NEET 2020

மாதிரி வினாத்தாள் - 9

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இயற்பியல்

1. A ball is thrown vertically upwards in air and reaches a maximum height of 50 m. The velocity of projection of ball is ($g = 9.8\ m\ s^{-2}$)
(a) $45\ m\ s^{-1}$ (b) $31\ m\ s^{-1}$
(c) $10\ m\ s^{-1}$ (d) None of these.

2. A train is moving along a straight path with uniform acceleration. Its engine passes across a pole with a velocity of 60 km h^{-1} and the end (guard's van) passes across the same pole with a velocity of 80 km h^{-1}. The middle point of the train will pass across the same pole with a velocity
(a) 70 km h^{-1} (b) 70.7 km h^{-1}
(c) 65 km h^{-1} (d) 75 km h^{-1}.

3. What is the angle between $\vec{P}$ and the resultant of $(\vec{P}+\vec{Q})$ and $(\vec{P}-\vec{Q})$?
(a) Zero (b) $\tan^{-1}\left(\frac{P}{Q}\right)$
(c) $\tan^{-1}\left(\frac{Q}{P}\right)$ (d) $\tan^{-1}\frac{(P-Q)}{(P+Q)}$

4. A projectile is thrown at an angle of $\theta = 45°$ to the horizontal, reaches a maximum height of 16 m. Then choose the incorrect option.
(a) Its velocity at the highest point is zero.
(b) Its range is 64 m.
(c) Its range will decreases when it is thrown at an angle of $\theta = 30°$.
(d) Both (b) and (c) are correct.

5. A disc of mass 100 g is kept floating horizontally in air by firing bullets, each of mass 5 g with the same velocity at the same rate of 10 bullets per second. The bullets rebound with the same speed in opposite direction, the velocity of each bullet at the time of impact is
(a) $196\ cm\ s^{-1}$ (b) $9.8\ cm\ s^{-1}$
(c) $98\ cm\ s^{-1}$ (d) $980\ cm\ s^{-1}$.

6. A ball of mass m is thrown vertically upwards with a velocity v. If air exerts an average resisting force F, the velocity with which the ball returns to the thrower is
(a) $v\sqrt{\frac{mg}{mg+F}}$ (b) $v\sqrt{\frac{F}{mg+F}}$ (c) $v\sqrt{\frac{mg-F}{mg+F}}$ (d) $v\sqrt{\frac{mg+F}{mg}}$.

7. A cyclist rides up a hill with a constant velocity. If the length of the connective rod of the pedal is $r = 25$ cm, the time of revolution of the rod is $t = 2$ s and the mean force exerted by his foot on the pedal is $F = 15$ kg wt. The power developed by the cyclist is
(a) 1154 W (b) 115.4 W (c) 15 W (d) 11.5 W

8. Two balls of masses m_1 and m_2 are separated from each other and a charge is placed between them. The whole system is at rest on the ground. Suddenly, the charge explodes and the masses are pushed apart. Mass m_1 travels a distance s_1 and then it stops. If the coefficient of friction between the balls and the ground are same, mass m_2 stops after covering a distance
(a) $s_2 = \frac{m_1}{m_2}s_1$ (b) $s_2 = \frac{m_2}{m_1}s_1$ (c) $s_2 = \frac{m_1^2}{m_2^2}s_1$ (d) $s_2 = \frac{m_2^2}{m_1^2}s_1$

9. The surface densities of a circular disc of radius a depends on the distance as $\rho(r) = A + Br$. The moment of inertia of the disc about the line perpendicular to its plane is
(a) $\pi a^4\left(\frac{A}{2}+\frac{2a}{5}B\right)$ (b) $\pi a^4\left(\frac{A}{2}+\frac{2B}{5}\right)$
(c) $2\pi a^3\left(\frac{A}{2}+\frac{Ba}{5}\right)$ (d) None of these.

10. The angle of contact between glass and water is 0° and it rises in a capillary upto 6 cm when its surface tension is 70 dyne cm^{-1}. Another liquid of surface tension 140 dyne cm^{-1}, angle of contact 60° and relative density 2 will rise in the same capillary by
(a) 12 cm (b) 24 cm (c) 3 cm (d) 6 cm.

11. Aerofoils are so designed that the speed of air
(a) on top side is more than on lower side
(b) on top side is less than on lower side
(c) is same on both sides (d) is turbulent.

12. Wires A and B have identical lengths and have circular cross-sections. The radius of A is twice the radius of B, *i.e.*, $r_A = 2r_B$. For a given temperature difference between the two ends, both wires conduct heat at the same rate. The relation between the thermal conductivities is given by
(a) $K_A = 4K_B$ (b) $K_A = 2K_B$
(c) $K_A = \frac{K_B}{2}$ (d) $K_A = \frac{K_B}{4}$.

13. If a body (coated black) at 600 K surrounded by atmosphere at 300 K has cooling rate r_0, the same body at 900 K, surrounded by the same atmosphere, will have cooling rate equal to
(a) $\frac{16}{3}r_0$ (b) $\frac{8}{16}r_0$ (c) r_0 (d) $4r_0$.

14. A Carnot engine whose sink is at 300 K has an efficiency of 40%. By how much should the temperature of source be increased so as to increase its efficiency of 50% of original efficiency?

(a) 275 K (b) 325 K (c) 250 K (d) 380 K

15. When volume of an ideal gas is increased two times and temperature is decreased half of its initial temperature, then pressure becomes
(a) 2 times (b) 4 times (c) $\frac{1}{4}$ times (d) $\frac{1}{2}$ times

16. The ratio of specific heats (γ) of an ideal gas is not given by
(a) $\frac{1}{1-\frac{R}{C_P}}$ (b) $1+\frac{R}{C_V}$ (c) $\frac{R+2C_V}{C_V}$
(d) None of these.

17. A system is subjected to two SHMs given by $y_1 = 6\cos\omega t$ and $y_2 = 8\cos\omega t$.
The resultant amplitude of SHM is given by
(a) 2 (b) 10 (c) 14 (d) 20.

18. An organ pipe, open from both ends produced 5 beats per second when vibrated with a source of frequency 200 Hz in its fundamental mode. The second harmonic of the same pipe produces 10 beats per second with a source of frequency 420 Hz. The fundamental frequency of pipe is
(a) 195 Hz (b) 205 Hz (c) 190 Hz (d) 210 Hz

19. The driver of a car travelling with speed 30 m s^{-1} towards a hill sounds a horn of frequency 600 Hz. If the velocity of sound in air is 330 m s^{-1}, the frequency of the reflected sound as heard by the driver is
(a) 720 Hz (b) 555.5 Hz (c) 550 Hz (d) 760 Hz

20. An air filled parallel plate capacitor charged to potential V_1 is connected to an uncharged identical parallel plate capacitor with dielectric constant K. The common potential is V_2. The value of K is
(a) $\frac{V_1-V_2}{V_1+V_2}$ (b) $\frac{V_1}{V_1-V_2}$ (c) $\frac{V_1-V_2}{V_2}$ (d) $\frac{V_1-V_2}{V_1}$

21. A wire of length l is bent to form a semicircle. If it has charge q, then electric field intensity at the centre of semicircle is
(a) $\frac{\pi q}{4\varepsilon_0 l^2}$ (b) $\frac{q}{8\pi\varepsilon_0 l^2}$ (c) $\frac{q}{4\pi\varepsilon_0 l^2}$ (d) $\frac{q}{2\varepsilon_0 l^2}$

22. In a straight conductor of uniform cross-section charge q is flowing for time t. Let s be the specific charge of an electron. The momentum of all the free electrons per unit length of the conductor, due to their drift velocity only is
(a) $\left(\frac{q}{ts}\right)$ (b) $\left(\frac{q}{ts}\right)^2$ (c) $\sqrt{\frac{q}{ts}}$ (d) qts.

23. The current in wire is directed towards east and the wire is placed in magnetic field directed towards north. The force on the wire is
(a) vertically upwards (b) vertically downwards
(c) due south (d) due east.

24. A circular loop and a square loop are formed from the same wire and the same current is passed through them. The ratio of their dipole moments is
(a) 4π (b) $\frac{4}{\pi}$ (c) $\frac{2}{\pi}$ (d) 2π.

25. Two bar magnets having same geometry with magnetic moments M and $2M$, are firstly placed in such a way that their similar poles are same side then its time period of oscillation is T_1. Now the polarity of one of the magnet is reversed then time period of oscillation is T_2, then
(a) $T_1 < T_2$ (b) $T_1 = T_2$ (c) $T_1 > T_2$ (d) $T_2 = \infty$.

26. A coil of inductance 300 mH and resistance 2 Ω is connected to a source of voltage 2 V. The current reaches half of its steady state value in
(a) 0 s (b) 0 s (c) 0 s (d) 0 s.

27. A long solenoid has 200 turns per cm and carries a current I. The magnetic field at its centre is 6.28×10^{-2} Wb m^{-2}. Another long solenoid has 100 turns per cm and it carries a current $I/3$. The value of the magnetic field at its centre is
(a) 1.05×10^{-2} Wb m^{-2} (b) 1.05×10^{-5} Wb m^{-2}
(c) 1.05×10^{-3} Wb m^{-2} (d) 1.05×10^{-4} Wb m^{-2}.

28. An electromagnetic wave going through vacuum is described by $E = E_0 \sin(kx - \omega t)$; $B = B_0 \sin(kx - \omega t)$.
Which of the following equations is true?
(a) $E_0 k = B_0 \omega$ (b) $E_0 \omega = B_0 k$
(c) $E_0 B_0 = \omega k$ (d) None of these

29. A thin rod of length $f/3$ is placed along the principal axis of a concave mirror of focal length f such that its real elongated image just touches the rod. The magnification produced by the mirror is
(a) $\frac{4}{3}$ (b) $\frac{3}{2}$ (c) 3 (d) 2.

30. The maximum number of possible interference maxima for a slit-separation equal to twice the wavelength in Young's double slit experiment is
(a) infinite (b) five (c) three (d) zero.

31. A small particle of mass m moves such that its potential energy is equal to $\frac{1}{2}mr^2\omega^2$. Assuming Bohr's model of quantisation of angular momentum and circular orbit, radius of n^{th} orbit is proportional to
(a) $\sqrt{n}$ (b) $\sqrt{n^3}$ (c) $\frac{1}{\sqrt{n}}$ (d) $\frac{1}{\sqrt{n^3}}$.

32. The half-life period of a radioactive element X is same as the mean life time of another radioactive element Y. Initially, they have the same number of atoms. Then,
(a) X will decay faster than Y
(b) Y will decay faster than X
(c) Y and X have same decay rate initially
(d) X and Y decay at same rate always.

33. A stone weighing 3 kg falls from the top of a tower 100 m high and buries itself 3 m deep in the sand. The time of penetration is
(a) 0.09 s (b) 0.13 s (c) 1.3 s (d) 0.9 s

34. In the middle of the depletion layer of reverse biased p-n junction, the
(a) electric field is zero (b) potential is maximum

(c) electric field is maximum
(d) potential is zero.

35. A body starts from rest, what is the ratio of the distance travelled by the body during the 4^{th} and 3^{rd} second ?
(a) $\frac{7}{5}$ (b) $\frac{5}{7}$ (c) $\frac{7}{3}$ (d) $\frac{3}{7}$

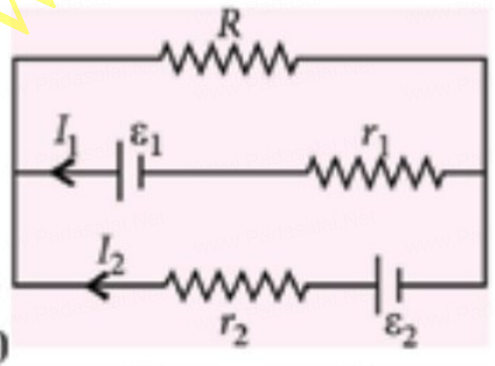
36. A car moves from X to Y with a uniform speed v_u and returns from Y to X with a uniform speed v_d. The average speed for this round trip is
(a) $\sqrt{v_u v_d}$ (b) $\frac{v_d v_u}{v_d + v_u}$ (c) $\frac{v_u + v_d}{2}$ (d) $\frac{2v_d v_u}{v_d + v_u}$

37. A series combination of n_1 capacitors, each of value C_1, is charged by a source of potential difference $4V$. When another parallel combination of n_2 capacitors, each of value C_2, is charged by a source of potential difference V, it has the same (total) energy stored in it, as the first combination has. The value of C_2 in terms of C_1 is
(a) $\frac{2C_1}{n_1 n_2}$ (b) $16\frac{n_2}{n_1}C_1$ (c) $2\frac{n_2}{n_1}C_1$ (d) $\frac{16C_1}{n_1 n_2}$

38. A positively charged particle moving towards east enters a region of uniform magnetic field directed vertically upwards. This particle will
(a) move in a circular path with a decreased speed
(b) move in a circular path with a uniform speed
(c) get deflected in vertically upward direction
(d) move in circular path with an increased speed.

39. In a circuit L, C and R are connected in series with an alternating voltage source of frequency υ. The current leads the voltage by 45°. The value of C is
(a) $\frac{1}{\pi\upsilon(2\pi\upsilon L - R)}$ (b) $\frac{1}{2\pi\upsilon(2\pi\upsilon L - R)}$
(c) $\frac{1}{\pi\upsilon(2\pi\upsilon L + R)}$ (d) $\frac{1}{2\pi\upsilon(2\pi\upsilon L + R)}$.

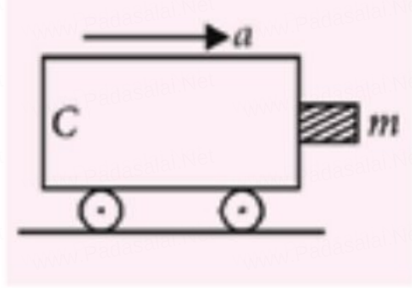
40. For the electrical circuit shown in the figure, which of the following equations is correct.



(a) $\varepsilon_2 - I_2 r_2 - \varepsilon_1 - I_1 r_1 = 0$
(b) $-\varepsilon_2 - (I_1 + I_2) R + I_2 r_2 = 0$
(c) $\varepsilon_1 - (I_1 + I_2) R + I_1 r_1 = 0$
(d) $\varepsilon_1 - (I_1 + I_2) R - I_1 r_1 = 0$

41. A thin circular ring of mass M and radius r is rotating about its axis with a constant angular velocity ω. Four objects each of mass m, are kept gently to the opposite ends of two perpendicular diameters of the ring. The angular velocity of the ring will be
(a) $\frac{M\omega}{4m}$ (b) $\frac{M\omega}{M+4m}$
(c) $\frac{(M+4m)\omega}{M}$ (d) $\frac{(M-4m)\omega}{M+4m}$.

42. A block of mass m is in contact with the cart C as shown in the figure. The coefficient of static friction between the block and the cart is μ.



The acceleration a of the cart that will prevent the block from falling satisfies
(a) $a > \frac{mg}{\mu}$ (b) $a > \frac{g}{\mu m}$ (c) $a \geq \frac{g}{\mu}$ (d) $a < \frac{g}{\mu}$

43. In a radioactive material the activity at time t_1 is R_1 and at a later time t_2, it is R_2. If the decay constant of the material is λ, then
(a) $R_1 = R_2$ (b) $R_1 = R_2 e^{-\lambda(t_1 - t_2)}$
(c) $R_1 = R_2 e^{\lambda(t_1 - t_2)}$ (d) $R_1 = R_2(t_2/t_1)$.

44. Which of the following statement is false for the properties of electromagnetic waves ?
(a) Both electric and magnetic field vectors attain the maxima and minima at the same place and same time.
(b) The energy in electromagnetic wave is divided equally between electric and magnetic vectors.
(c) Both electric and magnetic field vectors are parallel to each other and perpendicular to the direction of propagation of wave.
(d) These waves do not require any material medium for propagation.

45. The momentum of a photon of an electromagnetic radiation is 3.3×10^{-29} kg m s^{-1}. What is the frequency of the associated waves ?
($h = 6.6 \times 10^{-34}$ J s and $c = 3 \times 10^8$ m s^{-1})
(a) 1.5×10^{13} Hz (b) 7.5×10^{12} Hz
(c) 6×10^3 Hz (d) 3×10^3

உயிரியல்

1. Colchicine is a cell poison which arrests cell division at _____ and can induce _____.
(a) metaphase, parthenocarpy
(b) anaphase, parthenocarpy
(c) metaphase, polyploidy
(d) anaphase, polyploidy

2. Bohr's effect is related with
(a) reduced carbon level in lymph
(b) increased carbon dioxide level in blood
(c) oxidised phosphorus level in blood
(d) reduced carbon dioxide level in blood.

3. Hisardale is a new breed of sheep developed in Punjab by crossing
   (a) Merino ram and Bikaneri ewe
   (b) Aseel ram and White leg horn ewe
   (c) Rhode Island ram and White leg horn ewe
   (d) Cochin ram and Ghagus ewe.

4. Which of the following would be least true of a regulator?
   (a) It may have a larger geographic range than a conformer.
   (b) It can increase its tolerance limits through acclimatisation.
   (c) Much of its energy budget can be allocated to reproduction.
   (d) It possesses a constant internal environment.

5. Photosynthetic roots occur in
   (a) *Tinospora* (b) *Cuscuta* (c) *Pandanus* (d) maize

6. The following cell organelle takes part in disappearance of larval organs in frogs during metamorphosis.
   (a) Vacuoles (b) Lysosomes
   (c) Ribosomes (d) Microfilament

7. Read the given statements and select the correct option.
   Statement 1 : GMO tomato 'Flavr Savr' has increased shelf life and better nutrient quality.
   Statement 2 : This is achieved by reducing the amount of cell wall degrading enzyme 'polygalacturonase' responsible for fruit softening.
   (a) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
   (b) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
   (c) Statement 1 is correct but statement 2 is incorrect.
   (d) Both statements 1 and 2 are incorrect.

8. Which of the following is an example of artificial passive immunity?
   (a) A person, recovered from an attack of small pox
   (b) Administration of Salk vaccine for poliomyelitis in newborns
   (c) Administration of anti-tetanus serum in injured person
   (d) Resistance transferred to the infant through mother's milk

9. Which of the following holds true for SA node?
   (a) It is called pacesetter.
   (b) It is regulated by the cardiac centres present in medulla oblongata of brain.
   (c) It has very low rhythmicity.
   (d) It is present in the left atrium near the opening of superior vena cava.

10. Given below are the differences between wind pollinated and insect pollinated flowers.

	Wind pollinated	Insect pollinated
(i)	Flowers are small and inconspicuous.	Flowers are showy and brightly coloured.
(ii)	Flowers are devoid of nectar and edible pollen.	Flowers possess nectar and edible pollen.
(iii)	Pollen grains are heavier and sticky.	Pollen grains are light and unwettable.
(iv)	Anthers and stigmas are inserted.	Anthers and stigmas are usually exserted.

Select the incorrect differences.
(a) (i) and (ii) only (b) (i) and (iv) only
(c) (iii) and (iv) only (d) (ii) and (iii) only

11. The mortality rate of organisms following a type III survivorship curve is
   (a) fairly constant throughout life
   (b) higher in post reproductive years
   (c) lower after the organisms grow into reproductive individuals and become established
   (d) unrelated to age.

12. In *Artabotrys* _____ are modified into stiff curved hooks for climbing.
   (a) pedicels (b) petioles (c) leaf tips (d) stem buds

13. Which of the following is incorrect for biosynthetic phase of photosynthesis?
   (a) It occurs in matrix of chloroplast.
   (b) It does not require light.
   (c) It produces NADPH and ATP.
   (d) It is influenced by temperature.

14. Which of the following statements about enzymes are correct?
   (i) Enzymes do not alter the overall change in free energy for a reaction.
   (ii) Enzymes are proteins whose three dimensional shape is key to their functions.
   (iii) Enzymes speed up reactions by lowering activation energy.
   (iv) Enzymes are highly specific for reactions.
   (v) The energy input needed to start a chemical reaction is called activation energy.
   (a) (i) and (v) (b) (ii) and (iv)
   (c) (i), (ii) and (iv) (d) All of these

15. Which of the following is a connecting link between Phylum Annelida and Mollusca?
   (a) *Peripatus* (b) *Proterospongia*
   (c) *Balanoglossus* (d) *Neopilina*

16. If map distance between genes P and Q is 3 units, between P and R is 9 units, and between Q and R is 6 units, the order of genes on the linkage map can be traced as follows.
   (a) Q P R (b) P Q R
   (c) P Q R
   (d) P Q P R Q R

17. Mesogamy commonly occurs in
   (a) *Cucurbita* (b) Lily (c) *Juglans* (d) *Casuarina.*

18. Which of the following is an example of isometric contraction?
   (a) Bending of arms (b) Stair climbing
   (c) Pushing against a stationary wall
   (d) Lifting a heavy weight

19. Which of the following method involves transformation of host cell by inducing pores in plasma membrane through electrical impulse using $CaCl_2$?
   (a) Microinjection (b) Biolistic method
   (c) Electroporation (d) Direct DNA injection

20. Acoustic zoning is a control measure for
   (a) air pollution (b) noise pollution
   (c) water pollution (d) radiation pollution.

21. Select the correct statement from the following.
   (a) Classical taxonomy has a biosystematic concept whereas modern taxonomy has typological concept.
   (b) Classical taxonomy considers species to be dynamic whereas modern taxonomy considers species to be static.
   (c) Classical taxonomy studies evolution and interrelationships of species.
   (d) Modern taxonomy studies primitiveness, advancement and interrelationships of species.

22. Read the given statements.
(i) Coelenterates show polymorphism.
(ii) In *Pleurobrachia* locomotion takes place by comb plates.
(iii) In roundworm true coelom is present.
(iv) Parapodia are respiratory organs found in arthropodans.
Of the above statements
(a) only (i) and (iv) are correct (c) only (iii) and (iv) are correct
(b) only (i) and (ii) are correct (d) only (ii) and (iii) are correct.

23. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
A.	*Holoptelea*	(i)	Cremocarp
B.	*Capsella*	(ii)	Carcerulus
C.	Coriander	(iii)	Hesperidium
D.	*Abutilon*	(iv)	Silicula
E.	Orange	(v)	Simple samara

(a) A - (ii), B - (iii), C - (i) D - (iv), E - (v)
(b) A - (v), B - (iv), C - (i), D - (ii), E - (iii)
(c) A - (i), B - (ii), C - (iv), D - (v), E - (iii)
(d) A - (iii), B - (i), C - (ii), D - (v), E - (iv)

24. Two adjacent cells A and B are studied. Cell A has $\psi_w = -10$ atm whereas cell B has $\psi_w = -5$ atm. Movement of water will occur from
(a) A to B (b) B to A
(c) no movement of water (d) cannot be determined.

25. Select the correct match.
(a) Hexoses - Xylose, Fructose, Erythrose
(b) Steroids - Corticosterone, Digitoxin, Strophanthin
(c) Acidic amino acids - Glutamine, Lysine, Glycine
(d) Chromoproteins - Ribonucleoproteins, Haemocyanin, Rhodopsin

26. On exposure to a chemical mutagen, adenine is replaced by thymine, in a DNA segment. It is the case of
(a) inversion (b) transition (c) transversion (d) insertion

27. Emasculation is not required in case of ____ flowers for performing artificial hybridisation.
(a) pea (b) papaya (c) mustard (d) rice

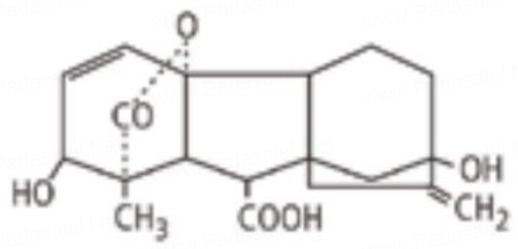
28. Oxyhaemoglobin dissociation curve shifts to right when
(a) temperature is low
(b) concentration of CO_2 increases in plasma
(c) temperature is high (d) both (b) and (c).

29. Cyclosporin A prevents rejection of transplanted organs by
(a) destroying T-cell mediated immune responses while sparing humoral antibody responses
(b) destroying humoral antibody responses while sparing T - cell mediated immune responses
(c) destroying both T-cell mediated and humoral antibody responses
(d) none of these.

30. Which of the following holds true for monerans?
(a) An organised nucleus is present sometimes.
(b) Cell wall contains sporopollenin.
(c) Sexual reproduction does not involve fusion of gametes.
(d) Ribosomes are 80S in nature.

31. The function of intracellular membrane is not to
(a) establish a number of compartments within the cell
(b) provide for the neat spatial organisation of enzymes and pigments
(c) keep the cell rigidity so that it does not collapse
(d) provide a system of channel for the distribution of nutrients within the cell.

32. Given below is the chemical structure of a plant hormone. Select the incorrect statement regarding it.

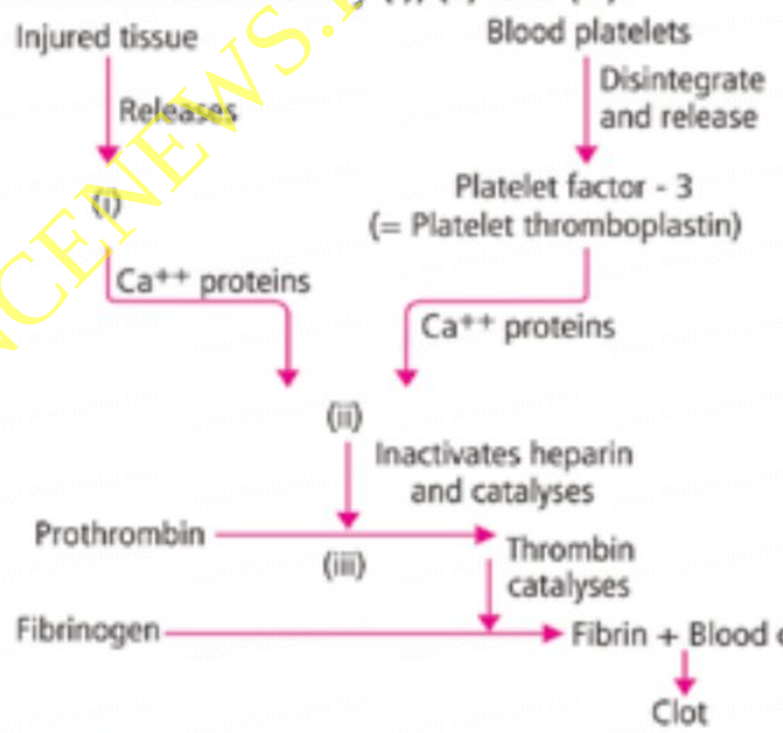


(a) Reducing sugar content of barley endosperm serves as its bioassay.
(b) It causes bolting in case of rosette plants.
(c) It overcomes natural dormancy of buds, tubers, seeds etc.
(d) It promotes formation of female flowers on genetically male plants of *Cannabis*.

33. Which of the following organisms reproduces asexually by fragmentation method?
(a) *Rhizopus* (b) *Riccia* (c) Sea anemone (d) All of these

34. Dikaryon stage during sexual reproduction occurs in
(a) Mycoplasma (b) *Puccinia*
(c) *Marchantia* (d) *Pseudomonas.*

35. Refer to the given flow chart showing the blood clotting mechanism and identify (i), (ii) and (iii).



(a) (i) Prothrombinase, (ii) Thromboplastin, (iii) Mg^{2+}
(b) (i) Thromboplastin, (ii) Prothrombinase, (iii) Zn^{2+}
(c) (i) Thromboplastin, (ii) Prothrombinase, (iii) Ca^{2+}
(d) (i) Prothrombinase, (ii) Thromboplastin, (iii) Fe^{2+}

36. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
A.	Potassium	(i)	Organisation of mitotic spindle
B.	Calcium	(ii)	Formation of chlorophyll
C.	Magnesium	(iii)	Nitrogen metabolism
D.	Molybdenum	(iv)	Opening and closing of stomata

(a) A - (i), B - (iv), C - (iii) D - (ii)
(b) A - (iv), B - (i), C - (ii), D - (iii)
(c) A - (iii), B - (ii), C - (iv), D - (i)
(d) A - (ii), B - (iii), C - (i), D - (iv)

37. Which of the following is correct regarding follicular phase of menstrual cycle in human female?
(a) Empty Graafian follicle changes into corpus luteum.
(b) Large amount of progesterone is secreted.
(c) It extends from 6^{th} to 13^{th} day in a 28 day cycle.
(d) The uterine glands secrete watery secretions.

38. If the sequence of coding strand in a transcription unit is : 5' - ATGCATGC-3' then the sequence of *m*RNA will be
(a) TACGTACG (b) AUGCAUGC (c) ATGCATGC (d) UACGUACG

39. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
A.	Pap test	(i)	Syphilis
B.	VDRL test	(ii)	Typhoid
C.	Widal test	(iii)	Bubonic plague
D.	Wayson stain test	(iv)	Tuberculosis
E.	Mantoux test	(v)	Cervical cancer

(a) A - (i), B - (ii), C - (iii) D - (iv) E- (v)
(b) A - (v), B - (i), C - (ii), D - (iii) E- (iv)
(c) A - (v), B - (iv), C - (iii), D - (ii) E- (i)
(d) A - (ii), B - (iv), C - (iii), D - (i), E- (v)

40. Read the following statements and select the incorrect one.
(a) Little decomposition occurs during the formation of primary sludge.
(b) Formation of primary sludge requires ample aeration.
(c) Activated sludge possess flocs of decomposer microbes.
(d) Formation of activated sludge requires aeration.

41. Select the correct match.
(a) Cauliflower mosaic virus - ssRNA
(b) T_4 bacteriophage - dsDNA
(c) Reovirus - ssRNA (d) Retrovirus - dsRNA

42. Which of the following is correct for a sanctuary?
(a) It is meant for protection of both flora and fauna.
(b) Private ownership is permitted.
(c) Grazing is not allowed.
(d) Boundary is well demarcated.

43. Siphonogamy is found in
(a) gymnosperms (b) angiosperms
(c) pteridophytes (d) both (a) and (b).

44. Which of the following groups include only *ex - situ* methods of biodiversity conservation?
(a) Sacred plants, home gardens, hotspots
(b) Seed banks, cryopreservation, Biosphere reserves
(c) Botanical gardens, National parks, Wildlife sanctuaries
(d) Zoological parks, cyropreservation, botanical gardens

45. Select the incorrect difference between gymnosperms and angiosperms.

	Gymnosperms	Angiosperms
(i)	Sporophylls are aggregated to form cones.	Sporophylls are aggregated to form flowers.
(ii)	Ovules occur covered inside the ovary.	Ovules lie exposed on megasporophyll.
(iii)	Endosperm is triploid and is a post fertilisation structure.	Endosperm is haploid and is a pre-fertilised structure.
(iv)	Ovules are sessile.	Ovules are generally borne on a stalk or funiculus.

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

46. Which of the following plants produce orthodox seeds?
(a) Cocoa (b) Legumes (c) Jack fruit (d) Tea

47. Read the given statements.
Statement I: Microtubules cause microcirculation by directing vesicles to particular direction.
Statement II: Microtubules are believed to cause cytoplasmic streaming.
(a) Both statements I and II are true and statement II is the correct explanation of statement I.
(b) Both statements I and II are true but statement II is not the correct explanation of statement I.
(c) Statement I is true but statement II is false.
(d) Both statements I and II are false.

48. _____ is located in nonappressed part of grana thylakoids whereas _____ is present in the appressed part of grana thylakoids. _____ phosphorylation is performed in collaboration of both of them.
(a) PS I, PS II, Non-cyclic (b) PS II, PS I, Cyclic
(c) PS II, PS I, Non-cyclic (d) PS I, PS II, Cyclic

49. Human skin colour is controlled by
(a) 2 pairs of polygenes (b) 3 pairs of polygenes
(c) 4 pairs of polygenes (d) 5 pairs of polygenes.

50. Which of the following is an example of conditioned reflex?
(a) Breast feeding in new born babies
(b) Blinking of eyes (c) Riding a bicycle
(d) Both (b) and (c)

51. The biggest difference between the flow of energy and the flow of chemical nutrients in an ecosystem is
(a) the amount of energy is much greater than the amount of nutrients
(b) nutrients are recycled but energy is not
(c) organisms always need nutrients but they don't always need energy
(d) energy is recycled but nutrients are not.

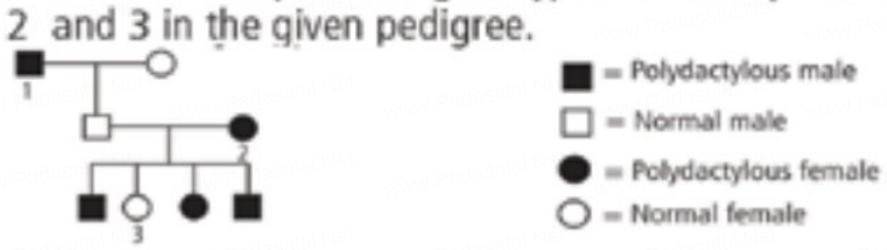
52. Reptiles got independent of water for survival and became true land animals because
(a) they possess internal fertilisation
(b) they possess shelled eggs
(c) they possess horny epidermal scales (d) all of these

53. Which of the following holds true for Whittaker's five kingdom classification?
(a) Cell structure is more complex in Kingdom Monera as compared to Kingdom Protista.
(b) Body organisation of protistans is more complicated as compared to fungi.
(c) Members of Plantae, Animalia and Fungi have different ecological roles due to difference in their modes of nutrition.
(d) Both (a) and (b)

54. Select the incorrect statement.
(a) White fibrous tissue occurs in pubic symphysis where it takes part in parturition.
(b) Mucoid tissue is present in umbilical cord and vitreous humour of eye.
(c) Multipolar neurons have several axons and one dendrite and are found in grey matter of brain.
(d) Osteocytes give off protoplasmic processes whereas chondroblasts do not have protoplasmic processes.

55. In case of gametophytic self incompatibility, pollen with S_1 allele (parent genotype S_1S_2) fails to germinate on stigma with genotype
(a) S_2S_3 (b) S_1S_2 (c) S_3S_4 (d) all of these

56. In humans, polydactyly (*i.e*, presence of extra fingers and toes) is determined by a dominant autosomal allele (P) and the normal condition is determined by a recessive allele (p). Find out the possible genotypes of family members 1, 2 and 3 in the given pedigree.



	1	2	3
(a)	PP	Pp	pp
(b)	PP	PP	pp
(c)	Pp	PP	Pp
(d)	Pp	Pp	pp

57. A double stranded DNA has 30% cytosine. What is the percentage of adenine in it?
(a) 60% (b) 30% (c) 20% (d) 10%

58. Which of the following is incorrect regarding anaphase stage of cell division?
(a) It could be a stage of both mitotic and meiotic cell divisions.
(b) In meiotic cell division dissimilar chromosomes move towards opposite poles at this stage whereas in mitotic cell division similar chromosomes move towards the opposite poles at this stage.
(c) Chromosomes are single stranded at this stage irrespective of the cell division type.
(d) None of these

59. In the process of animal evolution, the transformation of habitat from water to land was assisted by the
(a) development of shelled eggs
(b) development of horny scales on skin
(c) development of ctenidial respiration
(d) both (a) and (b).

60. Which of the following holds true for pachytene stage of meiotic cell division?
(a) This stage leads to genetic recombination, hence, variations in sexually reproducing organisms.
(b) In this stage, the process of exchange of genetic material between sister chromatids of non-homologous chromosomes takes place.
(c) This stage takes place only in haploid cells of body *e.g.*, gametes.
(d) All of these

61. Cadmium pollution causes
(a) itai - itai disease (b) minamata disease
(c) fluorosis (d) blue baby syndrome.

62. Which of the following holds true for gel electrophoresis?
(a) It separates DNA fragments on the basis of their charge.
(b) Smaller DNA fragments move slower than larger DNA fragments.
(c) The separated DNA fragments can be seen by staining them with ethidium bromide.
(d) DNA being positively charged moves towards cathode.

63. Effective filtration pressure in glomerulus is caused due to
(a) powerful pumping action of the heart
(b) secretion of adrenaline
(c) afferent arteriole is slightly larger than efferent arteriole
(d) vacuum develops in proximal convoluted tubule and sucks the blood.

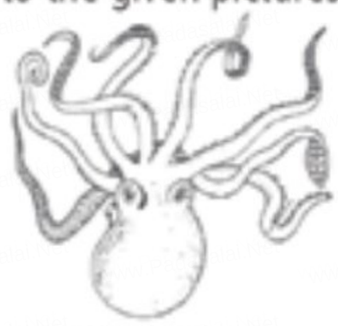
64. Bicarpellary, syncarpous, superior ovary with swollen placentae and obliquely placed carpels are found in
(a) *Solanum* (b) *Crotolaria* (c) *Dalbergia* (d) *Lathyrus*

65. Delta cells of islet of Langerhans secrete
(a) glucagon (b) insulin
(c) somatostatin (d) angiotensinogen.

66. Implantation of blastocyst at an abnormal site in the uterus is prevented by
(a) zona pellucida (b) corona radiata
(c) trophoblast (d) none of these.

67. The females are heterogametic in
(a) humans (b) birds
(c) *Drosophila* (d) grasshoppers.

68. Refer to the given pictures.



Organism A

Organism B

Which of the following holds true for organisms A and B ?
(a) Organism A is cuttle fish whereas organism B is devil fish.
(b) Organism A is freshwater species whereas organism B is a marine species.
(c) Both organisms A and B belong to Phylum Mollusca.
(d) Organism A respires through gills whereas organism B respires through spiracles.

69. Which of the following is responsible for higher proton concentration in thylakoid lumen?
(a) Thylakoid lumen becomes enriched with H^+ due to photolytic splitting of water.
(b) NADP reductase situated on the outerside of thylakoid membrane obtains electrons from PSI and H^+ from matrix to reduce $NADP^+$ to NADP + H^+ state.
(c) Primary acceptor of electron, located on outer side of thylakoid membrane transfers electrons to an H carrier which removes a proton from matrix thereby releasing it into the lumen.
(d) All of these

70. Which of the following is an example of sex monosomy in humans?
(a) Down's syndrome (b) Patau's syndrome
(c) Turner's syndrome (d) Klinefelter's syndrome

71. Identify the recognition sequence and site of cleavage for restriction enzyme *Sal I.*

(a) 5'– A – G ↓ C–T – 3'
3'– T – C – G – A – 5' ↑

(b) 5' – G ↓ G – A – T – C – C – 3'
3'– C – C – T – A – G – G – 5' ↑

(c) 5'– G – G ↓ C – C – 3'
3'– C – C – G – G – 5' ↑

(d) 5'– G ↓ T – C – G – A – C – 3'
3'– C – A – G – C – T – G – 5' ↑

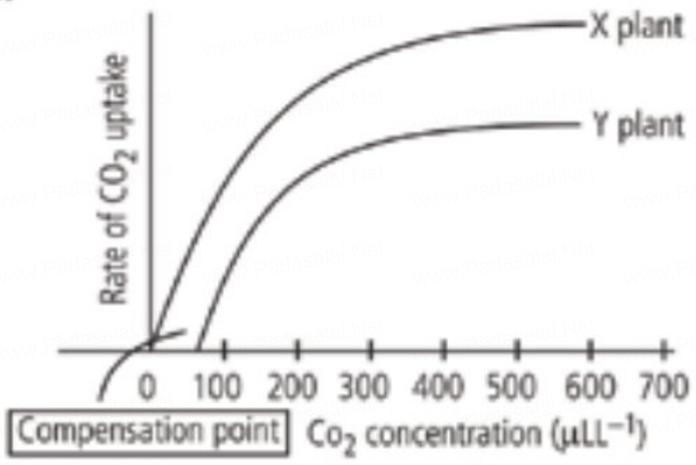
72. Which of the following holds true for the type of inflorescence shown in the picture?

(a) It is the modification of raceme.
(b) Peduncle is reduced and flattened to form receptacle.
(c) Flowers are pedicellate.
(d) Flowers are always of one type.

73. Select the hormone which is secreted by duodenum and inhibits gastric secretion and motility.

(a) Enterogastrone (b) Gastrin (c) Duocrinin (d) Villikinin

74. Refer to the given graph and answer the question that follows.



Which of the following holds true for X and Y plants?
(a) Plant X shows high tolerance to temperature, salinity and aridity and shows high productivity as compared to plant Y.
(b) The leaves of plant Y have Kranz anatomy.
(c) Plant X shows high rate of photorespiration whereas plant Y shows negligible photorespiration.
(d) Plant X usually performs photosynthesis when stomata are open whereas plant Y performs photosynthesis even when stomata are closed.

75. Match column I with column II and select the correct option from the codes given below.

	Column I	Column II
A.	*Trypanosoma*	(i) Mixotrophic nutrition
B.	*Euglena*	(ii) Symbiont in intestine of termites
C.	*Trichonympha*	(iii) Photosynthetic protozoans
D.	Dinoflagellates	(iv) Parasitic protozoan

(a) A - (iv), B - (i), C - (ii) D - (iii)
(b) A - (i), B - (iii), C - (iv), D - (ii)
(c) A - (i), B - (ii), C - (iii), D - (iv)
(d) A - (iv), B - (iii), C - (ii), D - (i)

76. It is a large elongated sac like structure present beneath utricular gland and ejaculatory duct in cockroach. The secretion of this gland forms the outermost layer of the spermatophore. It is
(a) stink gland (b) phallic gland
(c) uricose gland (d) colleterial gland.

77. Which one of the following hormones never reaches to cytoplasm?
(a) Estrogen (b) FSH (c) Progesterone (d) Testosterone

78. The syncytiotrophoblast cells of blastocyst secrete
(a) follicle stimulating hormone
(b) human chorionic gonadotropin
(c) growth hormone (d) prolactin.

79. Which of the following holds true for a dicot stem?
(a) Casparian strips are present on radial and tangential walls of endodermal cells.
(b) Vascular bundles are conjoint, collateral and open.
(c) Stem hairs are unicellular and always unbranched.
(d) Pith is absent.

80. Inflation or abnormal distension of bronchioles or alveolar sacs is known as
(a) asphyxia (b) emphysema (c) pleurisy (d) pertussis

81. During second and third trimester of pregnancy, the major source of estrogen and progesterone is
(a) corpus luteum (b) placenta
(c) embryoblast (d) ovary.

82. Which of the following is not present in Phylum Porifera?
(a) Canal system (b) Choanocytes
(c) Flame cells (d) Gemmules

83. r - strategists tend to
(a) have large number of offspring
(b) be relatively small organisms
(c) have short life spans (d) all of these.

84. Periodic abstinence or rhythm method of birth control is based on which of the following facts?
(a) Ovulation occurs on 14^{th} day of menstrual cycle.
(b) Ovulation does not occur in lactating mothers.
(c) Sperms survive in uterus only for 1-2 hrs after coitus.
(d) None of these.

85. A haemophiliac man is married to a normal woman. What could be assumed about their progenies?
(a) All normal male progenies and all carrier female progenies.
(b) 50% haemophiliac male progenies and all normal female progenies.
(c) All normal male progenies and 50% haemophiliac female progenies.
(d) All progenies normal.

86. Which of the following is the main cause of allopatric speciation?
(a) Geographical isolation (b) Reproductive isolation
(c) Allochronism (d) None of these

87. Polymerase Chain Reaction (PCR) can be used in case of
(a) gene therapy (b) prenatal diagnosis
(c) DNA fingerprinting (d) all of these.

88. Which of the following is an example of anthropogenic biome?
(a) Freshwater (b) Rainforests
(c) Grasslands (d) Croplands

89. Select the incorrect match from the following.
(a) Transgenic sheep - contains human gene for blood clotting factor IX
(b) Rosie - contains human gene for α_1 - antitrypsin
(c) Transgenic chicken - contains non-virulent genome of Avian leukosis virus
(d) Transgenic pig - contains gene expressing human growth hormone

90. The open ocean and tropical rainforest are two largest contributors to net primary productivity because
(a) both have high rates of net primary productivity
(b) both cover large surface areas on earth
(c) nutrients cycle fastest in these two ecosystems
(d) the ocean covers a large surface area and the tropical rainforest has a high rate of productivity.

வேதியியல்

1. The increasing order of CFSE value for the following compounds is

$[Rh(NH_3)_6]^{3+}$ (I); $[Ir(NH_3)_6]^{3+}$ (II); $[Co(NH_3)_6]^{3+}$ (III)

(a) I < II < III (b) II < I < III
(c) III < I < II (d) III < II < I

2. Which one of the following statements related to lanthanides is incorrect?

(a) La^{3+} and Lu^{3+} are diamagnetic
(b) Lanthanides are strong electropositive elements
(c) The basic character of oxides and hydroxides increases from $La(OH)_3$ to $Lu(OH)_3$
(d) Cerium shows +4 oxidation state

3. Identify the product (P) in the following reaction,

$$[Pt(NH_3)_4]^{2+} \xrightarrow{2Cl^-} \text{Product (P)}$$

(a) H_3N, H_3N, Cl, Cl around Pt (b) H_3N, Cl, Cl, NH_3 around Pt
(c) Cl, H_3N, Cl, NH_3 around Pt (d) H_3N, Cl, Cl, Cl around Pt

4. Among the following, which one is an incorrect statement?

(a) Fluorine does not form oxide with oxygen but it forms oxy-fluoride
(b) Bromine does not show + 7 oxidation state
(c) $(SiH_3)_3N$ is stronger base than $(CH_3)_3N$
(d) Nitric oxide is paramagnetic

5. Which one of the following sets of orbitals is include in the t_{2g} orbital?

(a) $d_{x^2-y^2}, d_{z^2}$ (b) d_{xy}, d_{yz}, d_{z^2}
(c) d_{xy}, d_{yz}, d_{xz} (d) $d_{x^2-y^2}, d_{xz}, d_{yz}$

6. Which one of the following *p*-orbitals combination forms two nodal planes?

(a) $2p_z$ + $2p_z$ ⟶
(b) $2p_z$ + $2p_z$ ⟶
(c) $2p_x$ + $2p_x$ ⟶
(d) $2p_x$ + $2p_x$ ⟶

7. The correct geometry of ClF_3 and I_3^- respectively are

(a) trigonal bipyramidal; trigonal bipyramidal
(b) trigonal bipyramidal; linear
(c) octahedral; trigonal planar (d) trigonal planar; linear

8. Which of the following reactions does not undergoes disproportionation reaction?

(a) $Cl_2 + 2\bar{O}H(aq) \longrightarrow ClO^-(aq) + Cl^-(aq) + H_2O(l)$
(b) $2H_2O_2(aq) \longrightarrow 2H_2O(l) + O_2(g)$
(c) $2F_2(g) + 2H_2O(l) \longrightarrow 4HF(aq) + O_2(g)$
(d) $2F_2(g) + 2OH^-(aq) \longrightarrow 2\ ^-(aq) + OF_2(g) + H_2O(l)$

9. Which one of the following statements is incorrect regarding the behaviour of lithium?

(a) Li is the strongest reducing agent among all the alkali metals
(b) Li nitrate when heated gives Li nitrite, whereas other alkali metal nitrates give the corresponding oxide
(c) Lithium reacts with N_2 to form Li_3N
(d) Lithium reacts directly with carbon to form an ionic carbide

10. Which of the following reactions does not used for the preparation of diborane?

(a) $BF_3 + LiH \xrightarrow{\Delta}$ (b) $BF_3 + LiAlH_4 \longrightarrow$
(c) $NaBH_4 + I_2 \longrightarrow$ (d) $BCl_3 + H_2O \longrightarrow$

11. The geometry of the adduct formed from the following acid-base reaction is

$$BF_3 + NH_3 \longrightarrow \text{Adduct}$$

(a) square planar (b) linear
(c) tetrahedral (d) trigonal bipyramidal

12. The bond order and magnetic behaviour of C_2 molecule respectively are

(a) 2, paramagnetic (b) 2, diamagnetic
(c) 3, paramagnetic (d) 1, diamagnetic

13. Which one of the following substance gives brick red colour in flame test and breaks down on heating to form oxygen and a brown gas is evolved?

(a) Magnesium carbonate (b) Magnesium nitrate
(c) Barium nitrate (d) Calcium nitrate

14. Which of the following complex species involves d^2sp^3-hybridisation?

(a) $[Fe(CN)_6]^{3-}$ (b) $[Cr(NH_3)_6]^{2+}$
(c) $[FeF_6]^{3-}$ (d) $[CoF_6]^{3-}$

15. Which of the following statements about $AlCl_3$ is incorrect?

(a) Its aqueous solution conducts electricity
(b) It involves back bonding between Cl and Al
(c) It exists as a dimer (d) It is a covalent compound

16. 10 g of acetic acid is dissolved in 1 L ethyl alcohol. If they do not react chemically with each other, then the molality of solution is
(Given, $d_{C_2H_5OH} = 0.789\ g\ mL^{-1}$)

(a) 0.28 mol kg^{-1} (b) 0.4 mol kg^{-1}
(c) 0.3 mol kg^{-1} (d) 0.2 mol kg^{-1}

17. The solubility of M_2X_3 in pure water, assuming that neither kind of ion reacts with H_2O if the solubility product of M_2X_3, ($K_{sp} = 1.1 \times 10^{-23}$) is

(a) 1.0×10^{-23} mol L^{-1} (b) 1.0×10^{-25} mol L^{-1}
(c) 1.0×10^{-5} mol L^{-1} (d) 2.0×10^{-5} mol L^{-1}

18. Select the correct arrangement of cubic unit cell in their increasing coordination number.

(a) scc < fcc < bcc (b) bcc < fcc < scc
(c) scc < bcc < fcc (d) fcc < scc < bcc

19. Equal volumes of three acidic solutions of pH 3, 4 and 5 are mixed in a vessel. What will be the H^+ ion concentration in the mixture?

(a) 1.11×10^{-4} M (b) 3.7×10^{-4} M
(c) 3.7×10^{-3} M (d) 1.11×10^{-8} M

20. For the following combustion reaction at 298 K,

$$C(s) + \frac{1}{2}O_2(g) \longrightarrow CO(g)$$

Which of the following alternative is correct?
(a) $\Delta H > \Delta U$ (b) $\Delta H = \Delta U$ (c) $\Delta H < \Delta U$
(d) ΔH and ΔU does not exhibit any relation with each other

21. Which one of the following sets of quantum numbers represents the highest energy level in an atom?
(a) $n = 4, l = 0, m = 0, s = +1/2$
(b) $n = 3, l = 1, m = 1, s = +1/2$
(c) $n = 3, l = 2, m = -2, s = +1/2$
(d) $n = 3, l = 0, m = 0, s = +1/2$

22. Which of the following compounds does not show the intramolecular hydrogen bond?
(a) *o*-nitrophenol (c) *o*-hydroxy benzaldehyde
(b) Ethylene glycol (d) Conc. acetic acid

23. Specific conductance of a 0.05 N solution of weak acid is 5.25×10^{-4} mho cm^{-1}. At this dilution, degree of dissociation is 0.0825. The equivalent conductivity of weak acid at infinite dilution is
(a) 172.3 mho $cm^2 eq^{-1}$ (b) 273.3 mho $cm^2 eq^{-1}$
(c) 150.5 mho $cm^2 eq^{-1}$ (d) 127.3 mho $cm^2 eq^{-1}$

24. If current strength of 125 A is passed through a solution of Al_2O_3, how much time will be required to liberate 100 g of Al?
(a) 96500 s (b) 8755.77 s
(c) 8577.77 s (d) 8500 s

25. Arsenic (III) sulphide forms a sol with a negative charge. Which of the following ionic substances should be most effective in coagulating the sol ?
(a) Na_3PO_4 (b) $Al_2(SO_4)_3$ (c) KCl (d) $MgCl_2$

26. Elevation in boiling point of an aqueous urea solution is 0.52°C (K_b = 0.52°C mol^{-1} kg). The mole fraction of urea in this solution is
(a) 0.982 (b) 0.018 (c) 0.0567 (d) 0.942

27. In which of the following case, van't Hoff factor (i) remains unchanged?
(a) $KMnO_4$ reduced to MnO_2 in alkaline medium
(b) $PtCl_4$ reacts with KCl
(c) *aq.* $ZnCl_2$ reacts with *aq.* NH_3
(d) *aq.* $FeCl_3$ reacts with *aq.* $K_4[Fe(CN)_6]$

28. One ampere of current strength is being passed through a metallic wire. The number of electrons flowing per minute through a point in the wire is
(a) 6.24×10^{18} (b) 62.4×10^{18}
(c) 6.24×10^{23} (d) 6.24×10^{19}

29. Consider the following chemical reactions,

I. $CH_2{=}CHCH_3 + Br_2 \xrightarrow{\text{High temp.}} A$

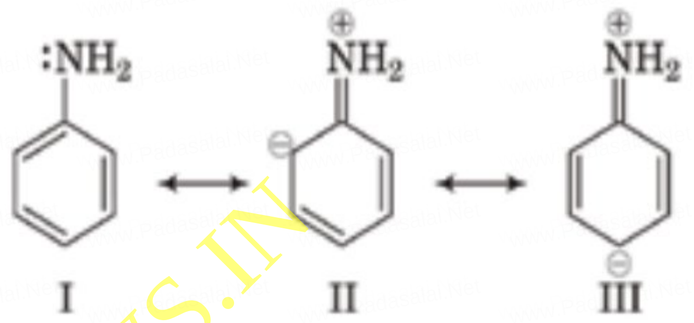
II. $CH_2{=}CHCH_3 + Br_2 \xrightarrow[CCl_4]{\text{Room temp.}} B$

A and B respectively are
(a) $CH_2(Br)CH(Br)CH_3$; $CH_2{=}CHCH_2Br$
(b) $CH_2{=}CHCH_2Br$; $CH_2(Br)CH(Br)CH_3$
(c) $CH_2(Br)CH_2CH_2(Br)$; $CH_2{=}CHCH_2Br$
(d) $CH_2(Br)CH$ CH_2; $CH_2CH_2CH_3$ (Br)

30. How many stereoisomers are possible for 2, 4-heptadiene?
(a) 2 (b) 4 (c) 6 (d) 8

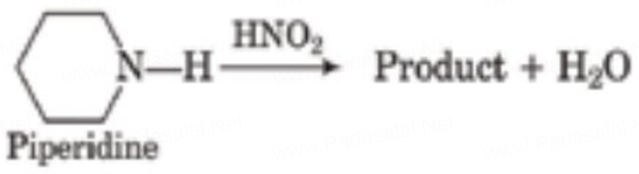
31. Which of the following polymers is produced when caprolactum is partially hydrolysed and then heated to 250°C?
(a) Nylon-6,6 (b) PVC (c) Nylon-6 (d) Dacron

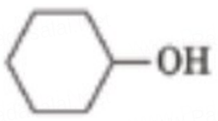
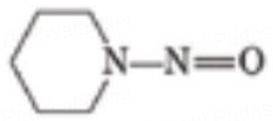
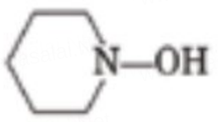
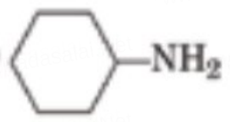
32. The resonating structures of aniline are given below,



The correct order of stability is
(a) I < II < III (b) I > II > III (c) II > I > III (d) II < III > I

33. Identify the product for the following transformation,

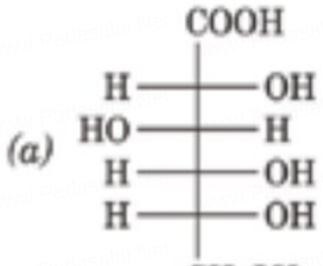


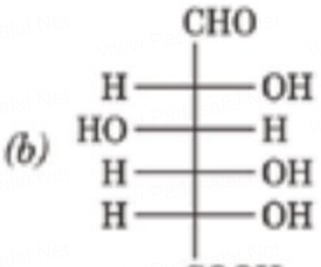
(a)  (b) 
(c)  (d) 

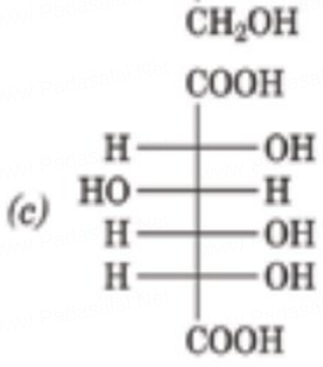
34. D-glucose on warming with nitric acid form a product A.

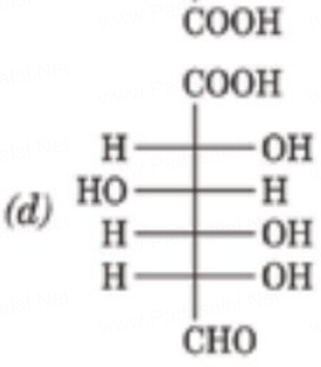
D-glucose + $HNO_3 \longrightarrow A$

The correct structure of A is

(a) 

(b) 

(c) 

(d) 

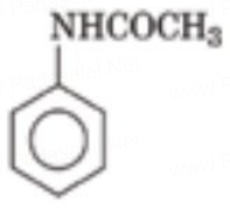
35. Some amino acids are given below, Phenylalanine (I), Threonine (II), Cystein (III), Tyrosine (IV)

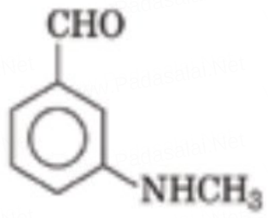
Which amino acids contain aromatic rings?
(a) I and II (b) I and IV (c) II and III (d) I, II and IV

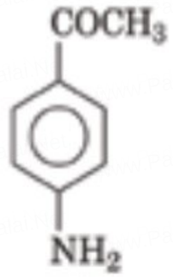
36. Electrolysis of an aqueous solution of sodium salt of a fatty acid gives an alkane having
(a) one carbon more than that of parent salt

(b) one carbon less than that of parent salt
(c) same carbon as parent salt
(d) two carbon more than that of parent salt

37. A compound A, C_8H_9NO, was boiled with NaOH, an oily liquid B was obtained alongwith a salt C. Liquid B gave carbylamine reaction, while C on heating with soda lime produced methane. The structure of compound A was

(a) 

(b) 

(c) 

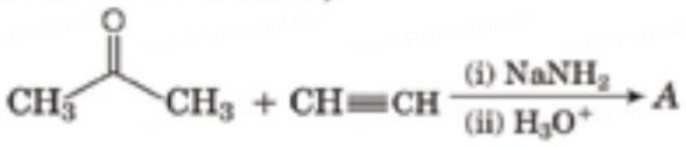
(d) Both (a) and (c)

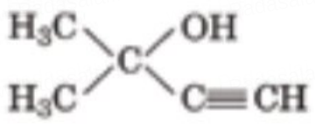
38. Arrange the following alkyl halides in order of increasing reactivity to S_N2 displacement.

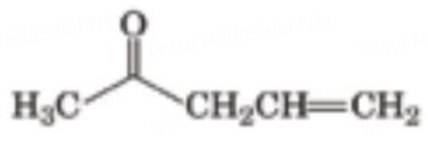
I. $CH_3CH_2CH_2Cl$ II. $CH_3CH_2CH_2CH_3Br$
III. $CH_3CH_2CHBrCH_3$ IV. $(CH_3)_2CClCH_2CH_3$

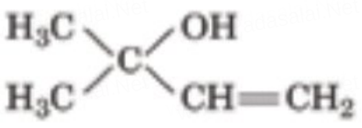
(a) II < I < III < IV (b) IV < I < II < III
(c) IV < III < I < II (d) III < IV < I < II

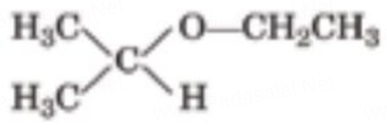
39. Identify the correct structure of the product A formed in the reaction,



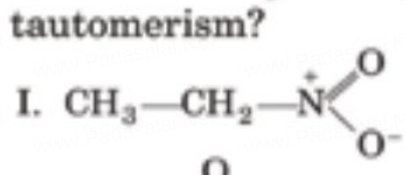
(a) 

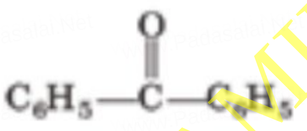
(b) 

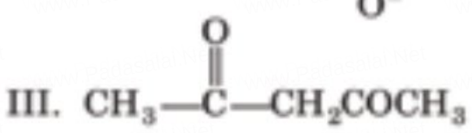
(c) 

(d) 

40. Which among the given molecules can exhibit tautomerism?

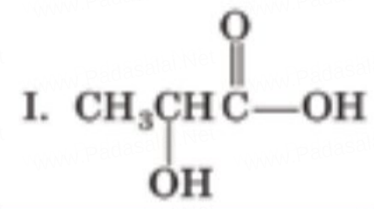
I. 

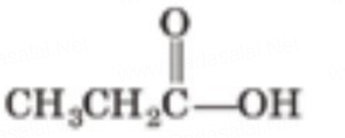
II. 

III. 

(a) Only II (b) I and II (c) I and III (d) Only III

41. The correct order of acidic strength of the following carboxylic acids is

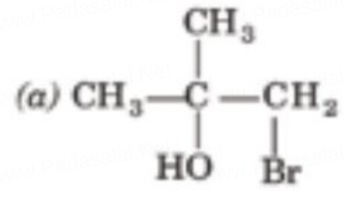
I. 

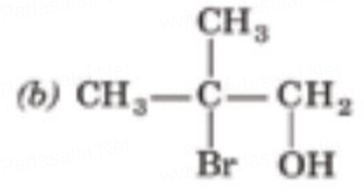
II. 

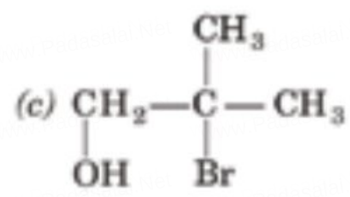
III. 

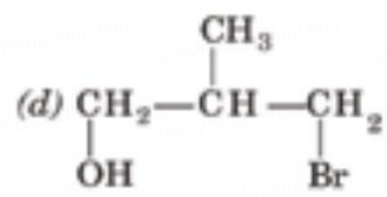
(a) I > II > III (b) I > III > II (c) III > II > I (d) II > I > III

42. The structure of the product formed when 2-methylpropene is treated with Br_2/H_2O is

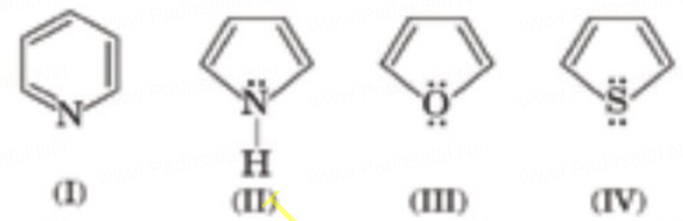
(a) 

(b) 

(c) 

(d) 

43. Which among the given heterocyclic compounds, imparting the properties of a (weak) base



(I) (II) (III) (IV)

(a) Only I (b) Only III (c) Only IV (d) Only II

44. Which one of following statements is/are correct?
(a) In the extraction of metals, the value of standard oxidation potentials of metal should be low in aqueous solution
(b) On electrolysis, metal dissolves from anode and deposits on cathode
(c) Electroplating of tin on iron sheets protects rusting of iron
(d) All of the above

45. Which of the following statement is correct?
(a) Reactions with low activation energy are usually exothermic
(b) The rate law sometimes enables to deduce the mechanism of a reaction
(c) The rate law for a reaction is an algebraic expression relating the forward reaction rate to product concentration
(d) Increase in the total pressure of a gas phase reaction increase the fraction of collisions effective in producing reaction

விடைகள்

இயற்பியல்

1	b	2	b	3	a	4	a	5	d	6	c	7	b
8	c	9	a	10	c	11	a	12	d	13	a	14	c
15	c	16	c	17	c	18	b	19	a	20	c	21	d
22	a	23	a	24	b	25	a	26	b	27	a	28	a
29	b	30	b	31	a	32	b	33	b	34	a	35	a
36	d	37	d	38	b	39	d	40	d	41	b	42	c
43	b	44	c	45	a								

வேதியியல்

1. (c)	2. (c)	3. (b)	4. (c)	5. (c)	6. (d)	7. (a)
8. (c)	9. (b)	10. (d)	11. (c)	12. (b)	13. (d)	14. (a)
15. (b)	16. (d)	17. (c)	18. (c)	19. (b)	20. (a)	21. (c)
22. (d)	23. (d)	24. (c)	25. (b)	26. (b)	27. (c)	28. (a)
29. (b)	30. (b)	31. (c)	32. (b)	33. (b)	34. (c)	35. (b)
36. (a)	37. (a)	38. (c)	39. (a)	40. (c)	41. (b)	42. (a)
43. (a)	44. (d)	45. (d)				

உயிரியல்

1.	(c)	2.	(b)	3.	(a)	4.	(c)	5.	(a)
6.	(b)	7.	(a)	8.	(c)	9.	(b)	10.	(c)
11.	(c)	12.	(a)	13.	(c)	14.	(d)	15.	(d)
16.	(c)	17.	(a)	18.	(c)	19.	(c)	20.	(b)
21.	(d)	22.	(b)	23.	(b)	24.	(b)	25.	(b)
26.	(c)	27.	(b)	28.	(d)	29.	(a)	30.	(c)
31.	(c)	32.	(d)	33.	(d)	34.	(b)	35.	(c)
36.	(b)	37.	(c)	38.	(b)	39.	(b)	40.	(b)
41.	(b)	42.	(b)	43.	(d)	44.	(d)	45.	(b)
46.	(b)	47.	(c)	48.	(a)	49.	(b)	50.	(c)
51.	(b)	52.	(d)	53.	(c)	54.	(c)	55.	(b)
56.	(d)	57.	(c)	58.	(c)	59.	(d)	60.	(a)
61.	(a)	62.	(c)	63.	(c)	64.	(a)	65.	(c)
66.	(a)	67.	(b)	68.	(c)	69.	(d)	70.	(c)
71.	(d)	72.	(b)	73.	(a)	74.	(a)	75.	(a)
76.	(b)	77.	(b)	78.	(b)	79.	(b)	80.	(b)
81.	(b)	82.	(c)	83.	(d)	84.	(a)	85.	(a)
86.	(a)	87.	(d)	88.	(d)	89.	(b)	90.	(d)

ஆன்லைன் ஆச்சரியங்கள்!

உலகளவில் கணினி தொழில்நுட்பம் மற்றும் இணைய வெளியில் தினம் தினம் உருவாகும் இணையதளம் மற்றும் ஆப்ஸ் பற்றிய தகவல்களை விரும்புபவர்களுக்கு இணைய மலர் மூலம் வழங்கிவருகிறார் இணைய வல்லுநர் சைபர்சிம்மன். அவர் அறிமுகப் படுத்தியுள்ள சில ஆன்லைன் அற்புதங்களை இங்கே பார்க்கலாம்.

பேச, பதிவுசெய்ய, பகிர ஓர் இணையதளம்

நீங்கள் விரும்பினால், ஒரு முழு வீச்சிலான இணைய வானொலியை நடத்தலாம். ஆன்கர்.எப்.எம் போன்ற பாட்காஸ்டிங் சேவைகள் அதற்கு கைகொடுக்கின்றன. ஆனால், நாம் பாட்காஸ்டிங் பற்றி பார்க்கப்போவதில்லை. மாறாக, மிக மிக எளிதான இணைய குரல்பதிவு சேவை வோகரூ (https://vocaroo.com) பற்றிப் பார்க்கலாம். இது பிரவுசரில் இருந்தே, ஒலி வடிவில் செய்திகளைப் பதிவுசெய்ய உதவுகிறது.

இந்த தளத்தில் உள்ள ஒலிபெருக்கி வசதியை இயக்கி, நாம் பகிர விரும்பும் கருத்துக்களைப் பேசிப் பதிவுசெய்துகொள்ளலாம். பின்னர், இந்த ஆடியோ கோப்பை இமெயில் அல்லது சமூக ஊடகங்கள் வாயிலாக பகிர்ந்துகொள்ளலாம். தேவை எனில், கம்ப்யூட்டரிலும் தரவிறக்கம் செய்துகொள்ளலாம். நாம் பேசிய பேச்சு சரியாக பதிவாகி இருக்கிறதா என சரிபார்த்துக்கொள்ளும் வசதியும் உண்டு. இந்த சேவையைப் பயன்படுத்த உறுப்பினராகப் பதிவு செய்துகொள்ளும் அவசியமில்லை. நேரடியாகவே பயன்படுத்தலாம்.

வோகரூ, பத்தாண்டுகளுக்கும் மேலாக செயல்பட்டுவரும் சேவை. ஆடியோ பதிவு வசதியை பலவிதங்களில் பயன்படுத்தலாம். குறிப்பாக, காட்சி விளக்கம் மற்றும் வகுப்புகளில் பாடம் நடத்தும்போது இடையே ஆடியோ குறிப்புகளை வழங்க, இந்த வசதியைப் பயன்படுத்திக் கொள்ளலாம். நாம் ஒலிப்பதிவு செய்த குறிப்புகளை கியூஆர் கோடு வடிவிலும் தரவிறக்கிப் பகிரும் வசதி உண்டு.

வாய்ஸ் மெசேஜ் போன்ற வசதி எங்கெல்லாம் தேவையோ, அங்கெல்லாம் பயன்படுத்திக் கொள்ளலாம். நம்மிடம் உள்ள ஆடியோ கோப்புகளையும் தளத்தில் பதிவேற்றி, அவற்றைப் பகிர்வதற்கான இணைப்பைப் பெறலாம். ஆனால், காப்புரிமை கொண்டவற்றை இவ்வாறு பதிவேற்றவேண்டாம்.

ஒருவரும் பார்க்காத காணொலிகள்

டாப் டென்கள், அதிகம் பார்க்கப்பட்டவை, அதிகம் பகிரப்பட்டவை, வைரலாக பரவியவை, இணையத்தில் இப்படிப்பட்டவைதான் நம் கவனத்தை ஈர்க்கின்றன. யூடியூப்பை எடுத்துக்கொண்டாலும், கோடிமுறை பார்க்கப்பட்ட, லட்சக்கணக்கான சந்தாதாரர்கள் கொண்ட சேனல்களின் வீடியோக்கள்தான் நமக்காக முன்னிறுத்தப்படுகின்றன. இத்தகைய டிரெண்டிங் மோகத்தில் இருந்து ஆசு

வாசம் அளிக்கும் வகையில், அஸ்ட்ரோநாட். இயோ என்ற வீடியோ பரிந்துரை தளம் அமைந்துள்ளது.

இந்த தளமும், யூடியூப் வீடியோக்களைத்தான் பார்க்க வழிசெய்கிறது என்றாலும், எல்லாமே ஒருவரும் பார்க்காத வீடியோக்கள். ஆம், சூடாக பதிவேற்றப்பட்டு, ஒருசில பார்வையாளர்களைக்கூட பெறாத வீடியோக்களைத் தேர்ந்தெடுத்து பார்க்க வைக்கிறது. ஹிட்களை அள்ளுவதை நோக்கமாகக் கொண்டிராத, அதிக செய்நேர்த்தியோ, செயற்கைத் தன்மையோ இல்லாத, அப்பாவித்தனமாக எடுக்கப்பட்ட வீடியோக்களை வரிசையாக பார்க்கலாம்.

இணைய முகவரி: http://astronaut.io

கடைக்கோடி தளங்களைத் தேட...

தேடியந்திரம் என்றவுடன் கூகுள்தான் நினைவுக்கு வரும். கூகுளில் தேடினாலும்கூட, முதலில் முன்வைக்கப்படும் முடிவுகளே நமக்குப் போதுமானதாக இருக்கிறது. எனவே, பெரும்பாலானோர் முதல்பக்க முடிவுகளைத் தாண்டி செல்வதில்லை. வெகுசிலர் முதல் சிலபக்க முடிவுகளைப் பரிசீலிக்கலாம். ஆனால், கூகுள் ஒவ்வொரு தேடலுக்கும் லட்சக்கணக்கான பக்கங்களைக் கொட்டுகிறதே. இந்த கடைக்கோடி பக்கங்களில் எல்லாம் என்ன இருக்கிறது எனப் பார்க்கத் தோன்றுகிறது.

அப்படியே விரும்பினாலும், தேடல்பட்டியலில் லட்சக்கணக்கில் பின்னே இருக்கும் முடிவுகளை எப்படிப் பார்ப்பது என கேட்கலாம். மனம் இருந்தால் மார்க்கம் உண்டு என்பது போல, தேடல் பட்டியலில் பின்னே இருக்கும் முடிவுகளைப் பார்ப்பதற்கு என்றே ஒரு தேடியந்திரம் இருக்கிறது.

மில்லியன் ஷார்ட் என்பது அதன் பெயர். நாம் அதில் தகவல்களைத் தேடும்போது, முதல் ஆயிரம் பக்கங்கள் தவிர முதல் பத்தாயிரம் பக்கங்கள் தவிர, முதல் லட்சம் பக்கங்கள் தவிர, என முதலில் உள்ள முடிவுகளை தள்ளிவிட்டு, அதற்குப் பின்னே காணப்படும் தேடல் முடிவுகளைப் பார்க்கலாம். அதே நேரத்தில், முதலில் தவிர்க்கப்பட்ட முடிவுகளில் உள்ள முக்கிய தளங்களையும் அருகே பட்டியலிட்டுக் காட்டுகிறது.

இணைய முகவரி: https://millionshort.com

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ஆசிரியர் டைரி

கணினித் தமிழ் வளர்ப்பதில் பேரார்வம்!

நான் விவசாயப் பின்னணியுள்ள குடும்பத்தில் குக்கிராமத்தில் பிறந்த முதல் தலைமுறை பட்டதாரி. இளங்கலையுடன் கல்வியியல் பட்டம் பயின்று 2005-ஆம் ஆண்டில் பட்டதாரி தமிழ் ஆசிரியராக அரசுப் பணியில் அடியெடுத்து வைத்தேன். இன்று வரையில் மாணவர்களுக்குக் கற்பிக்கும் அனுபவத்தில் இருந்து நானும் கற்றுக்கொண்டே, என் ஆசிரியப் பணி நாட்கள் நகர்கின்றன.

ஓர் ஆசிரியர் என்பவர் தொடர்ந்து கற்றுக் கொண்டே இருக்க வேண்டும் என்பதற்கேற்ப எம்.ஏ., எம்.ஃபில். படித்தேன். பின்னர் சு.வேணுகோபால் புனைவுகளில் நவீன வாழ்வியல் நெருக்கடிகள் என்ற தலைப்பில் பிஎச்டி செய்தேன். போட்டித் தேர்வுகளில் பங்கேற்கும் பட்டதாரிகளுக்குப் பயிற்சியளித்த அனுபவம் இருந்ததால், என் வகுப்பறைகளில் போட்டித்தேர்வுகளைப் பற்றியும் கூறி, மாணவர்களை ஊக்கப்படுத்திவருகிறேன். மேலும், தமிழ்த்துறை சார்ந்த வேலைவாய்ப்புகள் பற்றியும் எடுத்துரைப்பேன்.

திருவிழாக்களில், கிராமத்துச் சடங்குகளில் பாடப்படும் பாடல்களைக் கேட்டு வளர்ந்த அனுபவத்தில், வகுப்பறைகளில் அவ்வப்போது தமிழக பாரம்பரிய கலைகளையும் சொல்லித் தருகிறேன். செய்யுள் பகுதிகளை இசையுடன் பாடிக் கற்பிப்பதால் மனப்பாடம் அல்லாதவற்றையும் எளிதில் மனனம் செய்கிறார்கள்.

ஒன்பதாம் வகுப்பு மாணவர்கள் இருவரைத் தேர்ந்தெடுத்து தமிழில் தட்டச்சு செய்வது பற்றி தெளிவாகச் சொல்லிக்கொடுத்தேன். லேப்டாப்பில் தட்டச்சு செய்வது, குரல்வழி தட்டச்சு, போல்டு செய்வது, இட்டாலிக் செய்வது சில அடிப்படைகளை ஆர்வத்துடன் கற்றுக்கொண்டனர். எதிர்காலத்தில் அவர்கள் கணினிவழியில் தமிழ்மொழிக்குப் பங்களிப்பு செய்ய பயிற்றுவிக்கவேண்டும் என்பது என் ஆசை. பள்ளிப் பருவத்திலேயே கணினித்தமிழை அறிமுகம் செய்வது அவசியம்.

தமிழ்நாடு அரசின் புதிய பாடத்திட்ட உருவாக்கத்தில் ஆறாம் வகுப்பு பாடநூல் தயாரிப்புக் குழு உறுப்பினராகப் பணியாற்றிய அனுபவம் மறக்கமுடியாதது. கல்வித் தொலைக்காட்சியிலும் தமிழ்ப் பாடங்கள் நடத்தி சிறு பங்களிப்பு செய்திருக்கிறேன். பத்தாம் வகுப்பு மாணவர்களுக்கான ஜெயித்துக்காட்டுவோம் நிகழ்ச்சிகளில் இலவசமாக வகுப்பெடுப்பதில் எப்போதும் ஆர்வம் உண்டு. பள்ளிக்கல்வித் துறை நடத்திய தமிழ் விக்கிபீடியா பயிற்சி பெற்றது எனக்குப் பேருதவியாக இருந்தது. அதைத் தொடர்ந்து சிறப்புக் கட்டுரைகள் மூலம் விக்கிப்பீடியாவில் பங்களித்து வருகிறேன். பள்ளி ஆசிரியர்களுக்குக் கருத்தாளராகப் பணியாற்றிய அனுபவங்களும் தொடர்கின்றன.

தற்போது ஊரடங்கு காலத்தில் பள்ளி மாணவர்களுக்கான கற்றல் கற்பித்தல் உபகரணங்களைக் கணினியின் துணைகொண்டு தயாரித்தேன். யூடியூப்பில் பதிவேற்றம் செய்து சமூக ஊடகங்களில் பகிர்வதால், பலதரப்பட்ட மாணவர்களும் அதைப் பயன்படுத்திவருகின்றனர். பத்தாம் வகுப்பு இலக்கணப் பகுதிகளை எளிமையாக விளக்கும் வீடியோக்களை உருவாக்கி வாட்ஸ்ஆப் வழியாக அனுப்பி கற்கச் செய்கிறேன். தமிழ் ஆசிரியர்கள் கற்றல், கற்பித்தல் கருவிகளுக்கு கணினியை அதிகம் பயன்படுத்த வேண்டும் என்பதில் எனக்குப் பேரார்வம் இருந்துவருகிறது.

இணையவழி திறனறிதல் தேர்வு எழுதியும், கற்பித்தலில் தொழில்நுட்பம், ஆசிரியர் திறன் மேம்பாடு உள்ளிட்ட இணையவழி கருத்தரங்குகளில் பங்கேற்றும் என்னை செப்பம் செய்துவருகிறேன். தொல்காப்பியம் ஆழ்நிலை வாசிப்புத் திறனறிதல் என்ற ஒரு மாதகால இணையவழி சான்றிதழ் வகுப்பில் கலந்துகொள்வதன் மூலம் மாணவர்களின் கற்றல் திறனை அதிகரிக்க முடியும் என்பது எனது எண்ணம்.

முனைவர் **ரெ. விமலாதேவி,** பட்டதாரி தமிழ் ஆசிரியர்,
அரசு மேல்நிலைப்பள்ளி, திருமலைராயபுரம், திண்டுக்கல்