14} type are all paramagnetic.

(4) The overall decrease in atomic and ionic radii from lanthanum to lutetium is called lanthanoid contraction.

108.

Match the following aspects with the respective metal.

Aspects	Metal
(a) The metal which reveals a maximum number of oxidation states	(i) Scandium
(b) The metal although placed inn 3d block is considered not as a transition element	(ii) Copper
(c) The metal which does not exhibit variable oxidation states	(iii) Manganese
(d) The metal which in +1 oxidation state in aqueous solution undergoes disproportionation	(iv) Zinc

Select the correct option :

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

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

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

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

109.

If 8g of a non-electrolyte solute is dissolved in 114 g of n-octane to reduce its vapour pressure to 80%, the molar mass (in g mol^{-1}) of the solute is [Given that molar mass of n-octane is 114 g mol^{-1}]

(1) 40

(2) 60

(3) 80

(4) 20

110.

Match the coordination number and type of hybridisation with distribution of hybrid orbitals in space based on Valence bond theory.

Coordination number and type of hybridisation	Distribution of hybrid orbitals in space
(a) 4, sp^3	(i)

trigonal bipyramidal

(b) 4, dsp^2 (ii) Octahedral

(c) 5, sp^3d (iii) tetrahedral

(d) 6, d^2sp^3 (iv) square planar

Select the correct option :

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

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

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

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

111.

The number of angular nodes and radial nodes in 3s orbital are

(1) 0 and 2, respectively

(2) 1 and 0, respectively

(3) 3 and 0, respectively

(4) 0 and 1, respectively

112.

Identify the correct statement from the following.

(1) The order of hydration enthalpies of alkaline earth cations
$Be^{2+} < Mg^{2+} < Ca^{2+} < Sr^{2+} < Ba^{2+}$

(2) Lithium and Magnesium show some similarities in their physical properties as they are diagonally placed in periodic table.

(3) Lithium is softer among all alkali metals.

(4) Lithium chloride is deliquescent and crystallises as a hydrate, $LiCl \cdot H_2O$.

113.

Deficiency of which vitamin causes osteomalacia ?

(1) Vitamin A

(2) Vitamin D

(3) Vitamin K

(4) Vitamin E

114.

Identify the wrongly matched pair.

Molecule	Shape or geometry of the molecule
(1) PCl_5	Trigonal
(2) SF_6	Octahedral
(3) $BeCl_2$	Linear
(4) NH_3	Trigonal pyramidal

115.

$$CH_3CH_2CH=CH_2 \xrightarrow[H_2O,\ H_2O_2,\ OH^-]{B_2H_6} Z$$

What is Z?

(1) $CH_3CH_2CH_2CH_2OH$

(2) $CH_3CH_2\underset{OH}{CH}CH_3$

(3) $CH_3CH_2CH_2CHO$

(4) $CH_3CH_2CH_2CH_3$

116.

Identify the reaction from following having top position in EMF series (Std reduction potential) according to their electrode potential at 298 K.

(1) $Mg^{2+} + 2e^- \rightarrow Mg_{(s)}$

(2) $Fe^{2+} + 2e^- \rightarrow Fe_{(s)}$

(3) $Au^{3+} + 3e^- \longrightarrow Au_{(s)}$

(4) $K^+ + le^- \longrightarrow K_{(s)}$

117.

Match the elements in Column I with methods of purification in Column II.

Column I	Column II
(a) Boron	(i) Van Arkel method
(b) Tin	(ii) Mond's process
(c) Zirconium	(iii) Liquation
(d) Nickel	(iv) Zone refining

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

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

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

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

118.

Which among the following salt solutions is basic in nature ?

(1) Ammonium chloride

(2) Ammonium sulphate

(3) Ammonium nitrate

(4) Sodium acetate

119.

In which of the sols, the colloidal particles are with negative charge ?

(1) TiO_2

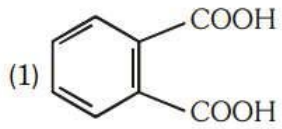
(2) Haemoglobin

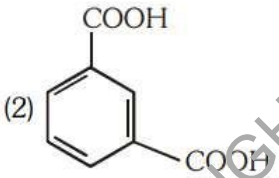
(3) Starch

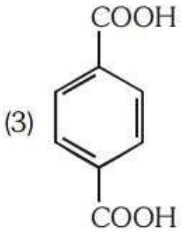
(4) Hydrated Al_2O_3

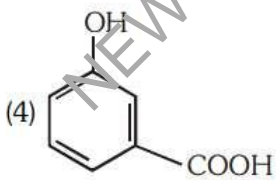
120.

Which of the following acid will form an (a) Anhydride on heating and (b) Acid imide on strong heating with ammonia?

(1) 

(2) 

(3) 

(4) 

121.

In a typical fuel cell, the reactants (R) and product (P) are :-

(1) $R = H_{2(g)},\ O_{2(g)};\ P = H_2O_{2(l)}$

(2) $R = H_{2(g)},\ O_{2(g)};\ P = H_2O_{(l)}$

(3) $R = H_{2(g)},\ O_{2(g)},\ Cl_2(g);\ P = HClO_{4(aq)}$

(4) $R = H_{2(g)},\ N_{2(g)};\ P = NH_{3(aq)}$

122.

In collision theory of chemical reaction, Z_{AB} represents

(1) the fraction of molecules with energies greater than E_a

(2) the collision frequency of reactants, A and B

(3) steric factor

(4) the fraction of molecules with energies equal to E_a

123.

Which of the following statement is not true about glucose ?

(1) It is an aldohexose.

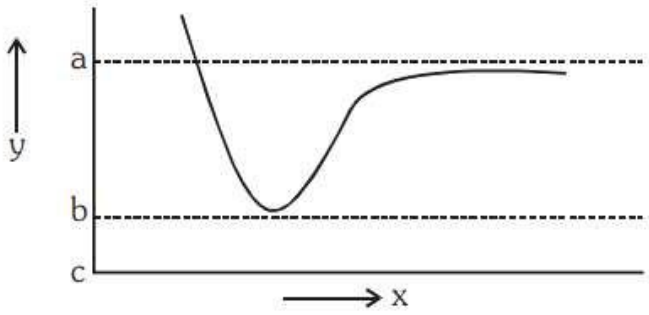
(2) It contains five hydroxyl groups.

(3) It is a reducing sugar.

(4) It is an aldopentose.

124.

The potential energy (y) curve for H2 formation as a function of internuclear distance (x) of the H atoms is shown below.



The bond energy of H_2 is:

(1) (b-a)

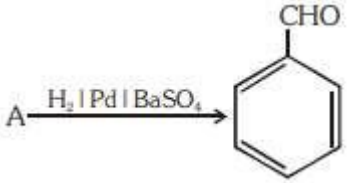
(2) $\frac{(c-a)}{2}$

(3) $\frac{(b-a)}{2}$

(4) (c-a)

125.

Identify compound (A) in the following reaction :



(1) Benzoyl chloride

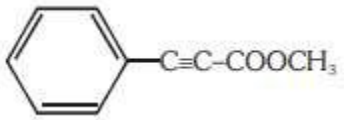
(2) Toluene

(3) Acetophenone

(4) Benzoic acid

126.

How many (i) sp^2 hybridised carbon atoms and (ii) π bonds are present in the following compound?



(1) 7, 5

(2) 8, 6

(3) 7, 6

(4) 8, 5

127.

At standard conditions, if the change in the enthalpy for the following reaction is -109 kJ mol^{-1}

$H_{2(g)}+Br_{2(g)} \rightarrow 2HBr_{(g)}$

Given that bond energy of H_2 and Br_2 is 435 kJ mol^{-1} and 192 kJ mol^{-1}, respectively, what is the bond energy (in kJ mol^{-1}) of HBr?

(1) 368

(2) 736

(3) 518

(4) 259

128.

The minimum pressure required to compress 600 dm^3 of a gas at 1 bar to 150 dm^3 at 40°C is

(1) 4.0 bar

(2) 0.2 bar

(3) 1.0 bar

(4) 2.5 bar

129.

What is the role of gypsum, $CaSO_4.2H_2O$ in setting of cement? Identify the correct option from the following:

(1) To fasten the setting process

(2) To provide water molecules for hydration process

(3) To help to remove water molecules

(4) To slow down the setting process

130.

Which of the following oxide is amphoteric in nature?

(1) SnO_2

(2) SiO_2

(3) GeO_2

(4) CO_2

131.

Which one of the following reactions does not come under hydrolysis type reaction?

(1) $SiCl_{4(l)} + 2H_2O_{(l)} \rightarrow SiO_{2(s)} + 4HCl_{(aq)}$

(2) $Li_3N_{(s)} + 2H_2O_{(l)} \rightarrow NH_{3(g)} + 3LiOH_{(aq)}$

(3) $2F_{2(g)} + 2H_2O_{(l)} \rightarrow 4HF_{(aq)} + O_{2(g)}$

(4) $P_4O_{10(s)} + 6H_2O_{(l)} \rightarrow 4H_3PO_{4(aq)}$

132.

Which one of the following compounds shows both, Frenkel as well as Schottky defects ?

(1) AgBr

(2) AgI

(3) NaCl

(4) ZnS

133.

One mole of carbon atom weighs 12 g, the number of atoms in it is equal to, (Mass of carbon – 12 is 1.9926×10^{-23} g)

(1) 1.2×10^{23}

(2) 6.022×10^{22}

(3) 12×10^{22}

(4) 6.022×10^{23}

134.

Isotonic solutions have same

(1) vapour pressure

(2) freezing temperature

(3) osmotic pressure

(4) boiling temperature

135.

The solubility product for a salt of the type AB is 4×10^{-8}. What is the molarity of its standard solution?

(1) $2 \times 10^{-4}\ mol/L$

(2) $16 \times 10^{-16}\ mol/L$

(3) $2 \times 10^{-16}\ mol/L$

(4) $4 \times 10^{-4}\ mol/L$

136.

The E.M wave with the shortest wavelength among the following is:

1. Ultraviolet rays
2. X-rays
3. Gamma-rays
4. Microwaves

137.

The angular speed of the wheel of a vehicle is increased from 360 rpm to 1200 rpm in 14 seconds. Its angular acceleration is:

1. $2\pi\ rad/s^2$
2. $28\pi\ rad/s^2$
3. $120\pi\ rad/s^2$
4. $1\ rad/s^2$

138.

What happens to the mass number and the atomic number of an element when it emits $\gamma-$radiation?

1. Mass number decreases by four and atomic number decreases by two.

2. Mass number and atomic number remain unchanged.

3. Mass number remains unchanged while atomic number decreases by one.

4. Mass number increases by four and the atomic number increases by two.

139.

The angle of 1' (minute of arc) in radian is nearly equal to:

1. $2.91 \times 10^{-4}\ rad$
2. $4.85 \times 10^{-4}\ rad$
3. $4.80 \times 10^{-6}\ rad$
4. $1.75 \times 10^{-2}\ rad$

140.

The magnetic flux linked with a coil (in Wb) is given by the equation $\phi = 5t^2 + 3t + 60$.
The magnitude of induced emf in the coil at the fourth second will be:

1. 33 V
2. 43 V
3. 108 V
4. 10 V

141.

The electric field at a point on the equatorial plane at a distance r from the centre of a dipole having dipole moment $\vec{P}$ is given by:

($r >>$ separation of two charges forming the dipole, ε_0 = permittivity of free space)

1. $\vec{E} = \frac{\vec{P}}{4\pi\,\varepsilon_0\,r^3}$
2. $\vec{E} = \frac{2\vec{P}}{4\pi\,\varepsilon_0\,r^3}$
3. $\vec{E} = -\frac{\vec{P}}{4\pi\,\varepsilon_0\,r^2}$
4. $\vec{E} = -\frac{\vec{P}}{4\pi\,\varepsilon_0\,r^3}$

142.

A plane-convex lens of unknown material and unknown focal length is given. With the help of a spherometer, we can measure the:

1. focal length of the lens.

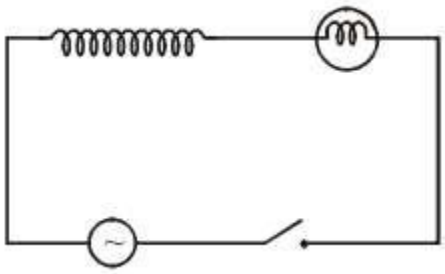
2. radius of curvature of the curved surface.

3. aperture of the lens.

4. refractive index of the material.

143.

A light bulb and an inductor coil are connected to an ac source through a key as shown in the figure below. The key is closed and after some time an iron rod is inserted into the interior of the inductor. The glow of the light bulb:



1. decreases
2. remains unchanged
3. will fluctuate
4. increases

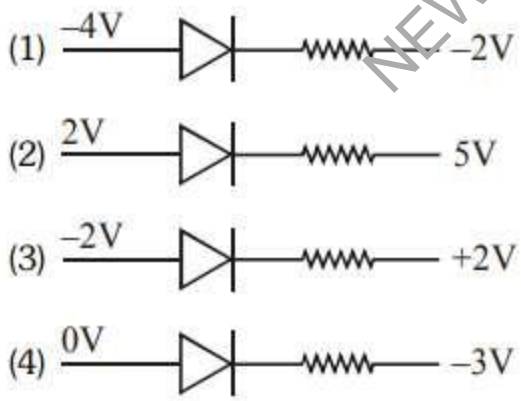
144.

The efficiency of a Carnot engine depends upon:

1. the temperature of the sink only.
2. the temperatures of the source and sink.
3. the volume of the cylinder of the engine.
4. the temperature of the source only.

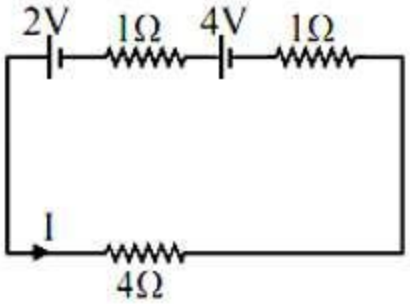
145.

Out of the following which one is a forward-biased diode?



146.

For the circuit shown in the figure, the current I will be:



1. 0.75 A
2. 1 A
3. 1.5 A
4. 0.5 A

147.

Two coherent sources of light interfere and produce fringe pattern on a screen. For the central maximum, the phase difference between the two waves will be:

1. zero
2. π
3. $3\pi/2$
4. $\pi/2$

148.

The total energy of an electron in the n^{th} stationary orbit of the hydrogen atom can be obtained by:

1. $E_n = \frac{13.6}{n^2}\ eV$
2. $E_n = -\frac{13.6}{n^2}\ eV$
3. $E_n = -\frac{1.36}{n^2}\ eV$
4. $E_n = -13.6 \times n^2\ eV$

149.

Identify the function which represents a periodic motion.

1. $e^{\omega t}$
2. $\log_e(\omega t)$
3. $\sin \omega t + \cos \omega t$
4. $e^{-\omega t}$

150.

The de-Broglie wavelength of an electron moving with the kinetic energy of 144 eV is nearly equal to:

1. $102 \times 10^{-3}\ nm$
2. $102 \times 10^{-4}\ nm$
3. $102 \times 10^{-5}\ nm$
4. $102 \times 10^{-2}\ nm$

151.

The mean free path l for a gas molecule depends upon the diameter, d of the molecule as:

1. $l \propto \frac{1}{d^2}$

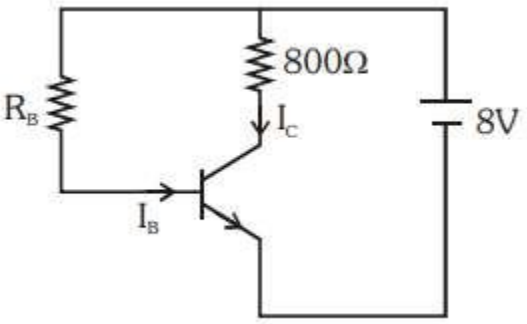
2. $l \propto d$

3. $l \propto d^2$

4. $l \propto \frac{1}{d}$

152.

An n-p-n transistor is connected in a common emitter configuration (see figure) in which collector voltage drop across load resistance (800 Ω) connected to the collector circuit is 0.8 V. The collector current is :



1. 2 mA

2. 0.1 mA

3. 1 mA

4. 0.2 mA

153.

A person sitting on the ground floor of a building notices through the window, of height 1.5 m, a ball dropped from the roof of the building crosses the window in 0.1 sec. What is the velocity of the ball when it is at the topmost point of the window? $\left(g = 10\ m/s^2 \right)$

1. 15.5 m/s

2. 14.5 m/s

3. 4.5 m/s

4. 20 m/s

154.

The magnetic field in a plane electromagnetic wave is given by:

$B_Y = 2 \times 10^{-7} \sin \left(\pi \times 10^3\, x + 3\pi \times 10^{11}\, t \right) T$

Calculate the wavelength.

1. $\pi \times 10^3\ m$

2. $2 \times 10^{-3}\ m$

3. $2 \times 10^3\ m$

4. $\pi \times 10^{-3}\ m$

155.

The length of the string of a musical instrument is 90 cm and has a fundamental frequency of 120 Hz. Where should it be pressed to produce a fundamental frequency of 180 Hz?

1. 75 cm

2. 60 cm

3. 45 cm

4. 80 cm

156.

The acceleration of an electron due to the mutual attraction between the electron and a proton when they are 1.6 $\mathring{A}$ apart is,

$\left(m_e \simeq 9 \times 10^{-31}\ kg,\ e = 1.6 \times 10^{-19}\ C \right)$

$\left(Take\ \frac{1}{4\pi\varepsilon_0} = 9 \times 10^9\ Nm^2C^{-2} \right)$

1. $10^{24}\ m/s^2$

2. $10^{23}\ m/s^2$

3. $10^{22}\ m/s^2$

4. $10^{25}\ m/s^2$

157.

The wave nature of electrons was experimentally verified by,

1. de-Broglie

2. Hertz

3. Einstein

4. Davisson and Germer

158.

Two solid conductors are made up of the same material, have the same length and same resistance. One of them has a circular cross-section of area A_1 and the other one has a square cross-section of area A_2. The ratio A_1/A_2 is:

1. 1.5

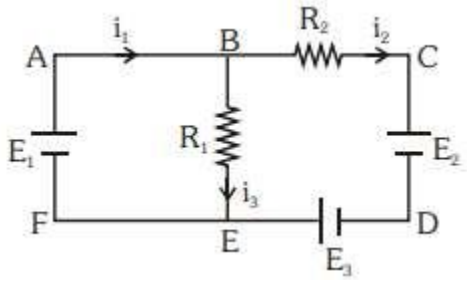
2. 1

3. 0.8

4. 2

159.

For the circuit given below, the Kirchoff's loop rule for the loop BCDEB is given by the equation:



1. $-i_2R_2 + E_2 - E_3 + i_3R_1 = 0$
2. $i_2R_2 + E_2 - E_3 - i_3R_1 = 0$
3. $i_2R_2 + E_2 + E_3 + i_3R_1 = 0$
4. $-i_2R_2 + E_2 + E_3 + i_3R_1 = 0$

160.

Three stars A, B, and C have surface temperatures T_A, T_B, $and\, T_C$ respectively. Star A appears bluish, star B appears reddish and star C yellowish. Hence,

1. $T_A > T_B > T_C$
2. $T_B > T_C > T_A$
3. $T_C > T_B > T_A$
4. $T_A > T_C > T_B$

161.

A liquid does not wet the solid surface if the angle of contact is:

1. equal to 45°
2. equal to 60°
3. greater then 90°
4. zero

162.

A point mass 'm' is moved in a vertical circle of radius 'r' with the help of a string. The velocity of the mass is $\sqrt{7\,gr}$ at the lowest point. The tension in the string at the lowest point is:

1. 6mg
2. 7mg
3. 8mg
4. 1mg

163.

An object is placed on the principal axis of a concave mirror at a distance of 1.5f (f is the focal length). The image will be at:

1. -3f
2. 1.5f
3. -1.5f
4. 3f

164.

The half-life of a radioactive sample undergoing $\alpha-$ decay is 1.4×10^{17} sec. If the number of nuclei in the sample is 2.0×10^{21}, the activity of the sample is nearly equal to:

1. $10^4\ Bq$
2. $10^5\ Bq$
3. $10^6\ Bq$
4. $10^3\ Bq$

165.

If the critical angle for total internal reflection from a medium to vacuum is 45°, the velocity of light in the medium is,

1. $1.5 \times 10^8\ m/s$
2. $\frac{3}{\sqrt{2}} \times 10^8\ m/s$
3. $\sqrt{2} \times 10^8\ m/s$
4. $3 \times 10^8\ m/s$

166.

A wheel with 20 metallic spokes, each 1 m long, is rotated with a speed of 120 rpm in a plane perpendicular to a magnetic field of 0.4 G. The induced emf between the axle and rim of the wheel will be, $\left(1\ G = 10^{-4}\ T\right)$

1. $2.51 \times 10^{-4}\ V$
2. $2.51 \times 10^{-5}\ V$
3. $4.0 \times 10^{-5}\ V$
4. 2.51 V

167.

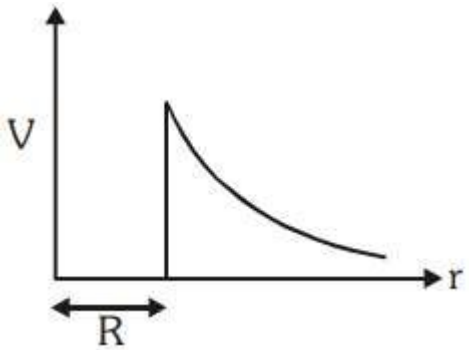
An ideal gas equation can be written as $\mathrm{P} = \frac{\rho \mathrm{RT}}{\mathrm{M_0}}$ where ρ and $\mathrm{M_0}$ are respectively,

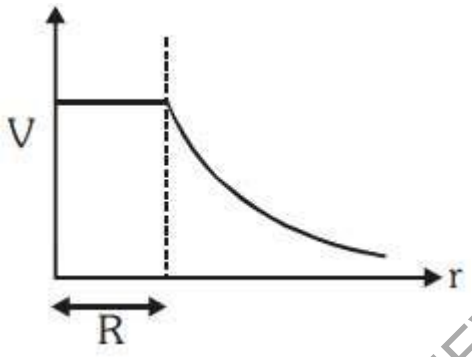
1. Mass density, the mass of the gas

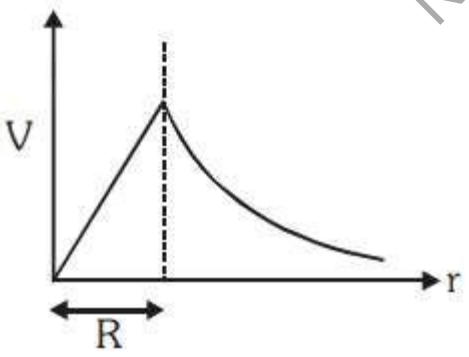
2. Number density, molar mass
3. Mass density, molar mass
4. Number density, the mass of the gas

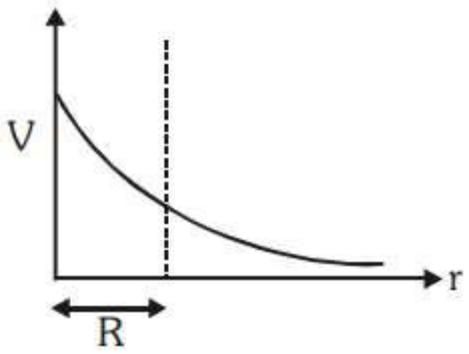
168.

The variation of electrostatic potential with radial distance r from the centre of a positively charged metallic thin shell of radius R is given by the graph:

1.


2.


3.


4.


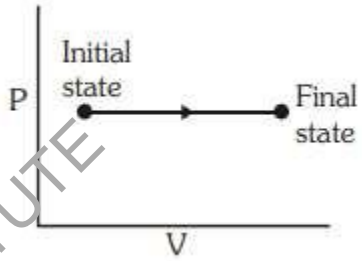
169.

Which of the following gate is called universal gate?

1. OR gate
2. AND gate
3. NAND gate
4. NOT gate

170.

The P-V diagram for an ideal gas in a piston-cylinder assembly undergoing a thermodynamic process is shown in the figure. The process is:



1. adiabatic
2. isochoric
3. isobaric
4. isothermal

171.

The power of a biconvex lens is 10 dioptre and the radius of curvature of each surface is 10 cm. Then the refractive index of the material of the lens is,

1. $\frac{4}{3}$
2. $\frac{9}{8}$
3. $\frac{5}{3}$
4. $\frac{3}{2}$

172.

An intrinsic semiconductor is converted into an n-type extrinsic semiconductor by doping it with:

1. Phosphorous
2. Aluminium
3. Silver
4. Germanium

173.

A barometer is constructed using a liquid (density = 760

kg/m^3). What would be the height of the liquid column, when a mercury barometer reads 76 cm?

$(\text{density of mercury} = 13600\ kg/m^3)$

1. 1.36 m
2. 13.6 m
3. 136 m
4. 0.76 m

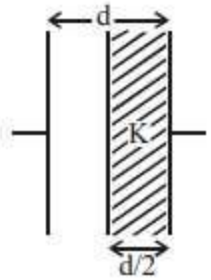
174.

A wire of length L meter carrying a current of I ampere is bent in the form of a circle. Its magnetic moment is,

1. $\frac{IL^2}{4}\ A-m^2$
2. $\frac{I\times\pi L^2}{4}\ A-m^2$
3. $\frac{2IL^2}{\pi}\ A-m^2$
4. $\frac{IL^2}{4\pi}\ A-m^2$

175.

A parallel plate capacitor having cross-sectional area A and separation d has air in between the plates. Now an insulating slab of the same area but thickness d/2 is inserted between the plates as shown in the figure having dielectric constant K(=4). The ratio of new capacitance to its original capacitance will be,



1. 2: 1
2. 8: 5
3. 6: 5
4. 4: 1

176.

What is the depth at which the value of acceleration due to gravity becomes 1/n times the value at the surface of the earth? (radius of the earth = R)

1. $\frac{R}{n^2}$
2. $\frac{R(n-1)}{n}$
3. $\frac{Rn}{(n-1)}$
4. R/n

177.

Time intervals measured by a clock give the following readings :

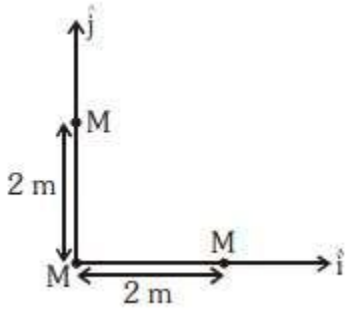
1.255 sec, 1.24 sec, 1.27sec, 1.21 sec and 1.28 sec.

What is the percentage relative error of the observations?

1. 2 %
2. 4 %
3. 16 %
4. 1.6 %

178.

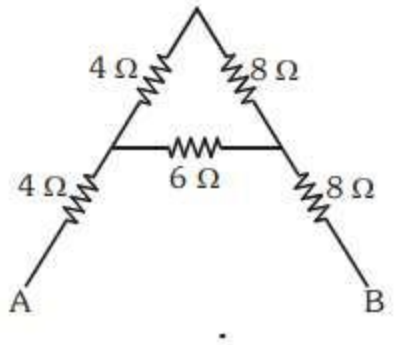
Three identical spheres, each of mass M, are placed at the corners of a right-angle triangle with mutually perpendicular sides equal to 2 m (see figure). Taking the point of intersection of the two mutually perpendicular sides as the origin, find the position vector of the centre of mass.



1. $2\left(\hat{i}+\hat{j}\right)$
2. $\left(\hat{i}+\hat{j}\right)$
3. $\frac{2}{3}\left(\hat{i}+\hat{j}\right)$
4. $\frac{4}{3}\left(\hat{i}+\hat{j}\right)$

179.

The equivalent resistance between A and B for the mesh shown in the figure is:

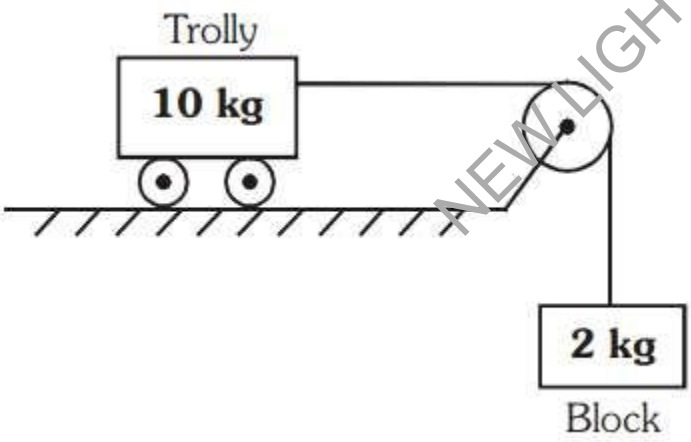


1. $7.2\ \Omega$
2. $16\ \Omega$
3. $30\ \Omega$
4. $4.8\ \Omega$

180.

Calculate the acceleration of the block and trolly system shown in the figure. The coefficient of kinetic friction between the trolly and the surface is 0.05.

($g = 10\ m/s^2$, mass of the string is negligible and no other friction exists).



1. $1.25\ m/s^2$
2. $1.50\ m/s^2$
3. $1.66\ m/s^2$
4. $1.00\ m/s^2$