



NEET - 2017

Time: 3 Hours

Total Marks: 720

General Instructions:

1. The test is of **3 hours** duration.
2. The Test Paper contains **180** questions. There are **three** parts in the question paper consisting of **Physics and Chemistry** having **45** questions each and **Biology** with **90** questions.
3. Each question carries **4 marks**. For each correct response, the candidate will get **4 marks**. For each incorrect response, **1 mark** will be deducted from the total scores. The maximum marks are **720**.
4. Out of the four options given for each question, only one option is the correct answer. If more than one response is marked in any question, it will be treated as wrong response and marked up for wrong response will be deducted.
5. No deduction from the total score will be made if no response is indicated for an item in the answer box.
6. Use of Electronic/Manual Calculator is prohibited.



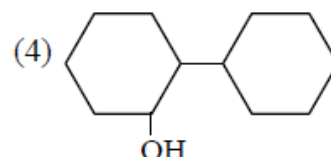
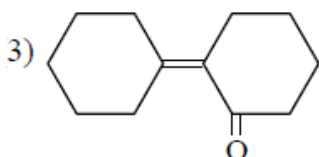
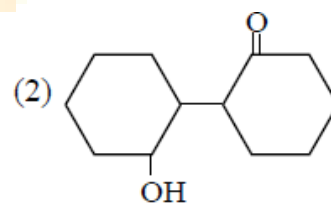
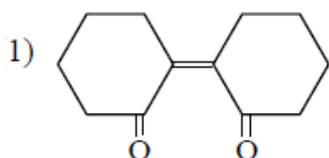
Q.1 The most suitable method of separation of 1 : 1 mixture of ortho and para-nitrophenols is :

- (1) Steam distillation (2) Sublimation (3) Chromatography (4) Crystallisation

Q.2 Which of the following statements is not correct?

- (1) Denaturation makes the proteins more active.
(2) Insulin maintains sugar level in the blood of a human body.
(3) Ovalbumin is a simple food reserve in egg-white.
(4) Blood proteins thrombin and fibrinogen are involved in blood clotting.

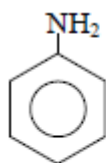
Q.3 Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating?



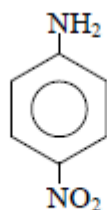
Q.4 The heating of phenyl-methyl ethers with HI produces

- (1) benzene (2) ethyl chlorides (3) iodobenzene (4) phenol

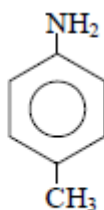
Q.5 The correct increasing order of basic strength for the following compounds is :



(I)



(II)



(III)

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

Q.6 Which one of the following pairs of species have the same bond order?

- (1) N₂, -O₂ (2) CO, NO (3) O₂, NO⁺ (4) CN⁻, CO



Q.7 Name the gas that can readily decolourise acidified KMnO_4 solution :

- (1) P_2O_5 (2) CO_2 (3) SO_2 (4) NO_2

Q.8 The reason for greater range of oxidation states in actinoids is attributed to :

- (1) 4f and 5d levels being close in energies
(2) the radioactive nature of actinoids
(3) actinoid contraction
(4) 5f, 6d and 7s levels having comparable energies

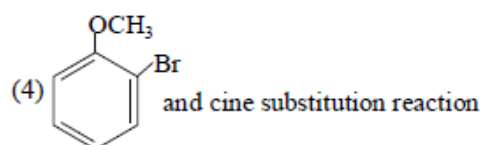
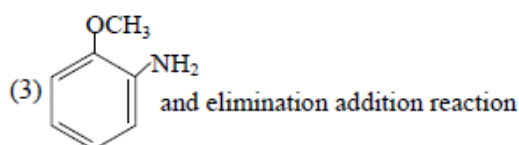
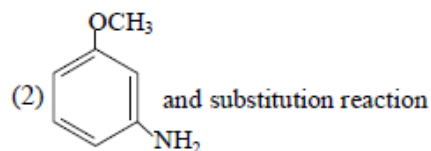
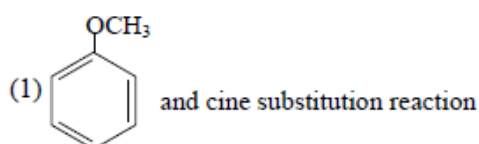
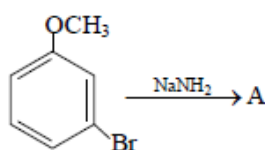
Q.9 Concentration of the Ag^+ ions in a saturated solution of $\text{Ag}_2\text{C}_2\text{O}_4$ is $2.2 \times 10^{-4} \text{ mol L}^{-1}$. Solubility product of $\text{Ag}_2\text{C}_2\text{O}_4$ is :

- (1) 5.3×10^{-12}
(2) 2.42×10^{-8}
(3) 2.66×10^{-12}
(4) 4.5×10^{-11}

Q.10 With respect to the conformers of ethane, which of the following statements is true?

- (1) Both bond angles and bond length remains same
(2) Bond angle remains same but bond length changes
(3) Bond angle changes but bond length remains same
(4) Both bond angle and bond length change

Q.11 Identify A and predict the type of reaction





Q.12 Which of the following is sink for CO?

- (1) Plants (2) Haemoglobin
(3) Micro organisms present in the soil (4) Oceans

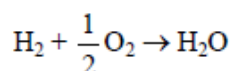
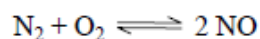
Q.13 In which pair of ions both the species contain S – S bond?

- (1) $S_4O_6^{2-}$, $S_2O_7^{2-}$ (2) $S_2O_7^{2-}$, $S_2O_3^{2-}$ (3) $S_4O_6^{2-}$, $S_2O_3^{2-}$ (4) $S_2O_7^{2-}$, $S_2O_8^{2-}$

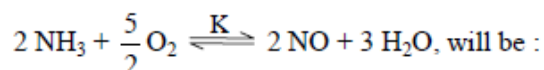
Q.14 Pick out the correct statement with respect to $[Mn(CN)_6]^{3-}$:

- (1) It is dsp^2 hybridised and square planar
(2) It is sp^3d^2 hybridised and octahedral
(3) It is sp^3d^2 hybridised and tetrahedral
(4) It is d^2sp^3 hybridised and octahedral

Q.15 The equilibrium constants of the following are :



The equilibrium constant (K) of the reaction :



- (1) $K_2^3 K_3/K_1$ (2) $K_1 K_3^3/K_2$ (3) $K_2 K_3^3/K_1$ (4) $K_2 K_3/K_1$

Q.16 Match the interhalogen compounds of column I with the geometry in column II and assign the correct code.

Column I	Column II
(a) XX'	(i) T - shape
(b) XX'_3	(ii) Pentagonal bipyramidal
(c) XX'_5	(iii) Linear
(d) XX'_7	(iv) Square – pyramidal
	(v) Tetrahedral



Code :

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

Q.17 Mixture of chloroxylenol and terpineol acts as :

- (1) antibiotic (2) analgesic
(3) antiseptic (4) antipyretic

Q.18 It is because of inability of ns² electrons of the valence shell to participate in bonding that :

- (1) Sn⁴⁺ is reducing while Pb⁴⁺ is oxidising
(2) Sn²⁺ is reducing while Pb⁴⁺ is oxidising
(3) Sn²⁺ is oxidising while Pb⁴⁺ is reducing
(4) Sn²⁺ and Pb²⁺ are both oxidising and reducing

Q.19 Extraction of gold and silver involves leaching with CN⁻ ion. Silver is later recovered by :

- (1) displacement with Zn (2) liquation
(3) distillation (4) zone refining

Q.20 A 20 litre container at 400 K contains CO₂(g) at pressure 0.4 atm and an excess of SrO (neglect the volume of solid SrO). The volume of the container is now decreased by moving the movable piston fitted in the container. The maximum volume of the container, when pressure of CO₂ attains its maximum value, will be :(Given that : SrCO₃(s) ⇌ SrO (s) + CO₂(g), K_p = 1.6 atm)

- (1) 2 litre (2) 5 litre (3) 10 litre (4) 4 litre

Q.21 Which is the incorrect statement ?

- (1) Frenkel defect is favoured in those ionic compounds in which sizes of cation and anions are almost equal
(2) FeO_{0.98} has non stoichiometric metal deficiency defect
(3) Density decreases in case of crystals with Schottky's defect
(4) NaCl(s) is insulator, silicon is semiconductor, silver is conductor, quartz is piezo electric crystal



Q.22 Which of the following is dependent on temperature ?

- (1) Weight percentage (2) Molality
(3) Molarity (4) Mole fraction

Q.23 The correct order of the stoichiometries of AgCl formed when AgNO₃ in excess is treated with the complexes :

CoCl₃.6NH₃, CoCl₃.5NH₃, CoCl₃.4NH₃ respectively is –

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

Q.24 An example of a sigma bonded organometallic compound is –

- (1) Cobaltocene (2) Ruthenocene
(3) Grignard's reagent (4) Ferrocene

Q.25 Which one is the wrong statement ?

- (1) The energy of 2s orbital is less than the energy of 2p orbital in case of Hydrogen like atoms
(2) de-Broglie's wavelength is given by $\lambda = \frac{h}{mv}$ where m = mass of the particle, v = group velocity of the particle.
(3) The uncertainty principle is $\Delta E \times \Delta t \geq \frac{h}{4\pi}$
(4) Half filled and fully filled orbitals have greater stability due to greater exchange energy, greater symmetry and more balanced arrangement

Q.26 Which one is the most acidic compound ?

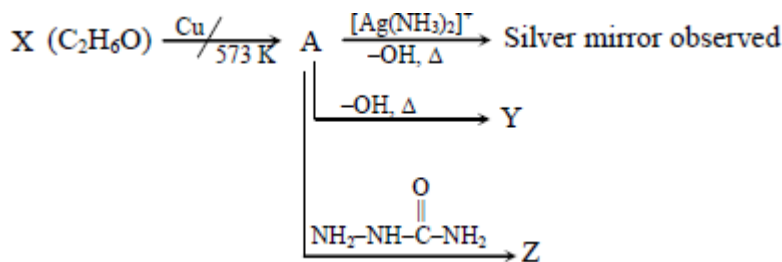


Q.27 A first order reaction has a specific reaction rate of 10⁻² sec⁻¹. How much time will it take for 20 g of the reactant to reduce to 5g ?

- (1) 693.0 sec (2) 238.6 sec (3) 138.6 sec (4) 346.5 sec



Q.28 Consider the reactions :



Identify A, X, Y and Z

- (1) A-Ethanol, X-Acetaldehyde, Y-Butanone Z-Hydrazone
- (2) A-Methoxymethane, X-Ethanoic acid, Y-Acetate ion, Z-Hydrazine
- (3) A-Methoxymethane, X-Ethanol, Y-Ethanoic acid, Z-Semicarbazide
- (4) A-Ethanal, X-Ethanol, Y-But-2-enal., Z-Semicarbazone

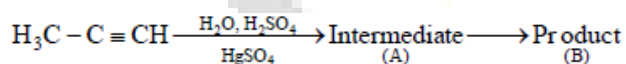
Q.29 Mechanism of a hypothetical reaction $\text{X}_2 + \text{Y}_2 \rightarrow 2\text{XY}$ is given below.

- (i) $\text{X}_2 \rightarrow \text{X} + \text{X}$ (fast)
- (ii) $\text{X} + \text{Y}_2 \rightleftharpoons \text{XY} + \text{Y}$ (slow)
- (iii) $\text{X} + \text{Y} \rightarrow \text{XY}$ (fast)

The overall order of the reaction will be –

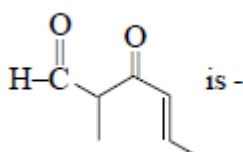
- (1) 1.5 (2) 1 (3) 2 (4) 0

Q.30 Predict the correct intermediate and product in the following reaction :



- | | | | |
|--|--|--|--|
| (1) A : $\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{CH}_2 \\ \\ \text{OH} \end{array}$ | B : $\begin{array}{c} \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{O} \end{array}$ | (2) A : $\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{CH}_2 \\ \\ \text{SO}_4 \end{array}$ | B : $\begin{array}{c} \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{O} \end{array}$ |
| (3) A : $\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{CH}_2 \\ \\ \text{OH} \end{array}$ | B : $\begin{array}{c} \text{H}_3\text{C}-\text{C}=\text{CH}_2 \\ \\ \text{SO}_4 \end{array}$ | (4) A : $\begin{array}{c} \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{O} \end{array}$ | B : $\text{H}_3\text{C}-\text{C}\equiv\text{CH}$ |

Q.31 The IUPAC name of the compound



- (1) 3-keto-2-methylhex-5-enal
- (2) 3-keto-2-methylhex-4-enal
- (3) 5-formylhex-2-en-3-one
- (4) 5-methyl-4-oxohex-2-en-5-al



Q.32 In the electrochemical cell –

Zn|ZnSO₄(0.01M) || CuSO₄ (1.0 M)| Cu, the emf of this Daniel cell is E₁. When the concentration of ZnSO₄ is changed to 1.0 M and that of CuSO₄ changed to 0.01M, the emf changes to E₂. From the followings, which one is the relationship between E₁ and E₂ ? (Given, $F RT = 0.059$).

- (1) $E_2 = 0 \neq E_1$ (2) $E_1 = E_2$ (3) $E_1 < E_2$ (4) $E_1 > E_2$

Q.33 A gas is allowed to expand in a well insulated container against a constant external pressure of 2.5 atm from an initial volume of 2.50 L to a final volume of 4.50 L. The change in internal energy ΔU of the gas in joules will be –

- (1) +505 J (2) 1136.25 J (3) – 500 J (4) – 505 J

Q.34 Correct increasing order for the wavelengths of absorption in the visible region for the complexes of Co³⁺ is –

- (1) [Co(NH₃)₆]³⁺, [Co(en)₃]³⁺, [Co(H₂O)₆]³⁺
(2) [Co(en)₃]³⁺, [Co(NH₃)₆]³⁺, [Co(H₂O)₆]³⁺
(3) [Co(H₂O)₆]³⁺, [Co(en)₃]³⁺, [Co(NH₃)₆]³⁺
(4) [Co(H₂O)₆]³⁺, [Co(NH₃)₆]³⁺, [Co(en)₃]³⁺

Q.35 The correct statement regarding electrophile is :

- (1) Electrophile can be either neutral or positively charged species and can form a bond by accepting a pair of electrons from a nucleophile
(2) Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from a nucleophile
(3) Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from another electrophile
(4) Electrophiles are generally neutral species and can form a bond by accepting a pair of electrons from a nucleophile

Q.36 For a given reaction, $\Delta H = 35.5 \text{ kJ mol}^{-1}$ and $\Delta S = 83.6 \text{ JK}^{-1} \text{ mol}^{-1}$. The reaction is spontaneous at : (Assume that ΔH and ΔS do not vary with temperature)

- (1) $T > 298 \text{ K}$ (2) $T < 425 \text{ K}$
(3) $T > 425 \text{ K}$ (4) All temperatures

Q.37 Which of the following pairs of compounds is isoelectronic and isostructural ?

- (1) IF₃, XeF₂ (2) BeCl₂, XeF₂
(3) TeI₂, XeF₂ (4) IBr₂, XeF₂



Q.38 HgCl_2 and I_2 both when dissolved in water containing I^- ions pair of species formed is :

- (1) $\text{Hg}_2\text{I}_2, \Gamma^-$ (2) $\text{HgI}_2, \text{I}_3^-$ (3) HgI_2, Γ^- (4) $\text{HgI}_4^{2-}, \text{I}_3^-$

Q.39 Which one of the following statements is not correct ?

- (1) Coenzymes increase the catalytic activity of enzyme
(2) Catalyst does not initiate and reaction
(3) The value of equilibrium constant is changed in the presence of a catalyst in the reaction at equilibrium
(4) Enzymes catalyse mainly bio-chemical reaction.

Q.40 Ionic mobility of which of the following alkali metal ions is lowest when aqueous solutions of their salts are put under an electric field?

- (1) Li (2) Na (3) K (4) Rb

Q.41 The element $Z = 114$ has been discovered recently. It will belong to which of the following family/group and electronic configuration ?

- (1) Nitrogen family, $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^6$
(2) Halogen family, $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^5$
(3) Carbon family, $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^2$
(4) Oxygen family, $[\text{Rn}] 5f^{14} 6d^{10} 7s^2 7p^4$

Q.42 Which one is the correct order of acidity ?

- (1) $\text{CH}_3 - \text{CH}_3 > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH} \equiv \text{CH}$
(2) $\text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{CH} = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH} \equiv \text{CH}$
(3) $\text{CH} \equiv \text{CH} > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{CH}_3$
(4) $\text{CH} \equiv \text{CH} > \text{CH}_2 = \text{CH}_2 > \text{CH}_3 - \text{C} \equiv \text{CH} > \text{CH}_3 - \text{CH}_3$

Q.43 If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be

- (1) unchanged (2) doubled (3) halved (4) tripled

Q.44 The species, having bond angles of 120° is

- (1) BCl_3 (2) PH_3 (3) ClF_3 (4) NCl_3



Q.45 Which of the following reactions is appropriate for converting acetamide to methanamine?

- (1) Gabriels phthalimide synthesis (2) Carbylamine reaction
(3) Hoffmann hypobromamide reaction (4) Stephens reaction

Q.46 Asymptote in a logistic growth curve is obtained when :

- (1) $K < N$ (2) The value of 'r' approaches zero
(3) $K = N$ (4) $K > N$

Q.47 The vascular cambium normally gives rise to :

- (1) Periderm (2) Phelloderm
(3) Primary phloem (4) Secondary xylem

Q.48 In case of poriferans, the spongocoel is lined with flagellated cells called :

- (1) Mesenchymal cells (2) Ostia
(3) Oscula (4) Choanocytes

Q.49 Fruit and leaf drop at early stages can be prevented by the application of

- (1) Gibberellic acid (2) Cytokinins (3) Ethylene (4) Auxin

Q.50 A gene whose expression helps to identify transformed cell is known as

- (1) Structural gene (2) Selectable marker
(3) Vector (4) Plasmid

Q.51 The final proof for DNA as the genetic material came from the experiments of

- (1) Hargobind Khorana
(2) Griffith
(3) Hershey and chase
(4) Avery, Mcleod and McCarty

Q.52 With reference to factors affecting the rate of photosynthesis, which of the following statements is not correct ?

- (1) Tomato is a greenhouse crop which can be grown in CO₂-enriched atmosphere for higher yield
(2) Light saturation for CO₂ fixation occurs at 10% of full sunlight
(3) Increasing atmospheric CO₂ concentration up to 0.05% can enhance CO₂ fixation rate
(4) C₃ plants respond to higher temperatures with enhanced photosynthesis while C₄ plants have much lower temperature optimum



Q.53 The association of histone H1 with a nucleosome indicates :

- (1) The DNA double helix is exposed
- (2) Transcription is occurring
- (3) DNA replication is occurring
- (4) The DNA is condensed into a Chromatin Fibre

Q.54 GnRH, a hypothalamic hormone, needed in reproduction, acts on

- (1) Posterior pituitary gland and stimulates secretion of LH and relaxin
- (2) Anterior pituitary gland and stimulates secretion of LH and oxytocin
- (3) Anterior pituitary gland and stimulates secretion of LH and FSH
- (4) Posterior pituitary gland and stimulates secretion of oxytocin and FSH

Q.55 DNA fragments are

- (1) Either positively or negatively charged depending on their size
- (2) Positively charged
- (3) Negatively charged
- (4) Neutral

Q.56 Which of the following options gives the correct sequences of events during mitosis ?

- (1) condensation → arrangement at equator → centromere division → segregation → telophase
- (2) condensation → nuclear membrane disassembly → crossing over → segregation → telophase
- (3) condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase
- (4) condensation → crossing over → nuclear membrane disassembly → segregation → telophase

Q.57 Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration, because of :

- (1) Expiratory Reserve Volume
- (2) Residual Volume
- (3) Inspiratory Reserve Volume
- (4) Tidal Volume

Q.58 Which one of the following statements is correct with reference to enzymes ?

- (1) Holoenzyme = Coenzyme + Co-factor
- (2) Apoenzyme = Holoenzyme + Coenzymes
- (3) Holoenzyme = Apoenzyme + Coenzyme
- (4) Coenzyme = Apoenzyme + Holoenzyme



Q.59 Which of the following are not polymeric ?

- (1) Lipids
- (2) Nucleic acids
- (3) Proteins
- (4) Polysaccharides

Q.60 Which of the following components provides sticky character to the bacterial cells ?

- (1) Glycocalyx
- (2) Cell wall
- (3) Nuclear membrane
- (4) Plasma membrane

Q.61 An example of colonial alga is :

- (1) Spirogyra
- (2) Chlorella
- (3) Volvox
- (4) Ulothrix

Q.62 A dioecious flowering plant prevents both :

- (1) Cleistogamy and xenogamy
- (2) Autogamy and xenogamy
- (3) Autogamy and geitonogamy
- (4) Geitonogamy and xenogamy

Q.63 Plants which produce characteristic pneumatophores and show vivipary belong to :

- (1) Hydrophytes
- (2) Mesophytes
- (3) Halophytes
- (4) Psammophytes

Q.64 Coconut fruit is

- (1) Capsule
- (2) Drupe
- (3) Berry
- (4) Nut

Q.65 Which of the following is made up of dead cells ?

- (1) Phloem
- (2) Xylem parenchyma
- (3) Collenchyma
- (4) Phellum

Q.66 Root hairs develop from the region of :

- (1) Meristematic activity
- (2) Maturation
- (3) Elongation
- (4) Root cap



Q.67 Which of the following options best represents the enzyme composition of pancreatic juice ?

- (1) Lipase, amylase, trypsinogen, procarboxypeptidase
- (2) Amylase, peptidase, trypsinogen, rennin
- (3) Amylase, pepsin, trypsinogen, maltase
- (4) Peptidase, amylase, pepsin, rennin

Q.68 Zygotic meiosis is characteristic of :

- (1) *Chlamydomonas*
- (2) *Marchentia*
- (3) *Fucus*
- (4) *Funaria*

Q.69 Which of the following are found in extreme saline conditions ?

- (1) Mycobacteria
- (2) Archaeobacteria
- (3) Eubacteria
- (4) Cyanobacteria

Q.70 In Bougainvillea thorns are the modifications of :

- (1) Leaf
- (2) Stipules
- (3) Adventitious root
- (4) Stem

Q.71 Viroids differ from viruses in having

- (1) RNA molecules without protein coat
- (2) DNA molecules with protein coat
- (3) DNA molecules without protein coat
- (4) RNA molecules with protein coat

Q.72 Adult human RBCs are enucleate. Which of the following statements(s) is / are most appropriate explanation for this feature ?

- (a) They do not need to reproduce
- (b) They are somatic cells
- (c) They do not metabolize
- (d) All their internal space is available for oxygen transport

Q.73 Which of the following RNAs should be most abundant in animal cell ?

- (1) mi-RNA
- (2) r-RNA
- (3) t-RNA
- (4) m-RNA



Q.74 During DNA replication, Okazaki fragments are used to elongate.

- (1) The lagging strand away from the replication fork
- (2) The leading strand towards replication fork
- (3) The lagging strand towards replication fork
- (4) The leading strand away from replication

Q.75 Select the correct route for the passage of sperms in male frogs :

- (1) Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca
- (2) Testes → Bidder's canal → Kidney → Vasa efferentia → Urinogenital duct → Cloaca
- (3) Testes → Vasa efferentia → Kidney → Seminal vesicle → Urinogenital duct → Cloaca
- (4) Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca

Q.76 If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered ?

- (1) 333
- (2) 1
- (3) 11
- (4) 33

Q.77 Which of the following facilitates opening of stomatal aperture ?

- (1) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
- (2) Contraction of outer wall of guard cells
- (3) Decrease in turgidity of guard cells
- (4) Radial orientation of cellulose microfibrils in the cell wall of guard cells

Q.78 Anaphase Promoting Complex (APC) is protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur ?

- (1) Recombination of chromosome arms will occur
- (2) Chromosomes will not condense
- (3) Chromosomes will be fragmented
- (4) Chromosomes will not segregate

Q.79 Life cycle of Ectocarpus and Fucus respectively are :

- (1) Haplodiplontic, Haplontic
- (2) Haplontic, Diplontic
- (3) Diplontic, Haplodiplontic
- (4) Haplodiplontic, Diplontic



Q.80 Which statements is wrong for Krebs' cycle?

- (1) The cycle starts with condensation of acetyl group (acetylCoA) with pyruvic acid to yield citric acid.
- (2) There are three points in the cycle where NAD^+ is reduced to $\text{NADH} + \text{H}^+$
- (3) There is one point in the cycle where FAD^+ is reduced to FADH_2
- (4) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised

Q.81 Transplantation of tissues/ organs fails often due to non-acceptance by the patient's body. Which type of immune response is responsible for such rejections?

- (1) Physiological immune response
- (2) Autoimmune response
- (3) Cell-mediated immune response
- (4) Hormonal immune response

Q.82 Artificial selection to obtain cows yielding higher milk output represents :

- (1) stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.
- (2) stabilizing selection as it stabilizes this character in the population.
- (3) directional as it pushes the mean of the character in one direction.
- (4) disruptive as it splits the population into two, one yielding higher output and the other lower output.

Q.83 Select the mismatch :

- (1) *Rhizobium* - Alfalfa
- (2) *Frانيا* - *Alnus*
- (3) *Rhodospirillum* - Mycorrhiza
- (4) *Anabaena* - Nitrogen fixer

Q.84 Presence of plants arranged into well defined vertical layers depending on their height can be seen best in :

- (1) Temperate Forest
- (2) Tropical Savannah
- (3) Tropical Rain Forest
- (4) Grassland



Q.85 Match the following sexually transmitted diseases (**Column – I**) with their causative agent (**Column – II**) and select the correct option.

Column – I

- (a) Gonorrhoea
- (b) Syphilis
- (c) Genital Warts
- (d) AIDS

Column – II

- (i) HIV
- (ii) *Neisseria*
- (iii) *Treponema*
- (iv) Human papilloma – virus

Options :

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

Q.86 Select the mismatch :

- (1) *Equisetum* - Homosporous
- (2) *Pinus* - Dioecious
- (3) *Cycas* - Dioecious
- (4) *Salvinia* – Heterosporous

Q.87 The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as :

- (1) Restoration zone
- (2) Core zone
- (3) Buffer zone
- (4) Transition zone

Q.88 Identify the wrong statement in context of heartwood :

- (1) It comprises dead elements with highly lignified walls
- (2) Organic compounds are deposited in it
- (3) It is highly durable.
- (4) It conducts water and minerals efficiently

Q.89 The function of copper ions in copper releasing IUD's is :

- (1) They inhibit ovulation
- (2) They suppress sperm motility and fertilising capacity of sperms.
- (3) They inhibit gametogenesis.



(4) They make uterus unsuitable for implantation

Q.90 The process of separation and purification of expressed protein before marketing is called:

- (1) Postproduction processing (2) Upstream processing
(3) Downstream processing (4) Bioprocessing

Q.91 Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen ?

- (1) Nostoc (2) Bacillus (3) Pseudomonas (4) Mycoplasma

Q.92 Phosphoenol pyruvate (PEP) is the primary CO₂ acceptor in :

- (1) C₃ and C₄ plants (2) C₃ plants (3) C₄ plants (4) C₂ plants

Q.93 MALT constitutes about _____ percent of the lymphoid tissue in human body.

- (1) 10% (2) 50% (3) 20% (4) 70%

Q.94 The DNA fragments separated on an agarose gel can be visualised after staining with :

- (1) Ethidium bromide (2) Bromophenol blue
(3) Acetocarmine (4) Aniline blue

Q.95 Capacitation occurs in :

- (1) Female Reproductive tract (2) Rete testis
(3) Epididymis (4) Vas deferens

Q.96 Which of the following is correctly matched for the product produced by them ?

- (1) *Sacchomyces cerevisiae* : Ethanol (2) *Acetobacter aceti* : Antibiotics
(3) *Methanobacterium* : Lactic acid (4) *Penicillium notatum* : Acetic acid

Q.97 Which of the following statements is correct?

- (1) The descending limb of loop of Henle is permeable to electrolytes.
(2) The ascending limb of loop of Henle is impermeable to water.
(3) The descending limb of loop of Henle is impermeable to water.



Q.98 The water potential of pure water is :

- (1) More than one
- (2) Zero
- (3) Less than zero
- (4) More than zero but less than one

Q.99 The genotypes of a Husband and Wife are IAIB and IAi. Among the blood types of their children, how many different genotypes and phenotypes are possible?

- (1) 4 genotypes ; 4 phenotypes
- (2) 3 genotypes ; 3 phenotypes
- (3) 3 genotypes ; 4 phenotypes
- (4) 4 genotypes ; 3 phenotypes

Q.100 An important characteristic that Hemichordates share with Chordates is :

- (1) pharynx without gill slits
- (2) absence of notochord
- (3) ventral tubular nerve cord
- (4) pharynx with gill slits

Q.101 Which one of the following is related to Ex-situ conservation of threatened animals and plants?

- (1) Himalayan region
- (2) Wildlife Safari Parks
- (3) Biodiversity hot spots
- (4) Amazon rainforest

Q.102 Which of the following in sewage treatment removes suspended solids ?

- (1) Sludge treatment
- (2) Tertiary treatment
- (3) Secondary treatment
- (4) Primary treatment

Q.103 Out of 'X' pairs of ribs in humans only 'Y' pairs are true ribs. Select the option that correctly represents values of X and Y and provides their explanation :

- (1) X = 24, Y = 12 True ribs are dorsally attached to vertebral column but are free on ventral side.
- (2) X = 12, Y = 7 True ribs are attached dorsally to vertebral column and ventrally to the sternum.
- (3) X = 12, Y = 5 True ribs are attached dorsally to vertebral column and sternum on the two ends.
- (4) X = 24, Y = 7 True ribs are dorsally attached to vertebral column but are free on ventral side.

Q.104 Double fertilization is exhibited by :

- (1) Angiosperms
- (2) Gymnosperms
- (3) Algae
- (4) Fungi



Q.105 Attractants and rewards are required for :

- | | |
|-----------------|----------------|
| (1) Cleistogamy | (2) Anemophily |
| (3) Entomophily | (4) Hydrophily |

Q.106 Which one from those given below is the period for Mendel's hybridization experiments ?

- | | |
|-----------------|-----------------|
| (1) 1870 – 1877 | (2) 1856 – 1863 |
| (3) 1840 – 1850 | (4) 1857 – 1869 |

Q.107 Receptor sites for neurotransmitters are present on

- | | |
|----------------------------|------------------------------------|
| (1) post-synaptic membrane | (2) membranes of synaptic vesicles |
| (3) pre-synaptic membrane | (4) tips of axons |

Q.108 Which among these is the correct combination of aquatic mammals ?

- (1) *Trygon*, Whales, Seals
- (2) Seals, Dolphins, Sharks
- (3) Dolphins, Seals, *Trygon*
- (4) Whales, Dolphins, Seals

Q.109 Good vision depends on adequate intake of carotene rich food. Select the best option from the following statements.

- (a) Vitamin A derivatives are formed from carotene.
- (b) The photopigments are embedded in the membrane discs of the inner segment
- (c) Retinal is derivative of Vitamin A
- (d) Retinal is a light absorbing part of all the visual photopigments

Q.110 What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis ?

- (1) Negatively charged fragments do not move
- (2) The larger the fragment size, the farther it moves
- (3) The smaller the fragment size, the farther it moves
- (4) Positively charged fragment move to farther end

Q.111 Hypersecretion of Growth Hormone in adults does not cause further increase in height, because :

- (1) Muscle fibres do not grow in size after birth
- (2) Growth Hormone becomes inactive in adults
- (3) Epiphyseal plates close after adolescence
- (4) Bones lose their sensitivity to Growth Hormone in adults



Q.119 The hepatic portal vein drains blood to liver from :

- (1) Intestine (2) Heart (3) Stomach (4) Kidneys

Q.120 Which cells of ‘Crypts of Lieberkuhn’ secrete antibacterial lysozyme ?

- (1) Kupffer cells (2) Argentaffin cells (3) Paneth cells (4) Zymogen cells

Q.121 Spliceosomes are not found in cells of :

- (1) Bacteria (2) Plants (3) Fungi (4) Animals

Q.122 Frog’s heart when taken out of the body continues to beat for sometime. Select the best option from the following statements.

- (a) Frog is a poikilotherm
(b) Frog does not have any coronary circulation
(c) Heart is “myogenic” in nature
(d) Heart is autoexcitable

Q.123 Functional megaspore in an angiosperm develops into :

- (1) Embryo (2) Ovule (3) Endosperm (4) Embryo sac

Q.124 Alexander Von Humbolt described for the first time :

- (1) Population Growth equation (2) Ecological Biodiversity
(3) Laws of limiting factor (4) Species are relationships

Q.125 The morphological nature of edible part of coconut is :

- (1) Pericarp (2) Perisperm (3) Cotyledon (4) Endosperm

Q.126 A temporary endocrine gland in the human body is :

- (1) Corpus allatum (2) Pineal gland
(3) Corpus cardiacum (4) Corpus luteum

Q.127 Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by :

- (1) Bat (2) Water
(3) Bee (4) Wind



Q.128 The pivot joint between atlas and axis is a type of :

- (1) saddle joint
- (2) fibrous joint
- (3) cartilaginous joint
- (4) synovial joint

Q.129 A decrease in blood pressure/volume will not cause the release of :

- (1) ADH
- (2) Renin
- (3) Atrial Natriuretic Factor
- (4) Aldosterone

Q.130 Which ecosystem has the maximum biomass ?

- (1) Lake ecosystem
- (2) Forest ecosystem
- (3) Grassland ecosystem
- (4) Pond ecosystem

Q.131 A disease caused by an autosomal primary non-disjunction is :

- (1) Sickle Cell Anemia
- (2) Down's Syndrome
- (3) Klinefelter's Syndrome
- (4) Turner's Syndrome

Q.132 Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?

- (1) Mitochondrion
- (2) Lysosome
- (3) Ribosome
- (4) Chloroplast

Q.133 DNA replication in bacteria occurs-

- (1) Just before transcription
- (2) During S phase
- (3) Within nucleolus
- (4) Prior to fission

Q.134 In case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilization ?

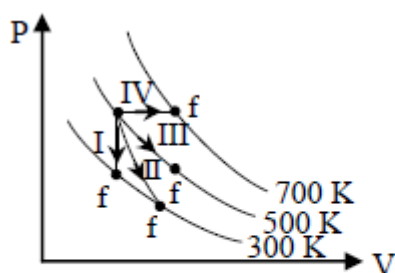
- (1) Intracytoplasmic sperm injection
- (2) Intrauterine transfer
- (3) Gamete intracytoplasmic fallopian transfer
- (4) Artificial Insemination



Q.135 Which one of the following statements is not valid for aerosols ?

- (1) They have negative impact on agricultural land
- (2) They are harmful to human health
- (3) They alter rainfall and monsoon patterns
- (4) They cause increased agricultural productivity

Q.136 Thermodynamic processes are indicated in the following diagram



Match the following :

Column -1

P. Process I

Q. Process II

R. Process III

S. Process IV

Column -2

a. Adiabatic

b. Isobaric

c. Isochoric

d. Isothermal

(1) $P \rightarrow d, Q \rightarrow b, R \rightarrow a, S \rightarrow c$

(2) $P \rightarrow a, Q \rightarrow c, R \rightarrow d, S \rightarrow b$

(3) $P \rightarrow c, Q \rightarrow a, R \rightarrow d, S \rightarrow b$

(4) $P \rightarrow c, Q \rightarrow d, R \rightarrow b, S \rightarrow a$

Q.137 Consider a drop of rain water having mass 1g falling from a height of 1 km. It hits the ground with a speed of 50 m/s. Take 'g' constant with a value 10 m/s². The work done by the (i) gravitational force and the (ii) resistive force of air is

- (1) (i) 10 J (ii) - 8.75 J
- (2) (i) -10 J (ii) -8.25 J
- (3) (i) 1.25 J (ii) -8.25 J
- (4) (i) 100 J (ii) 8.75 J

Q.138 A 250 Turn rectangular coil of length 2.1 cm and width 1.25 cm carries a current of 85 μ A and subjected to a magnetic field of strength 0.85 T. Work done for rotating the coil by 180° against the torque is :

- (1) 1.15 μ J
- (2) 9.1 μ J
- (3) 4.55 μ J
- (4) 2.3 μ J



Q.139 Two Polaroids P1 and P2 are placed with their axis perpendicular to each other. Unpolarised light I_0 is incident on P1. A third polaroid P3 is kept in between P1 and P2 such that its axis makes an angle 45° with that of P1. The intensity of transmitted light through P2 is

- (1) $\frac{I_0}{16}$ (2) $\frac{I_0}{2}$ (3) $\frac{I_0}{4}$ (4) $\frac{I_0}{8}$

Q.140 Radioactive material 'A' has decay constant ' 8λ ' and material 'B' has decay constant ' λ '. Initially they have same number of nuclei. After what time, the ratio of number of nuclei of material 'B' to that 'A' will be $1/e$?

- (1) $\frac{I_0}{16}$ (2) $\frac{I_0}{2}$ (3) $\frac{I_0}{4}$ (4) $\frac{I_0}{8}$

Q.141 The given electrical network is equivalent to



- (1) NOT gate (2) AND gate (3) OR gate (4) NOR gate

Q.142 The ratio of resolving powers of an optical microscope for two wavelengths $\lambda_1 = 4000 \text{ \AA}$ and $\lambda_2 = 6000 \text{ \AA}$ is

- (1) 16 : 81 (2) 8 : 27 (3) 9 : 4 (4) 3 : 2

Q.143 In a common emitter transistor amplifier the audio signal voltage across the collector is 3 V. The resistance of collector is $3 \text{ k}\Omega$. If current gain is 100 and the base resistance is $2 \text{ k}\Omega$, the voltage and power gain of the amplifier is :

- (1) 20 and 2000 (2) 200 and 1000
(3) 15 and 200 (4) 150 and 15000

Q.144 Two cars moving in opposite directions approach each other with speed of 22 m/s and 16.5 m/s respectively. The driver of the first car blows a horn having a frequency 400 Hz. The frequency heard by the driver of the second car is [velocity of sound 340 m/s] :

- (1) 448 Hz (2) 350 Hz (3) 361 Hz (4) 411 Hz



Q.145 Two astronauts are floating in gravitational free space after having lost contact with their spaceship. The two will :

- (1) will become stationary (2) keep floating at the same distance between them.
(3) move towards each other (4) move away from each other.

Q.146 A gas mixture consists of 2 moles of O₂ and 4 moles of Ar at temperature T. Neglecting all vibrational modes, the total internal energy of the system is :

- (1) 11 RT (2) 4 RT (3) 15 RT (4) 9 RT

Q.147 Which one of the following represents forward bias diode ?



Q.148 A long solenoid of diameter 0.1 m has 2×10^4 turns per meter. At the centre of the solenoid, a coil of 100 turns and radius 0.01 m is placed with its axis coinciding with the solenoid axis. The current in the solenoid reduces at a constant rate to 0A from 4 A in 0.05 s. If the resistance of the coil is $10 \pi^2 \Omega$, the total charge flowing through the coil during this time is :

- (1) $16 \pi \mu\text{C}$ (2) $32 \pi \mu\text{C}$ (3) $16 \mu\text{C}$ (4) $32 \mu\text{C}$

Q.149 A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. What is the angular acceleration of the cylinder if the rope is pulled with a force of 30 N ?

- (1) 5 m/s² (2) 25 m/s² (3) 0.25 rad/s² (4) 25 rad/s²

Q.150 A capacitor is charged by a battery. The battery is removed and another identical uncharged capacitor is connected in parallel. The total electrostatic energy of resulting system :

- (1) increases by a factor of 2 (2) increases by a factor of 4
(3) decreases by a factor of 2 (4) remains the same

Q.151 The acceleration due to gravity at a height 1 km above the earth is the same as at a depth d below the surface of earth. Then :

- (1) $d = 2\text{km}$ (2) $d = \frac{1}{2} \text{km}$ (3) $d = 1\text{km}$ (4) $d = \frac{3}{2} \text{km}$



Q.152 A particle executes linear simple harmonic motion with an amplitude of 3 cm. When the particle is at 2 cm from the mean position, the magnitude of its velocity is equal to that of its acceleration. Then its time period in seconds is :

- (1) $\frac{2\pi}{\sqrt{3}}$ (2) $\frac{\sqrt{5}}{\pi}$ (3) $\frac{\sqrt{5}}{2\pi}$ (4) $\frac{4\pi}{\sqrt{5}}$

Q.153 A carnot engine having an efficiency of 10% as heat engine, is used as a refrigerator. If the work done on the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is :

- (1) 100 J (2) 1 J
(2) 90 J (3) 99 J

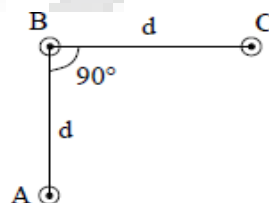
Q.154 The photoelectric threshold wavelength of silver is 3250×10^{-10} m. The velocity of the electron ejected from a silver surface by ultraviolet light of wavelength 2536×10^{-10} m is :
(Given $h = 4.14 \times 10^{-15}$ eVs and $c = 3 \times 10^8$ ms⁻¹)

- (1) $\approx 0.3 \times 10^6$ ms⁻¹ (2) $\approx 6 \times 10^5$ ms⁻¹
(2) $\approx 0.6 \times 10^6$ ms⁻¹ (3) $\approx 61 \times 10^3$ ms⁻¹

Q.155 Suppose the charge of a proton and an electron differ slightly. One of them is $-e$, the other is $(e + \Delta e)$. If the net of electrostatic force and gravitational force between two hydrogen atoms placed at a distance d (much greater than atomic size) apart is zero, then Δe is of the order of [Given mass of hydrogen $m_h = 1.67 \times 10^{-27}$ kg]

- (1) 10^{-47} C (2) 10^{-20} C
(3) 10^{-23} C (4) 10^{-37} C

Q.156 An arrangement of three parallel straight wires placed perpendicular to plane of paper carrying same current 'I' along the same direction is shown in Fig. Magnitude of force per unit length on the middle wire 'B' is given by :



- (1) $\frac{\mu_0 i^2}{\sqrt{2} \pi d}$ (2) $\frac{\mu_0 i^2}{2 \pi d}$ (3) $\frac{2\mu_0 i^2}{\pi d}$ (4) $\frac{\sqrt{2}\mu_0 i^2}{\pi d}$



Q.157 The resistance of a wire is 'R' ohm. If it is melted and stretched to 'n' times its original length, its new resistance will be

- (1) $\frac{R}{n^2}$ (2) nR (3) $\frac{R}{n}$ (4) n^2R
-

Q.158 A beam of light from a source L is incident normally in a plane mirror fixed at a certain distance x from the source. The beam is reflected back as a spot on a scale placed just above the source L. When the mirror is rotated through a small angle θ , the spot of the light is found to move through a distance y on the scale. The angle θ is given by-

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

Q.159 One end of string of length l is connected to a particle of mass 'm' and the other end is connected to a small peg on a smooth horizontal table. If the particle moves in circle with speed 'v' the net force on the particle (directed towards center) will be (T represents the tension in the string)

- (1) Zero (2) T (3) $T + \frac{mv^2}{l}$ (4) $T - \frac{mv^2}{l}$

Q.160 A physical quantity of the dimensions of length that can be formed out of c, G and $\frac{e^-}{4\pi\epsilon_0}$ is [c is velocity of light, G is universal constant of gravitation and e is charge] ;

- (1) $\frac{1}{c} G \frac{e^2}{4\pi\epsilon_0}$ (2) $\frac{1}{c^2} \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{\frac{1}{2}}$ (3) $c^2 \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{\frac{1}{2}}$ (4) $\frac{1}{c^2} \left[\frac{e^2}{G4\pi\epsilon_0} \right]^{\frac{1}{2}}$

Q.161 A thin prism having refracting angle 10° is made of glass of refractive index 1.42. This prism is combined with another thin prism of glass of refractive index 1.7. This combination produces dispersion without deviation. The refracting angle of second prism should be :

- (1) 10° (2) 4° (3) 6° (4) 8°



Q.162 The ratio of wavelengths of the last line of Balmer series and the last line of Lyman series is :

- (1) 0.5 (2) 2 (3) 1 (4) 4

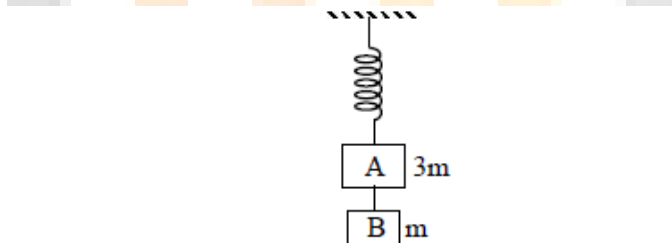
Q.163 The two nearest harmonics of a tube closed at one end and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system ?

- (1) 40 Hz (2) 10 Hz (3) 20 Hz (4) 30 Hz

Q.164 A potentiometer is an accurate and versatile device to make electrical measurements of E.M.F. because the method involves :

- (1) a combination of cells, galvanometer and resistances
(2) cells
(3) potential gradients
(4) a condition of no current flow through the galvanometer

Q.165 Two blocks A and B of masses $3m$ and m respectively are connected by a massless and inextensible string. The whole system is suspended by a massless spring as shown in figure. The magnitudes of acceleration of A and B immediately after the string is cut, are respectively :



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

Q.166 If θ_1 and θ_2 be the apparent angles of dip observed in two vertical planes at right angles to each other, then the true angle of dip θ is given by :

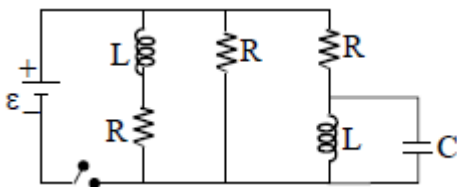
- (1) $\tan^2 \theta = \tan^2 \theta_1 - \tan^2 \theta_2$ (2) $\cot^2 \theta = \cot^2 \theta_1 + \cot^2 \theta_2$
(3) $\tan^2 \theta = \tan^2 \theta_1 + \tan^2 \theta_2$ (4) $\cot^2 \theta = \cot^2 \theta_1 - \cot^2 \theta_2$



Q.167 The bulk modulus of a spherical object is 'B'. If it is subjected to uniform pressure 'p', the fractional decrease in radius is :

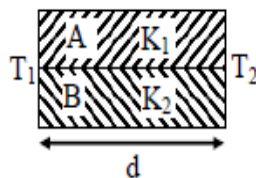
- (1) $\frac{p}{3B}$ (2) $\frac{p}{B}$ (3) $\frac{B}{3p}$ (4) $\frac{3p}{B}$

Q.168 Figure shows a circuit that contains three identical resistors with resistance $R = 9.0 \Omega$ each, two identical inductors with inductance $L = 2.0 \text{ mH}$ each, and an ideal battery with emf $\varepsilon = 18 \text{ V}$. The current 'I' through the battery just after the switch closed is,.....



- (1) 0 ampere (2) 2 mA (3) 0.2 A (4) 2 A

Q.169 Two rods A and B of different materials are welded together as shown in figure. Their thermal conductivities are K_1 and K_2 . The thermal conductivity of the composite rod will be



- (1) $2(K_1 + K_2)$ (2) $\frac{K_1 + K_2}{2}$ (3) $\frac{3(K_1 + K_2)}{2}$ (4) $K_1 + K_2$

Q.170 Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time t_1 . On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2 . The time taken by her to walk up on the moving escalator will be :

- (1) $t_1 - t_2$ (2) $\frac{t_1 + t_2}{2}$ (3) $\frac{t_1 t_2}{t_2 - t_1}$ (4) $\frac{t_1 t_2}{t_2 + t_1}$



Q.171 Two discs of same moment of inertia rotating about their regular axis passing through centre and perpendicular to the plane of disc with angular velocities ω_1 and ω_2 . They are brought into contact face to face coinciding the axis of rotation. The expression for loss of energy during this process is :

- (1) $\frac{I}{8} (\omega_1 - \omega_2)^2$ (2) $\frac{1}{2} I (\omega_1 + \omega_2)^2$ (3) $\frac{1}{4} I (\omega_1 - \omega_2)^2$ (4) $I (\omega_1 - \omega_2)^2$

Q.172 Which of the following statements are correct ?

- (a) Centre of mass of a body always coincides with the centre of gravity of the body.
(b) Centre of mass of a body is the point at which the total gravitational torque on the body is zero.
(c) A couple on a body produce both translational and rotational motion in a body
(d) Mechanical advantage greater than one means that small effort can be used to lift a large load.

- (1) (c) and (d) (2) (b) and (d) (3) (a) and (b) (4) (b) and (c)

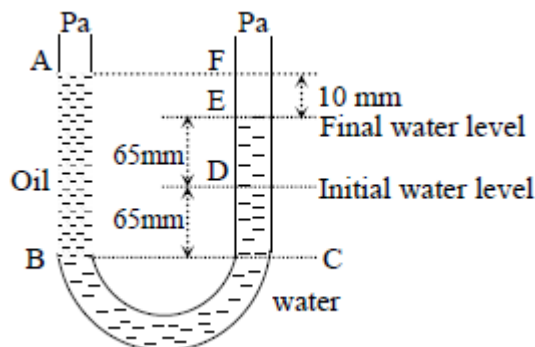
Q.173 A spherical black body with a radius of 12 cm radiates 450 watt power at 500 K. If the radius were halved and the temperature doubled, the power radiated in watt would be :

- (1) 1800 (2) 225 (3) 450 (4) 1000

Q.174 In an electromagnetic wave in free space the root mean square value of the electric field is $E_{rms} = 6V/m$. The peak value of the magnetic field is :

- (1) $4.23 \times 10^{-8} T$ (2) $1.41 \times 10^{-8} T$ (3) $2.83 \times 10^{-8} T$ (4) $0.70 \times 10^{-8} T$

Q.175 A U tube with both ends open to the atmosphere, is partially filled with water. Oil, which is immiscible with water, is poured into one side until it stands at a distance of 10 mm above the water level on the other side. Meanwhile the water rises by 65 mm from its original level (see diagram). The density of the oil is :



- (1) 928 kg m^{-3} (2) 650 kg m^{-3} (3) 425 kg m^{-3} (4) 800 kg m^{-3}



Q.176 Young's double slit experiment is first performed in air and then in a medium other than air. It is found that 8th bright fringe in the medium lies where 5th dark fringe lies in air. The refractive index of the medium is nearly :

- (1) 1.78 (2) 1.25 (3) 1.59 (4) 1.69

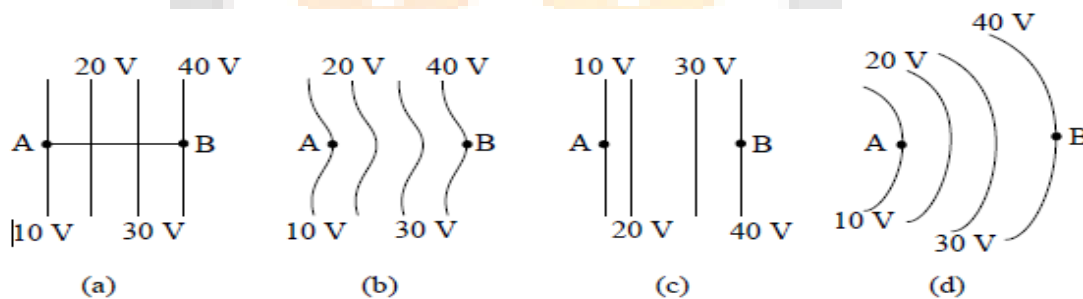
Q.177 The de-Broglie wavelength of a neutron in thermal equilibrium with heavy water at a temperature T (Kelvin) and mass m, is :

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

Q.178 The x and y coordinates of the particle at any time are $x = 5t - 2t^2$ and $y = 10t$ respectively, where x and y are in meters and t in seconds. The acceleration of the particle at $t = 2s$ is :

- (1) -8 m/s^2 (2) 0 (3) 5 m/s^2 (4) -4 m/s^2

Q.179 The diagrams below show regions of equipotentials.



A positive charge is moved from A to B in each diagram.

- (1) Maximum work is required to move q in figure (b).
(2) Maximum work is required to move q in figure (c).
(3) In all the four cases the work done is the same .
(4) Minimum work is required to move q in figure (a).

Q.180 A spring of force constant k is cut into lengths of ratio 1 : 2 : 3. They are connected in series and the new force constant is k'. Then they are connected in parallel and force constant is k''. Then k' : k'' is :

- (1) 1 : 14 (2) 1 : 6 (3) 1 : 9 (4) 1 : 11