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NEET Guess Paper 2027

Time: 3 hours · Maximum marks: 720 · 180 questions

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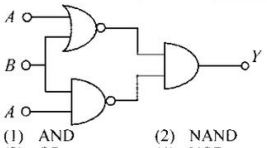
Section Physics

45 questions · 180 marks

Q1. The output (Y) of the given logic implementation is similar to the output of an/a _____ gate. (1) AND (2) NAND (3) OR (4) NOR

4 marks

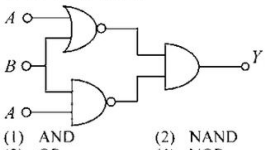
8 The output (Y) of the given logic implementation is similar to the output of an/a _____ gate.



(1) AND (2) NAND
(3) OR (4) NOR

9 The electric field in a plane electromagnetic wave is given by

8 दिए गए लॉजिक अनुप्रयोग का निर्गत (Y) एक _____ गेट के निर्गत के सदृश है।

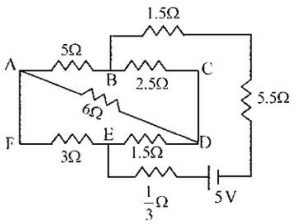


(1) AND (2) NAND
(3) OR (4) NOR

Q2. The current passing through the battery in the given circuit, is: (1) 2.0 A (2) 0.5 A (3) 2.5 A (4) 1.5 A

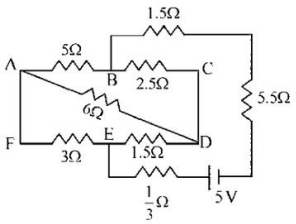
4 marks

6 The current passing through the battery in the given circuit, is:



(1) 2.0 A (2) 0.5 A
(3) 2.5 A (4) 1.5 A

6 दिए गए परिपथ में बैटरी से गुजरने वाली धारा है :

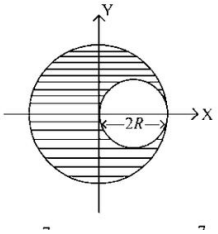


(1) 2.0 A (2) 0.5 A
(3) 2.5 A (4) 1.5 A

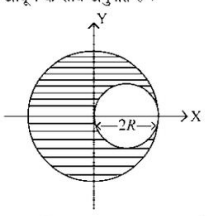
Q3. A sphere of radius R is cut from a larger solid sphere of radius 2R as shown in the figure. The ratio of the moment of inertia of the smaller sphere to that of the rest part of the sphere about the Y-axis is: (1) 7/8 (2) 7/40 (3) 7/57 (4) 7/64

4 marks

39 A sphere of radius R is cut from a larger solid sphere of radius $2R$ as shown in the figure. The ratio of the moment of inertia of the smaller sphere to that of the rest part of the sphere about the Y-axis is :



39 त्रिज्या R के एक गोले को चित्र में दर्शाए अनुसार त्रिज्या $2R$ के एक बड़े ठोस गोले से काटा जाता है। Y-अक्ष के सापेक्ष छोटे गोले के जड़त्व आघूर्ण का गोले के शेष भाग के जड़त्व आघूर्ण के साथ अनुपात है :



(1) $\frac{7}{8}$ (2) $\frac{7}{40}$

Q4. The maximum elongation of a steel wire of 1 m length if the elastic limit of steel and its Young's modulus, respectively, are 8 x 10^8 N m^{-2} and 2 x 10^{11} N m^{-2}, is: 4 marks
(1) 8 mm
(2) 4 mm
(3) 0.4 mm
(4) 40 mm

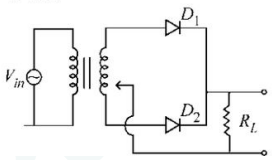
Q5. An oxygen cylinder of volume 30 litre has 18.20 moles of oxygen. After some oxygen is withdrawn from the cylinder, its gauge pressure drops to 11 atmospheric pressure at temperature 27 degrees C. The mass of the oxygen withdrawn from the cylinder is nearly equal to: [Given, R = 100/12 J mol^{-1} K^{-1}, and molecular mass of O_2 = 32, 1 atm pressure = 1.01x10^5 N/m] (1) 0.125 kg (2) 0.144 kg (3) 0.116 kg (4) 0.156 kg 4 marks

Q6. A wire of resistance R is cut into 8 equal pieces. From these pieces two equivalent resistances are made by adding four of these together in parallel. Then these two sets are added in series. The net effective resistance of the combination is: (1) R/64 (2) R/32 (3) R/16 (4) R/8 4 marks

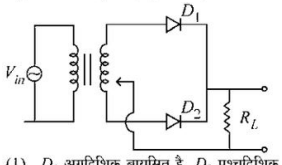
Q7. A full wave rectifier circuit with diodes (D_1) and (D_2) is shown in the figure. If input supply voltage V_{in} = 220 sin(100 pi t) volt, then at t = 15 msec (1) D_1 is forward biased, D_2 is reverse biased (2) D_1 is reverse biased, D_2 is forward biased (3) D_1 and D_2 both are forward biased (4) D_1 and D_2 both are reverse biased 4 marks

(3) $\frac{1}{57}$ (4) $\frac{1}{64}$

40 A full wave rectifier circuit with diodes (D_1) and (D_2) is shown in the figure. If input supply voltage V_{in} = 220sin (100 π t) volt, then at t = 15 *msec*



40 डायोडों (D_1) और (D_2) के साथ एक पूर्ण तरंग दिष्टकारी परिपथ को चित्र में दर्शाया गया है। यदि निवेश संभरण वोल्टेज V_{in} = 220sin (100 π t) volt है, तो t = 15 *msec* पर



(1) D_1 अग्रदिशिक बायसित है, D_2 पश्चदिशिक बायसित है

Q8. A thin flat circular disc of radius 4.5 cm is placed gently over the surface of water. If surface tension of water is 0.07 Nm^{-1}, then the excess force required to take it away from the surface is: 4 marks
(1) 99 N
(2) 19.8 mN
(3) 198 N
(4) 1.98 mN

Q9. A very long conducting wire is bent in a semi-circular shape from A to B as shown in figure. The magnetic field at point P for steady current configuration is given by : [Figure: a long wire carrying current i comes in from the left, bends into a semicircle of radius R around point P, and continues out to the left; P is the centre of the semicircle.] 4 marks

(1) (mu_0 i)/(4R) [1 - 2/pi] pointed into the page
(2) (mu_0 i)/(4R) pointed into the page
(3) (mu_0 i)/(4R) pointed away from the page
(4) (mu_0 i)/(4R) [1 - 2/pi] pointed away from page

(1) $\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ pointed into the page
(2) $\frac{\mu_0 i}{4R}$ pointed into the page
(3) $\frac{\mu_0 i}{4R}$ pointed away from the page
(4) $\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ pointed away from page

45 In the figure shown here, what is the equivalent

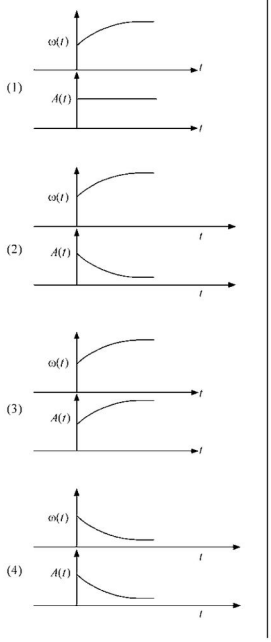
(1) $\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ पेज में अन्दर की ओर
(2) $\frac{\mu_0 i}{4R}$ पेज में अन्दर की ओर
(3) $\frac{\mu_0 i}{4R}$ पेज से बाहर की ओर
(4) $\frac{\mu_0 i}{4R}\left[1-\frac{2}{\pi}\right]$ पेज से बाहर की ओर

45 दिखाए गये चित्र में, लेंसों के संयोजन की तल्य फोकस दरी

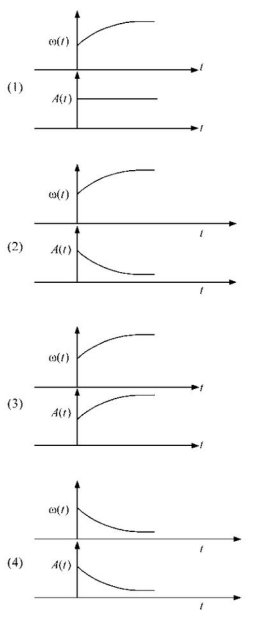
Q10. A model for quantized motion of an electron in a uniform magnetic field B states that the flux passing through the orbit of the electron is n(h/e) where n is an integer, h is Planck's constant and e is the magnitude of electron's charge. According to the model, the magnetic moment of an electron in its lowest energy state will be (m is the mass of the electron) (1) he/(pi m) (2) he/(2 pi m) (3) heB/(pi m) (4) heB/(2 pi m) 4 marks

Q11. In an oscillating spring mass system, a spring is connected to a box filled with sand. As the box oscillates, sand leaks slowly out of the box vertically so that the average frequency omega(t) and average amplitude A(t) of the system change with time t. Which one of the following options schematically depicts these changes correctly? (1) omega(t) increasing then saturating with A(t) constant (2) omega(t) increasing with A(t) decreasing (3) omega(t) increasing then saturating with A(t) increasing then saturating (4) omega(t) decreasing with A(t) decreasing 4 marks

with time *t*. Which one of the following options schematically depicts these changes correctly?



हैं। निम्नलिखित में से कौन सा विकल्प इन परिवर्तनों को आरेखीय रूप से प्रदर्शित करता है ?



45_Hindi+English] 8 [Contd...

Q12. An unpolarized light beam travelling in air is incident on a medium of refractive index 1.73 at Brewster's angle. Then- (1) reflected light is completely polarized and the angle of reflection is close to 60 degrees (2) reflected light is partially polarized and the angle of reflection is close to 30 degrees (3) both reflected and transmitted light are perfectly polarized with angles of reflection and refraction close to 60 degrees and 30 degrees, respectively (4) transmitted light is completely polarized with angle of refraction close to 30 degrees — 4 marks

Q13. Consider the diameter of a spherical object being measured with the help of a Vernier callipers. Suppose its 10 Vernier Scale Divisions (V.S.D.) are equal to its 9 Main Scale Divisions (M.S.D.). The least division in the M.S. is 0.1 cm and the zero of V.S. is at x = 0.1 cm when the jaws of Vernier callipers are closed. If the main scale reading for the diameter is M = 5 cm and the number of coinciding vernier division is 8, the measured diameter after zero error correction, is (1) 5.18 cm (2) 5.08 cm (3) 4.98 cm (4) 5.00 cm — 4 marks

Q14. Two gases A and B are filled at the same pressure in separate cylinders with movable pistons of radius r_A and r_B, respectively. On supplying an equal amount of heat to both the systems reversibly under constant pressure, the pistons of gas A and B are displaced by 16 cm and 9 cm, respectively. If the change in their internal energy is the same, then the ratio r_A/r_B is equal to (1) 4/3 (2) 3/4 (3) 2/sqrt(3) (4) sqrt(3)/2 — 4 marks

Q15. A body weighs 48 N on the surface of the earth. The gravitational force experienced by the body due to the earth at a height equal to one-third the radius of the earth from its surface is: (1) 16 N (2) 27 N (3) 32 N (4) 36 N — 4 marks

Q16. A microscope has an objective of focal length 2 cm, eyepiece of focal length 4 cm and the tube length of 40 cm. If the distance of distinct vision of eye is 25 cm, the magnification in the microscope is (1) 100 (2) 125 (3) 150 (4) 250 — 4 marks

Q17. The plates of a parallel plate capacitor are separated by d. Two slabs of different dielectric constant K_1 and K_2 with thickness (3/8)d and d/2 respectively are inserted in the capacitor. Due to this, the capacitance becomes two times larger than when there is nothing between the plates. If $K_1 = 1.25\ K_2$, the value of K_1 is: (1) 2.66 (2) 2.33 (3) 1.60 (4) 1.33 — 4 marks

Q18. A parallel plate capacitor made of circular plates is being charged such that the surface charge density on its plates is increasing at a constant rate with time. The magnetic field arising due to displacement current is: (1) zero at all places (2) constant between the plates and zero outside the plates (3) non-zero everywhere with maximum at the imaginary cylindrical surface connecting peripheries of the plates (4) zero between the plates and non-zero outside — 4 marks

Q19. A 2 amp current is flowing through two different small circular copper coils having radii ratio 1:2. The ratio of their respective magnetic moments will be (1) 1:4 (2) 1:2 (3) 2:1 (4) 4:1 — 4 marks

Q20. A balloon is made of a material of surface tension S and its inflation outlet (from where gas is filled in it) has small area A. It is filled with a gas of density rho and takes a spherical shape of radius R. When the gas is allowed to flow freely out of it, its radius r changes from R to 0 (zero) in time T. If the speed v(r) of gas coming out of the balloon depends on r as r^a and T is proportional to S^alpha A^{beta} rho^gamma R^delta, then (1) a = 1/2, alpha = 1/2, beta = -1, gamma = +1, delta = 3/2 (2) a = -1/2, alpha = -1/2, beta = -1, gamma = -1/2, delta = 5/2 (3) a = -1/2, alpha = 1/2, beta = -1, gamma = 1/2, delta = 7/2 (4) a = 1/2, alpha = 1/2, beta = -1, gamma = 1/2, delta = 7/2 — 4 marks

Q21. The electric field in a plane electromagnetic wave is given by $E_z = 60 \cos(5x + 1.5x10^9 t)$ V/m. Then expression for the corresponding magnetic field is (here subscripts denote the direction of the field) (1) $B_y = 2x10^{-7} \cos(5x + 1.5x10^9 t)$ T (2) $B_x = 2x10^{-7} \cos(5x + 1.5x10^9 t)$ T (3) $B_z = 60 \cos(5x + 1.5x10^9 t)$ T (4) $B_y = 60 \sin(5x + 1.5x10^9 t)$ T — 4 marks

Q22. A physical quantity P is related to four observations a, b, c and d as follows: $P = a^3 b^2 / (c \sqrt{d})$. The percentage errors of measurement in a, b, c and d are 1%, 3%, 2%, and 4% respectively. The percentage error in the quantity P is (1) 10% (2) 2% (3) 13% (4) 15% — 4 marks

Q23. An electric dipole with dipole moment $5x10^{-6}$ Cm is aligned with the direction of a uniform electric field of magnitude $4x10^5$ N/C. The dipole is then rotated through an angle of 60 degrees with respect to the electric field. The change in the potential energy of the dipole is: (1) 0.8 J (2) 1.0 J (3) 1.2 J (4) 1.5 J — 4 marks

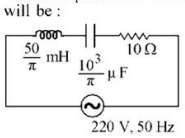
Q24. A ball of mass 0.5 kg is dropped from a height of 40 m. The ball hits the ground and rises to a height of 10 m. The impulse imparted to the ball during its collision with the ground is (Take g = 9.8 m/s^2) (1) 21 NS (2) 7 NS (3) 0 (4) 84 NS — 4 marks

Q25. A pipe open at both ends has a fundamental frequency f in air. The pipe is now dipped vertically in a water drum to half of its length. The fundamental frequency of the air column is now equal to: (1) f/2 (2) f (3) 3f/2 (4) 2f — 4 marks

Q26. The net impedance of circuit (as shown in figure) will be : [Circuit: series AC circuit with inductor (50/pi) mH, capacitor (10^3/pi) microF and resistor 10 ohm across a 220 V, 50 Hz source.] — 4 marks

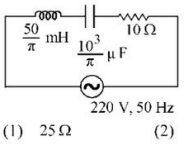
(1) 25 ohm
(2) 10 sqrt(2) ohm
(3) 15 ohm
(4) 5 sqrt(5) ohm

38 The net impedance of circuit (as shown in figure) will be :



(1) 25 Ω (2) $10\sqrt{2}$ Ω
(3) 15 Ω (4) $5\sqrt{5}$ Ω

38 पारपथ (जसा कि चित्र म प्रदाशत ह) का पारणामा प्रातबाधा होगी :



(1) 25 Ω (2) $10\sqrt{2}$ Ω
(3) 15 Ω (4) $5\sqrt{5}$ Ω

Q27. There are two inclined surfaces of equal length (L) and same angle of inclination 45 degrees with the horizontal. One of them is rough and the other is perfectly smooth. A given body takes 2 times as much time to slide down on rough surface than on the smooth surface. The coefficient of kinetic friction (mu_k) between the object and the rough surface is close to (1) 0.25 (2) 0.40 (3) 0.5 (4) 0.75 — 4 marks

Q28. The radius of Martian orbit around the Sun is about 4 times the radius of the orbit of Mercury. The Martian year is 687 Earth days. Then which of the following is the length of 1 year on Mercury? (1) 88 earth days (2) 225 earth days (3) 172 earth days (4) 124 earth days — 4 marks

Q29. In a certain camera, a combination of four similar thin convex lenses are arranged axially in contact. Then the power of the combination and the total magnification in comparison to the power (p) and magnification (m) for each lens will be, respectively - (1) 4p and 4m (2) p^4 and 4m (3) 4p and m^4 (4) p^4 and m^4 — 4 marks

Q30. The kinetic energies of two similar cars A and B are 100 J and 225 J respectively. On applying breaks, car A stops after 1000 m and car B stops after 1500 m. If F_A and F_B are the forces applied by the breaks on cars A and B, respectively, then the ratio F_A/F_B is (1) 3/2 (2) 2/3 (3) 1/3 (4) 1/2 — 4 marks

Q31. In the above diagram, a strong bar magnet is moving towards solenoid-2 from solenoid-1. The direction of induced current in solenoid-1 and that in solenoid-2, respectively, are through the directions: — 4 marks
(1) BA and DC
(2) AB and DC
(3) BA and CD
(4) AB and CD

Q32. In an ideal transformer, the turns ratio $N_p/N_s = 1/2$. The ratio $V_s : V_p$ is equal to (the symbols carry their usual meaning): — 4 marks
(1) 1 : 4
(2) 1 : 2
(3) 2 : 1
(4) 1 : 1

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Q33. Match List I with List II. 4 marks

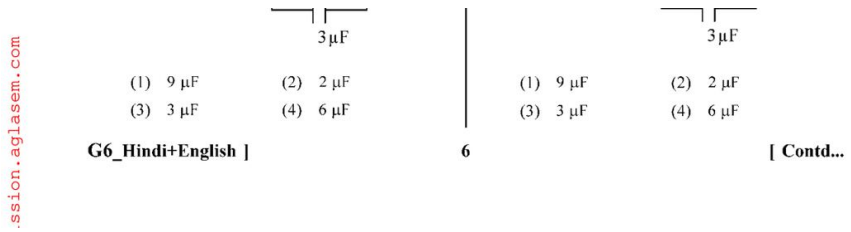
List I (Spectral Lines of Hydrogen for transitions from):
A. $n_2 = 3$ to $n_1 = 2$
B. $n_2 = 4$ to $n_1 = 2$
C. $n_2 = 5$ to $n_1 = 2$
D. $n_2 = 6$ to $n_1 = 2$
List II (Wavelengths (nm)):
I. 410.2
II. 434.1
III. 656.3
IV. 486.1
Choose the correct answer from the options given below:
(1) A-I, B-II, C-III, D-IV
(2) A-II, B-I, C-IV, D-III
(3) A-III, B-IV, C-II, D-I
(4) A-IV, B-III, C-I, D-II

Q34. Consider the following statements A and B and identify the correct answer (an I-V characteristics graph with quadrants I, II, III, IV is given): 4 marks

A. For a solar-cell, the I-V characteristics lies in the IV quadrant of the given graph.
B. In a reverse biased pn junction diode, the current measured in (microA), is due to majority charge carriers.
(1) Both A and B are incorrect.
(2) A is correct but B is incorrect.
(3) A is incorrect but B is correct.
(4) Both A and B are correct.

Q35. The equivalent capacitance of the system shown in the following circuit is : 4 marks

[Circuit: between terminals A and B, a 3 microF capacitor in series with a parallel combination of two 3 microF capacitors.]
(1) 9 microF
(2) 2 microF
(3) 3 microF
(4) 6 microF

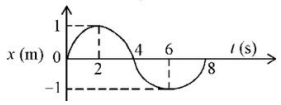


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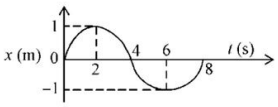
Q36. The x-t graph of a particle performing simple harmonic motion is shown in the figure. The acceleration of the particle at t = 2 s is : [Graph: displacement x (m) versus time t (s), sinusoidal with amplitude 1 m and period 8 s, passing through zero at t = 0.] 4 marks

(1) $-\pi^2/16$ m s^{-2}
(2) $\pi^2/8$ m s^{-2}
(3) $-\pi^2/8$ m s^{-2}
(4) $\pi^2/16$ m s^{-2}

42 The *x-t* graph of a particle performing simple harmonic motion is shown in the figure. The acceleration of the particle at $t = 2$ s is :



42 सरल आवर्त गति करते हुए एक कण का *x-t* ग्राफ चित्र में दर्शाया गया है। $t = 2$ सेकंड पर कण का त्वरण है :



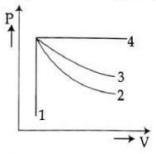
Q37. Two heaters A and B have power rating of 1 kW and 2 kW, respectively. Those two are first connected in series and then in parallel to a fixed power source. The ratio of power outputs for these two cases is: 4 marks

(1) 2 : 3
(2) 1 : 1
(3) 2 : 9
(4) 1 : 2

Q38. The graph which shows the variation of the de Broglie wavelength (lambda) of a particle and its associated momentum (p) is : 4 marks

(1) rectangular hyperbola (lambda decreasing with p)
(2) straight line increasing
(3) straight line decreasing
(4) curve increasing with p

the same initial state as shown in the figure below. Those processes are adiabatic, isothermal, isobaric and isochoric. The curve which represents the adiabatic process among 1, 2, 3 and 4 is :



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

13. The ratio of the distances travelled by a freely falling body in the 1st, 2nd, 3rd and 4th second :
(1) 1 : 1 : 1 : 1
(2) 1 : 2 : 3 : 4
(3) 1 : 4 : 9 : 16
(4) 1 : 3 : 5 : 7

(2) 23000
(3) 20000
(4) 34500

17. A copper wire of length 10 m and radius $(10^{-2}/\sqrt{\pi})$ m has electrical resistance of 10 Ω. The current density in the wire for an electric field strength of 10 (V/m) is :
(1) 10^5 A/m^2
(2) 10^4 A/m^2
(3) 10^6 A/m^2
(4) 10^{-5} A/m^2

18. If a soap bubble expands, the pressure inside the bubble :
(1) is equal to the atmospheric pressure
(2) decreases
(3) increases
(4) remains the same

Q39. The property which is not of an electromagnetic wave travelling in free space is that: 4 marks

(1) they originate from charges moving with uniform speed.
(2) they are transverse in nature.
(3) the energy density in electric field is equal to energy density in magnetic field.
(4) they travel with a speed equal to 1/sqrt(mu$_0$ epsilon$_0$).

Q40. For the nuclear decay chain: $_{82}^{290}$X --(alpha)--> Y --(e^+)--> Z --(beta^-)--> P --(e^-)--> Q. In the nuclear emission stated above, the mass number and atomic number of the product Q respectively are: 4 marks

(1) 286, 81
(2) 280, 81
(3) 286, 80
(4) 288, 82

Q41. At any instant of time t, the displacement of any particle is given by 2t - 1 (SI unit) under the influence of force of 5N. The value of instantaneous power is (in SI unit): 4 marks

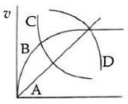
(1) 6
(2) 10
(3) 5
(4) 7

Q42. The displacement-time graphs of two moving particles make angles of 30 degrees and 45 degrees with the x-axis as shown in the figure. The ratio of their respective velocity is : 4 marks

(1) 1 : sqrt(3)
(2) sqrt(3) : 1
(3) 1 : 1
(4) 1 : 2

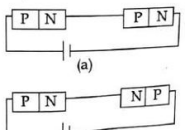
(4) $2\sqrt{2}\,v$

21. A spherical ball is dropped in a long column of a highly viscous liquid. The curve in the graph shown, which represents the speed of the ball (v) as a function of time (t) is :



(3) 1 : 1
(4) 1 : 2

26.



Q43. The quantities which have the same dimensions as those of solid angle are: 4 marks

(1) angular speed and stress
(2) strain and angle
(3) stress and angle
(4) strain and arc

Q44. The work functions of Caesium (Cs), Potassium (K) and Sodium (Na) are 2.14 eV, 2.30 eV and 2.75 eV respectively. If incident electromagnetic radiation has an incident energy of 2.20 eV, which of these photosensitive surfaces may emit photoelectrons? 4 marks

(1) Na only
(2) Cs only
(3) Both Na and K
(4) K only

Q45. A horizontal bridge is built across a river. A student standing on the bridge throws a small ball vertically upwards with a velocity 4 m s^{-1}. The ball strikes the water surface after 4 s. The height of bridge above water surface is (Take g = 10 m s^{-2}) : 4 marks

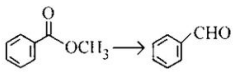
(1) 68 m
(2) 56 m
(3) 60 m
(4) 64 m

Section Chemistry
45 questions · 180 marks

Q46. The ratio of the wavelengths of the light absorbed by a Hydrogen atom when it undergoes n = 2 -> n = 3 and n = 4 -> n = 6 transitions, respectively, is (1) 1/36 (2) 1/16 (3) 1/9 (4) 1/4 4 marks

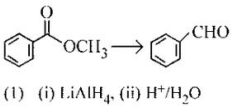
Q47. Identify the suitable reagent for the following conversion. Methyl benzoate (Ph-CO-OCH_3) -> benzaldehyde (Ph-CHO). (1) (i) $LiAlH_4$, (ii) H^+/H_2O (2) (i) $AlH(iBu)_2$ (ii) H_2O (3) (i) $NaBH_4$, (ii) H^+/H_2O (4) H_2 / Pd-$BaSO_4$ 4 marks

83 Identify the suitable reagent for the following conversion.



(1) (i) $LiAlH_4$, (ii) H^+/H_2O
(2) (i) $AlH(iBu)_2$ (ii) H_2O
(3) (i) $NaBH_4$, (ii) H^+/H_2O
(4) H_2 / Pd-$BaSO_4$

83 निम्नलिखित रूपांतरण के लिए उचित अभिकर्मक पहचानिए :



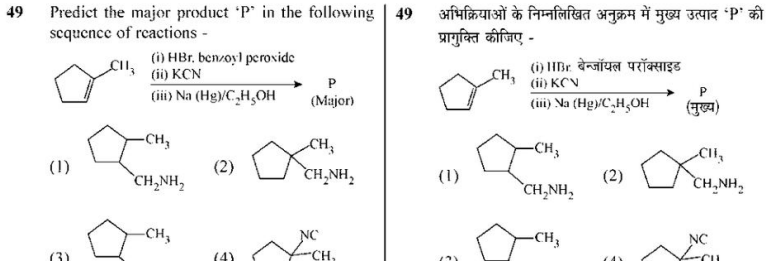
(1) (i) $LiAlH_4$, (ii) H^+/H_2O
(2) (i) $AlH(iBu)_2$ (ii) H_2O
(3) (i) $NaBH_4$, (ii) H^+/H_2O
(4) H_2 / Pd-$BaSO_4$

Q48. Given below are two statements: Statement I: Ferromagnetism is considered as an extreme form of paramagnetism. Statement II: The number of unpaired electrons in a Cr^{2+} ion (Z = 24) is the same as that of a Nd^{3+} ion (Z = 60). In the light of the above statements, choose the correct answer from the options given below: (1) Both Statement I and Statement II are true (2) Both Statement I and Statement II are false (3) Statement I is true but Statement II is false (4) Statement I is false but Statement II is true 4 marks

Q49. If the half-life ($t_1/2$) for a first order reaction is 1 minute, then the time required for 99.9% completion of the reaction is closest to (1) 2 minutes (2) 4 minutes (3) 5 minutes (4) 10 minutes 4 marks

Q50. Consider the following compounds: KO_2, H_2O_2 and H_2SO_4. The oxidation states of the underlined elements (O, O, S) in them are, respectively, (1) +1, -1, and +6 (2) +2, -2, and +6 (3) +1, -2, and +4 (4) +4, -4, and +6 — 4 marks

Q51. Predict the major product 'P' in the following sequence of reactions - 1-methylcyclopentene reacting with (i) HBr, benzoyl peroxide (ii) KCN (iii) $Na(Hg)/C_2H_5OH$ -> P (Major). (1) 2-methylcyclopentyl-CH_2NH_2 (2) 1-methylcyclopentyl-CH_2NH_2 (3) 2-methylcyclopentyl-NC (4) 1-methylcyclopentyl bearing NC and CH_3 — 4 marks



Q52. Given below are two statements: Statement I: A hypothetical diatomic molecule with bond order zero is quite stable. Statement II: As bond order increases, the bond length increases. In the light of the above statements, choose the most appropriate answer from the options given below: (1) Both Statement I and Statement II are true (2) Both Statement I and Statement II are false (3) Statement I is true but Statement II is false (4) Statement I is false but Statement II is true — 4 marks

Q53. 1 gram of sodium hydroxide was treated with 25 mL of 0.75 M HCl solution, the mass of sodium hydroxide left unreacted is equal to: (1) 200 mg (2) 750 mg (3) 250 mg (4) Zero mg — 4 marks

Q54. For the reaction A(g) <=> 2B(g), the backward reaction rate constant is higher than the forward reaction rate constant by a factor of 2500, at 1000 K. [Given: R = 0.0831 L atm mol^{-1} K^{-1}] K_p for the reaction at 1000 K is (1) 83.1 (2) 2.077 x 10^5 (3) 0.033 (4) 0.021 — 4 marks

Q55. Sugar 'X': A. is found in honey. B. is a keto sugar. C. exists in alpha and beta - anomeric forms. D. is laevorotatory. 'X' is: (1) D-Glucose (2) D-Fructose (3) Maltose (4) Sucrose — 4 marks

Q56. Which of the following are paramagnetic? A. $[NiCl_4]^{2-}$ B. $Ni(CO)_4$ C. $[Ni(CN)_4]^{2-}$ D. $[Ni(H_2O)_6]^{2+}$ E. $Ni(PPh_3)_4$. Choose the correct answer from the options given below: (1) A and C only (2) B and E only (3) A and D only (4) A, D and E only — 4 marks

Q57. Match List I with List II. List I (Mixture): A. $CHCl_3$ + $C_6H_5NH_2$ B. Crude oil in petroleum industry C. Glycerol from spent-lye D. Aniline - water. List II (Method of Separation): I. Distillation under reduced pressure II. Steam distillation III. Fractional distillation IV. Simple distillation. Choose the correct answer from the options given below: (1) A-IV, B-III, C-I, D-II (2) A-IV, B-III, C-II, D-I (3) A-III, B-IV, C-I, D-II (4) A-III, B-IV, C-II, D-I — 4 marks

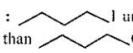
Q58. Among the following, choose the ones with equal number of atoms. A. 212 g of Na_2CO_3 (s) [molar mass = 106 g] B. 248 g of Na_2O (s) [molar mass = 62 g] C. 240 g of NaOH (s) [molar mass = 40 g] D. 12 g of H_2 (g) [molar mass = 2 g] E. 220 g of CO_2 (g) [molar mass = 44 g]. Choose the correct answer from the options given below: (1) A, B, and C only (2) A, B, and D only (3) B, C, and D only (4) B, D, and E only

4 marks

Q59. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A): 1-iodo compound undergoes S_N2 reaction faster than the corresponding 1-chloro compound. Reason (R): Iodine is a better leaving group because of its large size. In the light of the above statements, choose the correct answer from the options given below: (1) Both A and R are true and R is the correct explanation of A (2) Both A and R are true but R is not the correct explanation of A (3) A is true but R is false (4) A is false but R is true

4 marks

84 Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) :  undergoes S_N2 reaction faster than .

Reason (R) : Iodine is a better leaving group because of its large size.

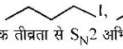
In the light of the above statements, choose the **correct** answer from the options given below :

(1) Both **A** and **R** are true and **R** is the correct explanation of **A**

(2) Both **A** and **R** are true but **R** is **not** the correct explanation of **A**

(3) **A** is true but **R** is false

84 नीचे दो कथन दिए गए हैं : एक को **अभिकथन (A)** और दूसरे को **कारण (R)** चिह्नित किया गया है।

अभिकथन (A) :  की तुलना में अधिक तीव्रता से S_N2 अभिक्रिया करता है।

कारण (R) : अपने बड़े आकार के कारण आयोडीन एक बेहतर अवशिष्ट समूह है।

उपर्युक्त कथनों के आलोक में नीचे दिए गए विकल्पों से **सही** उत्तर चुनिए :

(1) **A** और **R** दोनों सत्य हैं और **R**, **A** की सही व्याख्या है।

(2) **A** और **R** दोनों सत्य हैं, परंतु **R**, **A** की सही व्याख्या नहीं है।

Q60. Match List I with List II. List I (Ion): A. Co^{2+} B. Mg^{2+} C. Pb^{2+} D. Al^{3+}. List II (Group Number in Cation Analysis): I. Group-I II. Group-III III. Group-IV IV. Group-VI. Choose the correct answer from the options given below: (1) A-III, B-IV, C-II, D-I (2) A-III, B-IV, C-I, D-II (3) A-III, B-II, C-IV, D-I (4) A-III, B-II, C-I, D-IV

4 marks

Q61. Which of the following aqueous solution will exhibit highest boiling point? (1) 0.01M Urea (2) 0.01M KNO_3 (3) 0.01M Na_2SO_4 (4) 0.015M $C_6H_{12}O_6$

4 marks

Q62. Which one of the following reactions does NOT belong to "Lassaigne's test"? (1) Na + C + N -heat-> NaCN (2) 2Na + S -heat-> Na_2S (3) Na + X -heat-> NaX (4) 2CuO + C -heat-> 2Cu + CO_2

4 marks

Q63. If the molar conductivity ($Lambda_m$) of a 0.050 mol L^{-1} solution of a monobasic weak acid is 90 S cm^2 mol^{-1}, its extent (degree) of dissociation will be [Assume $Lambda_+^0$ = 349.6 S cm^2 mol^{-1} and $Lambda_-^0$ = 50.4 S cm^2 mol^{-1}.] (1) 0.115 (2) 0.125 (3) 0.225 (4) 0.215

4 marks

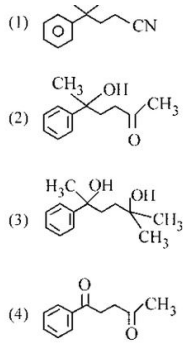
Q64. Arrange the following elements in increasing order of first ionization enthalpy: Li, Be, B, C, N
Choose the correct answer from the options given below:
(1) Li < Be < N < B < C
(2) Li < Be < B < C < N
(3) Li < B < Be < C < N
(4) Li < Be < C < B < N

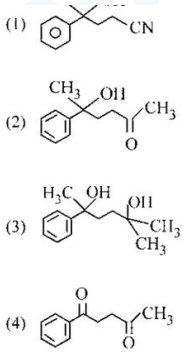
4 marks

Q65. Activation energy of any chemical reaction can be calculated if one knows the value of: 4 marks
(1) rate constant at two different temperatures.
(2) rate constant at standard temperature.
(3) probability of collision.
(4) orientation of reactant molecules during collision.

Q66. Match List I with List II. 4 marks
List I (Conversion): A. 1 mol of H_2O to O_2 B. 1 mol of MnO_4^- to Mn^{2+} C. 1.5 mol of Ca from molten $CaCl_2$ D. 1 mol FeO to Fe_2O_3
List II (Number of Faraday required): I. 3F II. 2F III. 1F IV. 5F
Choose the correct answer from the options given below:
(1) A-III, B-IV, C-II, D-I
(2) A-II, B-IV, C-I, D-III
(3) A-III, B-IV, C-I, D-II
(4) A-II, B-III, C-I, D-IV

Q67. The major product of the following reaction is: PhCO-CH_2-CH_2-CN (3-oxo-3-phenylpropanenitrile chain, i.e. an aryl ketone bearing a nitrile) treated with (i) CH_3MgBr (excess) (ii) H_3O^+. (1) tertiary alcohol from the ketone with CN retained: Ph-C(CH_3)(OH)-CH_2-CN (2) Ph-C(CH_3)(OH)-CH_2-CH_2-CO-CH_3 (alcohol from ketone + methyl ketone from nitrile) (3) diol: Ph-C(CH_3)(OH)-CH_2-C(OH)(CH_3)$_2$ (4) diketone: Ph-CO-CH_2-CH_2-CO-CH_3 4 marks





79 Which of the following aqueous solution will exhibit highest boiling point?
(1) 0.01M Urea
(2) 0.01M KNO_3
(3) 0.01M Na_2SO_4

79 निम्नलिखित जलीय विलयनों में से किसका उच्चतम क्वथनांक होगा ?
(1) 0.01M यूरिया
(2) 0.01M KNO_3
(3) 0.01M Na_2SO_4

Q68. The correct order of decreasing acidity of the following aliphatic acids is (1) (CH_3)$_3$CCOOH > (CH_3)$_2$CHCOOH > CH_3COOH > HCOOH (2) CH_3COOH > (CH_3)$_2$CHCOOH > (CH_3)$_3$CCOOH > HCOOH (3) HCOOH > CH_3COOH > (CH_3)$_2$CHCOOH > (CH_3)$_3$CCOOH (4) HCOOH > (CH_3)$_3$CCOOH > (CH_3)$_2$CHCOOH > CH_3COOH 4 marks

Q69. Given below are two statements: Statement I: Benzenediazonium salt is prepared by the reaction of aniline with nitrous acid at 273-278 K. It decomposes easily in the dry state. Statement II: Insertion of iodine into the benzene ring is difficult and hence iodobenzene is prepared through the reaction of benzenediazonium salt with KI. In the light of the above statements, choose the most appropriate answer from the options given below: (1) Both Statement I and Statement II are correct (2) Both Statement I and Statement II are incorrect (3) Statement I is correct but Statement II is incorrect (4) Statement I is incorrect but Statement II is correct — 4 marks

Q70. The correct order of the wavelength of light absorbed by the following complexes is. A. $[Co(NH_3)_6]^{3+}$ B. $[Co(CN)_6]^{3-}$ C. $[Cu(H_2O)_4]^{2+}$ D. $[Ti(H_2O)_6]^{3+}$. Choose the correct answer from the options given below: (1) B < D < A < C (2) B < A < D < C (3) C < D < A < B (4) C < A < D < B — 4 marks

Q71. Given below are two statements:
Statement I: $[Co(NH_3)_6]^{3+}$ is a homoleptic complex whereas $[Co(NH_3)_4Cl_2]$^+ is a heteroleptic complex.
Statement II: Complex $[Co(NH_3)_6]^{3+}$ has only one kind of ligands but $[Co(NH_3)_4Cl_2]$^+ has more than one kind of ligands.
In the light of the above statements, choose the correct answer from the options given below:
(1) Statement I is false but Statement II is true.
(2) Both Statement I and Statement II are true.
(3) Both Statement I and Statement II are false.
(4) Statement I is true but Statement II is false. — 4 marks

Q72. Match List I with List II.
List I (Molecule): A. ethane B. ethene C. carbon molecule, C_2 D. ethyne
List II (Number and types of bond/s between two carbon atoms): I. one σ-bond and two π-bonds II. two π-bonds III. one σ-bond IV. one σ-bond and one π-bond
Choose the correct answer from the options given below:
(1) A-III, B-IV, C-I, D-II
(2) A-I, B-IV, C-II, D-III
(3) A-IV, B-III, C-II, D-I
(4) A-III, B-IV, C-II, D-I — 4 marks

Q73. Match List I with List II.
List I (Quantum Number): A. m_l B. m_s C. l D. n
List II (Information provided): I. shape of orbital II. size of orbital III. orientation of orbital IV. orientation of spin of electron
Choose the correct answer from the options given below:
(1) A-II, B-I, C-IV, D-III
(2) A-I, B-III, C-II, D-IV
(3) A-III, B-IV, C-I, D-II
(4) A-III, B-IV, C-II, D-I — 4 marks

Q74. Match List I with List II. 4 marks

List I (Compound): A. NH_3 B. BrF_5 C. XeF_4 D. SF_6

List II (Shape/geometry): I. Trigonal Pyramidal II. Square Planar III. Octahedral IV. Square Pyramidal

Choose the correct answer from the options given below:

(1) A-II, B-III, C-IV, D-I

(2) A-I, B-IV, C-II, D-III

(3) A-II, B-IV, C-III, D-I

(4) A-III, B-IV, C-I, D-II

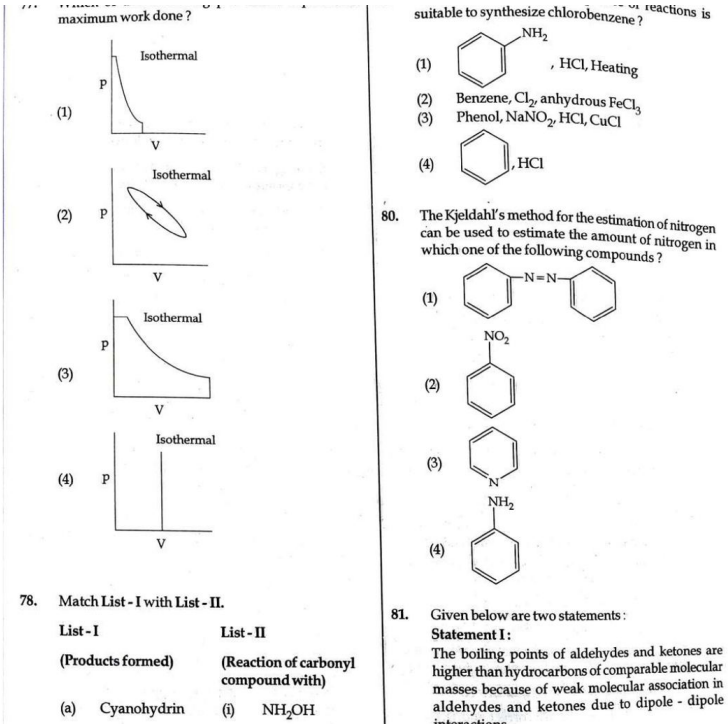
Q75. Which of the following p-V curve represents maximum work done? (Options show p-V isothermal curves) 4 marks

(1) Isothermal expansion curve with sharp initial drop

(2) Closed isothermal cyclic loop

(3) Isothermal expansion curve (gradual)

(4) Isothermal curve with vertical drop



Q76. Given below are two statements: 4 marks

Statement I: The boiling point of hydrides of Group 16 elements follow the order $H_2O > H_2Te > H_2Se > H_2S$.

Statement II: On the basis of molecular mass, H_2O is expected to have lower boiling point than the other members of the group but due to the presence of extensive H-bonding in H_2O, it has higher boiling point.

In the light of the above statements, choose the correct answer from the options given below:

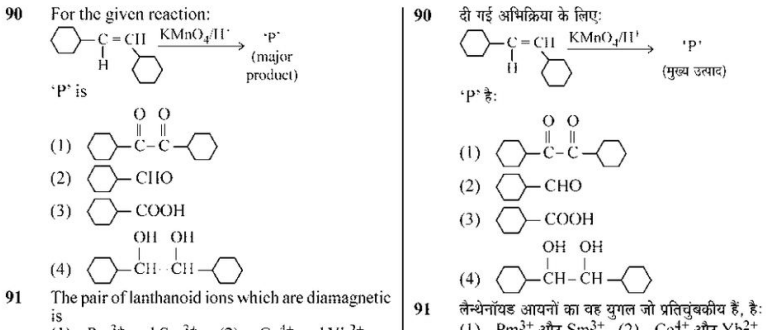
(1) Statement I is false but Statement II is true.

(2) Both Statement I and Statement II are true.

(3) Both Statement I and Statement II are false.

(4) Statement I is true but Statement II is false.

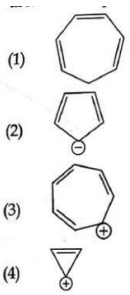
Q77. For the given reaction: (cyclohexyl)-CH=CH-(cyclohexyl) --$KMnO_4$/H^+--> 'P' (major product). 'P' is: (the four options are structures shown in the figure) 4 marks
(1) cyclohexyl-CO-CO-cyclohexyl (diketone)
(2) cyclohexanecarbaldehyde (cyclohexyl-CHO)
(3) cyclohexanecarboxylic acid (cyclohexyl-COOH)
(4) cyclohexyl-CH(OH)-CH(OH)-cyclohexyl (vicinal diol)



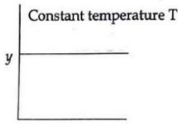
Q78. Consider the following reaction in a sealed vessel at equilibrium with concentrations of N_2 = 3.0×10^{-3} M, O_2 = 4.2×10^{-3} M and NO = 2.8×10^{-3} M. 4 marks
2 NO_(g) ⇌ N_2(g) + O_2(g)
If 0.1 mol L^{-1} of NO_(g) is taken in a closed vessel, what will be degree of dissociation (α) of NO_(g) at equilibrium?
(1) 0.717 (2) 0.00889 (3) 0.0889 (4) 0.8889

Q79. Match List-I with List-II: 4 marks
List-I: A. Coke, B. Diamond, C. Fullerene, D. Graphite
List-II: I. Carbon atoms are sp^3 hybridised. II. Used as a dry lubricant. III. Used as a reducing agent. IV. Cage like molecules
Choose the correct answer from the options given below:
(1) A-III, B-IV, C-I, D-II
(2) A-II, B-IV, C-I, D-III
(3) A-IV, B-I, C-II, D-III
(4) A-III, B-I, C-IV, D-II

Q80. Which compound amongst the following is not an aromatic compound? (Structures shown as options) 4 marks
(1) Cyclooctatetraene
(2) Cyclopentadienyl anion
(3) Tropylium (cycloheptatrienyl) cation
(4) Cyclopropenyl cation



71. The given graph is a representation of kinetics of a reaction.



Statement I:

Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.

Statement II:

Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) **Statement I** is incorrect but **Statement II** is correct.

(2) Both **Statement I** and **Statement II** are correct.

(3) Both **Statement I** and **Statement II** are incorrect.

(4) **Statement I** is correct but **Statement II** is incorrect.

74. Identify the **incorrect** statement from the following

Q81. Which of the following statements are true? A. Unlike Ga that has a very high melting point, Cs has a very low melting point. B. On Pauling scale, the electronegativity values of N and Cl are not the same. C. Ar, K^+, Cl^-, Ca^{2+}, and S^{2-} are all isoelectronic species. D. The correct order of the first ionization enthalpies of Na, Mg, Al, and Si is Si > Al > Mg > Na. E. The atomic radius of Cs is greater than that of Li and Rb. Choose the correct answer from the options given below: (1) A, B, and E only (2) C and E only (3) C and D only (4) A, C, and E only 4 marks

Q82. Given below are two statements: Statement I: Like nitrogen that can form ammonia, arsenic can form arsine. Statement II: Antimony cannot form antimony pentoxide. In the light of the above statements, choose the most appropriate answer from the options given below: (1) Both Statement I and Statement II are correct (2) Both Statement I and Statement II are incorrect (3) Statement I is correct but Statement II is incorrect (4) Statement I is incorrect but Statement II is correct 4 marks

Q83. Which among the following electronic configurations belong to main group elements? A. $[Ne]3s^1$ B. $[Ar]3d^3\ 4s^2$ C. $[Kr]4d^{10}\ 5s^2\ 5p^5$ D. $[Ar]3d^{10}\ 4s^1$ E. $[Rn]5f^6\ 6d^2\ 7s^2$. Choose the correct answer from the option given below: (1) B and E only (2) A and C only (3) D and E only (4) A, C and D only 4 marks

Q84. Dalton's Atomic theory could not explain which of the following? (1) Law of conservation of mass (2) Law of constant proportion (3) Law of multiple proportion (4) Law of gaseous volume 4 marks

Q85. Which one of the following compounds can exist as cis-trans isomers? (1) Pent-1-ene (2) 2-Methylhex-2-ene (3) 1,1-Dimethylcyclopropane (4) 1,2-Dimethylcyclohexane 4 marks

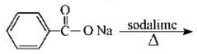
Q86. Phosphoric acid ionizes in three steps with their ionization constant values K_a1, K_a2 and K_a3, respectively, while K is the overall ionization constant. Which of the following statements are true? A. log K = log K_a1 + log K_a2 + log K_a3 B. H_3PO_4 is a stronger acid than H_2PO_4^- and HPO_4^{2-} C. K_a1 > K_a2 > K_a3 D. K_a1 = (K_a3 + K_a2)/2. Choose the correct answer from the options given below: (1) A and B only (2) A and C only (3) B, C and D only (4) A, B and C only

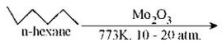
4 marks

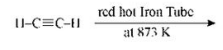
Q87. Which one of the following reactions does NOT give benzene as the product? (1) Sodium benzoate + sodalime, heat (2) n-hexane over Mo_2O_3 at 773 K, 10-20 atm (3) H-C#C-H (acetylene) through red hot iron tube at 873 K (4) benzenediazonium chloride + H_2O, warm

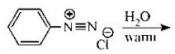
4 marks

give benzene as the product ?

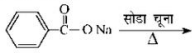
(1) 

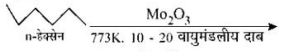
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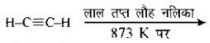
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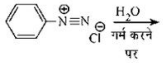
(4) 

बेन्जीन नहीं देती है ?

(1) 

(2) 

(3) 

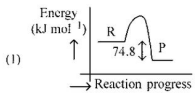
(4) 

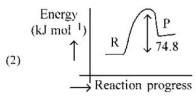
Q88. C(s) + $2H_2$(g) -> CH_4(g); Delta H = -74.8 kJ mol^{-1}. Which of the following diagrams gives an accurate representation of the above reaction? [R -> reactants; P -> products] The four options show energy vs reaction progress profiles: (1) R lower, P higher separated by 74.8 with barrier (2) R higher, products P below by 74.8 (3) R higher, P lower with gap 74.8 (4) R low, P high, exothermic-labelled 74.8. (Exothermic profile where products lie below reactants by 74.8 kJ mol^{-1}.)

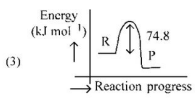
4 marks

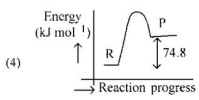
65 $C(s) + 2H_2(g) \rightarrow CH_4(g)$; $\Delta H = -74.8$ kJ mol^{-1}

Which of the following diagrams gives an accurate representation of the above reaction? [R → reactants; P → products]

(1) 

(2) 

(3) 

(4) 

66 Match **List - I** with **List - II**

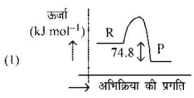
List-I (Example)	List-II (Type of Solution)
A. Humidity	I. Solid in solid
B. Alloys	II. Liquid in gas
C. Amalgams	III. Solid in gas
D. Smoke	IV. Liquid in solid

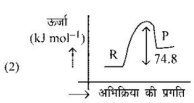
Choose the **correct** answer from the options given below :

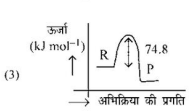
65 $C(s) + 2H_2(g) \rightarrow CH_4(g)$; $\Delta H = -74.8$ kJ mol^{-1}

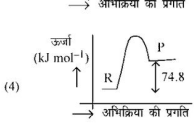
निम्नलिखित आरेखों में से कौन-सा आरेख ऊपर दी गई अभिक्रिया का यथार्थ निरूपण करता है ?

[R → अभिकारक; P → उत्पाद]

(1) 

(2) 

(3) 

(4) 

66 सूची-I का सूची-II के साथ मिलान कीजिए :

सूची I (उदाहरण)	सूची II (विलयन का प्रकार)
A. आर्द्रता	I. ठोस में ठोस
B. मिश्रातु	II. गैस में द्रव
C. अमलगम	III. गैस में ठोस
D. धुआँ	IV. ठोस में द्रव

नीचे दिए गए विकल्पों में से सही उत्तर चुनिए :

Q89. Match List-I with List-II. List-I (Example): A. Humidity B. Alloys C. Amalgams D. Smoke. List-II (Type of Solution): I. Solid in solid II. Liquid in gas III. Solid in gas IV. Liquid in solid. Choose the correct answer from the options given below: (1) A-II, B-IV, C-I, D-III (2) A-II, B-I, C-IV, D-III (3) A-III, B-I, C-IV, D-II (4) A-III, B-II, C-I, D-IV — 4 marks

Q90. The correct order of decreasing basic strength of the given amines is (1) N-methylaniline > benzenamine > ethanamine > N-ethylethanamine (2) N-ethylethanamine > ethanamine > benzenamine > N-methylaniline (3) N-ethylethanamine > ethanamine > N-methylaniline > benzenamine (4) benzenamine > ethanamine > N-methylaniline > N-ethylethanamine — 4 marks

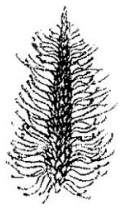
Section Botany
45 questions · 180 marks

Q91. Which one of the following is an example of ex-situ conservation? (1) National Park (2) Wildlife Sanctuary (3) Zoos and botanical gardens (4) Protected areas — 4 marks

Q92. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle? (1) 3 molecules of ATP and 2 molecules of NADPH (2) 2 molecules of ATP and 3 molecules of NADPH (3) 2 molecules of ATP and 2 molecules of NADPH (4) 3 molecules of ATP and 3 molecules of NADPH — 4 marks

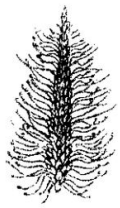
Q93. Identify the correct description about the given figure: (1) Compact inflorescence showing complete autogamy. (2) Wind pollinated plant inflorescence showing flowers with well exposed stamens. (3) Water pollinated flowers showing stamens with mucilaginous covering. (4) Cleistogamous flowers showing autogamy. — 4 marks

146 Identify the correct description about the given figure:



(1) Compact inflorescence showing complete autogamy.
(2) Wind pollinated plant inflorescence showing flowers with well exposed stamens.

146 दिए गए चित्र के सही विवरण को पहचानिए:



(1) पूर्ण स्वकयुग्मन (ऑटोगेमी) को दर्शाते हुए संहत (कॉम्पेक्ट) पुष्पक्रम
(2) सुउद्भासित पुंकेसरों को दर्शाते हुए वायु परागित पादप का पुष्पक्रम
(3) श्लेष्मीय आवरण युक्त पुंकेसरों को दर्शाते हुए जल

Q94. Epiphytes that are growing on a mango branch is an example of which of the following? (1) Commensalism (2) Mutualism (3) Predation (4) Amensalism — 4 marks

Q95. Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield? (1) Abscisic acid (2) Auxin (3) Gibberellin (4) Cytokinin — 4 marks

Q96. These are regarded as major causes of biodiversity loss: A. Over exploitation B. Co-extinction C. Mutation D. Habitat loss and fragmentation E. Migration. Choose the correct option: (1) A, B and D only (2) A, C and D only (3) A, B, C and D only (4) A, B and E only — 4 marks

Q97. Given below are two statements: Statement I : In C_3 plants, some O_2 binds to RuBisCO, hence CO_2 fixation is decreased. Statement II : In C_4 plants, mesophyll cells show very little photorespiration while bundle sheath cells do not show photorespiration. In the light of the above statements, choose the correct answer from the options given below: (1) Statement I is false but Statement II is true (2) Both Statement I and Statement II are true (3) Both Statement I and Statement II are false (4) Statement I is true but Statement II is false — 4 marks

Q98. Given below are the stages in the life cycle of pteridophytes. Arrange the following stages in the correct sequence. A. Prothallus stage B. Meiosis in spore mother cells C. Fertilisation D. Formation of archegonia and antheridia in gametophyte. E. Transfer of antherozoids to the archegonia in presence of water. Choose the correct answer from the options given below: (1) B, A, D, E, C (2) B, A, E, C, D (3) D, E, C, A, B (4) E, D, C, B, A — 4 marks

Q99. Which are correct: A. Computed tomography and magnetic resonance imaging detect cancers of internal organs. B. Chemotherapeutics drugs are used to kill non-cancerous cells. C. α-interferon activate the cancer patients' immune system and helps in destroying the tumour. D. Chemotherapeutic drugs are biological response modifiers. E. In the case of leukaemia blood cell counts are decreased. Choose the correct answer from the options given below: (1) B and D only (2) D and E only (3) C and D only (4) A and C only — 4 marks

Q100. Which one of the following enzymes contains 'Haem' as the prosthetic group? (1) RuBisCo (2) Carbonic anhydrase (3) Succinate dehydrogenase (4) Catalase — 4 marks

Q101. Streptokinase produced by bacterium Streptococcus is used for (1) Curd production (2) Ethanol production (3) Liver disease treatment (4) Removing clots from blood vessels — 4 marks

Q102. Match List - I with List - II. List - I: A. Centromere B. Cilium C. Cristae D. Cell membrane. List - II: I. Mitochondrion II. Cell division III. Cell movement IV. Phospholipid Bilayer. Choose the correct answer from the options given below: (1) A-I, B-II, C-III, D-IV (2) A-II, B-I, C-IV, D-III (3) A-IV, B-II, C-III, D-I (4) A-II, B-III, C-I, D-IV — 4 marks

Q103. Given below are two statements: Statement I: The primary source of energy in an ecosystem is solar energy. Statement II: The rate of production of organic matter during photosynthesis in an ecosystem is called net primary productivity (NPP). In the light of the above statements, choose the most appropriate answer from the options given below: (1) Both statement I and statement II are correct (2) Both statement I and statement II are incorrect (3) Statement I is correct but statement II is incorrect (4) Statement I is incorrect but statement II is correct — 4 marks

Q104. Match List I with List II: List-I: A. Alfred Hershey and Martha Chase B. Euchromatin C. Frederick Griffith D. Heterochromatin. List-II: I. Streptococcus pneumoniae II. Densely packed and dark-stained III. Loosely packed and light-stained IV. DNA as genetic material confirmation. Choose the correct answer from the options given below: (1) A-II, B-IV, C-I, D-III (2) A-IV, B-II, C-I, D-III (3) A-IV, B-III, C-I, D-II (4) A-III, B-II, C-IV, D-I — 4 marks

Q105. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A): A typical unfertilised, angiosperm embryo sac at maturity is 8 nucleate and 7-celled. Reason (R): The egg apparatus has 2 polar nuclei. In the light of the above statements, choose the correct answer from the options given below: (1) Both A and R are true and R is the correct explanation of A (2) Both A and R are true but R is NOT the correct explanation of A (3) A is true but R is false (4) A is false but R is true 4 marks

Q106. From the statements given below choose the correct option: A. The eukaryotic ribosomes are 80S and prokaryotic ribosomes are 70S. B. Each ribosome has two sub-units. C. The two sub-units of 80S ribosome are 60S and 40S while that of 70S are 50S and 30S. D. The two sub-units of 80S ribosome are 60S and 20S and that of 70S are 50S and 20S. E. The two sub-units of 80S ribosome are 60S and 30S and that of 70S are 50S and 30S. (1) A, B, C are true (2) A, B, D are true (3) A, B, E are true (4) B, D, E are true 4 marks

Q107. The complex II of mitochondrial electron transport chain is also known as (1) Cytochrome bc_1 (2) Succinate dehydrogenase (3) Cytochrome c oxidase (4) NADH dehydrogenase 4 marks

Q108. Polymerase chain reaction (PCR) amplifies DNA following the equation. (1) N^2 (2) 2^n (3) 2n+1 (4) $2N^2$ 4 marks

Q109. Which of following organisms cannot fix nitrogen? A. Azotobacter B. Oscillatoria C. Anabaena D. Volvox E. Nostoc. Choose the correct answer from the options given below: (1) A only (2) D only (3) B only (4) E only 4 marks

Q110. Which of the following is an example of actinomorphic flower? (1) Sesbania (2) Datura (3) Cassia (4) Pisum 4 marks

Q111. Read the following statements and choose the set of correct statements: In the members of Phaeophyceae. A. Asexual reproduction occurs usually by biflagellate zoospores. B. Sexual reproduction is by oogamous method only. C. Stored food is in the form of carbohydrates which is either mannitol or laminarin. D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll. E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin. Choose the correct answer from the options given below: (1) A, B, C and E only (2) A, B, C and D only (3) B, C, D and E only (4) A, C, D and E only 4 marks

Q112. Hind II always cuts DNA molecules at a particular point called recognition sequence and it consists of: (1) 10 bp (2) 8 bp (3) 6 bp (4) 4 bp 4 marks

Q113. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis? 4 marks
(1) Diakinesis
(2) Zygotene
(3) Pachytene
(4) Diplotene

Q114. Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae. 4 marks

(1) Epiphyllous and Dithecous anthers
(2) Diadelphous and Dithecous anthers
(3) Polyadelphous and epipetalous stamens
(4) Monoadelphous and Monothecous anthers

Q115. Identify the correct statements : 4 marks

A. Detrivores perform fragmentation.
B. The humus is further degraded by some microbes during mineralization.
C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D. The detritus food chain begins with living organisms.
E. Earthworms break down detritus into smaller particles by a process called catabolism.
Choose the correct answer from the options given below :
(1) D, E, A only
(2) A, B, C only
(3) B, C, D only
(4) C, D, E only

Q116. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R : 4 marks

Assertion A : ATP is used at two steps in glycolysis.
Reason R : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1-6-diphosphate.
In the light of the above statements, choose the correct answer from the options given below :
(1) A is false but R is true.
(2) Both A and R are true and R is the correct explanation of A.
(3) Both A and R are true but R is NOT the correct explanation of A.
(4) A is true but R is false.

Q117. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R : 4 marks

Assertion A : Late wood has fewer xylary elements with narrow vessels.
Reason R : Cambium is less active in winters.
In the light of the above statements, choose the correct answer from the options given below :
(1) A is false but R is true.
(2) Both A and R are true and R is the correct explanation of A.
(3) Both A and R are true but R is NOT the correct explanation of A.
(4) A is true but R is false.

Q118. Expressed Sequence Tags (ESTs) refers to 4 marks
(1) Certain important expressed genes.
(2) All genes that are expressed as RNA.
(3) All genes that are expressed as proteins.
(4) All genes whether expressed or unexpressed.

Q119. Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants : 4 marks
(1) Cytokinin
(2) ABA
(3) Gibberellin
(4) Ethylene

Q120. What are the potential drawbacks in adoption of the IVF method? A. High fatality risk to mother B. Expensive instruments and reagents C. Husband/wife necessary for being donors D. Less adoption of orphans E. Not available in India F. Possibility that the early embryo does not survive. Choose the correct answer from the options given below: (1) B, D, F only (2) A, C, D, F only (3) A, B, C, D only (4) A, B, C, E, F only 4 marks

Q121. What is the name of the blood vessel that carries deoxygenated blood from the body to the heart in a frog? (1) Aorta (2) Pulmonary artery (3) Pulmonary vein (4) Vena cava 4 marks

Q122. Which one of the following statements refers to Reductionist Biology? (1) Physico-chemical approach to study and understand living organisms. (2) Physiological approach to study and understand living organisms. (3) Chemical approach to study and understand living organisms. (4) Behavioural approach to study and understand living organisms. 4 marks

Q123. Match List - I with List - II. List - I: A. Emphysema B. Angina Pectoris C. Glomerulonephritis D. Tetany. List - II: I. Rapid spasms in muscle due to low Ca^++ in body fluid II. Damaged alveolar walls and decreased respiratory surface III. Acute chest pain when not enough oxygen is reaching to heart muscle IV. Inflammation of glomeruli of kidney. Choose the correct answer from the options given below: (1) A-III, B-I, C-IV, D-II (2) A-III, B-I, C-II, D-IV (3) A-II, B-IV, C-III, D-I (4) A-II, B-III, C-IV, D-I 4 marks

Q124. Which of the following statement is correct about location of the male frog copulatory pad? (1) First and Second digit of fore limb (2) First digit of hind limb (3) Second digit of fore limb (4) First digit of the fore limb 4 marks

Q125. While trying to find out the characteristic of a newly found animal, a researcher did the histology of adult animal and observed a cavity with presence of mesodermal tissue towards the body wall but no mesodermal tissue was observed towards the alimentary canal. What could be the possible coelome of that animal? (1) Acoelomate (2) Pseudocoelomate (3) Schizocoelomate (4) Spongocoelomate 4 marks

Q126. Match List - I with List - II. List - I: A. Head B. Middle piece C. Acrosome D. Tail. List - II: I. Enzymes II. Sperm motility III. Energy IV. Genetic material. Choose the correct answer from the options given below: (1) A-IV, B-III, C-I, D-II (2) A-IV, B-III, C-II, D-I (3) A-III, B-IV, C-II, D-I (4) A-III, B-II, C-I, D-IV — 4 marks

Q127. Cardiac activities of the heart are regulated by: A. Nodal tissue B. A special neural centre in the medulla oblongata C. Adrenal medullary hormones D. Adrenal cortical hormones. Choose the correct answer from the options given below: (1) A, B and C Only (2) A, B, C and D (3) A, C and D Only (4) A, B and D Only — 4 marks

Q128. Which of the following genetically engineered organisms was used by Eli Lilly to prepare human insulin? (1) Bacterium (2) Yeast (3) Virus (4) Phage — 4 marks

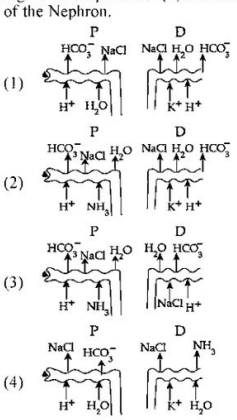
Q129. Name the class of enzyme that usually catalyze the following reaction: S-G + S^# → S + S^#-G Where, G → a group other than hydrogen, S → a substrate, S^# → another substrate. (1) Hydrolase (2) Lyase (3) Transferase (4) Ligase — 4 marks

Q130. Find the statement that is NOT correct with regard to the structure of monocot stem. (1) Hypodermis is parenchymatous. (2) Vascular bundles are scattered. (3) Vascular bundles are conjoint and closed. (4) Phloem parenchyma is absent. — 4 marks

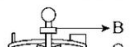
Q131. Find the correct statements: A. In human pregnancy, the major organ systems are formed at the end of 12 weeks. B. In human pregnancy the major organ systems are formed at the end of 8 weeks. C. In human pregnancy heart is formed after one month of gestation. D. In human pregnancy, limbs and digits develop by the end of second month. E. In human pregnancy the appearance of hair is usually observed in the fifth month. Choose the correct answer from the options given below: (1) A and E Only (2) B and C Only (3) B, C, D and E Only (4) A, C, D and E Only — 4 marks

Q132. Which of the following diagrams is correct with regard to the proximal (P) and distal (D) tubule of the Nephron. (Four labelled diagrams showing ionic exchange at P and D tubules are given.) (1) (2) (3) (4) — 4 marks

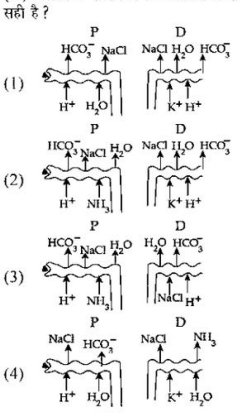
125 Which of the following diagrams is correct with regard to the proximal (P) and distal (D) tubule of the Nephron.



126 Identify the part of a bio-reactor which is used as a foam braker from the given figure.



125 वृक्काणु (नेफ्रोन) की समीपस्थ संवलित (P) और दूरस्थ संवलित (D) नलिका के सन्दर्भ में निम्नलिखित में से कौन सा आरेख सही है ?



126 दिए गए चित्र में बायो–रिएक्टर के उस भाग की पहचान कीजिए जिसका उपयोग झाग भंजक (फोम तोड़ने वाले) के रूप में किया जाता है ?

Q133. What is the pattern of inheritance for polygenic trait? (1) Mendelian inheritance pattern (2) Non-mendelian inheritance pattern (3) Autosomal dominant pattern (4) X-linked recessive inheritance pattern — 4 marks

Q134. Each of the following characteristics represent a Kingdom proposed by Whittaker. Arrange the following in increasing order of complexity of body organization. A. Multicellular heterotrophs with cell wall made of chitin. B. Heterotrophs with tissue/organ/organ system level of body organization. C. Prokaryotes with cell wall made of polysaccharides and amino acids. D. Eukaryotic autotrophs with tissue/organ level of body organization. E. Eukaryotes with cellular body organization. Choose the correct answer from the options given below: (1) A, C, E, B, D (2) C, E, A, D, B (3) A, C, E, D, B (4) C, E, A, B, D — 4 marks

Q135. Who is known as the father of Ecology in India? (1) S. R. Kashyap (2) Ramdeo Misra (3) Ram Udar (4) Birbal Sahni — 4 marks

Section Zoology
45 questions · 180 marks

Q136. Match List - I with List - II. — 4 marks
List I: A. Heart B. Kidney C. Gastro-intestinal tract D. Adrenal Cortex
List II: I. Erythropoietin II. Aldosterone III. Atrial natriuretic factor IV. Secretin
Choose the correct answer from the options given below :
(1) A-II, B-I, C-III, D-IV
(2) A-IV, B-III, C-II, D-I
(3) A-I, B-III, C-IV, D-II
(4) A-III, B-I, C-IV, D-II

Q137. Sweet potato and potato represent a certain type of evolution. Select the correct combination of terms to explain the evolution. — 4 marks
(1) Analogy, convergent
(2) Homology, divergent
(3) Homology, convergent
(4) Analogy, divergent

Q138. Match List I with List II : 4 marks

List I
A. Common cold
B. Haemozoin
C. Widal test
D. Allergy
List II
I. Plasmodium
II. Typhoid
III. Rhinoviruses
IV. Dust mites
Choose the correct answer from the options given below :
(1) A-IV, B-II, C-III, D-I
(2) A-II, B-IV, C-III, D-I
(3) A-I, B-III, C-II, D-IV
(4) A-III, B-I, C-II, D-IV

Q139. Consider the following : 4 marks

A. The reductive division for the human female gametogenesis starts earlier than that of the male gametogenesis.
B. The gap between the first meiotic division and the second meiotic division is much shorter for males compared to females.
C. The first polar body is associated with the formation of the primary oocyte.
D. Luteinizing Hormone (LH) surge leads to disintegration of the endometrium and onset of menstrual bleeding.
Choose the correct answer from the options given below :
(1) A and B are true
(2) A and C are true
(3) B and D are true
(4) B and C are true

Q140. Which of the following is not a natural/traditional contraceptive method? 4 marks

(1) Vaults
(2) Coitus interruptus
(3) Periodic abstinence
(4) Lactational amenorrhoea

Q141. Given below are two statements: 4 marks

Statement I: Ligaments are dense irregular tissue.
Statement II: Cartilage is dense regular tissue.
In the light of the above statements, choose the correct answer from the options given below:
(1) Statement I is false but Statement II is true.
(2) Both Statement I and Statement II are true.
(3) Both Statement I and Statement II are false.
(4) Statement I is true but Statement II is false.

Q142. After maturation, in primary lymphoid organs, the lymphocytes migrate for interaction with antigens to secondary lymphoid organ(s) / tissue(s) like : 4 marks
A. thymus B. bone marrow C. spleen D. lymph nodes E. Peyer's patches
Choose the correct answer from the options given below :
(1) B, C, D only
(2) A, B, C only
(3) E, A, B only
(4) C, D, E only

Q143. The first menstruation is called : 4 marks
(1) Menopause
(2) Menarche
(3) Diapause
(4) Ovulation

Q144. Match List I with List II : 4 marks
List I
A. Pons
B. Hypothalamus
C. Medulla
D. Cerebellum
List II
I. Provides additional space for Neurons, regulates posture and balance
II. Controls respiration and gastric secretions
III. Connects different regions of the brain
IV. Neuro secretory cells
Choose the correct answer from the options given below :
(1) A-II, B-I, C-III, D-IV
(2) A-II, B-III, C-I, D-IV
(3) A-III, B-IV, C-II, D-I
(4) A-I, B-III, C-II, D-IV

Q145. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R). 4 marks
Assertion (A) : All vertebrates are chordates but all chordates are not vertebrate.
Reason (R) : The members of subphylum Vertebrata possess notochord during the embryonic period, the notochord is replaced by a cartilaginous or bony vertebral column in adults.
In the light of the above statements, choose the correct answer from the options given below :
(1) Both A and R are true and R is the correct explanation of A
(2) Both A and R are true but R is not the correct explanation of A
(3) A is true but R is false
(4) A is false but R is true

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Q146. Which of the following microbes is NOT involved in the preparation of household products? 4 marks

A. Aspergillus niger
B. Lactobacillus
C. Trichoderma polysporum
D. Saccharomyces cerevisiae
E. Propionibacterium sharmanii

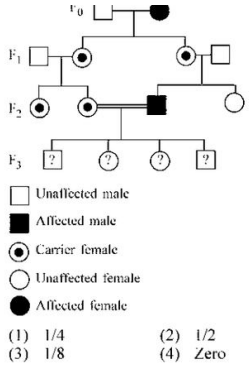
Choose the correct answer from the options given below :

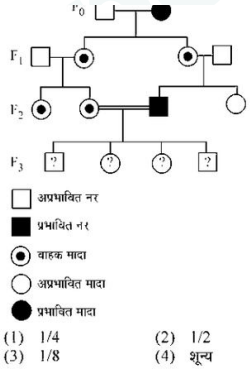
(1) A and B only
(2) A and C only
(3) C and D only
(4) C and E only

Q147. With the help of given pedigree, find out the probability for the birth of a child having no disease and being a carrier (has the disease mutation in one allele of the gene) in F3 generation. 4 marks

(Pedigree shown across F0-F3 with symbols: Unaffected male, Affected male, Carrier female, Unaffected female, Affected female.)

(1) 1/4
(2) 1/2
(3) 1/8
(4) Zero





Q148. Match List I with List II : 4 marks

List I
A. Fibrous joints
B. Cartilaginous joints
C. Hinge joints
D. Ball and socket joints
List II
I. Adjacent vertebrae, limited movement
II. Humerus and Pectoral girdle, rotational movement
III. Skull, don't allow any movement
IV. Knee, help in locomotion
Choose the correct answer from the options given below :
(1) A-III, B-I, C-IV, D-II
(2) A-IV, B-II, C-III, D-I
(3) A-I, B-III, C-II, D-IV
(4) A-III, B-III, C-I, D-IV

Q149. Match List I with List II : 4 marks

List I
A. Expiratory capacity
B. Functional residual capacity
C. Vital capacity
D. Inspiratory capacity
List II
I. Expiratory reserve volume + Tidal volume + Inspiratory reserve volume
II. Tidal volume + Expiratory reserve volume
III. Tidal volume + Inspiratory reserve volume
IV. Expiratory reserve volume + Residual volume
Choose the correct answer from the options given below :
(1) A-I, B-III, C-II, D-IV
(2) A-II, B-IV, C-III, D-III
(3) A-III, B-II, C-IV, D-I
(4) A-II, B-I, C-IV, D-III

Q150. Choose the correct statement given below regarding juxta medullary nephron. 4 marks

(1) Juxta medullary nephrons outnumber the cortical nephrons.
(2) Juxta medullary nephrons are located in the columns of Bertini.
(3) Renal corpuscle of juxta medullary nephron lies in the outer portion of the renal medulla.
(4) Loop of Henle of juxta medullary nephron runs deep into medulla.

Q151. Match List I with List II : 4 marks

List I
A. P wave
B. QRS complex
C. T wave
D. T-P gap
List II
I. Heart muscles are electrically silent
II. Depolarisation of ventricles
III. Depolarisation of atria
IV. Repolarisation of ventricles
Choose the correct answer from the options given below :
(1) A-IV, B-II, C-I, D-III
(2) A-I, B-III, C-II, D-IV
(3) A-III, B-II, C-IV, D-I
(4) A-II, B-III, C-I, D-IV

Q152. The following are the statements about non-chordates : 4 marks

A. Pharynx is perforated by gill slits.
B. Notochord is absent.
C. Central nervous system is dorsal.
D. Heart is dorsal if present.
E. Post anal tail is absent.
Choose the most appropriate answer from the options given below :
(1) B, C & D only
(2) A & C only
(3) A, B & D only
(4) B, D & E only

Q153. Which one is the correct product of DNA dependent RNA polymerase to the given template? 4 marks

3'TACATGGCAAATATCCATTCA5'
(1) 5'ATGTACCGTTTATAGGTAAGT3'
(2) 5'AUGUACCGUUUAUAGGUAAGU3'
(3) 5'AUGUAAAGUUUAUAGGUAAGU3'
(4) 5'AUGUACCGUUUAUAGGGAAGU3'

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Q154. Match List I with List II : 4 marks

List I
A. Non-medicated IUD
B. Copper releasing IUD
C. Hormone releasing IUD
D. Implants
List II
I. Multiload 375
II. Progestogens
III. Lippes loop
IV. LNG-20
Choose the correct answer from the options given below :
(1) A-III, B-I, C-IV, D-II
(2) A-II, B-I, C-III, D-IV
(3) A-I, B-III, C-IV, D-II
(4) A-IV, B-I, C-II, D-III

Q155. Match List I with List II. 4 marks

List I
A. Mast cells
B. Inner surface of bronchiole
C. Blood
D. Tubular parts of nephron
List II
I. Ciliated epithelium
II. Areolar connective tissue
III. Cuboidal epithelium
IV. specialised connective tissue
Choose the correct answer from the options given below:
(1) A-III, B-IV, C-II, D-I
(2) A-I, B-II, C-IV, D-III
(3) A-II, B-III, C-I, D-IV
(4) A-II, B-I, C-IV, D-III

Q156. Which of the following is not a cloning vector? 4 marks

(1) Probe
(2) BAC
(3) YAC
(4) pBR322

Q157. Given below are two statements : 4 marks
Statement I : The DNA fragments extracted from gel electrophoresis can be used in construction of recombinant DNA.
Statement II : Smaller size DNA fragments are observed near anode while larger fragments are found near the wells in an agarose gel.
In the light of the above statements, choose the most appropriate answer from the options given below :
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

Q158. Match List I with List II. 4 marks
List I: A. Adenosine B. Adenylic acid C. Adenine D. Alanine
List II: I. Nitrogen base II. Nucleotide III. Nucleoside IV. Amino acid
Choose the option with all correct matches.
(1) A-III, B-IV, C-I, D-II
(2) A-III, B-II, C-I, D-I
(3) A-III, B-II, C-I, D-IV
(4) A-II, B-III, C-I, D-IV

Q159. Match List I with List II : 4 marks
List I: A. Scutellum B. Non-albuminous seed C. Epiblast D. Perisperm
List II: I. Persistent nucellus II. Cotyledon of Monocot seed III. Groundnut IV. Rudimentary cotyledon
Choose the option with all correct matches.
(1) A-II, B-III, C-IV, D-I
(2) A-IV, B-III, C-II, D-I
(3) A-IV, B-III, C-I, D-II
(4) A-II, B-IV, C-III, D-I

Q160. Silencing of specific mRNA is possible via RNAi because of - 4 marks
(1) Complementary dsRNA
(2) Inhibitory ssRNA
(3) Complementary tRNA
(4) Non-complementary ssRNA

Q161. Genes R and Y follow independent assortment. If RRYY produce round yellow seeds and rryy produce wrinkled green seeds, what will be the phenotypic ratio of the F2 generation? 4 marks
(1) Phenotypic ratio - 1 : 2 : 1
(2) Phenotypic ratio - 3 : 1
(3) Phenotypic ratio - 9 : 3 : 3 : 1
(4) Phenotypic ratio - 9 : 7

Q162. Histones are enriched with - 4 marks
(1) Lysine & Arginine
(2) Leucine & Lysine
(3) Phenylalanine & Leucine
(4) Phenylalanine & Arginine

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Q163. The protein portion of an enzyme is called : 4 marks
(1) Cofactor
(2) Coenzyme
(3) Apoenzyme
(4) Prosthetic group

Q164. Which of the following is the unit of productivity of an Ecosystem? 4 marks
(1) gm^{-2}
(2) KCal m^2
(3) KCal m^{-3}
(4) (KCal m^{-2})yr^{-1}

Q165. How many meiotic and mitotic divisions need to occur for the development of a mature female gametophyte from the megaspore mother cell in an angiosperm plant? 4 marks
(1) 2 Meiosis and 3 Mitosis
(2) 1 Meiosis and 2 Mitosis
(3) 1 Meiosis and 3 Mitosis
(4) No Meiosis and 2 Mitosis

Q166. Which of the following is an example of a zygomorphic flower? 4 marks
(1) Petunia
(2) Datura
(3) Pea
(4) Chilli

Q167. Given below are two statements : 4 marks
Statement I : Fig fruit is a non-vegetarian fruit as it has enclosed fig wasps in it.
Statement II : Fig wasp and fig tree exhibit mutual relationship as fig wasp completes its life cycle in fig fruit and fig fruit gets pollinated by fig wasp.
In the light of the above statements, choose the most appropriate answer from the options given below :
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

Q168. What is the main function of the spindle fibers during mitosis? 4 marks
(1) To separate the chromosomes
(2) To synthesize new DNA
(3) To repair damaged DNA
(4) To regulate cell growth

Q169. Which one of the following is the characteristic feature of gymnosperms? 4 marks
(1) Seeds are enclosed in fruits.
(2) Seeds are naked.
(3) Seeds are absent.
(4) Gymnosperms have flowers for reproduction.

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Q170. Consider the following statements regarding function of adrenal medullary hormones : 4 marks

A. It causes pupilary constriction
B. It is a hyperglycemic hormone
C. It causes piloerection
D. It increases strength of heart contraction
Choose the correct answer from the options given below :
(1) C and D Only
(2) B, C and D Only
(3) A, C and D Only
(4) D Only

Q171. Match List I with List II. 4 marks

List I: A. Pteridophyte B. Bryophyte C. Angiosperm D. Gymnosperm
List II: I. Salvia II. Ginkgo III. Polytrichum IV. Salvinia
Choose the option with all correct matches.
(1) A-III, B-IV, C-II, D-I
(2) A-IV, B-III, C-I, D-II
(3) A-III, B-IV, C-I, D-II
(4) A-IV, B-III, C-II, D-I

Q172. Match List I with List II : 4 marks

List I: A. The Evil Quartet B. Ex situ conservation C. Lantana camara D. Dodo
List II: I. Cryopreservation II. Alien species invasion III. Causes of biodiversity losses IV. Extinction
Choose the option with all correct matches.
(1) A-III, B-I, C-I, D-IV
(2) A-III, B-I, C-II, D-IV
(3) A-III, B-IV, C-II, D-I
(4) A-III, B-II, C-IV, D-I

Q173. Given below are two statements : 4 marks

Statement I : In ecosystem, there is unidirectional flow of energy of sun from producers to consumers.
Statement II : Ecosystems are exempted from 2nd law of thermodynamics.
In the light of the above statements, choose the most appropriate answer from the options given below :
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct

Q174. Which of the following statements about RuBisCO is true? 4 marks

(1) It is active only in the dark.
(2) It has higher affinity for oxygen than carbon dioxide.
(3) It is an enzyme involved in the photolysis of water.
(4) It catalyzes the carboxylation of RuBP.

Q175. Read the following statements on plant growth and development. 4 marks

A. Parthenocarpy can be induced by auxins.
B. Plant growth regulators can be involved in promotion as well as inhibition of growth.
C. Dedifferentiation is a pre-requisite for re-differentiation.
D. Abscisic acid is a plant growth promoter.
E. Apical dominance promotes the growth of lateral buds.
Choose the option with all correct statements.
(1) A, B, C only
(2) A, C, E only
(3) A, D, E only
(4) B, D, E only

Q176. Which one of the following equations represents the Verhulst-Pearl Logistic Growth of population? 4 marks

(1) dN/dt = r[(K-N)/K]
(2) dN/dt = rN[(K-N)/K]
(3) dN/dt = rN[(N-K)/N]
(4) dN/dt = N[(r-K)/K]

Q177. Following are the stages of pathway for conduction of an action potential through the heart: 4 marks

A. AV bundle
B. Purkinje fibres
C. AV node
D. Bundle branches
E. SA node
Choose the correct sequence of pathway from the options given below :
(1) E-A-D-B-C
(2) E-C-A-D-B
(3) A-E-C-B-D
(4) B-D-E-C-A

Q178. Match List I with List II : 4 marks

List I
A. α-1 antitrypsin
B. Cry IAb
C. Cry IAc
D. Enzyme replacement therapy
List II
I. Cotton bollworm
II. ADA deficiency
III. Emphysema
IV. Corn borer
Choose the correct answer from the options given below :
(1) A-II, B-IV, C-I, D-III
(2) A-II, B-I, C-IV, D-III
(3) A-I, B-II, C-III, D-IV
(4) A-III, B-IV, C-I, D-II

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Q179. Following are the stages of cell division: 4 marks

A. Gap 2 phase
B. Cytokinesis
C. Synthesis phase
D. Karyokinesis
E. Gap 1 phase

Choose the correct sequence of stages from the options given below :

(1) E-C-A-D-B
(2) C-E-D-A-B
(3) E-B-D-A-C
(4) B-E-A-C–D

Q180. Match List I with List II : 4 marks

List I

A. Axoneme
B. Cartwheel pattern
C. Crista
D. Satellite

List II

I. Centriole
II. Cilia and flagella
III. Chromosome
IV. Mitochondria

Choose the correct answer from the options given below :

(1) A-II, B-I, C-IV, D-III
(2) A-IV, B-III, C-II, D-I
(3) A-III, B-II, C-I, D-IV
(4) A-II, B-IV, C-I, D-III

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