FINAL NEET(UG)–2020 EXAMINATION

PHASE - 2

ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

CODE - X6

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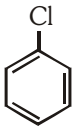
1. Which of the following statement is **NOT** true about acid rain ?
(1) It is due to reaction of SO_2, NO_2 and CO_2 with rain water
(2) Causes no damage to monuments like Taj Mahal.
(3) It is harmful for plants.
(4) Its pH is less than 5.6

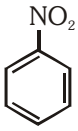
2. The oxidation number of the underlined atom in the following species
(1) $Cu_2\underline{O}$ is –1 (2) $\underline{Cl}O_3^-$ is +5
(3) $K_2\underline{Cr}_2O_7$ is + 6 (4) $H\underline{Au}Cl_4$ is +3
Identify the incorrect option.

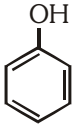
3. Reaction of propanamide with ethanolic sodium hydroxide and bromine will give
(1) Ethylamine (2) Methylamine
(3) Propylamine (4) Aniline

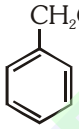
4. A liquid compound (x) can be purified by steam distillation only if it is
(1) Steam volatile, immiscible with water
(2) Not steam volatile, miscible with water
(3) Steam volatile, miscible with water
(4) Not steam volatile, immiscible with water

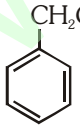
5. Among the compounds shown below which one revealed a linear structure ?
(1) NO_2 (2) HOCl (3) O_3 (4) N_2O

6. Which of the following compound is most reactive in electrophilic aromatic substitution ?
(1) 

(2) 

(3) 
(4) 

7. Which of the following will **NOT** undergo S_N1 reaction with $\bar{O}H$?
(1) $CH_2 = CH - CH_2Cl$ (2) $(CH_3)_3 CCl$
(3) 

(4) 

8. 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.

9. 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.

10. If for a certain reaction Δ_rH is 30 kJ mol^{-1} at 450 K, the value of Δ_rS (in JK^{-1} mol^{-1}) for which the same reaction will be spontaneous at the same temperature is
(1) 70 (2) –33 (3) 33 (4) –70

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

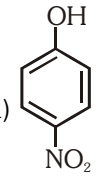
Column-I	Column-II
(a) Copper	(i) Non-metal
(b) Fluorine	(ii) Transition metal
(c) Silicon	(iii) Lanthanoid
(d) Cerium	(iv) Metalloid

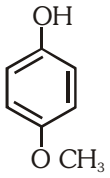
Identify the correct match :
(1) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(2) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
(3) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
(4) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

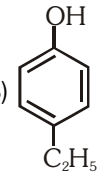
12. Which of the following is a free radical substitution reaction ?
(1) Benzene with $Br_2/AlCl_3$
(2) Acetylene with HBr
(3) Methane with Br_2/hv
(4) Propene with $HBr/(C_6H_5COO)_2$

13. 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

14. Which of the following substituted phenols is the strongest acid?

(1) 

(2) 

(3) 

(4) 

15. 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)

16. 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}

17. 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.

18. 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 in 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)

19. 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

20. 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)

21. 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

22. 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, $LiCl{\cdot}H_2O$.

23. Deficiency of which vitamin causes osteomalacia ?

(1) Vitamin A (2) Vitamin D

(3) Vitamin K (4) Vitamin E

24. Identify the wrongly matched pair.

Molecule	**Shape or geometry of molecule**
(1) $PC1_5$	Trigonal planar
(2) SF_6	Octahedral
(3) $BeCl_2$	Linear
(4) NH_3	Trigonal pyramidal

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

What is Z ?

(1) $CH_3CH_2CH_2CH_2OH$

(2) $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_3$

(3) $CH_3CH_2CH_2CHO$

(4) $CH_3CH_2CH_2CH_3$

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

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

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

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

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

27. 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)

28. Which among the following salt solutions is basic in nature ?

(1) Ammonium chloride

(2) Ammonium sulphate

(3) Ammonium nitrate

(4) Sodium acetate

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

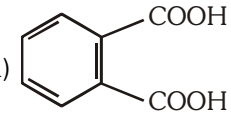
(1) TiO_2

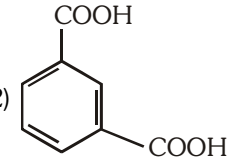
(2) Haemoglobin

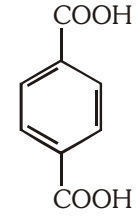
(3) Starch

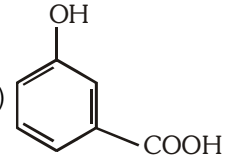
(4) Hydrated $A\ell_2O_3$

30. 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) 

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

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

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

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

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

32. 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

33. Which of the following statement is **not** true about glucose ?

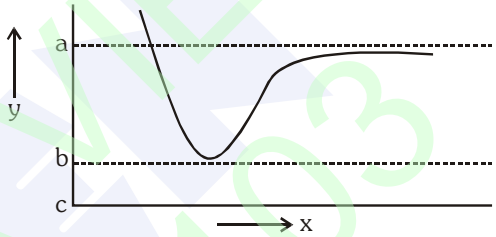
(1) It is an aldohexose.

(2) It contains five hydroxyl groups.

(3) It is a reducing sugar.

(4) It is an aldopentose.

34. The potential energy (y) curve for H_2 formation as a function of internuclear distance (x) of the H atoms is shown below.



The bond energy of H_2 is :

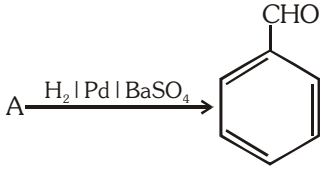
(1) (b – a)

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

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

(4) (c – a)

35. Identify compound (A) in the following reaction :



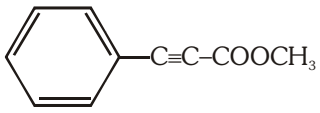
(1) Benzoyl chloride

(2) Toluene

(3) Acetophenone

(4) Benzoic acid

36. 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

37. 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

38. 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

39. 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

40. Which of the following oxide is amphoteric in nature?
(1) SnO_2 (2) SiO_2
(3) GeO_2 (4) CO_2

41. 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) $Li_3N_{(s)} + 3H_2O_{(l)} \rightarrow NH_{3(g)} + 3LiOH_{(aq)}$
(3) $2F_{2(g)} + 2H_2O_{(l)} \rightarrow 4HF_{(aq)} + O_{2(g)}$
(4) $P_4O_{10(s)} + 6H_2O_{(l)} \rightarrow 4H_3PO_{4(aq)}$

42. Which one of the following compounds shows both, Frenkel as well as Schottky defects ?
(1) AgBr
(2) AgI
(3) NaCl
(4) ZnS

43. 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}

44. Isotonic solutions have same
(1) vapour pressure
(2) freezing temperature
(3) osmotic pressure
(4) boiling temperature

45. The solubility product for a salt of the type AB is 4×10^{-8}. What is the molarity of its standard solution?
(1) 2×10^{-4} mol/L
(2) 16×10^{-16} mol/L
(3) 2×10^{-16} mol/L
(4) 4×10^{-4} mol/L

46. In some plants thalamus contributes to fruit formation. Such fruits are termed as :
(1) False fruits
(2) Aggregate fruits
(3) True fruits
(4) Parthenocarpic fruit

47. First discovered restriction endonuclease that always cuts DNA molecule at a particular point by recognising a specific sequence of six base pairs is:
(1) EcoR1
(2) Adenosine deaminase
(3) Thermostable DNA polymerase
(4) Hind II

48. 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

49. The term 'Nuclein' for the genetic material was used by :
(1) Franklin (2) Meischer
(3) Chargaff (4) Mendel

50. Chromosomal theory of inheritance was proposed by :
(1) Sutton and Boveri
(2) Bateson and Punnet
(3) T. H. Morgan
(4) Watson and Crick

51. Phycoerythrin is the major pigment in :
(1) Red algae
(2) Blue green algae
(3) Green algae
(4) Brown algae

52. Identify the statement which is **incorrect**.
(1) Sulphur is an integral part of cysteine.
(2) Glycine is an example of lipids.
(3) Lecithin contains phosphorus atom in its structure.
(4) Tyrosine possesses aromatic ring in its structure.

53. 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

54. A species which was introduced for ornamentation but has become a trouble-some weed in India :
(1) *Parthenium hysterophorus*
(2) *Eichhornia crassipes*
(3) *Prosopis juliflora*
(4) *Trapa spinosa*

55. Correct position of floral parts over thalamus in 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 centre and other parts cover it partially.
(4) Gynoecium is situated in the centre, and other parts of the flower are located at the rim of the thalamus, at the same level.

56. 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

57. According to Alexander von Humboldt :
(1) Species richness decreases with increasing area of exploration
(2) Species richness increases with 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

58. 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 coloured
(4) Pollen grains are light and non-sticky

59. 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) $\text{Br} \oplus ♀ \; \widehat{P_{(3+3)} \; A_{3+3}} \; G_{(3)}$
(4) $\oplus ♀ \; K_{(5)} \; \widehat{C_{(5)} \; A_5} \; \underline{G}_{(2)}$

60. 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

61. 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

62. The number of contrasting characters studied by Mendel for his experiments was :
(1) 14 (3) 4 (2) 2 (4) 7

63. Attachment of spindle fibers to kinetochores of chromosomes becomes evident in :
(1) Anaphase (2) Telophase
(3) Prophase (4) Metaphase

64. 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)

65. Vegetative propagule in *Agave* is as :
(1) Rhizome (2) Bulbil
(3) Offset (4) Eye

66. 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)

67. Which of the following elements helps in maintaining the structure of ribosomes ?
(1) Magnesium (2) Zinc
(3) Copper (4) Molybdenum

68. Who coined the term 'Kinetin' ?
(1) Skoog and Miller
(2) Darwin
(3) Went
(4) Kurosawa

69. In the following in each set a conservation approach and an example of 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 correct match of approach and method :
(1) (a) and (c) (2) (a) and (d)
(3) (b) and (d) (4) (a) and (b)

70. Embryological support for evolution was proposed by :
(1) Ernst Heckel
(2) Karl Ernst von Baer
(3) Charles Darwin
(4) Alfred Wallace

71. During non-cyclic photophosphorylation, when electrons are lost from the reaction centre at PS II, what is the source which replaces these electrons?
(1) Oxygen (2) Water
(3) Carbon dioxide (4) Light

72. 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

73. Inclusion bodies of blue- green, purple and green photosynthetic bacteria are :
(1) Contractile vacuoles
(2) Gas vacuoles
(3) Centrioles
(4) Microtubules

74. Large, empty colourless cells of the adaxial epidermis along the veins of grass leaves are
(1) Lenticels
(2) Guard cells
(3) Bundle sheath cells
(4) Bulliform cells

75. The biosynthesis of ribosomal RNA occurs in :
(1) Ribosomes
(2) Golgi apparatus
(3) Microbodies
(4) Nucleolus

76. Which of the following is **incorrect** about Cynobacteria ?
(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

77. Which of the following statements about cork cambium is **incorrect**?
(1) It forms secondary cortex on its outerside
(2) It forms a part of periderm
(3) It is responsible for the formation of lenticels
(4) It is a couple of layers thick

78. Select the **incorrect** statement.
(1) Transport of molecules in phloem can be bidirectional.
(2) Movement of minerals in xylem is unidirectional.
(3) Unloading of sucrose at sink does not involve the utilization of ATP.
(4) Elements most easily mobilized in plants from one region to another are: phosphorus, sulphur, nitrogen and potassium.

79. 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

80. Inhibitory substances in dormant seeds cannot be removed by subjecting seeds to :
(1) Gibberellic acid
(2) Nitrate
(3) Ascorbic acid
(4) Chilling conditions

81. 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)

82. Which of the following statements is **incorrect**?
(1) RuBisCO is a bifunctional enzyme
(2) In C_4 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

83. Which of the following statements is incorrect regarding the phosphorus cycle?
(1) Phosphates are the major form of phosphorus reservoir
(2) Phosphorus solubilising bacteria facilitate the release of phosphorus from organic remains
(3) There is appreciable respiratory release of phosphorus into atmosphere
(4) It is sedimentary cycle

84. After about how many years of formation of earth, life appeared on this planet ?
(1) 500 billion years (2) 50 million years
(3) 500 million years (4) 50 billion years

85. In a mixture, DNA fragments are separated by :-
(1) Bioprocess engineering
(2) Restriction digestion
(3) Electrophoresis
(4) Polymerase chain reaction

86. 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, fruit develops from 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

87. The impact of immigration on population density is :-
(1) Negative
(2) Both positive and negative
(3) Neutralized by natality
(4) Positive

88. Male and female gametophytes do not have an independent free living existence in :-
(1) Pteridophytes (2) Algae
(3) Angiosperms (4) Bryophytes

89. 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)

90. Pyruvate dehydrogenase activity during aerobic respiration requires :-
(1) Calcium (2) Iron
(3) Cobalt (4) Magnesium

91. The rate of decomposition is faster in the ecosystem due to 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

92. 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 butylicum*

93. 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

94. 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

95. The phenomenon of 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

96. The best example for pleiotropy is :-
(1) Skin colour
(2) Phenylketoneuria
(3) Colour Blindness
(4) ABO Blood group

97. 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

98. 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)

99. Which of the following options does correctly represent the characteristic features of phylum Annelida ?
(1) Triploblastic, unsegmented body and bilaterally symmetrical.
(2) Triploblastic, segmented body and bilaterally symmetrical.
(3) Triploblastic, flattened body and acoelomate condition.
(4) Diploblastic, mostly marine and radially symmetrical.

100. 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)

101. 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

102. 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

103. 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)

104. 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 foetus

105. Match the following columns and select the correct option :

Column - I	**Column - II**
(a) Rods and Cones	(i) Absence of photoreceptor cells
(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)

106. The size of Pleuropneumonia - like Organism (PPLO) is :
(1) 0.02 µm (2) 1-2 µm
(3) 10-20 µm (4) 0.1 µm

107. The proteolytic enzyme rennin is found in :
(1) Intestinal juice (2) Bile juice
(3) Gastric juice (4) Pancreatic juice

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

Organisms	**Characteristics**
(a) Platyhelminthes	(i) Cylindrical body with no segmentation
(b) Echinoderms	(ii) Warm blooded animals with direct development
(c) Hemichordates	(iii) Bilateral symmetry with incomplete digestive system
(d) Aves	(iv) 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)

109. Cyclosporin A, used as immuno suppression agent, is produced from :
(1) *Monascus purpureus*
(2) *Saccharomyces cerevisiae*
(3) *Penicillium notatum*
(4) *Trichoderma polysporum*

110. Select the correct statement from the following :
(1) Gel electrophoresis is used for 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 gene of interest.

111. 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)

112. The yellowish fluid "colostrum" secreted by mammary glands of 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

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

Column - I	**Column - II**
(a) Grinding of the food particles	(i) Hepatic caecal
(b) Secrete gastric juice	(ii) 10^{th} segment
(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)

114. 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

115. *E.coli* has only 4.6×10^6 base pairs and completes the process of replication within 18 minutes; then the average rate of polymerisation is approximately-
(1) 2000 base pairs/second
(2) 3000 base pairs/second
(3) 4000 base pairs/second
(4) 1000 base pairs/second

116. 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

117. According to 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

118. The Total Lung Capacity (TLC) is the total volume of air accomodated in the lungs at the end of a 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)

119. 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

120. During Meiosis 1, in which stage synapsis takes place ?
(1) Pachytene (2) Zygotene
(3) Diplotene (4) Leptotene

121. Match the following columns and select the correct option :

Column - I	Column - II
(a) Smooth endoplasmic reticulum	(i) Protein synthesis
(b) Rough endoplasmic reticulum	(ii) Lipid synthesis
(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)

122. 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.

123. Which of the following is associated with decrease in cardiac output ?
(1) Sympathetic nerves
(2) Parasympathetic neural signals
(3) Pneumotaxic centre
(4) Adrenal medullary hormones

124. 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

125. Select the **incorrectly** matched pair from following:
(1) Chondrocytes - Smooth muscle cells
(2) Neurons - Nerve cells
(3) Fibroblast - Areolar tissue
(4) Osteocytes - Bone cells

126. The laws and rules to prevent unauthorised exploitation of bio-resources are termed as -
(1) Biopatenting (2) Bioethics
(3) Bioengineering (4) Biopiracy

127. 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)

128. 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)

129. A Hominid fossil discovered in Java in 1891, now extinct, having cranial capacity of about 900 cc was:
(1) *Homo erectus* (2) Neanderthal man
(3) *Homo sapiens* (4) *Australopithecus*

130. 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)

131. 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 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)

132. Which is the basis of genetic mapping of human genome as well as DNA finger printing ?
(1) Polymorphism in DNA sequence
(2) Single nucleotide polymorphism
(3) Polymorphism in hnRNA sequence
(4) Polymorphism in RNA sequence

133. Which of the following conditions cause erythroblastosis foetalis ?
(1) Mother Rh^{+ve} and foetus Rh^{-ve}
(2) Mother Rh^{-ve} and foetus Rh^{+ve}
(3) Both mother and foetus Rh^{-ve}
(4) Both mother and foetus Rh^{+ve}

134. All vertebrates are chordates but all chordates are not vertebrates, why ?
(1) Notochord is replaced by vertebral column in adult of some chordates.
(2) Ventral hollow nerve cord remains throughout life in some chordates.
(3) All chordates possess vertebral column.
(4) All chordates possess notochord throughout their life.

135. 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) Auto immune 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)

136. The E.M. wave with 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 second. Its angular acceleration is

(1) 2π rad/s^2 (2) 28π rad/s^2

(3) 120π rad/s^2 (4) 1 rad/s^2

138. What happens to the mass number and atomic number of an element when it emits γ-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 atomic number increases by two.

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

(1) 2.91×10^{-4} rad (2) 4.85×10^{-4} rad

(3) 4.80×10^{-6} rad (4) 1.75×10^{-2} rad

140. The magnetic flux linked with a coil (in Wb) is given by the equation

$\phi = 5t^2 + 3t + 16$

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) $\vec{E} = \frac{\vec{P}}{4\pi \epsilon_0 r^3}$ (2) $\vec{E} = \frac{2\vec{P}}{4\pi \epsilon_0 r^3}$

(3) $\vec{E} = -\frac{\vec{P}}{4\pi \epsilon_0 r^2}$ (4) $\vec{E} = -\frac{\vec{P}}{4\pi \epsilon_0 r^3}$

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

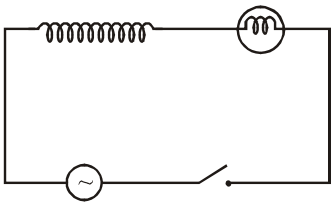
(1) focal length of the lens

(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 sometime an iron rod is inserted into the interior of the inductor. The glow of the light bulb



(1) decreases

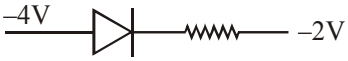
(2) remains unchanged

(3) will fluctuate

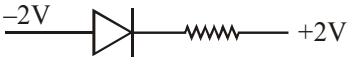
(4) increases

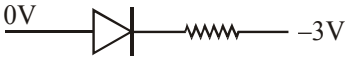
144. The efficiency of a Carnot engine depends upon
(1) the temperature of the sink only
(2) the temperatures of the source and sink
(3) the volume of the cylinder of the engine
(4) the temperature of the source only

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

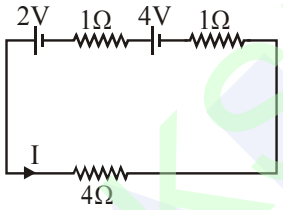
(1) 

(2) 

(3) 

(4) 

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 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) $e^{-\omega t}$

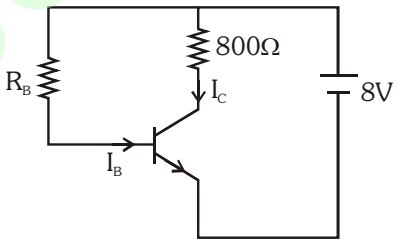
150. The de Broglie wavelength of an electron moving with kinetic energy of 144 eV is nearly
(1) 102×10^{-3} nm (2) 102×10^{-4} nm
(3) 102×10^{-5} nm (4) 102×10^{-2} nm

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

(1) $\ell \propto \frac{1}{d^2}$ (2) $\ell \propto d$

(3) $\ell \propto d^2$ (4) $\ell \propto \frac{1}{d}$

152. A n-p-n transistor is connected in 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 in 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 s. What is the velocity of the ball when it is at the topmost point of the window ? ($g = 10\ m/s^2$)
(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 :

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

Calculate the wavelength.

(1) $\pi \times 10^3$ m (2) 2×10^{-3} m

(3) 2×10^3 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 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 Å apart is, ($m_e \simeq 9 \times 10^{-31}$ kg, $e = 1.6 \times 10^{-19}$ C) (Take $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9$ Nm^2 C^{-2})

(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

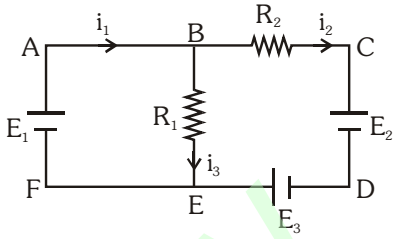
(4) Davisson and Germer

158. Two solid conductors are made up of same material, have 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, C have surface temperatures T_A, T_B, 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 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 $\sqrt{7gr}$ at the lowest point. The tension in the string at the lowest point is :

(1) 6 mg (2) 7 mg

(3) 8 mg (4) 1 mg

163. An object is placed on the principal axis of a concave mirror at a distance of 1.5 f (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 radioactive sample undergoing α-decay is 1.4×10^{17} s. If the number of nuclei in the sample is 2.0×10^{21}, the activity of the sample is nearly :

(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°, then velocity of light in the medium is,

(1) 1.5×10^8 m/s (2) $\frac{3}{\sqrt{2}} \times 10^8$ m/s

(3) $\sqrt{2} \times 10^8$ m/s (4) 3×10^8 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, (1 G = 10^{-4} T)

(1) 2.51×10^{-4} V (2) 2.51×10^{-5} V

(3) 4.0×10^{-5} V (4) 2.51 V

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

(1) mass density, mass of the gas

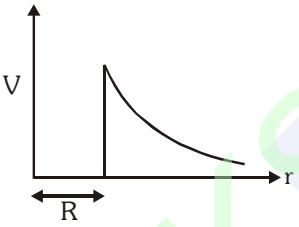
(2) number density, molar mass

(3) mass density, molar mass

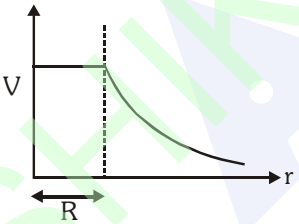
(4) number density, mass of the gas

168. The variation of electrostatic potential with radial distance *r* from the centre of a positively charged metallic thin shell of radius R is givey by the graph

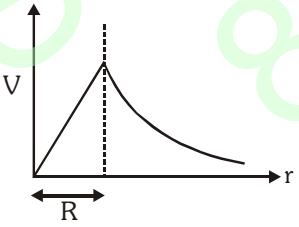
(1)



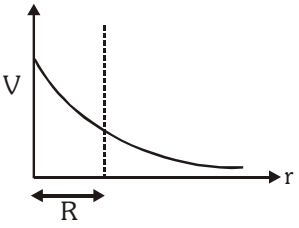
(2)



(3)



(4)

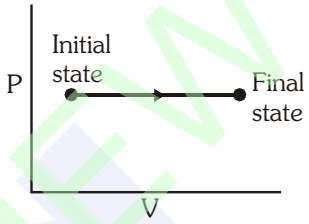


169. Which of the following gate is called universal gate?

(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 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 ?

(density of mercury = 13600 kg/m^3)

(1) 1.36 m (2) 13.6 m

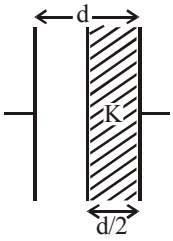
(3) 136 m (4) 0.76 m

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

(1) I $L^2/4$ A m^2 (2) I π L^2 /4 A m^2

(3) 2 I L^2 /π A m^2 (4) I L^2 /4π 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 same area but thickness d/2 is inserted between the plates as shown in 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 that at the surface of earth? (radius of earth = R)

(1) R/n^2 (2) R(n – 1)/n

(3) Rn/(n – 1) (4) R/n

177. Time intervals measured by a clock give the following readings :

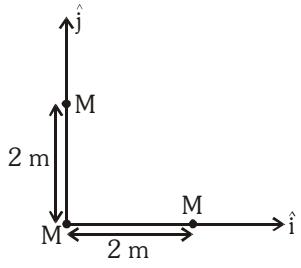
1.25 s, 1.24 s, 1.27 s, 1.21 s and 1.28 s.

What is the percentage relative error of the observations ?

(1) 2 % (2) 4 %

(3) 16 % (4) 1.6 %

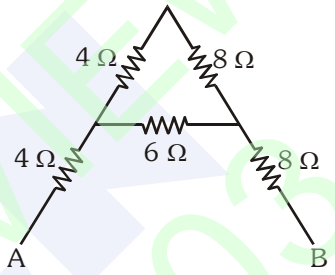
178. Three identical spheres, each of mass M, are placed at the corners of a right angle triangle with mutually perpendicular sides equal to 2 m (see figure). Taking the point of intersection of the two mutually perpendicular sides as the origin, find the position vector of centre of mass.



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

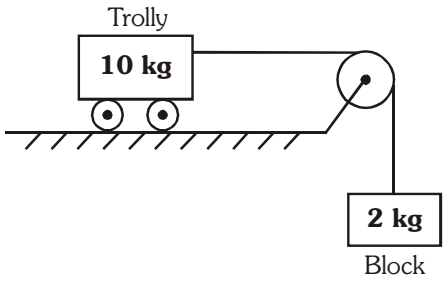
179. The equivalent resistance between A and B for the mesh shown in the figure is



(1) 7.2 Ω (2) 16 Ω

(3) 30 Ω (4) 4.8 Ω

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

Ques. No.	Ans.	Ques. No.	Ans.	Ques. No.	Ans.	Ques. No.	Ans.	Ques. No.	Ans.	Ques. No.	Ans.
1	2	31	2	61	4	91	4	121	1	151	1
2	1	32	2	62	4	92	1	122	4	152	3
3	1	33	4	63	4	93	1	123	2	153	2
4	1	34	1	64	2	94	4	124	4	154	2
5	4	35	1	65	2	95	4	125	1	155	2
6	4	36	3	66	1	96	2	126	1	156	3
7	3	37	1	67	1	97	4	127	4	157	4
8	1	38	1	68	1	98	2	128	3	158	2
9	1	39	4	69	2	99	2	129	1	159	2
10	1	40	1	70	1	100	4	130	4	160	4
11	2	41	3	71	2	101	3	131	2	161	3
12	3	42	1	72	2	102	2	132	1	162	3
13	1	43	4	73	2	103	1	133	2	163	1
14	1	44	3	74	4	104	2	134	1	164	1
15	4	45	1	75	4	105	1	135	2	165	2
16	1	46	1	76	2	106	4	136	3	166	1
17	2	47	4	77	1	107	3	137	1	167	3
18	2	48	2	78	3	108	1	138	2	168	2
19	1	49	2	79	3	109	4	139	1	169	3
20	2	50	1	80	3	110	3	140	2	170	3
21	1	51	1	81	2	111	4	141	4	171	4
22	2	52	2	82	2	112	1	142	2	172	1
23	2	53	2	83	3	113	1	143	1	173	2
24	1	54	2	84	3	114	2	144	2	174	4
25	1	55	1	85	3	115	1	145	4	175	2
26	3	56	2/4	86	1	116	3	146	2	176	2
27	1	57	2	87	4	117	2	147	1	177	4
28	4	58	2	88	3	118	4	148	2	178	3
29	3	59	3	89	3	119	2	149	3	179	2
30	1	60	4	90	4	120	2	150	1	180	1