SHIKSHA CLASSES,BHANDARA

FULL TEST-2

CHEMISTRY , PHYSICS, BIOLOGY

Time : - 3 Hours   **Max. Marks:- 720**   **Date : ....**

INSTRUCTIONS :

1. The test is of 3 hours duration.

2. The Test Booklet consists of 180 questions. The maximum marks are 720.

3. There are three parts in the question paper A, B, C consisting of Chemistry, Physics having 45 questions each and Biology having 90 questions of equal weightage. Each question is allotted 4 (four) marks for each correct response. ¼ (one fourth) marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.

4. There is only one correct response for each question. Filling up more than one response in each question will be treated as wrong response and marks for wrong response will be deducted accordingly.
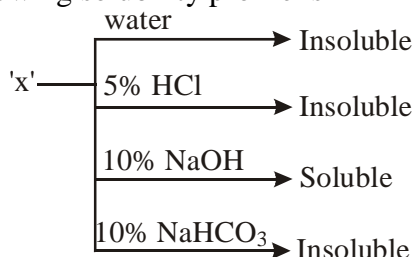

Name : ....

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Phone/Mobile No. ....

Roll No. ....

PART A – CHEMISTRY

Q.1 An organic compound 'X' showing the following solubility profile is -

'x' ─┬─ water ──→ Insoluble
　　 ├─ 5% HCl ──→ Insoluble
　　 ├─ 10% NaOH ──→ Soluble
　　 └─ 10% $NaHCO_3$ ──→ Insoluble

(1) m-Cresol　　　　(2) Oleic acid
(3) o-Toluidine　　 (4) Benzamide

Q.2 For the reaction $2A + B \rightarrow C$, the values of initial rate at different reactant concentrations are given in the table below. The rate law for the reaction is :

[A] (mol L^{-1})	[B] (mol L^{-1})	Initial Rate (mol $L^{-1}s^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

(1) Rate = k [A][B]　　(2) Rate = k $[A]^2[B]^2$
(3) Rate = k $[A][B]^2$　(4) Rate = k $[A]^2[B]$

Q.3 The correct statements among (a) to (b) are:
(a) saline hydrides produce H_2 gas when reacted with H_2O.
(b) reaction of $LiAH_4$ with BF_3 leads to B_2H_6.
(c) PH_3 and CH_4 are electron-rich and electron precise hydrides, respectively.
(d) HF and CH_4 are called as molecular hydrides.
(1) (c) and (d) only　　(2) (a), (b) and (c) only
(3) (a), (b), (c) and (d) (4) (a), (c) and (d) only

Q.4 The combination of plots which does not represent isothermal expansion of an ideal gas is:

P | O, 1/V_m　　　P | O, V_m

(a)
PV_m | O P

(b)
U | O V_m
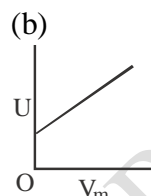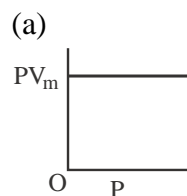
(c)　　　　　　　(d)
(1) (a) and (c)　　(2) (a) and (d)
(3) (b) and (d)　　(4) (b) and (c)

Q.5 The covalent alkaline earth metal halide (X = Cl, Br, I) is :
(1) CaX_2　　　　(2) SrX_2
(3) BeX_2　　　　(4) MgX_2

Q.6 The degenerate orbitals of $[Cr(H_2O)6]^{3+}$ are :
(1) d_{yz} and d_{z^2}　　(2) d_{z^2} and d_{xz}
(3) d_{xz} and d_{yz}　　(4) $d_{x^2-y^2}$ and d_{xy}

Q.7 With respect to an ore, Ellingham diagram helps to predict the feasibility of its -
(1) Vapour phase refining
(2) Zone refining
(3) Electrolysis
(4) Thermal reduction

Q.8 Element 'B' forms ccp structure and 'A' occupies half of the octahedral voids, while oxygen atoms occupy all the tetrahedral voids. The structure of bimetallic oxide is :
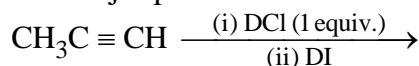(1) A_2BO_4　　　(2) A_2B_2O
(3) A_4B_2O　　　(4) AB_2O_4

Q.9 The electronegativity of aluminium is similar to
(1) Boron　　　　(2) Carbon
(3) Lithium　　　(4) Beryllium

Q.10 Air pollution that occurs in sunlight is :
(1) oxidising smog　(2) acid rain
(3) reducing smog　(4) fog
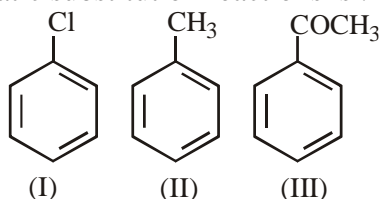
Q.11 The mojor product of the following reaction is :
$$CH_3C \equiv CH \xrightarrow[\text{(ii) DI}]{\text{(i) DCl (1 equiv.)}}$$
(1) CH_3CD (Cl) CHD (I)
(2) CH_3CD_2CH (Cl) (I)
(3) CH_3CD (I) CHD (Cl)

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(4) $CH_3C(I)(Cl)CHD_2$

Q.12 The increasing order of the reactivity of the following compounds towards electrophilic aromatic substitution reactions is :

(I)   (II)   (III)

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

Q.13 The structures of beryllium chloride in the solid state and vapour, phase, respectively, are :
(1) chain and dimeric
(2) chain and chain
(3) dimeric and dimeric
(4) dimeric and chain

Q.14 Which of the following amines can be prepared by Gabriel phthalimide reaction ?
(1) Neo-pentylamine
(2) n-butylamine
(3) triethylamine
(4) t-butylamine

Q.15 The correct order for acid strength of compounds
$CH \equiv CH$, $CH_3 - C \equiv CH$ and $CH_2 = CH_2$ is as follows :
(1) $CH \equiv CH > CH_2 = CH_2 > CH_3 - C \equiv CH$
(2) $HC \equiv CH > CH_3 - C \equiv CH > CH_2 = CH_2$
(3) $CH_3 - C \equiv CH > CH_2 = CH_2 > HC \equiv CH$
(4) $CH_3 - C \equiv CH > CH \equiv CH > CH_2 = CH_2$

Q.16 Chlorine on reaction with hot and concentrated sodium hydroxide gives :
(1) Cl^- and ClO_2^-
(2) Cl^- and ClO_3^-
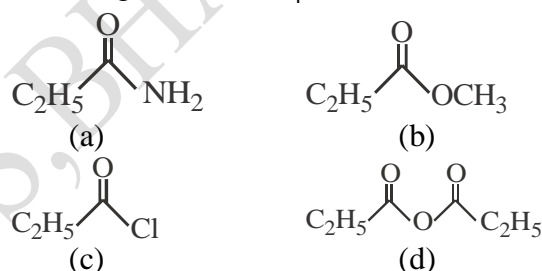(3) Cl^- and ClO^-
(4) ClO_3^- and ClO_2^-

Q.17 The statement that is **INCORRECT** about the interstitial compounds is :
(1) They have high melting points.
(2) They are chemically reactive.
(3) They have metallic conductivity.
(4) They are very hard.

Q.18 The major product of the following reaction is:

(1)   (2)

(3)   (4)
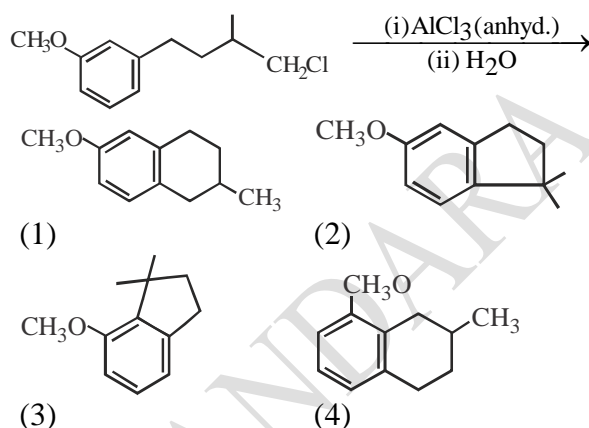
Q.19 The increasing order of the reactivity of the following with $LiAlH_4$ is :

(a)   (b)

(c)   (d)

(1) (a) < (b) < (d) < (c)
(2) (a) < (b) < (c) < (d)
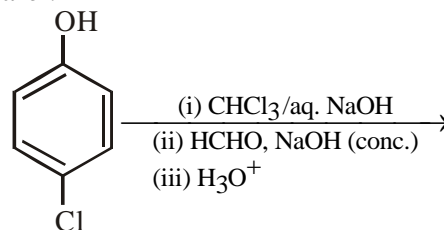(3) (b) < (a) < (d) < (c)
(4) (b) < (a) < (c) < (d)

Q.20 The molar solubility of $Cd(OH)_2$ is 1.84×10^{-5} M in water. The expected solubility of $Cd(OH)_2$ in a buffer solution of pH = 12 is :
(1) 6.23×10^{-11} M
(2) 1.84×10^{-9} M
(3) $\dfrac{2.49}{1.84} \times 10^{-9}$ M
(4) 2.49×10^{-10} M

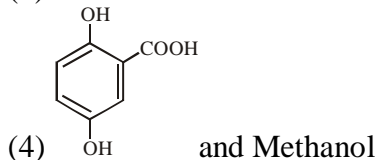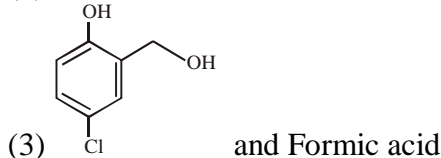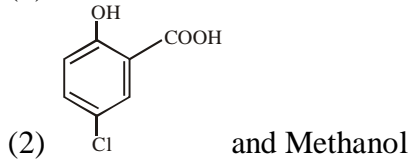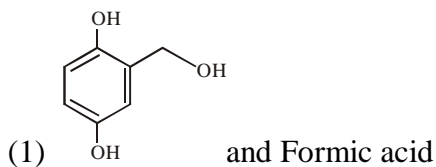**Q.21** The C–C bond length is maximum in
(1) graphite
(2) C_{70}
(3) diamond
(4) C_{60}

**Q.22** The major products of the following reaction are :

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(1) and Formic acid

(2) and Methanol

(3) and Formic acid

(4) and Methanol
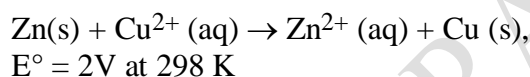
Q.23 An ideal gas undergoes isothermal compression from 5 m^3 against a constant external pressure of 4Nm^{-2}. Heat released in this process is used to increase the temperature of 1 mole of Al. If molar heat capacity of Al is 24 J mol^{-1} K^{-1}, the temperature of Al increases by :
(1) (3/2) K
(2) (2/3) K
(3) 1 K
(4) 2 K

Q.24 The major product in the following conversion is :

$$CH_3O-\bigodot-CH=CH-CH_3 \xrightarrow[\text{Heat}]{\text{HBr(excess)}} ?$$

(1)

(2)

(3)

(4)
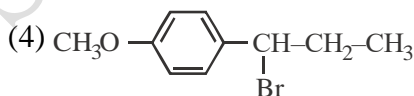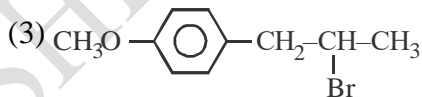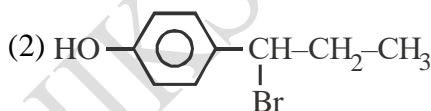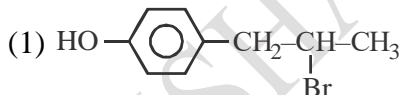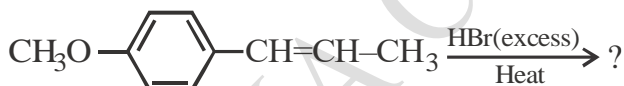
Q.25 The standard Gibbs energy for the given cell reaction in kJ mol^{-1} at 298 K is :
Zn(s) + Cu^{2+} (aq) → Zn^{2+} (aq) + Cu (s),
E° = 2V at 298 K
(Faraday's constant, F = 96000 C mol^{-1})
(1) −384
(2) −192
(3) 192
(4) 384

Q.26 In the following skew conformation of ethane, H'–C–C–H" dihedral angle is :

(1) 120º
(2) 58º
(3) 149º
(4) 151º
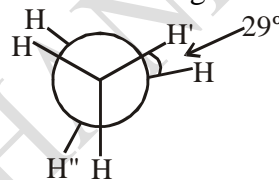
Q.27 Among the following species, the diamagnetic molecule is
(1) O$_2$
(2) NO
(3) B$_2$
(4) CO

Q.28 Which of the following statements is not true about sucrose?
(1) On hydrolysis, it produces glucose and fructose
(2) The glycosidic linkage is present between C$_1$ of α-glucose and C$_1$ of β-fructose
(3) It is also named as invert sugar.
(4) It is a non reducing sugar.

Q.29 A metal on combustion in excess air forms X, X upon hydrolysis with water yields H$_2$O$_2$ and O$_2$ along with another product. The metal is :
(1) Rb
(2) Na
(3) Mg
(4) Li

Q.30 A process has ΔH = 200 J mol^{-1} and ΔS = 40 JK^{-1} mol^{-1}. Out of the values given below, choose the minimum temperature above which the process will be spontaneous :
(1) 5 K
(2) 4 K
(3) 20 K
(4) 12 K

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Q.31 A compound 'X' on treatment with Br_2 / NaOH, provided C_3H_9N, which gives positive carbylamine test. Compound 'X' is :
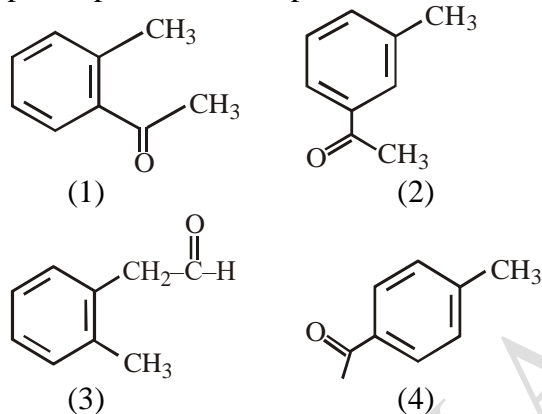(1) $CH_3COCH_2NHCH_3$
(2) $CH_3CH_2COCH_2NH_2$
(3) $CH_3CH_2CH_2CONH_2$
(4) $CH_3CON(CH_3)_2$

Q.32 Compound A ($C_9H_{10}O$) shows positive iodoform test. Oxidation of A with $KMnO_4/KOH$ gives acid $B(C_8H_6O_4)$. Anhydride of B is used for the preparation of phenolphthalein. Compound A is

(1)   (2)

(3)   (4)

Q.33 The correct order of the atomic radii of C, Cs, Al and S is :
(1) S < C < Al < Cs   (2) S < C < Cs < Al
(3) C < S < Cs < Al   (4) C < S < Al < Cs

Q.34 The mole fraction of a solvent in aqueous solution of a solute is 0.8. The molality (in mol kg^{-1}) of the aqueous solution is
(1) 13.88×10^{-1} (2) 13.88×10^{-2}
(3) 13.88   (4) 13.88×10^{-3}

Q.35 Among the following, the energy of 2s orbital is lowest in :
(1) K   (2) Na
(3) Li   (4) H

Q.36 The temporary hardness of a water sample is due to compound X. Boiling this sample converts X to compound Y. X and Y, respectively, are :

(1) $Ca(HCO_3)_2$ and CaO
(2) $Mg(HCO_3)_2$ and $MgCO_3$
(3) $Mg(HCO_3)_2$ and $Mg(OH)_2$
(4) $Ca(HCO_3)_2$ and $Ca(OH)_2$

Q.37 The major product of the following reaction is:

(1)   (2)

(3)   (4)
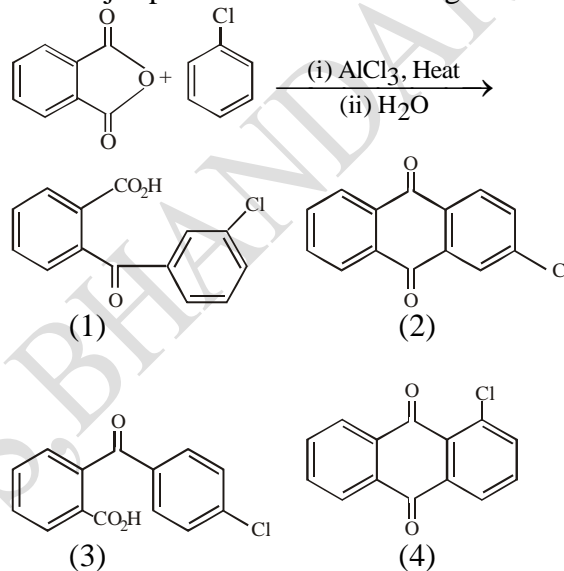
Q.38 The correct order of catenation is :
(1) C > Si > Ge ≈ Sn   (2) C > Sn > Si ≈ Ge
(3) Ge > Sn > Si > C   (4) Si > Sn > C > Ge

Q.39 $CH_3CH_2 - \overset{\overset{\displaystyle OH}{|}}{\underset{\underset{\displaystyle Ph}{|}}{C}} - CH_3$ cannot be prepared by :

(1) HCHO + $PhCH(CH_3)CH_2MgX$
(2) $PhCOCH_2CH_3 + CH_3MgX$
(3) $PhCOCH_3 + CH_3CH_2MgX$
(4) $CH_3CH_2COCH_3 + PhMgX$

Q.40 Haemoglobin and gold sol are examples of :
(1) negatively charged sols
(2) positively charged sols
(3) negatively and positively charged sols, respectively
(4) positively and negatively charged sols, respectively

Q.41 The chloride that CANNOT get hydrolysed is :

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(1) $SiCl_4$ (2) $SnCl_4$

(3) $PbCl_4$ (4) CCl_4

Q.42 Molal depression constant for a solvent is 4.0 kg mol^{-1}. The depression in the freezing point of the solvent for 0.03 mol kg^{-1} solution of K_2SO_4 is :

(Assume complete dissociation of the electrolyte)

(1) 0.12 K   (2) 0.36 K

(3) 0.18 K   (4) 0.24 K

Q.43 The major product of the following reaction is :

(1)   (2)

(3)   (4)

Q.44 HF has highest boiling point among hydrogen halides, because it has :

(1) lowest dissociation enthalpy.

(2) strongest van der Waals' interactions.

(3) strongest hydrogen bonding.

(4) lowest ionic character.

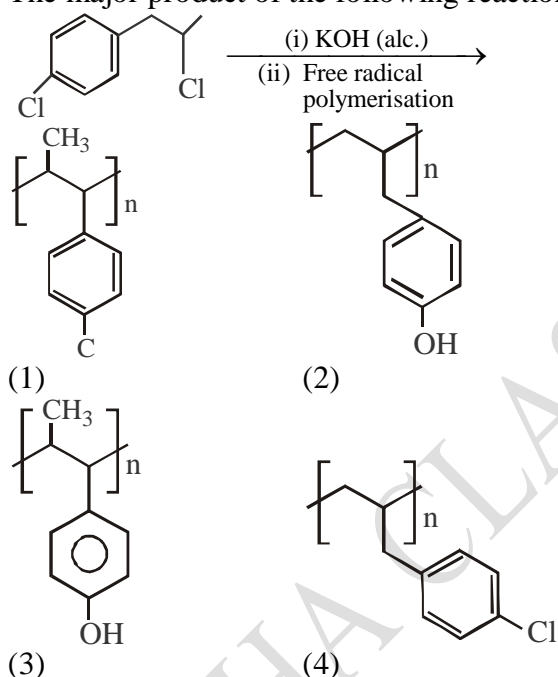**Q.45** Which of the following is a condensation polymer?

(1) Buna-S   (2) Nylon 6, 6

(3) Teflon   (4) Neoprene

PART B – PHYSICS

Q.46 Using a nuclear counter the count rate of emitted particles from a radioactive source is measured. At t = 0 it was 1600 counts per second and t = 8 seconds it was 100 counts per second. The count rate observed, as counts per second, at t = 6 seconds is close to :

(1) 150   (2) 360

(3) 200   (4) 400

Q.47 A point source of light, S is placed at a distance L in front of the centre of plane mirror of width d which is hanging vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror, at a distance 2L as shown below. The distance over which the man can see the image of the light source in the mirror is :
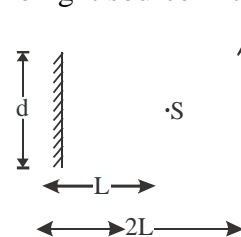
(1) 3d   (2) d/2

(3) d   (4) 2d

Q.48 There are two long co-axial solenoids of same length ℓ. the inner and outer coils have radii r_1 and r_2 and number of turns per unit length n_1 and n_2 respectively. The rate of mutual inductance to the self-inductance of the inner-coil is :

(1) $\dfrac{n_2}{n_1} \cdot \dfrac{r_2^2}{r_1^2}$ (2) $\dfrac{n_2}{n_1} \cdot \dfrac{r_1}{r_2}$

(3) $\dfrac{n_1}{n_2}$ (4) $\dfrac{n_2}{n_1}$

Q.49 A string 2.0 m long and fixed at its ends is driven by a 240 Hz vibrator. The string vibrates in its third harmonic mode. The speed of the wave and its fundamental frequency is :

(1) 320 m/s, 120 Hz   (2) 180 m/s, 80 Hz

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(3) 180 m/s, 120 Hz (4) 320 m/s, 80 Hz

Q.50 The following bodies are made to roll up (without slipping) the same inclined plane from a horizontal plane. : (i) a ring of radius R, (ii) a solid cylinder of radius R/2 and (iii) a solid sphere of radius R/4 . If in each case, the speed of the centre of mass at the bottom of the incline is same, the ratio of the maximum heights they climb is :
(1) 4 : 3 : 2   (2) 20 : 15 : 14
(3) 10 : 15 : 7   (4) 2 : 3 : 4

Q.51 In a photoelectric effect experiment the threshold wavelength of the light is 380 nm. If the wavelength of incident light is 260 nm, the maximum kinetic energy of emitted electrons will be: Given E (in eV) $= \dfrac{1237}{\lambda \text{ (in nm)}}$
(1) 1.5 eV   (2) 4.5 eV
(3) 15.1 eV   (4) 3.0 eV

Q.52 A load of mass M kg is suspended from a steel wire of length 2 m and radius 1.0 mm in Searle's apparatus experiment. The increase in length produced in the wire is 4.0 mm. Now the load is fully immersed in a liquid of relative density 2. The relative density of the material of load is 8. The new value of increase in length of the steel wire is :
(1) 4.0 mm   (2) 3.0 mm
(3) 5.0 mm   (4) zero

Q.53 For the circuit shown below, the current through the Zener diode is :
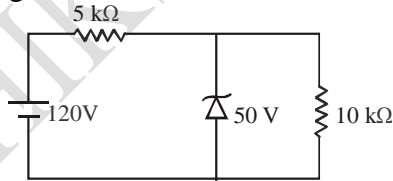
(1) 5 mA   (2) Zero
(3) 14 mA   (4) 9 mA

Q.54 A diatomic gas with rigid molecules does 10 J of work when expanded at constant pressure. What would be the heat energy absorbed by the gas, in this process ?
(1) 35 J   (2) 40 J
(3) 25 J   (4) 30 J

Q.55 A particle of mass m moves in a circular orbit in a central potential field $U(r) = \dfrac{1}{2}kr^2$. If Bohr's quantization conditions are applied, radii of possible orbitals and energy levels vary with quantum number n as:
(1) $r_n \propto n^2,\ E_n \propto \dfrac{1}{n^2}$ (2) $r_n \propto \sqrt{n},\ E_n \propto \dfrac{1}{n}$

(3) $r_n \propto n,\ E_n \propto n$ (4) $r_n \propto \sqrt{n},\ E_n \propto n$

Q.56 Seven capacitors, each of capacitance 2μF, are to be connected in a configuration to obtain an effective capacitance of (6/13) μF. Which of the combinations, shown in figures below, will achieve the desired value ?
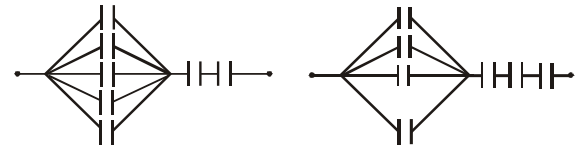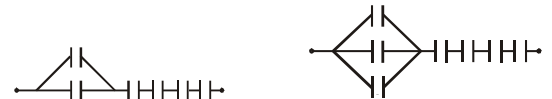
Q.57 The specific heats, C_P and C_V of a gas of diatomic molecules, A, are given (in units of J mol^{-1} K^{-1}) by 29 and 22, respectively. Another gas of diatomic molecules, B, has the corresponding values 30 and 21. If they are treated as ideal gases, then :-
(1) A has one vibrational mode and B has two.
(2) Both A and B have a vibrational mode each.
(3) A is rigid but B has a vibrational mode.
(4) A has a vibrational mode but B has none.

Q.58 A particle starts from the origin at time t = 0 and moves along the positive x-axis. The graph

of velocity with respect to time is shown in figure. What is the position of the particle at time t = 5s ?
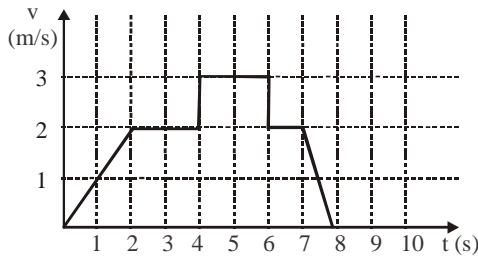
(1) 6 m (2) 9 m
(3) 3 m (4) 10 m

Q.59 Determine the charge on the capacitor in the following circuit :
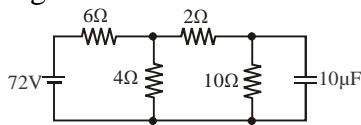
(1) $2\mu C$ (2) $60\mu C$
(3) $200\mu C$ (4) $10\mu C$

Q.60 A block of mass 5 kg is (i) pushed in case a and (ii) pulled in case b, by a force F = 20 N, making an angle of 30º with the horizontal, as shown in the figures. The coefficient of friction between the block and floor is m = 0.2. The difference between the accelerations of the block, in case b and case a will be :
($g = 10$ ms^{-2})

(1) 0 ms^{-2} (2) 0.8 ms^{-2}
(3) 0.4 ms^{-2} (4) 3.2 ms^{-2}

Q.61 If 'M' is the mass of water that rises in a capillary tube of radius 'r', then mass of water which will rise in a capillary tube of radius '2r' is :
(1) 4M (2) M
(3) 2M (4) M/2

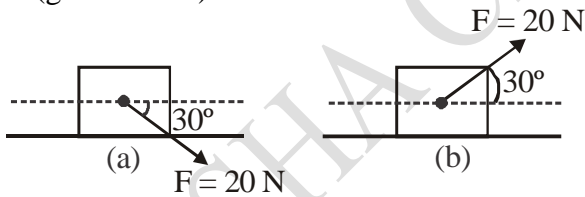**Q.62** If speed (V), acceleration (A) and force (F) are considered as fundamental units, the dimension of Young's modulus will be :
(1) $V^{-2}A^2F^2$ (2) $V^{-4}A^2F$
(3) $V^{-4}A^{-2}F$ (4) $V^{-2}A^2F^{-2}$

Q.63 The value of acceleration due to gravity at Earth's surface is 9.8 ms^{-2}. The altitude above its surface at which the acceleration due to gravity decreases to 4.9 ms^{-2}, is close to :
(Radius of earth = 6.4×10^6 m)
(1) 1.6×10^6 m (2) 6.4×10^6 m
(3) 9.0×106 m (4) 2.6×10^6 m

Q.64 A progressive wave travelling along the positive x-direction is represented by
$y(x, t) = A \sin(kx - \omega t + \phi)$. Its snapshot at t=0 is given in the figure:
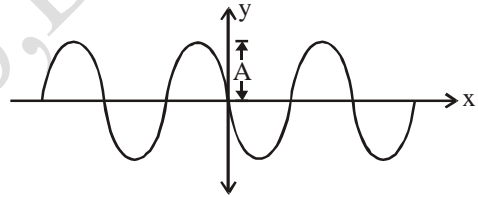
For this wave, the phase ϕ is :
(1) 0 (2) $-\pi/2$
(3) π (4) $\pi/2$

Q.65 Two guns A and B can fire bullets at speeds 1 km/s and 2 km/s respectively. From a point on a horizontal ground, they are fired in all possible directions. The ratio of maximum areas covered by the bullets fired by the two guns, on the ground is :
(1) 1 : 2 (2) 1 : 4
(3) 1 : 8 (4) 1 : 16

Q.66 A thin smooth rod of length L and mass M is rotating freely with angular speed ω_0 about an axis perpendicular to the rod and passing through its center. Two beads of mass m and negligible size are at the center of the rod initially. The beads are free to slide along the rod. The angular speed of the system , when the beads reach the opposite ends of the rod, will be :

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(1) $\dfrac{M\omega_0}{M+3m}$ (2) $\dfrac{M\omega_0}{M+m}$

(3) $\dfrac{M\omega_0}{M+2m}$ (4) $\dfrac{M\omega_0}{M+6m}$

Q.67 The transfer characteristic curve of a transistor, having input and output resistance 100Ω and 100kΩ respectively, is shown in the figure. The Voltage and Power gain, are respectively :

(1) 5×10^4, 5×10^5 (2) 5×10^4, 5×10^6

(3) 5×10^4, 2.5×10^6 (4) 2.5×10^4, 2.5×10^6

Q.68 Find the magnetic field at point P due to a straight line segment AB of length 6 cm carrying a current of 5 A. (See figure)
($\mu_0 = 4\pi \times 10^{-7}$ N-A^{-2})
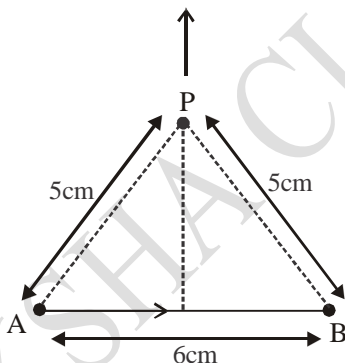
(1) 3.0×10^{-5} T   (2) 2.5×10^{-5} T

(3) 2.0×10^{-5} T   (4) 1.5×10^{-5} T
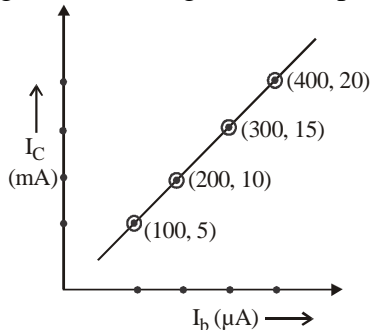
Q.69 Calculate the limit of resolution of a telescope objective having a diameter of 200 cm, if it has to detect light of wavelength 500 nm coming from a star :

(1) 305×10^{-9} radian   (2) 152.5×10^{-9} radian

(3) 610×10^{-9} radian   (4) 457.5×10^{-9} radian

Q.70 For the given cyclic process CAB as shown for a gas, the work done is :
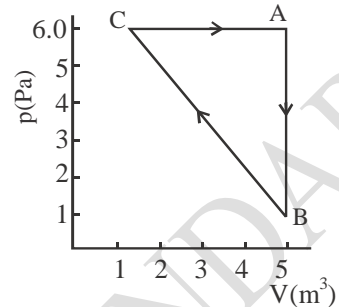
(1) 1 J   (2) 5 J

(3) 10 J   (4) 30 J

Q.71 An object is at a distance of 20 m from a convex lens of focal length 0.3 m. The lens forms an image of the object. If the object moves away from the lens at a speed of 5 m/s, the speed and direction of the image will be :

(1) 0.92×10^{-3} m/s away from the lens

(2) 2.26×10^{-3} m/s away from the lens

(3) 1.16×10^{-3} m/s towards the lens

(4) 3.22×10^{-3} m/s towards the lens

Q.72 The charges $Q + q$ and $+q$ are placed at the vertices of a right-angle isosceles triangle as shown below. The net electrostatic energy of the configuration is zero, it the value of Q is:
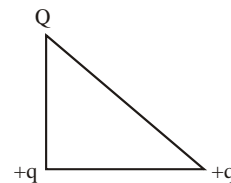
(1) $\dfrac{-\sqrt{2}q}{\sqrt{2}+1}$ (2) $-2q$

(3) $\dfrac{-q}{1+\sqrt{2}}$ (4) $+q$

Q.73 A particle executes simple harmonic motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is :

(1) $(7/3)\,\pi$ (2) $(3/8)\,\pi$

(3) $(4/3)\,\pi$ (4) $(8/3)\,\pi$

Q.74 The figure shows a Young's double slit experimental setup. It is observed that when a thin transparent sheet of thickness t and refractive index μ is put in front of one of the slits, the central maximum get shifted by a distance equal to n fringe widths. If the wavelength of light used is λ, t will be :
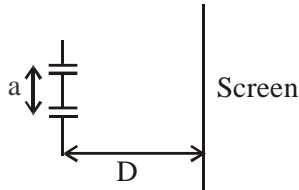
(1) $\dfrac{2D\lambda}{a\,(\mu-1)}$ (2) $\dfrac{D\lambda}{a\,(\mu-1)}$

(3) $\dfrac{2nD\lambda}{a\,(\mu-1)}$ (4) $\dfrac{n\lambda}{(\mu-1)}$

Q.75 One kg of water, at 20ºC, is heated in an electric kettle whose heating element has a mean (temperature averaged) resistance of 20Ω. The rms voltage in the mains is 200 V. Ignoring heat loss from the kettle, time taken for water to evaporate fully, is close to :
[Specific heat of water = 4200 J/kgºC),
Latent heat of water = 2260 kJ/kg]

(1) 3 minutes   (2) 22 minutes

(3) 10 minutes   (4) 16 minutes

Q.76 Two magnetic dipoles X and Y are placed at a separation d, with their axes perpendicular to each other. The dipole moment of Y is twice that of X. A particle of charge q is passing, through their midpoint P, at angle θ = 45° with the horizontal line, as shown in figure. What would be the magnitude of force on the particle at that instant ? (d is much larger than the dimensions of the dipole)
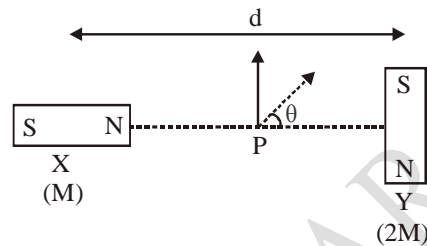
(1) $\sqrt{2}\left(\dfrac{\mu_0}{4\pi}\right)\dfrac{M}{(d/2)^3}\times qv$

(2) $\left(\dfrac{\mu_0}{4\pi}\right)\dfrac{2M}{(d/2)^3}\times qv$

(3) $\left(\dfrac{\mu_0}{4\pi}\right)\dfrac{M}{(d/2)^3}\times qv$

(4) 0

Q.77 What is the minimum energy required to launch a satellite of mass m from the surface of a planet of mass M and radius R in a circular orbit at an altitude of 2R ?

(1) $\dfrac{5GmM}{6R}$ (2) $\dfrac{2GmM}{3R}$

(3) $\dfrac{GmM}{2R}$ (4) $\dfrac{GmM}{3R}$

Q.78 A circular coil having N turns and radius r carries a current I. It is held in the XZ plane in a magnetic field The torque on the coil due to the magnetic field is :

(1) $B\pi r^2 IN$ (2) $\dfrac{Br^2 I}{\pi N}$

(3) Zero   (4) $\dfrac{B\pi r^2 I}{N}$

Q.79 A particle A of mass 'm' and charge 'q' is accelerated by a potential difference of 50 V. Another particle B of mass '4 m' and charge 'q' is accelerated by a potential difference of 2500 V. The ratio of de-Broglie wavelengths $\dfrac{\lambda_A}{\lambda_B}$ is close to :

(1) 10.00   (2) 14.14

10

(3) 4.47 (4) 0.07

Q.80 When the value of R in the balanced Wheatstone bridge, shown in the figure, is increased from 5Ω to 7Ω, the value of S has to be increased by 3Ω in order to maintain the balance. What is the initial value of S?

(1) 2.5 Ω (2) 3 Ω
(3) 5 Ω (4) 7.5 Ω
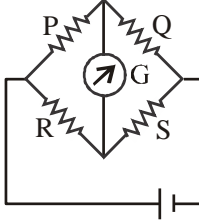
Q.81 A particle P is moving in a circle of radius 'a' with a uniform speed v. C is the centre of the circle and AB is a diameter. When passing through B the angular velocity of P about A and C are in the ratio
(1) 1 : 1 (2) 1 : 2
(3) 2 : 1 (4) 4 : 1

Q.82 The force constant of a wire is k and that of another wire is 2k. When both the wires are stretched through same distance, then the work done :-
(1) $W_2 = 3W_1$ (2) $W_2 = 2W_1$
(3) $W_2 = W_1$ (4) $W_2 = 0.5 W_1$

Q.83 For the following nuclear disintegration process $^{238}_{92}U \rightarrow \,^{206}_{82}Pb + x\,[^4_2He] + [^0_{-2}e]$
then value of x is
(1) 8 (2) 6
(3) 4 (4) 10

Q.84 A block of wood resting on an inclined plane of angle 30°, just starts moving down. If the coefficient of friction is 0.2, its velocity (in ms⁻¹) after 5 seconds is : (g = 10 ms⁻²) -
(1) 12.75 (2) 16.34

(3) 18.25 (4) 20

Q.85 The angular spread of central maximum, in diffraction pattern, does not depend on_____
(1) the distance between the slit and source.
(2) width of slit
(3) wavelength of light
(4) frequency of light

Q.86 A particle of mass 4 m which is at rest explodes into three fragments. Two of the fragments each of mass m are found to move with a speed v each in perpendicular directions. The total energy released in the process will be :
(1) 3 mv² (2) (7/2) mv²
(3) (3/2) mv² (4) 4mv²

Q.87 A tuning of fork of frequency 392 Hz, resonates with 50 cm length of a string under tension (T). If length of the string is decreased by 2%, keeping the tension constant, the number of beats heard when the string and the tuning fork made to vibrate simultaneously is:
(1) 4 (2) 6
(3) 8 (4) 12

Q.88 A Carnot engine has efficiency 25%. It operates between reservoirs of constant temperature with temperature difference of 80K. What is the temperature of low temperature reservoir ?
(1) –22°C (2) 25°C
(3) –33°C (4) 33°C

Q.89 Six vectors, $\vec{a}$ to $\vec{f}$ have the magnitudes and directions indicated in the figures. Which of the following statements is true ?
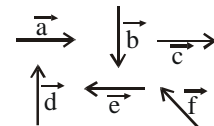
(1) $\vec{b} + \vec{c} = \vec{f}$ (2) $\vec{d} + \vec{c} = \vec{f}$
(3) $\vec{d} + \vec{e} = \vec{f}$ (4) $\vec{b} + \vec{e} = \vec{f}$

Q.90 Shown in the figure is a circular loop of radius r and resistance R. A variable magnetic field of

induction $B = B_0 e^{-t}$ is established inside the coil. If the key (K) is closed, the electrical power developed right after closing the switch is equal to
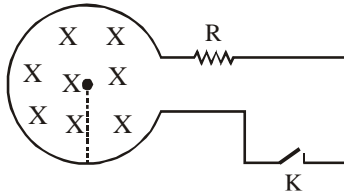
(1) $\dfrac{B_0^2 \pi r^2}{R}$ (2) $\dfrac{B_0 10 r^3}{R}$

(3) $\dfrac{B_0^2 \pi^2 r^4 R}{5}$ (4) $\dfrac{B_0^2 \pi^2 r^4}{R}$

PART C – BIOLOGY

Q.91 Which fish is known as false fish ?
(1) *Petromyzon* (2) *Scoliodon*
(3) *Amphioxus* (4) *Gambusia*

Q.92 Phase characterized by the alignment of chromosomes at the equator is :-
(1) Prophase (2) Metaphase
(3) Anaphase (4) Telophase

Q.93 What serves as the landing platform for pollen grains?
(1) Style (2) Stamen
(3) Ovary (4) Stigma

Q.94 Testa of a seed is derived from :
(1) Ovary wall
(2) Hilum
(3) Nucellus
(4) Outer integument of ovule

Q.95 Identify incorrect labelling and **incorrect** relation with labelled part in given diagram :-
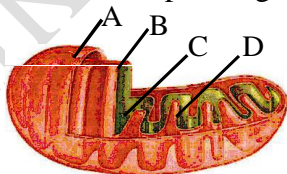
(1) A $\rightarrow$ Outer membrane - form limiting boundary of the organelle.

(2) B $\rightarrow$ Inner membrane - Enzymes of ETS pathway.
(3) C $\rightarrow$ Intermembrane space
(4) D $\rightarrow$ Crista - Increase surface area

Q.96 The acid insoluble fraction, has only four type of organic compounds i.e. :-
(1) Protein, lipid, Amino acid, N_2 base
(2) Protein, Nucleic acids, Polysaccharides, lipid
(3) Amino acid, N_2 base, Monosaccharide, lipid
(4) Amino acid, N_2-base, Polysaccharides, protein

Q.97 How many traits in the given below list belong to dominant form in pea plant ?
Tall plant, terminal flower, inflated pod, axial flower, white flowers, green seed, wrinkle seed, yellow pod, violet flower in pea plant .
(1) 4 (2) 3
(3) 2 (4) 1

Q.98 Which of the following gland do not have a duct
(1) Salivary gland (2) Mammary gland
(3) Tear gland (4) Adrenal gland

Q.99 Which one of the following statement is not true for Bryophytes:-
(1) Their zygote undergo reduction division immediately.
(2) They are called amphibians of the plant kingdom.
(3) They show photosynthetic nature.
(4) Their spore germinates and produces gametophyte.

Q.100 Match column-I to column-II :-

Codon	Amino acid
(i) AUG	(a) Valine
(ii) GUG	(b) Metheionine
(iii) AAA	(c) Phenylalaine
(iv) UUU	(d) Lysine

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

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

Q.101 Cell would normally proceed to prophase without interruption ?
(1) Once it had started the S-period
(2) Once it had entered the G_2-phase
(3) At anytime during cell division
(4) Once it had completed G_0-phase

Q.102 Which one of the following is not incorrect ?
(1) Ovary is also called womb
(2) Myometrium is middle thick layer of uterus
(3) The clitoris lies at the lower junction of two labia minora
(4) Opening of uterus covered by hymen

Q.103 Study the pedigree chart given below :-

What does it show :
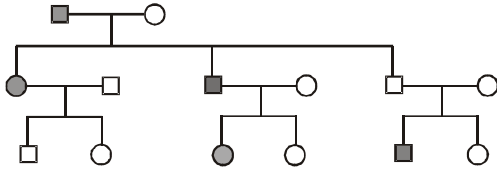(1) Inheritance of phenylketonuria
(2) Inheritance of colourblindness
(3) Inheritance of myotonic dystrophy
(4) Inheritance of hypertrichosis

Q.104 I. Mostly marine
II. Appear yellow, green, brown, blue or red colour.
III. Photosynthetic
IV. Cell wall has stiff cellulose plates
V. Most of them have two flagella
Above statements are correct for
(1) Diatoms   (2) Dinoflagellates
(3) *Chlorella*   (4) *Euglena*

Q.105 Why the distance between two polynucleotide chains in DNA remains almost constant ?
(1) The bases in two strands are paired through hydrogen bonds.
(2) The two chains have anti-parallel polarity.
(3) Always a purine comes opposite to a pyrimidine.
(4) The two chains are coiled in right handed fashion.

Q.106 CO_2 transport in blood is primarily dependent upon
(1) Solubility of O_2 and CO_2
(2) Binding affinity of CO to Hb
(3) Carbonic anhydrase
(4) Binding affinity of Hb to O_2

Q.107 "Stone-wort" belong to which class of algae.
(1) Green algae   (2) Blue green algae
(3) Red algae   (4) Brown algae

Q.108 Match the Column-I with Column-II :

Column-I	**Column-II**
(a) ATP binding site	(i) Troponin
(b) Actin binding site	(ii) Meromyosin
(c) Myosin binding site	(iii) Actin
(d) Tropomyosin binding site	(iv) Myosin

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

Q.109 Which of the following is not a function of kidneys?
(1) Regulation of blood pressure
(2) Removal of urea
(3) Regulation of pH of fluid
(4) Secretion of antibodies

Q.110 RNA dependent DNA polymerase enzyme present in :
(1) Tobacco mosaic virus (2) Retro virus
(3) *E.coli*   (4) SV-40 virus

Q.111 If Hepatopancreatic duct is cut, then which of the following juice do/does not transport into duodenum ?
(a) Gastric juice   (b) Bile juice
(c) Pancreatic juice   (d) Intestinal juice
(1) a and b   (2) b and d
(3) c and d   (4) b and c

Q.112 What is common among Tunicata, cephalochordata and hemichordata ?
(1) All are chordates   (2) Marine habitat

(3) All are vertebrates (4) Both (2) and (3)

Q.113 Refer the given reaction :

(i) Adenine + x → adenosine

(ii) Adenosine + y → adenylic acid

What does x and y represent here ?

X	Y
(1) Phosphate group	Sugar molecule
(2) Sugar molecule	Phosphate group
(3) Sugar molecule	Nitrogenous base
(4) Nitrogenous base	Sugar molecule

Q.114 Which of the following hormone does not act directly on any other gland ?
(1) ACTH (2) Prolactin
(3) MSH (4) TSH

Q.115 "Theory of continuity of Germ plasm" was proposed by :
(1) Weismann (2) Malthus
(3) Mayer (4) Lamarck

Q.116 At the time of diastole , heart is filled with :
(1) Mixed blood
(2) Venous blood
(3) Deoxygenated blood
(4) Oxygenated blood

Q.117 ERV + RV is called :
(1) Vital capacity
(2) Expiratory capacity
(3) Functional residual capacity
(4) Total lung capacity

Q.118 The most common period for amniocentasis during pregnancy is :
(1) 12th weeks (2) 14th - 15th week
(3) 10th - 12th weeks (4) 6th - 8th week

Q.119 Which joint occurs between humerus & radio ulna
(1) Ball & socket (2) Sliding
(3) Pivot (4) Hinge joint

Q.120 LUBB sound of cardiac cycle occurs during closure of :
(1) Eustachian valve
(2) Atrio-ventricular valves
(3) Thebesian valve
(4) Semilunar valve

Q.121 Choose the incorrect statement :-
(1) The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind.
(2) In *Cycas* male and female cones borne on the same tree but in *Pinus* male cones and megasporophylls are borne on different trees.
(3) Pollination in gymnosperms is carried by air
(4) In gymnosperms male and female gametophytes do not have independent free-living existence.

Q.122 Zygote is formed by which process during seed formation ?
(1) Triple fussion (2) Syngamy
(3) Fragmentation (4) Hybridisation

Q.123 Select the **incorrect** match :
(1) **Francis Crick**- Postulated the presence of an adapter molecule that would on one hand read the code and other hand would bind to specific amino acids.
(2) **Severo Ochoa** - Discovered polynucleotide phosphorylase which is helpful in polymerising RNA with defined sequence in template dependent manner.
(3) **Taylor and Colleagues** - Experimented on *Vicia faba* and proved that the DNA in chromosomes also replicates semiconservatively
(4) **F.Griffith** - Experimented on *Streptococcus pneumoniae* and he found that a living bacteria could change in physical form in transformation

Q.124 Which of the following is correctly matched ?
(1) Jaundice – The liver is affected, skin and eyes turn blue due to the deoxygenated blood.
(2) Vomiting – Abnormal frequency of bowel movement and increased liquidity of the faecal discharge.
(3) Physiological energy value of fat

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– 10.45 Kcal/gm.

(4) Kwashiorkor – Protein deficiency

Q.125 If a fruit is formed without fertilisation, it is called as :

(1) Pericarp   (2) Epicarp

(3) Mesocarp   (4) Parthenocarpic

Q.126 In Funaria haploid structure is :

(1) Foot   (2) Seta

(3) Capsule   (4) Rhizoids

Q.127 Read carefully the following statements about pteridophytes.

I. They are called vascular cryptogams

II. They produce spores rather than seed.

III. They are used for medicinal purposes.

IV. They are used as soil binders

V. They are frequently grown as ornamental plants.

Which of the statements given above are correct?

(1) I, II and V   (2) II, IV and V

(3) II, III, IV and IV   (4) I, II, III, IV and V

Q.128 Given below are the steps of genetically modifying an organism, which of the following step is not true

(1) Introduction of the identified DNA into the host

(2) Maintenance of introduced DNA in the host and transfer of the DNA to its progeny.

(3) Identification of DNA with desirable genes.

(4) All are true, none is false.

Q.129 Which of the following is correctly matched for the product produced by them ?

(1) *Trichoderma* = Statin

(2) *Methanobacterium* = Biogas

(3) *Nucleopolyhedrovirus* = Antibiotics

(4) *Saccharomyces* = Swiss cheese

Q.130 Enzyme, which catalyses the conversion of atmospheric nitrogen to ammonia, is a :

(1) Mn-Fe protein   (2) Fe-Mo protein

(3) Mg-Fe protein   (4) Mn-Cl protein

Q.131 Yellow mosaic virus resistant variety "Parbhani Kranti" belongs to :

(1) Bhindi   (2) Barley

(3) Chilli   (4) Cauli flower

Q.132 Plant → Rabbit → Wolf → Lion

In above food chain if plant produce 1000 Kcal energy during photosynthesis than how much amount of energy available for wolf in given food chain:

(1) 10 kcal   (2) 1 kcal

(3) 100 kcal   (4) 0.1 kcal

Q.133 Quiescent centre of root meristem serves as :

(1) Site of food storage

(2) Reservoir for growth Hormone

(3) Reserve for replenishment of damaged cells of meristem

(4) Help in absorption of water

Q.134 Examine the figure given below and select the right option given all the four parts (a, b, c, d) correctly identified :-
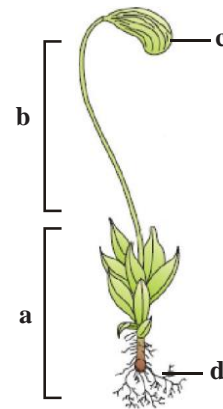
(1) a-Gametophyte, b-Sporophyte, c-Capsule, d-Rhizoids

(2) a-Sporophyte, b-Capsule, c-Rhizoids, d-Gametophyte

(3) a-Gametophyte, b-Capsule, c-Sporophyte d-Rhizoids

(4) a-Sporophyte, b-Gametophyte, c-Capsule d-Rhizoids

Q.135 Which of the following statement is incorrect for epithelium tissue :

(1) It always rest upon underlying connective tissue.

(2) During embryonic development epithelium originate first.

(3) Power of regeneration is very less or absent in epithelium.

(4) Intercellular spaces are absent or less in epithelium.

Q.136 Which of the following statement is false ?

(1) DNA polymerase catalyse polymerization only in one direction that is $3' \rightarrow 5'$.

(2) During replication, deoxyribonucleoside triphosphate serve dual purpose.

(3) DNA replication is an anabolic process.

(4) Any mistake during replication would result into mutation.

Q.137 The cutting of DNA by restriction endonuclease results in the fragments of DNA these fragments can be seperated by technique known as :-

(1) Southern blotting   (2) Gel electrophoresis

(3) Autoradiography   (4) PCR

Q.138 In which cell organelles CO_2 is released during photorespiration :-

(1) Chloroplast   (2) Peroxisome

(3) Golgi body   (4) Mitochondria

Q.139 Find out the enzyme which is activated by AMP/ADP and inhibited by ATP is :

(1) Cytochrome oxidase

(2) Phosphofructokinase

(3) Hexo kinase

(4) Succinate dehydrogenase

Q.140 Which of the following hormone not synthesize by hypothalamus ?

(1) GnRH

(2) Oxytocin

(3) Vasopressin

(4) Thyroid stimulating hormone

Q.141 Given graph showing interaction between two species A and B identify the interaction between them :
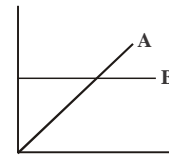
(1) Commensalism   (2) Predation

(3) Competition   (4) Mutualism

Q.142 All the diseases are spread by mosquito except

(1) Chikungunya   (2) Dengue

(3) Chicken pox   (4) Filariasis

Q.143 Loss of biodiversity ln a region may lead to :

(1) increase in plant production.

(2) increased resistance to Drought.

(3) increased variability in plant productivity.

(4) Both (1) and (2) above.

Q.144 If cell A with OP = 5 and TP = 4 is surrounded by the cells with OP = 3 and TP = 1 what will be direction of water movement :

(1) From cell A to other cells.

(2) From other cells to cell A.

(3) Water will not move.

(4) Water will move up.

Q.145 Anaerobic respiration in yeast does not produce

(1) Ethanol   (2) CO_2

(3) OAA   (4) Energy

Q.146 In an area a single banyan tree overshadows 200 parthenium grass. Which of the following is a more meaningful measure of population density ?

(1) Detritus percent

(2) Standing crop percent

(3) Total number per unit area

(4) Standing state percent

Q.147 $\oplus \, \updownarrow \;\; K_{(5)} \;\; \overgroup{C_{(5)} \;\; A_5} \;\; \underline{G}_{(2)}$

These floral formula is related with :

(1) Malvaceae family (2) Solanaceae family

(3) Cruciferae family (4) Papilionaceae family

Q.148 Which hormone regulate the growth of mammary gland and formation of milk in them?

(1) Oestrogen   (2) Progesteron

(3) Oxytocin   (4) Prolactin

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Q.149 Which of the following are characteristics of a community ?
(a) Dominance   (b) Species diversity
(c) Natality   (d) Stratification
(1) a and b   (2) b and c
(3) a, b and d   (4) only c

Q.150 The international treaty which was signed by 27 industrialised countries to protect stratospheric ozone is known as :
(1) Johensberg protocol
(2) Montreal protocol
(3) Stockholm protocol
(4) Rio-de-Jenerio protocol

Q.151 The cerebrum wrap around a structure called **A** . Which is major coordinating centre for **B** signaling. Another very important part of the brain called **C** lies at the base of thalamus.
Choose the correct option for A, B and C to complete the given statement :
(1) A-Pons, B-Visual, C-Hypothalamus
(2) A-Cerebellum, B-Smell, C-Epithalamus
(3) A-Thalamus, B-Sensory & Motor, C-Hypothalamus
(4) A-Pons, B-Sensory & Motor, C-Hypothalamus

Q.152 Select the correct option w.r.t. given diagrams.
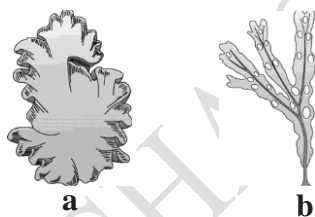
(1) a – Reserve food structurally similar to amylopectin.
   b – Oogamous reproduction.
(2) a – Oogamous reproduction by involvement of motile gamete
   b – Zoospores with lateral flagella
(3) a – *Ulva* of chlorophyceae
   b – Grass green in colour
(4) a – Chlorophyll a and d

b – Chlorophyll a and floridean starch

Q.153 In which one of the following plants, endosperm is not consumed completely by developing embryo and it may persist in mature seed?
(1) Pea   (2) Groundnut
(3) Bean   (4) Castor

Q.154 What will be chromosomes number and DNA amount in sporocyte of liverworts in G_2-phase if spore contains 20 chromosomes with 10 Picogram DNA?
(1) 20, 40 Pg   (2) 40, 20 Pg
(3) 40, 40 Pg   (4) 20, 20 Pg

Q.155 All the given statements are correct except one. Choose the **incorrect** statement
(1) Significant digestive activity occurs in large intestine.
(2) The egestion of faeces to the outside through the anal opening is a voluntary process and is carried out by a mass peristaltic movement.
(3) Glucose and some amino acids are absorbed from the intestinal lumen with the help of carrier proteins.
(4) The activities of gastrointestinal tract are under neural and hormonal control.

Q.156 Elongated or columnar mesophyll cells without intercellular spaces are found towards
(1) Adaxial epidermis of dorsiventral leaf.
(2) Abaxial epidermis of dorsiventral leaf.
(3) Adaxial epidermis of isobilateral leaf.
(4) Abaxial side of isobilateral leaf

Q.157 In r-DNA technology or genetic engineering elution means –
(1) Remove the DNA from centrifuge tube after centrifugation.
(2) The separated band of DNA are cut out from the gel and extracted from the gel piece.
(3) Separation of the recombinant protein from recombinant cell.

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(4) Insertion of recombinant DNA into the host cell.

Q.158 How many of the following is the variety of wheat:
Sonalika, Pusaswarnim, Himgiri, Jaya, Pusa komal, IR8
(1) Three　　　　　(2) One
(3) Two　　　　　　(4) Five

Q.159 Select the correct match.
(1) Phanerogams without ovary
　　　　　　　　　　　　– Gymnosperms
(2) Archegoniates without NCC – Angiosperms
(3) Vascular amphibians – Bryophytes
(4) Non-vascular embryophytes
　　　　　　　　　　　　– Pteridophytes

Q.160 The enomorous amount of data expected to be generated also neccessitated the use of high speed computational device closely associated with the rapid development of new area of biology called
(1) Genetic engineering
(2) Recombinant DNA technology
(3) Bioinformatics
(4) Biotechnology

Q.161 A tissue is a group of cells performing common functions and having common origin. Which of the following cells in the human tissues do not have mesodermal origin?
(1) Fibroblasts　　　(2) Mast cells
(3) Macroglia　　　　(4) Microglial cells

Q.162 If a pregnant woman is suffering from AIDS infection then after parturition which type of antibody not be present in her new born :
(1) Ig G　　　　　　(2) Ig M
(3) Ig A　　　　　　(4) 1 & 2 both

Q.163 Select the **incorrect** statement.
(1) Flocs are formed in secondary treatment of sewage.
(2) A bioactive molecule, cyclosporin A, is produced by an organism of class Deuteromycetes.

(3) Baculoviruses have species–specific, broad spectrum insecticidal applications.
(4) Many members of genus Glomus form mycorrhiza.

Q.164 In which type of the forest, humus is formed by the dry and dead leaves ?
(1) Coniferous forest　(2) Deciduous forest
(3) Tundra forest　　　(4) Alpine

Q.165 A person who is A^- can receive blood from which of the following donors?
a. A^+　　　　　　　b. A^-
c. AB^+　　　　　　d. O^+
e. O^-
(1) a, b, d & e　　　　(2) b & e
(3) d & e　　　　　　(4) b, d & e

Q.166 In adenohypophysis different types of principal cells are found which secrete different types of hormones
Mark the incorrect cell w.r.t. its secretion
(1) Gonadotroph – Follicle stimulating hormone
(2) Corticotroph – Growth hormone
(3) Thyrotroph – Thyroid stimulating hormone
(4) Lactotroph – Prolactin

Q.167 Major cause of FSH and LH surge at the end of pre-ovulatory phase is :
(1) Progesterone released from corpus luteum.
(2) Estrogen from corpus luteum.
(3) Estrogen from theca interna.
(4) Negative feedback of LH and FSH.

Q.168 Most of the nitrogen and phosphorus travels through xylem as _____ respectively.
(1) Inorganic and organic compounds
(2) Organic and inorganic compounds
(3) Inorganic and inorganic compounds
(4) Organic and organic compounds

Q.169 Features like perennial herbs with underground modified stems, ex-stipulate leaves with parallel venation and actinomorphic, trimerous flowers; are associated with angiospermic family _____.
(1) Fabaceae　　　　(2) Brassicaceae

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(3) Liliaceae   (4) Solanaceae

Q.170 In gel Electrophoresis, the DNA fragments separate (resolve) according to their :
(1) Shape   (2) Negative charge
(3) Positive charge   (4) Size

Q.171 The step catalysed by Taq polymerase in PCR is
(1) Denaturation of template DNA.
(2) Annealing of primers to template DNA.
(3) Extension of primers corresponding to the template DNA.
(4) All of these.

Q.172 Select the incorrect match w.r.t. different parts of the brain and their respective functions.
(1) Amygdala   – Defense castle of body
(2) Medulla oblongata – Emesis reflex
(3) Cerebellum   – Intelligence, logical reasoning and Wernicke's association area
(4) Cerebrum   – Broca's area

Q.173 According to which one of the following plots with more species show less year to year variation in total biomass ?
(1) Rivet popper hypothesis
(2) Tilman
(3) IUCN
(4) JFM

Q.174 The exons are not interrupted by intervening sequences in
(1) hnRNA and mRNA
(2) Archaebacteria and primary transcript
(3) Eubacterial DNA and mRNA
(4) mRNA, split genes and tRNA

Q.175 Select the correct set of statements from given below.
a. The cytoplasm is the main arena of cellular activities in plants and animals.
b. Cell envelope in bacteria is tightly linked 2-layered structure.
c. The endomembrane system does not include semi-autonomous organelles.

d. Convex face of golgi bodies is maturing face.
(1) a & d   (2) a & c
(3) a, c, d   (4) All are correct

Q.176 Select the correct statement w.r.t. biodiversity.
(1) A stable community must be either resistant or resilient to occasional disturbances.
(2) Species diversity increases from lower to higher latitudes.
(3) Extinction of Steller's sea cow and passenger pigeon occurred due to habitat loss and fragmentation.
(4) All the biodiversity hotspots put together cover more than 2 percent of the earth's land area

Q.177 Functional characters of community, which change during succession :
(a) Energy use efficiency
(b) Nutrient conservation
(c) Complexity of food web
(d) species diversity
(1) a, b and c   (2) b, c and d
(3) only d   (4) a and d only

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Q.178 Second polar body is released after '**a**' in '**b**' region of female reproductive system
(1) a – First meiotic division, b – Ovary
(2) a – Second meiotic division, b – Cervix
(3) a – Second meiotic division, b – Ovary
(4) a – Second meiotic division, b – Oviduct

Q.179 The "cry" gene inserted in 'Bt cotton' which makes it tolerant to attacks of 'corn borer' pest is
(1) Cry I Ab   (2) Cry II Ab
(3) Cry I Ac   (4) Cry II Ac

Q.180 The first clinical gene therapy was given in 1990 to a four year old girl suffering from SCID. The process involved
(1) Transferring ADA gene into the blood.
(2) Treatment by enzyme replacement therapy.
(3) Introduction of functional ADA c-DNA (using a retroviral vector) into the lymphocytes of patient, which are subsequently returned to the patient.
(4) Transferring ADA gene via DNA vaccine method.