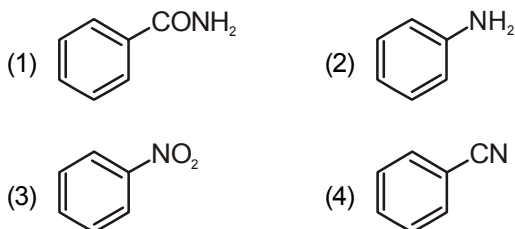


CHEMISTRY NEET-2016 (ii) (UNSOLVED)

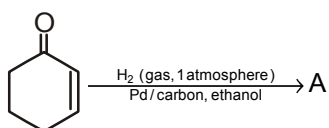
1. A given nitrogen-containing aromatic compound A reacts with Sn/HCl, followed by HNO₂ to give an unstable compound B. B₁ on treatment with phenol, forms a beautiful coloured compound C with the molecular formula C₁₂H₁₀N₂O. The structure of compound A is :



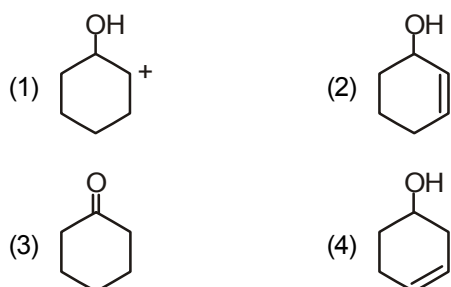
2. Consider the reaction
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NaCN} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{CN} + \text{NaBr}$
 This reaction will be the fastest in :

- (1) Water
 (2) ethanol
 (3) methanol
 (4) N, N'-dimethylformamide (DMF)

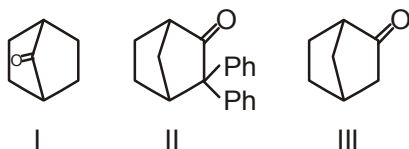
3. The correct structure of the product A formed in the reaction



is :

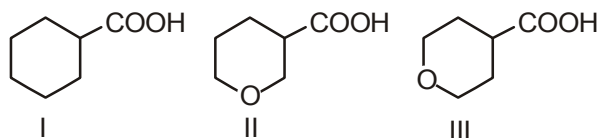


4. Which among the given molecules can exhibit tautomerism :



- (1) Both II and III
 (2) III only
 (3) Both I and III
 (4) Both I and II

5. The correct order of strengths of the carboxylic acids



is :

- (1) II > I > III
 (2) I > II > III
 (3) II > III > I
 (4) III > II > I

6. The compound that will react most readily with gaseous bromine has the formula :

- (1) C₂H₄
 (2) C₃H₆
 (3) C₂H₂
 (4) C₄H₁₀

7. Which one of the following compounds shows the presence of intramolecular hydrogen bond :

- (1) Concentrated acetic acid
 (2) H₂O₂
 (3) HCN
 (4) Cellulose

8. The molecular conductivity of a 0.5 mol/dm³ solution of AgNO₃ with electrolytic conductivity of 5.76 × 10⁻³ S cm⁻¹ at 298 K is :

- (1) 28.9 S cm²/mol
 (2) 2.88 S cm²/mol
 (3) 11.52 S cm²/mol
 (4) 0.086 S cm²/mol

9. The decomposition of phosphine (PH₃) on tungsten at low pressure is a first-order reaction. It is because the

- (1) rate of decomposition is very slow
 (2) rate is proportional to the surface coverage
 (3) rate is inversely proportional to the surface coverage
 (4) rate is independent of the surface coverage

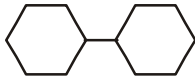
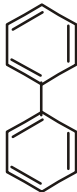

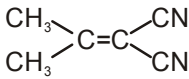
10. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As₂S₃ are given below :

- i. (NaCl) = 52
 ii. (BaCl₂) = 0.69
 iii. (MgSO₄) = 0.22

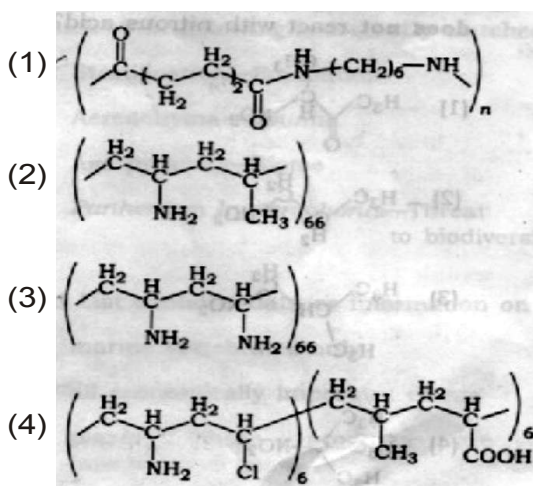
The correct order of their coagulating power is :

- (1) iii > i > ii
 (2) i > ii > iii
 (3) ii > i > iii
 (4) iii > ii > i

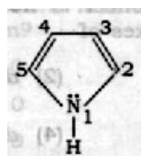
11. During the electrolysis of molten sodium chloride, the time required to produce 0.10 mol of chlorine gas using a current of 3 amperes is :
- (1) 330 minutes (2) 55 minutes
(3) 110 minutes (4) 220 minutes
12. How many electrons can fit in the orbital for which $n=3$ and $l=1$
- (1) 14 (2) 2
(3) 6 (4) 10
13. For a sample of perfect gas when its pressure is changed isothermally from p_i to p_f , the entropy change is given by :
- (1) $\Delta S = RT \ln \left(\frac{P_i}{P_f} \right)$ (2) $\Delta S = nR \ln \left(\frac{P_f}{P_i} \right)$
(3) $\Delta S = nR \ln \left(\frac{P_i}{P_f} \right)$ (4) $\Delta S = nRT \ln \left(\frac{P_f}{P_i} \right)$
14. The van't Hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is :
- (1) 3 (2) 0
(3) 1 (4) 2
15. The percentage of pyridine (C_5H_5N) that forms pyridinium ion ($C_5H_5N^+H$) in a 0.10 M aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is :
- (1) 1.6% (2) 0.0060%
(3) 0.013% (4) 0.77%
16. In calcium fluoride, having the fluorite structure, the coordination numbers for calcium ion (Ca^{2+}) and fluoride ion (F^-) are :
- (1) 4 and 8 (2) 4 and 2
(3) 6 and 6 (4) 8 and 4
17. If the E°_{cell} for a given reaction has a negative value, which of the following gives the correct relationships for the value of ΔG° and K_{eq} :
- (1) $\Delta G^\circ < 0$; $K_{eq} < 1$
(2) $\Delta G^\circ > 0$; $K_{eq} < 1$
(3) $\Delta G^\circ > 0$; $K_{eq} > 1$
(4) $\Delta G^\circ < 0$; $K_{eq} > 1$
18. Which one of the following is incorrect for ideal solution:
- (1) $\Delta G_{mix} = 0$
(2) $\Delta H_{mix} = 0$
(3) $\Delta U_{mix} = 0$
(4) $\Delta P = P_{obs} - P_{calculated \text{ by Raoult's law}} = 0$
19. The solubility of $AgCl(s)$ with solubility product 1.6×10^{-10} in 0.1 M NaCl solution would be :
- (1) zero
(2) 1.26×10^{-5} M
(3) 1.6×10^{-9} M
(4) 1.6×10^{-11} M
20. Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2 . When 0.1 mole of XY_2 weights 10 g and 0.05 mole of X_3Y_2 weights 9 g, the atomic weights of X and Y are :
- (1) 30, 20
(2) 40, 30
(3) 60, 40
(4) 20, 30
21. The number of electrons delivered at the cathode during electrolysis by a current of 1 ampere in 60 seconds is (charge on electron = 1.60×10^{-19} C) :
- (1) 7.48×10^{23}
(2) 6×10^{23}
(3) 6.10×10^{20}
(4) 3.75×10^{20}
22. Boric acid is an acid because its molecule :
- (1) combines with proton from water molecule
(2) contains replaceable H^+ ion
(3) gives up a proton
(4) accepts OH^- from water releasing proton
23. AlF_3 is soluble in HF only in presence of KF. It is due to the formation of :
- (1) $K[AlF_3H]$
(2) $K_3[AlF_3H_3]$
(3) $K_3[AlF_6]$
(4) AlH_3
24. Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because :
- (1) zinc has higher negative electrode potential than iron
(2) zinc is lighter than iron
(3) zinc has lower melting point than iron
(4) zinc has lower negative electrode potential than iron
25. The suspension of slaked lime in water is known as :
- (1) aqueous solution of slaked lime
(2) limewater
(3) quicklime
(4) milk of lime

26. The hybridizations of atomic orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ respectively are :
- sp^2 , sp and sp^3
 - sp , sp^3 and sp^2
 - sp^2 , sp^3 and sp
 - sp , sp^2 and sp^3
27. Which of the following fluoro compounds is most likely to behave as a Lewis base :
- SiF_4
 - BF_3
 - PF_3
 - CF_4
28. Which of the following pairs of ions is isoelectronic and isostructural :
- ClO_3^- , SO_3^{2-}
 - CO_3^{2-} , NO_3^-
 - ClO_3^- , CO_3^{2-}
 - SO_3^{2-} , NO_3^-
29. In context with beryllium, which one of the following statements is incorrect :
- Its hydride is electron deficient and polymeric
 - It is rendered passive by nitric acid
 - It forms Be_2C
 - Its salts rarely hydrolyze
30. Hot concentrated sulphuric acid is a moderately strong oxidizing agent. Which of the following reactions does not show oxidizing behaviour :
- $\text{CaF}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + 2\text{HF}$
 - $\text{Cu} + 2\text{H}_2\text{SO}_4 \rightarrow \text{CuSO}_4 + \text{SO}_2 + 2\text{H}_2\text{O}$
 - $3\text{S} + 2\text{H}_2\text{SO}_4 \rightarrow 3\text{SO}_2 + 2\text{H}_2\text{O}$
 - $\text{C} + 2\text{H}_2\text{SO}_4 \rightarrow \text{CO}_2 + 2\text{SO}_2 + 2\text{H}_2\text{O}$
31. Which of the following pairs of d-orbitals will have electron density along the axes :
- d_{xy} , $d_{x^2-y^2}$
 - d_{x^2} , d_{xz}
 - d_{xz} , d_{y^2}
 - d_{z^2} , $d_{x^2-y^2}$
32. The correct geometry and hybridization for XeF_4 are :
- square planar, sp^3d^2
 - octahedral, sp^3d^2
 - trigonal bipyramidal, sp^3d
 - planar triangle, sp^3d^3
33. Among the following, which one is a wrong statement :
- I_3^+ has bent geometry
 - PH_3 and BiCl_5 do not exist
 - $\text{p}\pi\text{-d}\pi$ bonds are present in SO_2
 - SeF_4 and CH_4 have same shape
34. The correct increasing order of trans-effect of the following species is :
- $\text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^- > \text{NH}_3$
 - $\text{NH}_3 > \text{CN}^- > \text{Br}^- > \text{C}_6\text{H}_5^-$
 - $\text{CN}^- > \text{C}_6\text{H}_5^- > \text{Br}^- > \text{NH}_3$
 - $\text{Br}^- > \text{CN}^- > \text{NH}_3 > \text{C}_6\text{H}_5^-$
35. Which one of the following statements related to lanthanons is incorrect :
- $\text{Ce}(+4)$ solutions are widely used as oxidizing agent in volumetric analysis
 - Europium shows +2 oxidation state
 - The basicity decreases as the ionic radius decreases from Pr to Lu
 - All the lanthanons are much more reactive than aluminium
36. Jahn-Teller effect is not observed in high spin complexes of
- | | |
|-----------|-----------|
| (1) d^9 | (2) d^7 |
| (3) d^8 | (4) d^4 |
37. Which of the following can be used as the halide component for Friedal-Crafts reaction :
- Isopropyl chloride
 - Chlorobenzene
 - Bromobenzene
 - Chloroethene
38. In which of the following molecules, all atoms are coplanar :
- | | |
|--|---|
| (1)  | (2)  |
| (3)  | (4)  |

39. Which one of the following structures represents nylon 6,6 polymer :



40. In pyrrole



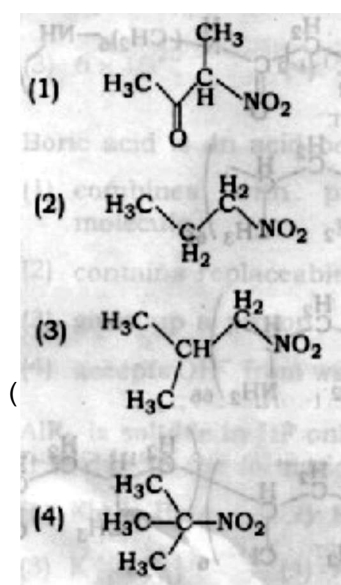
the electron density is maximum on

- (1) 2 and 5 (2) 2 and 3
 (3) 3 and 4 (4) 2 and 4

41. Which of the following compounds shall not produce propene by reaction with HBr followed by elimination or direct only elimination reaction :

- (1) $\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\text{CH}_2\text{Br}$ (2) $\text{H}_2\text{C}-\overset{\text{H}_2}{\text{C}}-\text{CH}_2$
 (3) $\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\text{CH}_2\text{OH}$ (4) $\text{H}_2\text{C}=\text{C}=\text{O}$

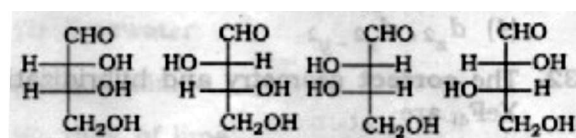
42. Which one of the following nitro-compounds does not react with nitrous acid :



43. The central dogma of molecular genetics states that the genetic information flows from :

- (1) DNA → RNA → Carbohydrates
 (2) Amino acids → Proteins → DNA
 (3) DNA → Carbohydrates → Proteins
 (4) DNA → RNA → Proteins

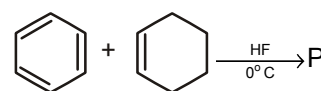
44. The correct corresponding order of names of four aldoses with configuration given below



respectively, is :

- (1) D-erythrose, D-threose, L-erythrose, L-threose
 (2) L-erythrose, L-threose, L-erythrose, D-threose
 (3) D-threose, D-erythrose, L-threose, L-erythrose
 (4) L-erythrose, L-threose, D-erythrose, D-threose

45. In the given reaction



the product P is :

- (1)
- (2)
- (3)
- (4)



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NEET (PHASE-II)-2016 : BIOLOGY

SET : XX

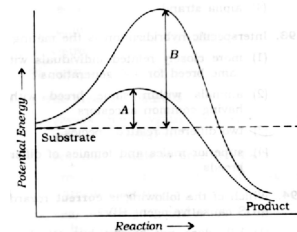
46. A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using
- (1) Ligase
 - (2) Eco RI
 - (3) Taq polymerase
 - (4) Polymerase III
47. Which of the following is not a component of downstream processing ?
- (1) Expression
 - (2) Separation
 - (3) Purification
 - (4) Preservation
48. Which of the following restriction enzymes produces blunt ends ?
- (1) Hind III
 - (2) Sal I
 - (3) Eco RV
 - (4) Xho I
49. Which kind of therapy was given in 1990 to a four - year - old girl with adenosine deaminase (ADA) deficiency?
- (1) Radiation therapy
 - (2) Gene therapy
 - (3) Chemotherapy
 - (4) Immunotherapy
50. How many hot spots of biodiversity in the world have been identified till date by Norman Myers?
- (1) 43
 - (2) 17
 - (3) 25
 - (4) 34
51. The primary producers of the deep-sea hydrothermal vent ecosystem are
- (1) Coral reefs
 - (2) Green algae
 - (3) Chemosynthetic bacteria
 - (4) Blue - green algae
52. Which of the following is correct for r-selected species?
- (1) Small number of progeny with large size
 - (2) Large number of progeny with small size
 - (3) Large number of progeny with large size
 - (4) Small number of progeny with small size
53. If '+' sign is assigned to beneficial interaction, '-' sign to detrimental and '0' sign to neutral interaction, then the population interaction represented by '+ -' refers to
- (1) Parasitism
 - (2) Mutualism
 - (3) Amensalism
 - (4) Commensalism
54. Which of the following is correctly matched ?
- (1) Stratification – Population
 - (2) Aerenchyma – Opuntia
 - (3) Age pyramid – Biome
 - (4) Parthenium hysterophorus –Threat to biodiversity
55. Red List contains data or information on
- (1) Marine vertebrates only
 - (2) All economically important plants
 - (3) Plants whose products are in international trade
 - (4) Threatened species
56. Which one of the following is wrong for fungi ?
- (1) They are both unicellular and multicellular
 - (2) They are eukaryotic
 - (3) All fungi possess a purely cellulosic cell wall
 - (4) They are heterotrophic
57. Methanogens belong to
- (1) Slime moulds
 - (2) Eubacteria
 - (3) Archaeobacteria
 - (4) Dinoflagellates
58. Select the wrong statement
- (1) Diatoms are microscopic and float passively in water
 - (2) The walls of diatoms are easily destructible
 - (3) 'Diatomaceous earth' is formed by the cell walls of diatoms
 - (4) Diatoms are chief producers in the oceans
59. The label of a herbarium sheet does not carry information on
- (1) Height of the plant
 - (2) Date of collection
 - (3) Name of collector
 - (4) Local names

60. Conifers are adapted to tolerate extreme environmental conditions because of
- (1) Presence of vessels
 - (2) Broad hardy leaves
 - (3) Superficial stomata
 - (4) Thick cuticle
61. Which one of the following statements is wrong ?
- (1) Laminaria and Sargassum are used as food
 - (2) Algae increase the level of dissolved oxygen in the immediate environment
 - (3) Algin is obtained from red algae, and carrageenan from brown algae
 - (4) Agar-agar is obtained from Gelidium and Gracilaria
62. The term 'polyadelphous' is related to
- (1) Calyx
 - (2) Gynoecium
 - (3) Androecium
 - (4) Corolla
63. How many plants among indigofera, Sesbania, Salvia, Allium, Aloe, mustard, groundnut, radish, gram and turnip have stamens with different lengths in their flowers?
- (1) Six
 - (2) Three
 - (3) Four
 - (4) Five
64. Radial symmetry is found in the flowers of
- (1) Cassia
 - (2) Brassica
 - (3) Trifolium
 - (4) Pisum
65. Free-central placentation is found in
- (1) Citrus
 - (2) Dianthus
 - (3) Argemone
 - (4) Brassica
66. Cortex is the region found between
- (1) Endodermis and vascular bundle
 - (2) Epidermis and stele
 - (3) Pericycle and endodermis
 - (4) Endodermis and pith
67. The balloon - shaped structures called tyloses
- (1) Are linked to the ascent of sap through xylem vessels
 - (2) Originate in the lumen of vessels
 - (3) Characterize the sapwood
 - (4) Are extensions of xylem parenchyma cells into vessels
68. A non - proteinaceous enzyme is
- (1) Deoxyribonuclease
 - (2) Lysozyme
 - (3) Ribozyme
 - (4) Ligase
69. Select the mismatch
- (1) Methanogens – Prokaryotes
 - (2) Gas vacuoles – Green bacteria
 - (3) Large central vacuoles – Animal cells
 - (4) Protists – Eukaryotes
70. Select the wrong statement
- (1) Mycoplasma is a wall - less microorganism
 - (2) Bacterial cell wall is made up of peptidoglycan
 - (3) Pili and fimbriae are mainly involved in motility of bacterial cells
 - (4) Cyanobacteria lack flagellate cells
71. A cell organelle containing hydrolytic enzymes is :
- (1) Mesosome
 - (2) Lysosome
 - (3) Microsome
 - (4) Ribosome
72. During cell growth, DNA synthesis takes place in
- (1) M phase
 - (2) S phase
 - (3) G₁ phase
 - (4) G₂ phase
73. Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins ?
- (1) Acetyl CoA
 - (2) Glucose - 6-phosphate
 - (3) Fructose 1, 6-bisphosphate
 - (4) Pyruvic acid
74. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap ?
- (1) Absence of sugar
 - (2) Acidic
 - (3) Alkaline
 - (4) Low refractive index

75. You are given a tissue with is potential for differentiation in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots ?
- (1) Gibberellin and abscisic acid
 - (2) IAA and gibberellin
 - (3) Auxin and cytokinin
 - (4) Auxin and abscisic acid
76. Phytochrome is a
- (1) Chromoprotein
 - (2) Flavoprotein
 - (3) Glycoprotein
 - (4) Lipoprotein.
77. Which is essential for the growth of root tip ?
- (1) Mn
 - (2) Zn
 - (3) Fe
 - (4) Ca
78. The process which makes major difference between C_3 and C_4 plants is
- (1) Respiration
 - (2) Glycolysis
 - (3) Calvin cycle
 - (4) Photorespiration
79. Which one of the following statements is not correct ?
- (1) Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes
 - (2) Offspring produced by the asexual reproduction are called clone
 - (3) Microscopic, motile asexual reproductive structures are called zoospores
 - (4) In potato, banana and ginger, the plantlets arise from the internodes present in the modified stem
80. Which one of the following generates new genetic combination leading to variation ?
- (1) Nucellar polyembryony
 - (2) Vgetative reproduction
 - (3) Pathenogenesis
 - (4) Sexual reproduction
81. Match column – I with column - II and select the correct option using the codes given below :
- | Column – I | Column – II |
|----------------------------------|--------------------|
| (a) Pistils fused together | (i) Gametogenesis |
| (b) Formation of gametes | (ii) Pistillate |
| (c) Hyphae of higher Ascomycetes | (iii) Syncarpous |
| (d) Unisexual female flower | (iv) Dikaryotic |
- Codes :**
- (1) a-(iii), b-(i), c-(iv), d-(ii)
 - (2) a-(iv), b-(iii), c-(i), d-(ii)
 - (3) a-(ii), b-(i), c-(iv), d-(iii)
 - (4) a-(i), b-(ii), c-(iv), d-(iii)
82. In majority of angiosperms
- (1) A small central cell is present in the embryo sac
 - (2) Egg has a filiform apparatus
 - (3) There are numerous antipodal cells
 - (4) Reduction division occurs in the megaspore mother cells
83. Pollination in water hyacinth and water lily is brought about by the agency of
- (1) Bats
 - (2) Water
 - (3) Insects or wind
 - (4) Birds
84. The ovule of an angiosperm is technically equivalent to:
- (1) Megaspore
 - (2) Megasporangium
 - (3) Megasporophyll
 - (4) Megaspore mother cell
85. Taylor conducted the experiments to prove semiconservative mode of chromosome replication on
- (1) E. coli
 - (2) Winca rosea
 - (3) Vicia faba
 - (4) Drosophila melanogaster
86. The mechanism that causes a gene to move from one linkage group to another is called
- (1) Crossing - over
 - (2) Inversion
 - (3) Duplication
 - (4) Translocation

87. The equivalent of a structural gene is
- (1) Recon
 - (2) Muton
 - (3) Cistron
 - (4) Operon
88. A true breeding plant is
- (1) Always homozygous recessive in its genetic constitution
 - (2) One that is able to breed on its own
 - (3) Produced due to cross-pollination among unrelated plants
 - (4) Near homozygous and produces offspring of its own kind
89. Which of the following rRNAs acts as structural RNA as well as ribozyme in bacteria ?
- (1) 5.8 S rRNA
 - (2) 5 S rRNA
 - (3) 18 S rRNA
 - (4) 23 S rRNA
90. Stirred - tank bioreactors have been designed for
- (1) Ensuring anaerobic conditions in the culture vessel
 - (2) Purification of product
 - (3) Addition of preservatives to the product
 - (4) Availability of oxygen throughout the process
91. A molecule that can act as a genetic material must fulfill the traits given below, except :
- (1) It should provide the scope for slow changes that are required for evolution
 - (2) It should be able to express itself in the form of 'Mendelian characters'
 - (3) It should be able to generate its replica
 - (4) It should be unstable structurally and chemically
92. DNA -dependent RNA polymerase catalyzes transcription on one strand of the DNA which is called the
- (1) Antistrand
 - (2) Template strand
 - (3) Coding strand
 - (4) Alpha strand
93. Interspecific hybridization is the mating of :
- (1) More closely related individuals within same breed for 4-6 generations
 - (2) Animals within same breed without
 - (3) Two different related species
 - (4) Superior males and females of different breeds
94. Which of the following is correct regarding AIDS causative agent HIV:
- (1) HIV does not escape but attacks the acquired immune response
 - (2) HIV is enveloped virus containing one molecules of single - stranded RNA and one molecule of reverse transcriptase
 - (3) HIV is enveloped virus that contains two identical molecules of single- stranded RNA and two molecules of reverse transcriptase
 - (4) HIV is unenveloped retrovirus
95. Among the following edible fishes, which one is a marine fish having rich source of omega -3 fatty acids:
- (1) Mackerel
 - (2) Mystus
 - (3) Mangur
 - (4) Mrigala
96. Match Column -I with Column -II and select the correct option using the codes given below :
- | Column -I | Column -II |
|------------------|------------------|
| a. Citric acid | i. Trichoderma |
| b. Cyclosporin A | ii. Clostridium |
| c. Statins | iii. Aspergillus |
| d. Bulyric acid | iv. Monascus |
- a
- (1) a-iii, b- iv, c-i, d-ii
 - (2) a-iii, b- i, c-ii, d-iv
 - (3) a-iii, b- i, c-iv, d-ii
 - (4) a-i, b- iv, c-ii, d-iii
97. Biochemical Oxygen Demand (BOD) may not be a good index for pollution for water bodies receiving effluents from :
- (1) sugar industry
 - (2) domestic sewage
 - (3) dairy industry
 - (4) petroleum industry
98. The principle of competitive exclusion was stated by :
- (1) Verhulst and Pearl
 - (2) C. Darwin
 - (3) G. F. Gasuse
 - (4) MacArthur
99. Which of the following National Parks is home to the famous musk deer or hangul :
- (1) Dachigam National park, Jammu & Kashmir
 - (2) Keibul Lamjao National Park, Manipur
 - (3) Bandhavgarh Nationa Park, madhya Pradesh
 - (4) Eaglenest Wildlife Sanctuary, Arunachal Pradesh

100. A lake which is rich in organic waste may result in :
- (1) Mortality of fish due to lack of oxygen
 - (2) increased population of aquatic organisms due to minerals
 - (3) drying of the lake due to algal bloom
 - (4) increased population of fish due to lots of nutrients
101. The highest DDT concentration in aquatic food chain shall occur in :
- (1) eel
 - (2) phytoplankton
 - (3) seagull
 - (4) crab
102. Which of the following sets of diseases is caused by bacteria:
- (1) Herpes and influenza
 - (2) Cholera and tetanus
 - (3) Typhoid and smallpox
 - (4) Tetanus and mumps
103. Match Column -I with Column -II for housefly classification and select the correct option using the codes given below :
- | | |
|-----------|----------------|
| Column -I | Column -II |
| a. Family | i. Diptera |
| b. Order | ii. Arthropoda |
| c. Class | iii. Muscidae |
| d. Phylum | iv. Insecta |
- Codes :**
- (1) a-iv, b- ii, c-i, d-iii
 - (2) a-iii, b- i, c-iv, d-ii
 - (3) a-iii, b- ii, c-iv, d-i
 - (4) a-iv, b- iii, c-ii, d-i
104. Choose the correct statement:
- (1) All Pisces have gills covered by an operculum
 - (2) All mammals are viviparous
 - (3) All cyclostomes do not possess jaws and paired fins
 - (4) All reptiles have a three - chambered heart
105. Study the four statements (A-D) given below and select the two correct ones out of them :
- A. Definition of biological species was given by Ernst Mayr.
 - B. Photoperiod does not affect reproduction in plants
 - C. Binomial nomenclature system was given by r.H. Whittaker
 - D. In unicellular organisms, reproduction is synonymous with growth
- The two correct statements are
- (1) A and B
 - (2) B and C
 - (3) C and D
 - (4) A and D
106. In male cockroaches, sperms are stored in which part of the reproductive system :
- (1) Vas deferens
 - (2) Seminal vesicles
 - (3) Mushroom glands
 - (4) Testes
107. Smooth muscles are :
- (1) Voluntary, spindle -shaped, uninucleate
 - (2) involuntary, fusiform, non- striated
 - (3) voluntary, multinucleate, cylindrical
 - (4) involuntary, cylindrical, striated
108. Oxidative phosphorylation is :
- (1) formation of ATP by energy released from electrons removed during substrate oxidation
 - (2) formation of ATP by transfer of phosphate group from a substrate to ADP
 - (3) oxidation of phosphate group in ATP
 - (4) addition of phosphate group to ATP
109. Which of the following is the least likely to be involved in stabilizing the three- dimensional folding of most proteins :
- (1) Ester bonds
 - (2) Hydrogen bonds
 - (3) Electrostatic interaction
 - (4) Hydrophobic interaction
110. Which of the following describes the given graph correctly:



- (1) Exothermic reaction with energy A in absence of enzyme and B is presence of enzyme
 - (2) Endothermic reaction with energy A in presence of enzyme and B in absence of enzyme
 - (3) Exothermic reaction with energy A in presence of enzyme and B is absence of enzyme
 - (4) Endothermic reaction with energy A in absence of enzyme and B in presence of enzyme
111. When cell has stalled DNA replication fork, which checkpoint should be predominantly activated :
- (1) Both G₂/M and M
 - (2) G₁/S
 - (3) G₂/M
 - (4) M

112. Match the stages of meiosis in Column -I to their characteristic features in Column -II and select the correct option using the codes given below :
- | Column-I | Column -II |
|----------------|---|
| a. Pachytene | i. Pairing of homologous chromosomes |
| b. Metaphase I | ii. Terminalization of chiasmata |
| c. Diakinesis | iii. Crossing -over takes place |
| d. Zygotene | iv. Chromosomes align at equatorial plate |
- (1) a-iv, b- iii, c-ii, d-i
 (2) a-iii, b- iv, c-ii, d-i
 (3) a-i, b-iv, c-ii, d-iii
 (4) a-ii, b- iv, c-iii, d-i
113. Which hormones do stimulate the production of pancreatic juice and bicarbonate :
- (1) Insulin and glucagon
 (2) Angiotensin and epinephrine
 (3) Gastrin and insulin
 (4) Cholecystokinin and secretin
114. The partial pressure of oxygen in the alveoli of the lungs is :
- (1) less than that of carbon dioxide
 (2) equal to that in the blood
 (3) more than that in the blood
 (4) less than that in the blood
115. Choose the correct statement :
- (1) Receptors do not produce graded potentials
 (2) Nociceptors respond to changes in pressure
 (3) Meissner's corpuscles are thermoreceptors
 (4) Photoreceptors in the human eye are depolarized during darkness and become hyperpolarized in response to the light stimulus
116. Graves' disease is caused due to :
- (1) hypersecretion of adrenal gland
 (2) hyopsecretion of thyroid gland
 (3) hypersecretion of thyroid gland
 (4) hyopsecretion of adrenal gland
117. Name the ion responsible for unmasking of active sites for myosin for cross-bridge activity during muscle contraction :
- (1) Potassium
 (2) Calcium
 (3) Magnesium
 (4) Sodium
118. Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body :
- (1) Thrombocytes
 (2) Erythrocytes
 (3) Leucocytes
 (4) Neutrophils
119. Name a peptide hormone which acts mainly on hepatocytes and enhances cellular glucose uptake and utilization :
- (1) Gastrin
 (2) Insulin
 (3) Glucagon
 (4) Secretin
120. Osteoporosis, an age- related disease of skeletal system, may occur due to :
- (1) accumulation of uric acid leading to inflammation of joints
 (2) immune disorder affecting neuromuscular junction leading to fatigue
 (3) high concentration of Ca^{++} and Na^+
 (4) decreased level of estrogen
121. Serum differs from blood in :
- (1) lacking antibodies
 (2) lacking globulins
 (3) lacking albumins
 (4) lacking clotting factors
122. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because :
- (1) pressure in the lungs is higher than the atmospheric pressure
 (2) there is a negative pressure in the lungs
 (3) there is a negative intrapleural pressure pulling at the lung walls
 (4) there is a positive intrapleural pressure

123. The posterior pituitary gland is not a 'true' endocrine gland because :
- (1) it secretes enzymes
 - (2) it is provided with a duct
 - (3) it only stores and releases hormones
 - (4) it is under the regulation of hypothalamus
124. The part of nephron involved in active reabsorption of sodium is :
- (1) descending limb of Henle's loop
 - (2) distal convoluted tubule
 - (3) proximal convoluted tubule
 - (4) Bowman's capsule
125. Which of the following is hormone releasing IUD:
- (1) Cu7
 - (2) LNG -20
 - (3) Multiload 375
 - (4) Lippes loop
126. Which of the following is incorrect regarding vasectomy:
- (1) Irreversible sterility
 - (2) No sperm occurs in seminal fluid
 - (3) No sperm occurs in epididymis
 - (4) Vasa deferentia is cut and tied
127. Embryo with more than 16 blastomeres formed due to in vitro fertilization is transferred into :
- (1) cervix
 - (2) uterus
 - (3) fallopian tube
 - (4) fimbriae
128. Which of the following depicts the correct pathway of transport of sperms :
- (1) Efferent ductules → Rete testis → Vas deferens → Epididymis
 - (2) Rete testis → Efferent ductules → Epididymis → Vas deferens
 - (3) Rete testis → Epididymis → Efferent ductules → Vas deferens
 - (4) Rete testis → Vas deferens → Efferent ductules → Epididymis
129. Match Column -I with Column -II and select the correct option using the codes given below :
- | Column -I | Column -II |
|------------------|--------------------------------|
| a. Mons pubis | i. Embryo formation |
| b. antrum | ii. Sperm |
| c. Trophoctoderm | iii. Female external genitalia |
| d. Nebenkern | iv. Graafian follicle |
- (1) a-i, b- iv, c-iii, d-ii
 - (2) a-iii, b- iv, c-ii, d-i
 - (3) a-iii, b-iv, c-i, d-ii
 - (4) a-ii, b- i, c-iv, d-ii
130. Several hormones like hCg, hPL, estrogen, progesterone are produced by :
- (1) pituitary
 - (2) ovary
 - (3) placenta
 - (4) Fallopian tube
131. If a colour -blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is :
- (1) 1
 - (2) 0
 - (3) 0.5
 - (4) 0.75
132. Genetic drift operates in :
- (1) slow reproductive population
 - (2) small isolated population
 - (3) large isolated population
 - (4) non-reproductive population
133. In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by :
- (1) q^2
 - (2) p^2
 - (3) $2pq$
 - (4) pq

134. The chronological order of human evolution from early to the recent is :

- (1) Australopithecus → Homo habilis → Ramapithecus → Homo erectus
- (2) Australopithecus → Ramapithecus → Homo habilis → Homo erectus
- (3) Ramapithecus → Australopithecus → Homo habilis → Homo erectus
- (4) Ramapithecus → Homo habilis → Australopithecus → Homo erectus

135. Which of the following is the correct sequence of events in the origin of life :

- I. Formation of protobionts
 - II. Synthesis of organic monomers
 - III. Synthesis of organic polymers
 - IV. Formation of DNA - based genetic system
- (1) II, III, IV, I
 - (2) I, II, III, IV
 - (3) I, III, II, IV
 - (4) II, III, I, IV
-



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NEET (PHASE-II) PHYSICS [24 JULY 2016]

SET : XX

136. A person can see clearly objects only when they lie between 50 cm and 400 cm from the distance of distinct vision to infinity, the type and power of the correcting lens, the person has to use, will be :

- (1) convex, +0.15 diopter
- (2) convex, +2.25 diopter
- (3) concave, -0.25 diopter
- (4) concave, -0.2 diopter.

137. A linear aperture whose width is 0.02 cm is placed immediately in front of a lens of focal length 60 cm. The aperture is illuminated normally by a parallel beam of wavelength 5×10^{-5} cm. The distance of the first dark band of the diffraction pattern from the centre of the screen is :

- (1) 0.15 cm
- (2) 0.10 cm
- (3) 0.25 cm
- (4) 0.20 cm

138. Electrons of mass m with de-Broglie wavelength λ fall on the target in an X-ray tube. The cutoff wavelength (λ_0) of the emitted X-ray is :

- (1) $\lambda_0 = \lambda$
- (2) $\lambda_0 = \frac{2mc\lambda^2}{h}$
- (3) $\lambda_0 = \frac{2h}{mc}$
- (4) $\lambda_0 = \frac{2m^2c^2\lambda^3}{h^2}$

139. Photons with energy 5eV are incident on a cathode C in a photoelectric cell. The maximum energy of emitted photoelectrons is 2 eV. When photons of energy 6 eV are incident on C, no photoelectrons will reach the anode A, if the stopping potential of A relative of C is :

- (1) -3V
- (2) +3V
- (3) +4V
- (4) -1V.

140. If an electron in a hydrogen atom jumps from the 3rd orbit to the 2nd orbit, it emits a photon of wavelength λ . When it jumps from the 4th orbit to the 3rd orbit, the corresponding wavelength of the photon will be :

- (1) $\frac{20}{13}\lambda$
- (2) $\frac{16}{25}\lambda$
- (3) $\frac{9}{16}\lambda$
- (4) $\frac{20}{7}\lambda$

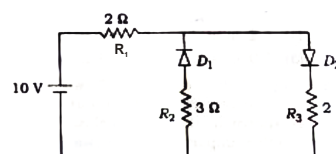
141. The half-life of a radioactive substance is 30 minutes. The time (in minutes) taken between 40% decay and 85% decay of the same radioactive substance is :

- (1) 60
- (2) 15
- (3) 30
- (4) 45.

142. For CE transistor amplifier, the audio signal voltage the collector resistance of $2k\Omega$ is 4V. If the current amplification factor of the transistor is 100 and the base resistance is 1 $k\Omega$, then the input signal voltage is :

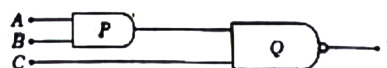
- (1) 15 mV
- (2) 10 mV
- (3) 20 mV
- (4) 30 mV

143. The given circuit has two ideal diodes connected as shown in the figure below. The current flowing through the resistance R_1 will be :



- (1) 3.13 A
- (2) 2.5 A
- (3) 10.0 A
- (4) 1.43

144. What is the output Y in the following circuit, when all the three inputs A, B, C are first 0 and then 1 :



- (1) 1, 1
- (2) 0, 1
- (3) 0, 0
- (4) 1, 0

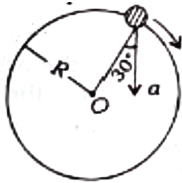
145. Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combination of these has the dimension of length?

- (1) $\sqrt{\frac{Ge}{h^{3/2}}}$
- (2) $\frac{\sqrt{hG}}{c^{3/2}}$
- (3) $\frac{\sqrt{hG}}{c^{5/2}}$
- (4) $\sqrt{\frac{hc}{G}}$

146. Two cars P and Q start from a point at the same time in a straight line and their positions are represented by $x_p(t) = at + bt^2$ and $x_q(t) = ft - t^2$. At what time do the cars have the same velocity :

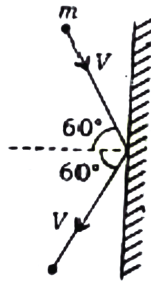
- (1) $\frac{f-a}{2(1+b)}$
- (2) $\frac{a-f}{1+b}$
- (3) $\frac{a+f}{2(b-1)}$
- (4) $\frac{a+f}{2(b+1)}$

147. In the given figure, $a = 15 \text{ m/s}^2$ represents the total acceleration of a particle moving in the clockwise direction in a circle of radius $R = 2.5 \text{ m}$ at a given instant of time. The speed of the particle is :



- (1) 6.2 m/s (2) 4.5 m/s
 (3) 5.0 m/s (4) 5.7 m/s

148. A rigid ball of mass m strikes a rigid wall at 60° and gets reflected without loss of speed as shown in the figure below. The value of impulse imparted by the wall on the ball will be :



- (1) $\frac{mV}{3}$ (2) mV
 (3) $2mV$ (4) $\frac{mV}{2}$

149. A bullet of mass 10 g moving horizontally with a velocity of 400 ms^{-1} strikes a wooden block of mass 2 kg which is suspended by a light inextensible string of length 5 m. As a result, the centre of gravity of the block is found to rise a vertical distance of 10 cm. The speed of the bullet after it emerges out horizontally from the block will be :

- (1) 160 ms^{-1} (2) 100 ms^{-1}
 (3) 80 ms^{-1} (4) 120 ms^{-1}

150. Two identical balls A and B having velocities of 0.5 m/s and -0.3 m/s respectively collide elastically in one dimension. The velocities of B and A after the collision respectively will be :

- (1) 0.3 m/s and 0.5 m/s
 (2) -0.5 m/s and 0.3 m/s
 (3) 0.5 m/s and -0.3 m/s
 (4) -0.3 m/s and 0.5 m/s

151. A particle moves from a point $(-2\hat{i} + 5\hat{j})$ to $(4\hat{j} + 3\hat{k})$ when a force of $(4\hat{i} + 3\hat{j}) \text{ N}$ is applied. How much work has been done by the force ?

- (1) 2 J (2) 8 J
 (3) 11 J (4) 5 J.

152. Two rotating bodies A and B of masses m and $2m$ with moments of inertia I_A and $I_B (I_B > I_A)$ have equal kinetic energy of rotation. If L_A and L_B be their angular momenta respectively, then :

- (1) $L_A > L_B$ (2) $L_A = \frac{L_B}{2}$
 (3) $L_A = 2L_B$ (4) $L_B > L_A$.

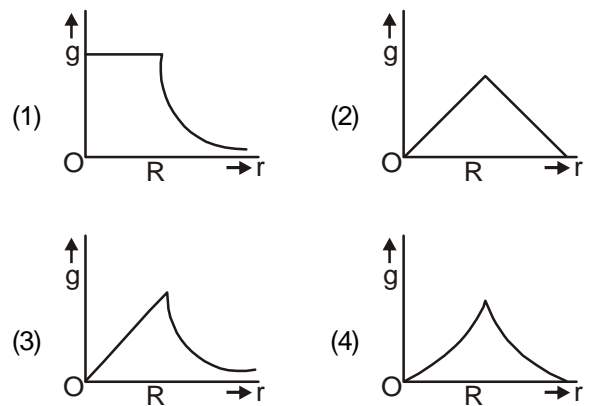
153. A solid sphere of mass m and radius R is rotating about its diameter. A solid cylinder of the same mass and same radius is also rotating about its geometrical axis with an angular speed twice that of the sphere. The ratio of their kinetic energies of rotation ($E_{\text{sphere}}/E_{\text{cylinder}}$) will be :

- (1) 3 : 1 (2) 2 : 3
 (3) 1 : 5 (4) 1 : 4

154. A light rod of length l has two masses m_1 and m_2 attached to its two ends. The moment of inertia of the system about an axis perpendicular to the rod and passing through the centre of mass is :

- (1) $\sqrt{m_1 m_2} l^2$ (2) $\frac{m_1 m_2}{m_1 + m_2} l^2$
 (3) $\frac{m_1 + m_2}{m_1 m_2} l^2$ (4) $(m_1 + m_2) l^2$.

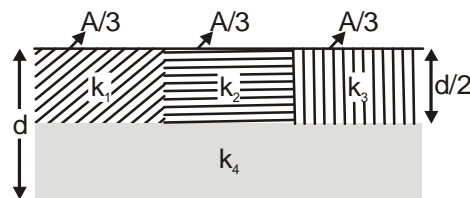
155. Starting from the centre of the earth having radius R , the variation of g (acceleration due to gravity) is shown by :



156. A satellite of mass m is orbiting the earth (of radius R) at a height h from its surface. The total energy of the satellite in terms of g_0 , the value of acceleration due to gravity at the earth's surface, is :

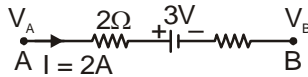
- (1) $-\frac{2mg_0 R^2}{R+h}$ (2) $\frac{mg_0 R^2}{2(R+h)}$
 (3) $-\frac{mg_0 R^2}{2(R+h)}$ (4) $\frac{2mg_0 R^2}{R+h}$

157. A rectangular film of liquid is extended from (4 cm × 2 cm) to (5 cm × 4 cm). If the work done is 3×10^{-4} J, the value of the surface tension of the liquid is :
 (1) 8.0 N m^{-1} (2) 0.250 N m^{-1}
 (3) 0.125 N m^{-1} (4) 0.2 N m^{-1}
158. Three liquids of densities ρ_1, ρ_2 and ρ_3 (with $\rho_1 > \rho_2 > \rho_3$), having the same value of surface tension T, rise to the same height in three identical capillaries. The angles of contact θ_1, θ_2 and θ_3 obey :
 (1) $\pi > \theta_1 > \theta_2 > \theta_3 > \frac{\pi}{2}$
 (2) $\frac{\pi}{2} > \theta_1 > \theta_2 > \theta_3 \geq 0$
 (3) $0 \leq \theta_1 < \theta_2 < \theta_3 < \frac{\pi}{2}$
 (4) $\frac{\pi}{2} < \theta_1 < \theta_2 < \theta_3 < \pi$
159. Two identical bodies are made of a material for which the heat capacity increases with temperature. One of these is at 100°C , while the other one is at 0°C . If the two bodies are brought into contact, then, assuming no heat loss, the final common temperature is :
 (1) 0°C
 (2) 50°C
 (3) more than 50°C
 (4) less than 50°C but greater than 0°C
160. A body cools from a temperature $3T$ to $2T$ in 10 minutes. The room temperature is T . Assume that Newton's law of cooling is applicable. The temperature of the body at the end of next 10 minutes will be :
 (1) T (2) $\frac{7}{4}T$
 (3) $\frac{3}{2}T$ (4) $\frac{4}{3}T$
161. One mole of an ideal monatomic gas undergoes a process described by the equation $PV^3 = \text{constant}$. The heat capacity of the gas during this process is :
 (1) R (2) $\frac{3}{2}R$
 (3) $\frac{5}{2}R$ (4) $2R$
162. The temperature inside a refrigerator is $t_2^\circ\text{C}$ and the room temperature is $t_1^\circ\text{C}$. The amount of heat delivered to the room for each joule electrical energy consumed ideally will be :
 (1) $\frac{t_1 + t_2}{t_1 + 273}$ (2) $\frac{t_1}{t_1 - t_2}$
 (3) $\frac{t_1 + 273}{t_1 - t_2}$ (4) $\frac{t_2 + 273}{t_1 - t_2}$
163. A given sample of an ideal gas occupies a volume V at a pressure P and absolute temperature T . The mass of each molecule of the gas is m . Which of the following gives the density of the gas?
 (1) mKT (2) $P/(kT)$
 (3) $Pm/(kT)$ (4) $P/(kTV)$
164. A body of mass m is attached to the lower end of a spring whose upper end is fixed. The spring has negligible mass. When the mass m is slightly pulled down and released, it oscillates with a time period of 3s. When the mass m is increased by 1 kg, the time period of oscillations becomes 5 s. The value of m in kg is :
 (1) $\frac{9}{16}$ (2) $\frac{3}{4}$
 (3) $\frac{4}{3}$ (4) $\frac{16}{9}$
165. The second overtone of an open organ pipe has the same frequency as the first overtone of closed pipe L metre long. The length of the open pipe will be :
 (1) $4L$ (2) L
 (3) $2L$ (4) $\frac{L}{2}$
166. Three sound waves of equal amplitudes have frequencies $(n - 1), n, (n + 1)$. They superimpose to give beats. The number of beats produced per second will be :
 (1) 2 (2) 1
 (3) 4 (4) 3
167. An electric dipole is placed at an angle of 30° with an electric field intensity $2 \times 10^5 \text{ N/C}$. It experiences a torque equal to 4 N m . The charge on the dipole, if the dipole length is 2 cm, is :
 (1) $7 \mu\text{C}$ (2) 8 mC
 (3) 2 mC (4) 5 mC
168. A parallel-plate capacitor of area A , plate separation d and capacitance C is filled with four dielectric materials having dielectric constants k_1, k_2, k_3 and k_4 as shown in the figure below. If a single dielectric material is to be used to have the same capacitance C in this capacitor, then its dielectric constant is given by :



- (1) $\frac{1}{k} = \frac{1}{k_1} + \frac{1}{k_2} + \frac{1}{k_3} + \frac{3}{2k_4}$
 (2) $k = k_1 + k_2 + k_3 + 3k_4$
 (3) $k = \frac{2}{3}(k_1 + k_2 + k_3) + 2k_4$
 (4) $\frac{2}{k} = \frac{3}{k_1 + k_2 + k_3} + \frac{1}{k_4}$

169. The potential difference ($V_A - V_B$) between the points A and B in the given figure is :



- (1) +9V (2) -3V
 (3) +3V (4) +6V
170. A filament bulb (500W, 100V) is to be used in a 230 V main supply. When a resistance is connected in series, it works perfectly and the bulb consumes 500 W. The value of R is :

- (1) 13Ω (2) 230Ω
 (3) 46Ω (4) 26Ω

171. A long wire carrying a steady current is bent into a circular loop of one turn. The magnetic field at the centre of the loop is B. It is then bent into a circular coil of n turns. The magnetic field at the centre of this coil n turns will be :

- (1) 2 n²B (2) nB
 (3) n²B (4) 2nB.

172. A bar magnet is hung by a thin cotton thread in a uniform horizontal magnetic field and is in equilibrium state. The energy required to rotate it by 60° is W. Now the torque required to keep the magnet in this new position is :

- (1) $\frac{2W}{\sqrt{3}}$ (2) $\frac{W}{\sqrt{3}}$
 (3) $\sqrt{3}W$ (4) $\frac{\sqrt{3}W}{2}$

173. An electron is moving in a circular path under the influence of a transverse magnetic field of 3.57×10^{-2} T. If the value of e/m is 1.76×10^{11} C/kg, the frequency of revolution of the electrons is :

- (1) 6.28 MHz (2) 1 GHz
 (3) 100 MHz (4) 62.8 MHz.

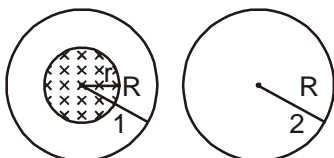
174. Which of the following combinations should be selected for better tuning of an L-C-R circuit used for communication?

- (1) R = 25 Ω, L = 1.5 H, C = 45 μF
 (2) R = 20 Ω, L = 1.5 H, C = 35 μF
 (3) R = 25 Ω, L = 2.5 H, C = 45 μF
 (4) R = 15 Ω, L = 3.5 H, C = 30 μF

175. A uniform magnetic field is restricted within a region of radius r. The magnetic field changes with time at a rate

$\frac{d\vec{B}}{dt}$. Loop 1 of radius R > r encloses the region r and

loop 2 of radius R is outside the region of magnetic field as shown in the figure below. Then the e.m.f. generated is :



(1) $-\frac{d\vec{B}}{dt} \pi r^2$ in loop 1 and zero in loop 2

(2) zero in loop 1 and zero in loop 2

(3) $-\frac{d\vec{B}}{dt} \pi r^2$ in loop 1 and $-\frac{d\vec{B}}{dt} \pi R^2$ in loop 2

(4) $-\frac{d\vec{B}}{dt} \pi r^2$ in loop 1 and zero in loop 2

176. The potential differences across the resistance, capacitance and inductance are 80V, 40V and 100V respectively in a L-C-R circuit. The power factor of this circuit is :

- (1) 1.0 (2) 0.4
 (3) 0.5 (4) 0.8

177. A 100Ω resistance and a capacitor of 100Ω reactance are connected in series across a 220V source. When the capacitor is 50% charged, the peak value of the displacement current is :

- (1) $11\sqrt{2}$ A (2) 2.2 A
 (3) 11 A (4) 4.4 A.

178. Two identical glass ($\mu_g = 3/2$) equiconvex lenses of focal length f each are kept in contact. The space between the two lenses is filled with water ($\mu_w = 4/3$). The focal length of the combination is :

- (1) 3f/4 (2) f/3
 (3) f (4) 4f/3

179. An air bubble in a glass slab with refractive index 1.5 (near normal incidence) is 5 cm deep when viewed from one surface and 3cm deep when viewed from the opposite face. The thickness (in cm) of the slab is :

- (1) 16 (2) 8
 (3) 10 (4) 12

180. The interference pattern is obtained with two coherent light sources of intensity ratio n. In the interference pattern, the ratio

$$\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}}$$

will be :

(1) $\frac{2\sqrt{n}}{(n+1)^2}$ (2) $\frac{\sqrt{n}}{n+1}$

(3) $\frac{2\sqrt{n}}{n+1}$ (4) $\frac{\sqrt{n}}{(n+1)^2}$