MOTION

Question Paper [CODE - 27561]

NEET PATTERN TEST Brahmastra Semi Major Test-05 (New pattern)

13th NEET - Phase 12

KOTA

Date: 23-Feb-2025 | **Duration: 3 Hours** | **Max Marks: 720**

IMPORTANT INSTRUCTIONS

1. The test is of **3 hours** duration and the Test Booklet contains **180** multiple-choice questions (four options with a single correct answer) from **Physics (45 Ques.), Chemistry (45 Ques.) and Biology (90 Ques.). [All Questions are compulsory]**
2. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, one mark will be deducted from the total score. **The maximum marks are 720.**
3. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
4. Blank papers, Clipboards, Log tables, Slide Rule, Calculators, Cellular Phones, Pagers and Electronic Gadgets in any form are **not** allowed to be carried inside the examination hall.

GENERAL INSTRCUTION FOR FILLING THE OMR

1. Use **Blue/Black Ball Point Pen only** for marking responses on Answer Sheet (OMR sheet).
2. Indicate the correct answer for each question by filling appropriate bubble in your OMR answer sheet.
3. While filling the bubbles please be careful about Question Number

महत्वपूर्ण निर्देश

1. परीक्षा अवधि **3 घंटा** है एवं परीक्षा पुस्तिका में **भौतिकी, (45 प्रश्न), रसायनशास्त्र (45 प्रश्न)** एवं **जीव विज्ञान (45 प्रश्न)** विषयों से कुल **180** बहुविकल्पीय प्रश्न हैं (4 विकल्पों में से एक सही उत्तर है)। **[सभी प्रश्न अनिवार्य है]**
2. प्रत्येक प्रश्न **4** अंक का है। प्रत्येक सही उत्तर के लिए परीक्षार्थी को **4** अंक दिए जाएगें। प्रत्येक गलत उत्तर के लिए कुल योग में से **एक अंक** घटाया जाएगा। **अधिकतम अंक 720 हैं।**
3. रफ कार्य इस परीक्षा पुस्तिका में केवल निर्धारित स्थान पर ही करें।
4. खाली पेपर, क्लिप बोर्ड, लॉग टेबल, स्लाइड रूल, कैलकुलेटर, सेल्युलर फोन, पेजर और इलेक्ट्रोनिक गैजेट्स को किसी भी रूप में परीक्षा हॉल के अंदर ले जाने की अनुमति **नहीं** है।

OMR भरने के लिए सामान्य निर्देश

1. उत्तर पुस्तिका (OMR पुस्तिका) पर निशान लगाने के लिए **केवल नीले/काले बॉल पॉइंट पेन** का प्रयोग करें।
2. उत्तर अपनी OMR उत्तर पुस्तिका में उपयुक्त गोले भरके प्रत्येक प्रश्न के लिए सही उत्तर अंकित करें।
3. उत्तर गोले भरते समय प्रश्न संख्या पर ध्यान दें।

SYLLABUS

Physics

Physical World,Unit dimension,Error and Measurement,Kinematics,Laws of Motion andFriction,Circular Motion,WPE,Rotational Motion,Gravitation,COM,Oscillations andWaves,Thermometry,Calorimetry,Heat transfer,Thermodynamics,Elasticity,ThermalExpansion,KTG,Mechanical properties of Fluids,Mechanical properties of Solids

Chemistry

Some basic concepts of chemistry,Atomic structure,Redox Reaction,Chemical equilibrium,Ionicequilibrium,thermodynamics & thermochemistry,Classification of elements and periodicity inproperties,Chemical bonding,P Block elements,Nomenclature (IUPAC),GOC I,Isomerism

Biology

The living world,Biological classification,Plant kingdom,Morphology of flowering plant,Anatomy offlowering plant,Cell the unit of life,Cell cycle and cell division,Photosynthesis in higherplants,Respiration in plants,plant growth & development,Animal Kingdom,Structural organizationin animals (Frog,Cockroach),Excretory products and their elimination,Breathing and exchange ofgases,Body fluids and circulation,Biomolecules,Locomotion & Movement,Neural control andcoordination,Chemical coordination and interigation

[PHYSICS]

1. A rod of length $2\,\mathrm{m}$ has uniform crosssection but linear mass density varies as $\lambda = (1+x)\,\mathrm{kg/m}$. It is placed as shown in figure. The moment of inertia of rod about an axis passing through O and perpendicular to rod is (x is in metre)

(1) $\frac{5}{3}\ \mathrm{kg\ m^2}$

(2) $\frac{20}{3}\ \mathrm{kg\ m^2}$

(3) $\frac{3}{5}\ \mathrm{kg\ m^2}$

(4) $\frac{8}{3}\ \mathrm{kg\ m^2}$

2. A total of 48 J heat is given to one mole of helium kept in a cylinder. The temperature of helium increases by 2°C. The work done by the gas is : (Given : R = 8.31 J k^{-1} mol^{-1})

(1) 48 J

(2) 23.1 J

(3) 24.9 J

(4) 72.9 J

3. In a particular system, the unit of length,mass and time are choosen to be 10cm, 10g and 0.1s respectively. The unit of force in this system will be equivalent to -

(1) 1/10 N

(2) 1 N

(3) 10 N

(4) 100 N

4. If the position vector of a particle is $\hat{r} = \left(3\hat{i} + 4\hat{j}\right)$ metre and its angular velocity is $\vec{\omega} = \left(\hat{j} + 2\hat{k}\right)$ rad/sec then its linear velocity is (in m/s) -

(1) $-\left(8\hat{i} - 6\hat{j} + 3\hat{k}\right)$

(2) $\left(3\hat{i} + 6\hat{j} + 8\hat{k}\right)$

(3) $-\left(3\hat{i} + 6\hat{j} + 6\hat{k}\right)$

(4) $\left(6\hat{i} + 8\hat{j} + 3\hat{k}\right)$

5. **Assertion :** Strain is a unitless quantity.
Reason : Strain is equivalent to force.

(1) Both (Assertion) and (Reason) are correct and (Reason) is not the correct explanation of (Assertion).

(2) (Assertion) is correct but (Reason) is not correct.

(3) (Assertion) is not correct but (Reason) is correct.

(4) Both (Assertion) and (Reason) are correct and (Reason) is the correct explanation of (Assertion).

6. A monatomic gas at pressure P_1 and volume V_1 is compressed adiabatically to $\frac{1}{8}$th of its original volume. What is the final pressure of the gas

(1) $64P_1$

(2) P_1

(3) $16P_1$

(4) $32P_1$

7. A body of mass $22.42\ \mathrm{gm}$ and has a volume $4.7\ \mathrm{cc}$. The possible error in the measurement of mass is 0.01 and in volume is 0.1 respectively. The maximum error in density is -

(1) 20%

(2) 0.02%

(3) 0.2%

(4) 2.2%

8. A ball is dropped from height H on to a horizontal surface. If the coefficient of restitution is e then the total time after which it comes to rest is

(1) $\sqrt{\frac{2H}{g}}\left(\frac{1-e}{1+e}\right)$

(2) $\sqrt{\frac{2H}{g}}\left(\frac{1+e}{1-e}\right)$

(3) $\sqrt{\frac{2H}{g}}\left(\frac{1+e^2}{1-e^2}\right)$

(4) $\sqrt{\frac{2H}{g}}\left(\frac{1-e^2}{1+e^2}\right)$

9. **Assertion :** Stress is the internal force per unit area of a body.
Reason : Rubber is more elastic than steel.

(1) Both (Assertion) and (Reason) are correct and (Reason) is not the correct explanation of (Assertion).

(2) (Assertion) is correct but (Reason) is not correct.

(3) (Assertion) is not correct but (Reason) is correct.

(4) Both (Assertion) and (Reason) are correct and (Reason) is the correct explanation of (Assertion).

10. A gas at 10^5 Pascal pressure and $27^\circ C$ temperature is compressed adiabatically to $\frac{1}{8}$th of its initial volume. The final temperature of gas becomes $927^\circ C$. The value of γ for the gas will be

(1) $\frac{3}{2}$

(2) $\frac{4}{3}$

(3) $\frac{5}{4}$

(4) $\frac{5}{3}$

11. A student measured the diameter of a wire using a screw gauge with least count 0.001cm and listed the measurements. The correct measurement is-

(1) 5.3 cm

(2) 5.32 cm

(3) 5.320 cm

(4) 5.3200 cm

12. If the external forces acting on a system have zero resultant, the centre of mass

(1) must not move

(2) must not accelerate

(3) may accelerate

(4) None of these

13. An airplane wing generates lift due to:

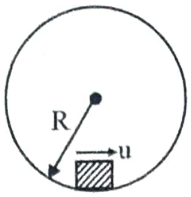
(1) Higher pressure above the wing

(2) Lower velocity above the wing

(3) Lower pressure above the wing

(4) Equal pressure on both sides of the wing

14. A particle is given an initial speed u inside a smooth spherical shell of radius R = 1 m that it is just able to complete the circle. Acceleration of the particle when its velocity is vertical is -



(1) $g\sqrt{10}$

(2) g

(3) $g\sqrt{2}$

(4) 3g

15. In the equation $X = A\sin(\omega t + \pi/4)$ match the following :

	List-I		List-II
(P)	Kinetic energy at $x = A/2$	(1)	Zero
(Q)	Potential energy at $x = A/2$	(2)	Maximum
(R)	Kinetic energy at $x = A$	(3)	$\frac{1}{4}$ times the maximum value
(S)	Potential energy at $x = A$	(4)	$\frac{3}{4}$ times the maximum value

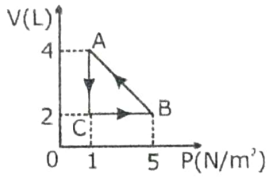
(1) $P \to 1; Q \to 2; R \to 3; S \to 4$

(2) $P \to 4; Q \to 3; R \to 1; S \to 2$

(3) $P \to 2; Q \to 4; R \to 2; S \to 3$

(4) $P \to 3; Q \to 1; R \to 4; S \to 1$

16. Calculate the work done for $B \to A$, :-



(1) 6×10^{-3}J

(2) 12×10^{-3}

(3) 3×10^{-3}J

(4) 4×10^{-3}J

17. The speed of efflux (Torricelli's law) from an orifice in a tank filled with liquid is:

(1) $\sqrt{2gH}$

(2) $\sqrt{gH}$

(3) $\sqrt{3gH}$

(4) $\sqrt{gH/2}$

18. A pump ejects 12000 kg of water at speed of 4 m/s in 40 second. Find the average rate at which the pump is working

(1) 0.24 kW

(2) 2.4 W

(3) 2.4 kW

(4) 24 W

19. From the ceiling of a train a pendulum of length 'ℓ' is suspended. The train is moving with an acceleration a_0 on horizontal surface. What must be the period of oscillation of pendulum ?

(1) $T = 2\pi\sqrt{\left(\frac{\ell}{g}\right)}$

(2) $T = 2\pi\sqrt{\left(\frac{\ell}{\sqrt{a_0^2+g^2}}\right)}$

(3) $T = \pi\sqrt{\left(\frac{\ell}{\sqrt{a_0^2+g^2}}\right)}$

(4) $T = 2\pi\sqrt{\left(\frac{\ell}{\sqrt{a_0^2-g^2}}\right)}$

20. The temperature of a gas is -78°C and the average translational kinetic energy of its molecules is K. The temperature at which the average translational kinetic energy of the molecules of the same gas becomes 2K is

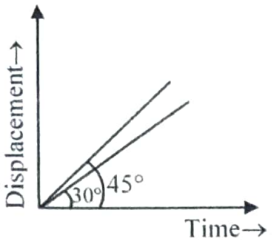
(1) -39°C

(2) 127°C

(3) -78°C

(4) 117°C

21. The displacement-time graphs of two moving particles make angles of 30° and 45° with the time axis. The ratio of their velocities is :



(1) 1 : 1

(2) 1 : 2

(3) 1 : $\sqrt{3}$

(4) $\sqrt{3}$: 1

22. The pressure of given mass of a gas in a thermodynamic system is changed in such a way that 20 joule of heat is released from the gas and 8 joule of work is done on the gas. If the initial internal energy of the gas was 30 joule then final internal energy will be

(1) 2 Joule

(2) 42 Joule

(3) 18 Joule

(4) 58 Joule

23. The ratio of angular speed of hours hand and seconds hand of a clock is-

(1) 1 : 1

(2) 1 : 60

(3) 1 : 720

(4) 3600 : 1

24. In a container neon gas has two isotopes Ne^{20} and Ne^{22}. The ratio of rms velocities of Ne^{20} and Ne^{22} is:

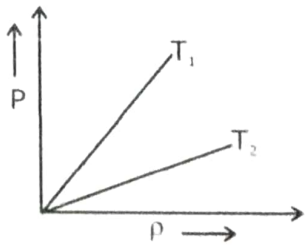
(1) $\sqrt{11} : \sqrt{10}$

(2) $\sqrt{10} : \sqrt{11}$

(3) 10 : 11

(4) 11 : 10

25. Figure shows graphs of pressure versus density for an ideal gas at two temperatures T_1 and T_2



(1) $T_1 > T_2$

(2) $T_1 = T_2$

(3) $T_1 < T_2$

(4) None of these

26. A body is moving in a circular path with acceleration a. If its velocity gets doubled, find the ratio of acceleration after and before the change :

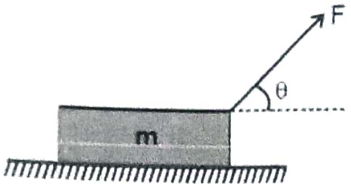
(1) 1 : 4

(2) 4: 1

(3) 2 : 1

(4) 1 : 2

27. A wooden block of mass 'm' resting on a rough horizontal table (coefficient of friction $= \mu$) is pulled by a force F as shown in figure. The acceleration of the block moving horizontally is



(1) $\frac{F\cos\theta}{m}$

(2) $\frac{\mu F\sin\theta}{M}$

(3) $\frac{F}{m}(\cos\theta + \mu\sin\theta) - \mu g$

(4) None

28. A cylinder contains 10 kg of gas at pressure of 10^7 N/m^2. The quantity of gas taken out of the cylinder, if final pressure is 2.5×10^6 N/m^2, will be (temperature of gas is constant) -

(1) 15.2 kg

(2) 3.7 kg

(3) zero

(4) 7.5 kg

29. A block of mass 2 kg is placed on the floor. The coefficient of static friction is 0.4. If a force of 2.8 N is applied on the block parallel to floor, the force of friction between the block and floor (taking g = 10 m/s^2) is :

(1) 2.8 N

(2) 8 N

(3) 2 N

(4) Zero

30. A cube of metal is subjected to a hydrostatic pressure of 4 GPa. The percentage change in the length of the side of the cube is close to : (Given bulk modulus of metal, B = 8×10^{10} Pa)

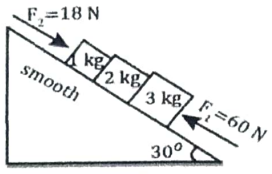
(1) 0.6

(2) 20

(3) 1.67

(4) 5

31. In the figure (g = 10 m/s^2). Acceleration of 2 kg block is :



(1) 2 m/sec^2

(2) 4 m/sec^2

(3) 6 m/sec^2

(4) 8 m/sec^2

32. Two soap bubbles of different radii are formed at the two ends of a hollow tube. Initially, a valve in the middle of the tube separates the air in the two halves of the tube. When the valve is opened, then

(1) air flows from the bigger bubble to the smaller bubble till the sizes become equal

(2) air flows from bigger bubble to the smaller bubble till their sizes are interchanged

(3) air flows from the smaller bubble to the larger bubble

(4) there is no flow of air

33. The equation of a plane progressive wave is given by y = 0.09sin8 $\pi\left(t - \frac{x}{20}\right)$ where x and y are in m and t is in second, then choose the incorrect statement.

(1) Amplitude of wave is 0.09 m

(2) Wavelength is 5 m

(3) Wave speed is 20 m/s

(4) Maximum possible speed of particles of wave is 3.3 m/s

34. Surface tension of a soap bubble is T. Work done in increasing its radius from r to 2r is

(1) $8\pi r^2 T$

(2) $24\pi r^2 T$

(3) $32\pi r^2 T$

(4) $12\pi r^2 T$

35. The frequency of the first overtone of a closed organ pipe is equal to the frequency of third harmonic of open organ pipe then ratio of lengths of both pipes :-

(1) 1 : 2

(2) 4 : 1

(3) 8 : 3

(4) 3 : 8

36. Calculate the acceleration due to gravity at the surface of Mars if its diameter is half of earth's diameter and mass $\frac{1}{8}$ that of earth. The acceleration due to gravity on earth is 9.8 m/s^2.

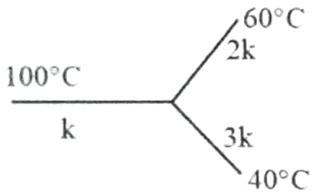
(1) 9.8 m/s^2

(2) 4.9 m/s^2

(3) 4.28 m/s^2

(4) 3.48 m/s^2

37. Three rods of equal lengths and equal cross sectional area are connected as shown, with their coefficient of thermal conductivity and temperatures at their terminals. The temperature at the junction is



(1) 56.7°C

(2) 53.3°C

(3) 47.5°C

(4) -43.2°C

38. A block of mass 10 kg placed on rough horizontal surface having coefficient of friction $\mu = 0.5$, if a horizontal force of 100 N acting on it then acceleration of the block will be :-

(1) 10 m/s^2

(2) 5 m/s^2

(3) 15 m/s^2

(4) 0.5 m/s^2

39. The displacement of a particle, moving in a straight line, is given by $s = 2t^2 + 2t + 4$ where S is in metres and t in seconds. The acceleration of the particle is

(1) 2 m/s^2

(2) 4 m/s^2

(3) 6 m/s^2

(4) 8 m/s^2

40. A ball falling in a lake of depth 200 m shows a decrease of 0.1% in its volume at the bottom. The bulk modulus of elasticity of the material of the ball is (Take $g = 10\ ms^{-2}$). (density of water = 10^3 kg/m^3)

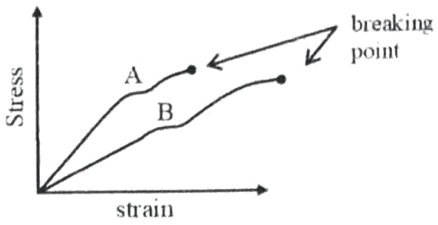
(1) $10^9\ Nm^2$

(2) $2 \times 10^9\ Nm^{-2}$

(3) $3 \times 10^9\ Nm^{-2}$

(4) $4 \times 10^9\ Nm^{-2}$

41. Select the correct statement on the basis of the given graph :



(1) Young's modulus of A is greater but it is less ductile

(2) Young's modulus of A is greater and it is more ductile

(3) Young's modulus of A is less and it is less ductile

(4) Young's modulus of A is less but it is more ductile

42. A boat takes time t_1 hour to cover certain distance between two spots in a river in downstream and t_2 hours in upstream. The ratio of speed of boat to that of river is

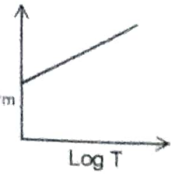
(1) $\frac{t_1}{t_2}$

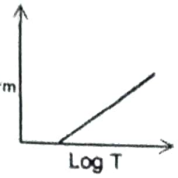
(2) $\frac{t_1+t_2}{t_2-t_1}$

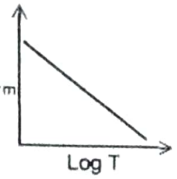
(3) $\frac{t_2}{t_1} - \frac{t_1}{t_2}$

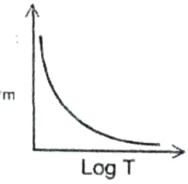
(4) $\frac{t_2-t_1}{t_1+t_2}$

43. Wien's displacement law is shown by the following relation $\lambda_m T = b$ then the curve drawn between log T and log λ_m will be –

(1) 

(2) 

(3) 

(4) 

44. A man standing on a road holds his umbrella at 30° with the vertical (backward) to keep the rain away. He throws the umbrella and starts running at 10 km/h. He finds that rain drops are hitting his head vertically, the speed of raindrop with respect to the road will be-

(1) 10 km/h

(2) 20 km/h

(3) 30 km/h

(4) 40 km/h

45. The density of a substance decreases from 10×10^{-3} kg m^{-3} to 7×10^{-3} kg m^{-3} on heating it from $0^{\circ}C$ to $100^{\circ}C$. The coefficient of linear expansion of substance, is nearly

(1) $4 \times 10^{-3}\ (^{\circ}C)^{-1}$

(2) $3 \times 10^{-3}\ (^{\circ}C)^{-1}$

(3) $10^{-3}\ (^{\circ}C)^{-1}$

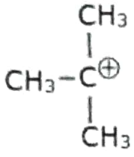
(4) $2 \times 10^{-3}\ (^{\circ}C)^{-1}$

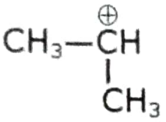
[CHEMISTRY]

46. Which amongst the following is the most stable carbocation :-

(1) $CH_3\overset{\oplus}{C}H_2$

(2) $\overset{\oplus}{C}H_3$

(3) 

(4) 

47. Which of the following contains maximum number of atoms ?

(1) 4 g of H_2

(2) 16 g of O_2

(3) 28 g of N_2

(4) 18 g of H_2O

48. Number of lone pair on central atom $XeOF_4$ is/are

(1) 0

(2) 1

(3) 2

(4) 3

49. How many moles of $Zn(FeS_2)$ can be made from 2 mole zinc, 3 mole iron and 5 mole sulphur?

(1) 2 mole

(2) 3 mole

(3) 4 mole

(4) 5 mole

50. The element having lowest ionisation energy among the following is:

(1) $1s^2, 2s^2\ 2p^3$

(2) $1s^2, 2s^2\ 2p^6, 3s^1$

(3) $1s^2, 2s^2\ 2p^6$

(4) $1s^2, 2s^2\ 2p^5$

51. Find mass of 80% pure $CaCO_3$ which produces 11.2 lit of CO_2 at NTP.

(1) 42.5 gm

(2) 50 gm

(3) 62.5 gm

(4) 72.5 gm

52. Bond energies in NO, NO^+ and NO^- are such as

(1) $NO^- > NO > NO^+$

(2) $NO > NO^- > NO^+$

(3) $NO^+ > NO > NO^-$

(4) $NO^+ > NO^- > NO$

53. Which of the following can not exist in syn-anti /Geometrical isomerism form ?

(1) Ph – N = N – OH

(2) Ph – N = N – Ph

(3) Ph – CH = N – OH

(4) Ph_2C = N – OH

54. Two type of bond lenght are present in which of the following molecules? (X=S, Xe, C)

(1) SF_4

(2) XeF_4

(3) SF_6

(4) CF_4

55. The ionization potential of a hydrogen atom is −13.6 eV. What will be the energy of the atom corresponding to n=2

(1) −3.4 eV

(2) −6.8 eV

(3) −1.7 eV

(4) − 2.7 eV

56. Electronic transition in H atom would emit light in which region when e^- jumps from fourth orbit to second orbit :

(1) UV

(2) Visible

(3) IR

(4) No spectral region can be defined

57. If the ionic radii of K^+ and F^- are approx. 134 pm each, then the expected values of atomic radii of K and F should be respectively :

(1) 134 and 134 pm

(2) 231 and 64 pm

(3) 64 pm and 231 pm

(4) 231 and 134 pm

58. A sub-shell l = 2 can take how many electrons

(1) 3

(2) 10

(3) 5

(4) 6

59. Which one of the following have linear structure?

(I) I_3^- (II) NO_2^-

(III) I_3^+ (IV) SO_2

(V) N_3^-

(1) I, II and III

(2) I and V

(3) II, III and IV

(4) All of these

60. One mole of N_2H_4 loses 14 mole of electrons to form a new compound Y. Assuming that all nitrogen appear in the new compound, what is the oxidation number of nitrogen in Y ?

(1) $+3$

(2) -3

(3) -1

(4) $+5$

61. In $TeCl_4$, the central atom tellurium involves

(1) sp^3 hybridisation

(2) sp^3d hybridization

(3) sp^3d^2 hybridisation

(4) dsp^2 hybridisation

62. The oxidation number of N in NH_4Cl is

(1) +5

(2) +3

(3) −5

(4) −3

63. Which of the following statement is wrong?

(1) Nitrogen cannot form dπ - pπ bond.

(2) Single N–N bond is weaker than the single P–P bond,

(3) N_2O_4 is a diamagnetic molecule

(4) The stability of hydrides increases from NH_3 to BiH_3 in group 15 of the periodic table

64. The equilibrium constant at 298 K for a reaction $A+B \rightleftharpoons C+D$ is 100. If the initial concentration of all the four species were 1 M each, then equilibrium concentration of D (in mol L^{-1}) will be :

(1) 1.818

(2) 1.182

(3) 0.182

(4) 0.818

65. For a reaction, $N_2+3H_2 \rightleftharpoons 2NH_3$, the value of K_c would depend upon

(1) Initial concentration of the reactions

(2) Pressure

(3) Temperature

(4) All of the above

66. The correct ionic radii order is:

(1) $N^{3-} > O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$

(2) $N^{3-} > Na^+ > O^{2-} > F^- > Mg^{2+} > Al^{3+}$

(3) $Na^+ > O^{2-} > N^{3-} > F^- > Mg^{2+} > Al^{3+}$

(4) $O^{2-} > F^- > Na^+ > N^{3-} > Mg^{2+} > Al^{3+}$

67. For the reaction $CO_3(s) \rightleftharpoons O(s) + CO_2(g)$, K_p = 1.642 atm at 727°C. If 4 moles of CO_3 (s) was put into a 50 litre container and heated to 727°C. What mole percent of the CO_3 remains unreacted at equilibrium?

(1) 20

(2) 25

(3) 50

(4) 75

68. The radii of F, F^-, O and O^{2-} are in the order of:

(1) $O^{2-} > F^- > F > O$

(2) $F^- > O^{2-} > F > O$

(3) $O^{2-} > O > F^- > F$

(4) $O^{2-} > F^- > O > F$

69. How many H^+ ions are present in 1 ml of a solution whose pH is 13 ?

(1) 10^{-16}

(2) 6.022×10^{13}

(3) 6.022×10^{7}

(4) 6.022×10^{23}

70. A weak acid HX has the dissociation constant 1×10^{-5} M. It forms a salt NaX on reaction with alkali. The degree of hydrolysis of 0.1 M solution of NaX is -

(1) 0.0001%

(2) 0.01%

(3) 0.1%

(4) 0.15%

71. A certain weak acid has a dissociation constant of 1.0×10^{-4}. The equilibrium constant for its reaction with a strong base is

(1) 1.0×10^{-4}

(2) 1.0×10^{-10}

(3) 1.0×10^{10}

(4) 1.0×10^{14}

72. A reversible adiabatic expansion is an

(1) Isothermal process

(2) Isobaric process

(3) Isentropic process

(4) Isochoric process

73. Calculate the work done by 0.1 mole of a gas at 27°C to double its volume at constant pressure (in isobaric process) (R = 2 cal mol^{-1} K^{-1})

(1) –60 cal

(2) +70 cal

(3) –40 cal

(4) +56 cal

74. The heat of formation of CO_2 is –95 kcal. The amount of carbon which on burning will evolve 1000 kcal is

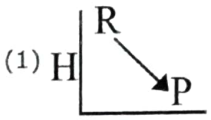
(1) 12.63 g

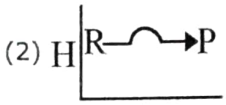
(2) 17.95 g

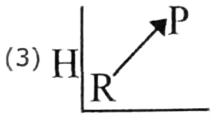
(3) 126.3 g

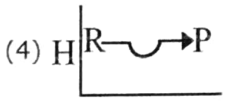
(4) 179.5 g

75. Which plot represents for an exothermic reaction

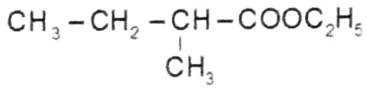
(1) 

(2) 

(3) 

(4) 

76. The IUPAC name of



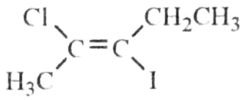
(1) 2–Methyl–ethyl propanoate

(2) Ethyl 3–ethyl acetate

(3) Ethyl 2–methyl butanoate

(4) 2–Methyl butanoic acid ethylester

77. IUPAC name of the compounds



(1) E-3 iodo- 4 chloro-3-pentene

(2) Z-2-chloro-3-iodo-2-pentene

(3) E-2-chloro-3-iodo-2-pentene

(4) Z-3-iodo-4-chloro-3-pentene

78. Which of the following are isoelectronic and isostructural?

NO_3^-, CO_3^{2-}, ClO_3^-, SO_3^{2-}

(1) NO_3^-, CO_3^{2-}

(2) SO_3^{2-}, NO_3^-

(3) ClO_3^-, CO_3^{2-}

(4) CO_3^{2-}, SO_3^{2-}

79. Which one of the following orders is not in according with the property stated against it?

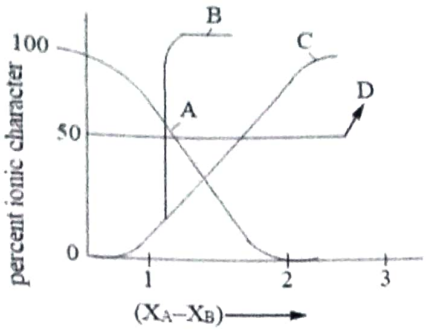
(1) $F_2 > Cl_2 > Br_2 > I_2$; Oxidising power

(2) HI > HBr > HCl > HF ; Acidic property in water

(3) $F_2 > Cl_2 > Br_2 > I_2$; Electronegativity

(4) $F_2 > Cl_2 > Br_2 > I_2$; Bond dissociation energy

80. For AB bond if per cent ionic character is plotted against electronegativity difference ($X_A - X_B$), the shape of the curve would look like



The correct curve is

(1) A

(2) B

(3) C

(4) D

81. Chlorine atom, in its third excited state, reacts with fluorine to form a compound X. The formula and shape of X are

(1) ClF_5, Squre pyramidal

(2) ClF_4, tetrahedral

(3) ClF_4, pentagonal bipyramidal

(4) ClF_7, pentagonal bipyramidal

82. The correct order of second ionisation potential of carbon, nitrogen, oxygen and fluorine is:

(1) C > N > O > F

(2) O > N > F > C

(3) O > F > N > C

(4) F > O > N > C

83. **Statement 1 :** GeO, SnO and PbO are more basic and covalent than the corresponding GeO_2, SnO_2 and PbO_2

Statement 2 : GeO is acidic while SnO And PbO are amphoteric

(1) Statement 1 is True, Statement 2 is True, Statement 2 is correct explanation for Statement 1

(2) Statement 1 is True, Statement 2 is True, Statement 2 is not correct explanation for Statement 1

(3) Statement 1 is True, Statement 2 is False

(4) Statement 1 is False, Statement 2 is True

84. The number of gram molecules of oxygen in 6.023×10^{24} CO molecules is :-

(1) 10 gm molecules

(2) 5 gm molecules

(3) 1 gm molecule

(4) 0.5 gm molecules

85. The reaction $2H_2O(\ell) \rightarrow 4H^+(aq) + O_2(g) + 4e^-$ is :-

(1) An oxidation reaction

(2) A reduction reaction

(3) A redox reaction

(4) A hydrolysis reaction

86. In the reaction

$$MnO_4^- + SO_3^{2-} + H^+ \rightarrow SO_4^{2-} + Mn^{2+} + H_2O$$

(1) MnO_4^- and H^+ both are reduced

(2) MnO_4^- is reduced and H^+ is oxidised

(3) MnO_4^- is reduced and SO_3^{2-} is oxidised

(4) MnO_4^- is oxidised and SO_3^{2-} is reduced

87. The series limit for Balmer series of H-spectra is

(1) 3800 A°

(2) 4200 A°

(3) 3647 A°

(4) 4000 A°

88. Following gaseous reaction is undergoing in a vessel

$C_2H_4 + H_2 \rightleftharpoons C_2H_6$; ΔH = –32.7 Kcal

Which will increase the equilibrium concentration of C_2H_6

(1) Increase of temperature

(2) By reducing temperature

(3) By removing some hydrogen

(4) By decreasing the pressure

89. A particalular saturated solution of silver chromate has $[Ag^+] = 5.0 \times 10^{-5}$M and $[CrO_4^{-2}] = 4.4 \times 10^{-4}$M. What is value of K_{sp} of silver chromate ?

(1) 1.1×10^{-12}

(2) 3.1×10^{-10}

(3) 1.1×10

(4) 1.1×10^{-21}

90. "Heat cannot be itself flow from a body at lower temperature to a body at higher temperature" is a statement or consequence of –

(1) Conservation of momentum

(2) Conservation of mass

(3) First law of thermodynamics

(4) Second law of thermodynamics.

[BIOLOGY]

91. The lateral roots arise from primary root is-

(1) Primary root

(2) Secondary root

(3) Tertiary root

(4) (1) & (2) both

92. Separation of leaf pigments occurs through:-

(1) Spooling

(2) Photooxidation

(3) Paper chromatography

(4) Keeping in intense light

93. Which of following stage corresponds to the interval between mitosis & initiation of DNA replication?

(1) S-phase

(2) G2-phase

(3) M-phase

(4) G1-phase

94. Match the following and choose the correct option.

Column - I		Column - II	
(a)	Family	(i)	Tuberosum
(b)	Kingdom	(ii)	Polymoniales
(c)	Order	(iii)	Solanum
(d)	Species	(iv)	Plantae
(e)	Genus	(v)	Solanaceae

(1) a-iv, b-iii, c-v, d-ii, e-i

(2) a-v, b-iv, c-ii, d-i, e-iii

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

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

95. Some plants of arid regions modify their stems into flattened structure, as in -

(1) Euphorbia

(2) Opuntia

(3) Bongainvillea

(4) Both (1) & (2)

96. Match the following columns-

	Column I		Column II
(A)	Light reaction	1	Membranous system
(B)	Dark reaction	2	NADPH and ATP
		3	Starch

Codes :

(1) A–1, 2 B–3

(2) A–3 B–1, 2

(3) A–1, 3 B–2

(4) A–2 B–1, 3

97. Find out the correct sequence of C_3 Cycle steps:-

(1) Carboxylation → Reduction→ Regeneration

(2) Reduction→ Regeneration→ Carboxylation

(3) Regeneration→ Carboxylation→ Reduction

(4) Reduction→ Carboxylation→ Regeneration

98. Mitosis is significant for
(a) Growth
(b) Healing and regeneration
(c) Repair
(d) Maintenance of cell size

(1) Only (a) and (b)

(2) Only (c) and (d)

(3) Only (b) and (c)

(4) All (a), (b), (c) and (d)

99. Select the incorrect statement about viroids :

(1) They were discovered by T.O. Diener

(2) They are infectious RNA molecule

(3) They are known to cause potato spindle tuber disease in plants.

(4) They are larger than virus.

100. The number of oxygen atoms utilized during aerobic oxidation of one molecule of pyruvate is:

(1) 12

(2) 6

(3) 5

(4) 3

101. Plastids are absent in :-

(1) Parenchyma

(2) Collenchyma

(3) Sclerenchyma

(4) All of the above

102. Diakinesis marked by:-

(1) Terminalisation of chiasmata

(2) Chromosomes are fully condensed

(3) Meiotic spindle assembled

(4) All of these

103. Virus is a/an:-

(1) Obligate parasite

(2) Facultative parasite

(3) Obligate saprophyte

(4) Facultative saprophyte

104. Gritty flesh of guava is due to the presence of:

(1) Fibres

(2) Sclereids

(3) Crystals

(4) Seeds

105. Match the following regarding respiration:-

1. Amino acids	i Pyruvic acid
2. Fatty acid	ii Dihyroxy Acetone Phosphate
3. Glycerol	iii Acetyl CoA

(1) 1-i, 2-iii, 3-ii

(2) 1-ii, 2-i, 3-iii

(3) 1-iii, 2-i, 3-ii

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

106. Read the following statements carefully w.r.t gymnosperms :
A. Thick cuticle and sunken stomata present in the leaves of gymnosperms help to reduce water loss.
B. All gymnosperms are heterosporous.
C. Sequoia is one of the tallest gymnosperm.
D. In Pinus, the male and female gametophytes have free-living existence.
How many of the above given statements are correct?

(1) Two

(2) Three

(3) Four

(4) One

107. Fixation of one molecule of CO_2 through Calvin cycle requires:-

(1) 3 ATP and 3 $NADPH_2$ molecules

(2) 3 ATP and 2 $NADPH_2$ molecules

(3) 2 ATP and 1 $NADPH_2$ molecules

(4) 1 ATP and 2 $NADPH_2$ molecules

108. Match the following columns and choose the correct option.

	Column I		Column II
a.	Leptotene	(i)	Terminalisation of chiasmata
b.	Diplotene	(ii)	Chiasmata formation
c.	Pachytene	(iii)	Use of recombinase enzyme
d.	Diakinesis	(iv)	Compaction of chromosome

(1) a(ii), b(iii), c(iv), d(i)

(2) a(iv), b(ii), c(iii), d(i)

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

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

109. Which of the following structure is not present in Cycas?

(1) Unbranched stem

(2) Coralloid roots

(3) Pinnate leaves

(4) Female cone

110. Gibberellin is obtained from a

(1) Fungus Gibberella

(2) Alga

(3) Basidiolichen

(4) Bacteria

111. Match list-I with list-II and select correct answer:-

	List-I		List-II
a.	Nucleolus	(i)	Lipid storage
b.	Sphaerosomes	(ii)	Glycolate metabolism
c.	Peroxisomes	(iii)	Transport of macromolecules
d.	Plasmodesmata	(iv)	RNA synthesis

(1)

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

(2)

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

(3)

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

(4)

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

112. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I	Column-II
A. Psilopsida	(i) Psilotum
B. Lycopsida	(ii) Equisetum
C. Sphenopsida	(iii) Selaginella
O. Pteropsida	(iv) Dryopteris

(1) A-(i), B-(ii), C-(iii), D-(iv)

(2) A-(i), B-(iv), C-(iii), D-(ii)

(3) A-(i), B-(iii), C-(ii), D-(iv)

(4) A-(i), B-(iii), C -(iv), D-(ii)

113. Read the following statements & choose the correct option -
(a) PGR can perform complimentary or antagonistic role.
(b) Auxin promote the growth of apical bud by suppressing the growth of lateral bud.
(c) GA promote nutrient mobilisation in platns.
(d) Auxin induces flowering in Pineapple and mango.

(1) a and d are correct

(2) c and d are correct

(3) a and b are correct

(4) a, b, d are correct

114. Match the columns I and II, and choose the correct combination from the options given.

	Column-I		Column-II
(a)	Chlamydomonas	(i)	Moss
(b)	Cycas	(ii)	Pteridophyta
(c)	Selaginella	(iii)	Algae
(d)	Sphagnum	(iv)	Gymnosperm

(1) a-v, b-iv, c-iii, d-i

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

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

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

115. Cousins confirmed the release of a volatile substance _(i)_, from ripened _(ii)_ that hastened the ripening of stored unripe _(iii)_.

(1) (i)-ABA, (ii)-banana, (iii)-orange

(2) (i)-ABA, (ii)-orange, (iii)-banana

(3) (i)-C_2H_4, (ii)-banana, (iii)-orange

(4) (i)- C_2H_4, (ii)- orange, (iii)-banana

116. Which of the following is **true** for algae ?

(1) Atleast one half of the total CO_2 fixation on earth is carried out by algae through photosynthesis

(2) Being photosynthetic they increase the level of dissolved oxygen in their immediate environment

(3) They are of paramount importance as primary producers which form the basis of food cycles of all aquatic animals

(4) All of the above

117. **Assertion (A):** 6 molecules of CO_2 and 12 molecules of $NADPH^+ + H^+$ and 18 ATP are used to form one hexose molecule.
Reason (R): Light reaction results in formation of ATP and $NADPH_2$.

(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 statement but **(R)** is false.

(4) Both **(A)** and **(R)** are false.

118. Which of the following taxonomic category is the lowest in hierarchy?

(1) Species

(2) Class

(3) Division

(4) Kingdom

119. The source of O_2 liberated in photosynthesis in green plants is:-

(1) Photosynthetic enzyme

(2) Carbohydrate present in leaf

(3) Water

(4) Carbon dioxide

120. Order of monkey, gorilla and gibbon is same as that of

(1) Tiger

(2) Man

(3) Cat

(4) Dog

121. Pitcher of pitcher plant is modified –

(1) Leaf

(2) Stem

(3) Root

(4) Fruit

122. The inner layer of the seed coat is called ?

(1) Testa

(2) Hilum

(3) Micropyle

(4) Tegmen

123. Which of the following surface structure of bacteria take part in motility?

(1) Flagella

(2) Pilli

(3) Fimbrae

(4) Cilia

124. Why are vascular bundles closed in monocots?

(1) Xylem and phloem are present

(2) Xylem and phloem occur in separate bundles

(3) Vascular cambium is present between xylem and phloem

(4) Vascular cambium is not present

125. Match the following.

(i)	Plasmodesmata	(a)	Nuclear matrix
(ii)	Kinetochores	(b)	Thick and tough glycocalyx
(iii)	Nucleoplasm	(c)	Disc shaped structure on centromere
(iv)	Capsule	(d)	Cytoplasmic connections

(1) (i) – (d), (ii) – (a), (iii) – (c), (iv) – (b)

(2) (i) – (c), (ii) – (a), (iii) – (d), (iv) – (b)

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

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

126. Increase in girth of plant-

(1) Involves lateral meristem

(2) Involves intercalary meristem

(3) Involves apical meristem

(4) All of these

127. Which of the following statements about plastids is incorrect?

(1) Plastids are pigment containing organelles found in all plant cells and in Euglenoids

(2) Chloroplast is double membrane bound, with the inner chloroplast membrane being more permeable

(3) Chromoplast is responsible for giving colour to fruits and flowers

(4) The number and shape of chloroplasts is variable

128. What is the final end product of TCA cycle from Acetyl Co. A?

(1) 3 NADH + H^+

(2) 1 ATP

(3) 1 FADH2

(4) All of the above

129. Choose the odd one out w.r.t. features of Protists:-

(1) Boundaries of this kingdom is not well-defined

(2) Cell structure is eukaryotic

(3) Show locomotion by cilia or flagella

(4) Largely terrestrial in habitat

130. Match the columns:

	Column - I		**Column - II**
(A)	Oxidative-Decarboxylation	(i)	Succinate to malate
(B)	Substrate level phosphorylation	(ii)	Malate to Oxaloacetate
(C)	$FADH_2$ synthesis	(iii)	Pyruvate to acetylation
(D)	$NADH_2$ synthesis	(iv)	Phosphoenol pyruvate to pyruvate

(1) A–(ii), B–(iii), C–(iv), D–(i)

(2) A–(iii), B–(iv), C–(i), D–(ii)

(3) A–(ii), B–(i), C–(iv), D–(iii)

(4) A–(iii), B–(i), C–(iv), D–(ii)

131. Which of the following is incorrect about chrysophytes?

A. Found in fresh water as well as in marine environments.

B. Have indestructible cell wall embedded with silica.

C. Can float passively on the surface of water.

D. Absence of asexual reproduction.

(1) A, B, C and D

(2) D only

(3) B and C

(4) C and D

132. Read the given statements and select the correct option.
(i) One maize root cell can give rise to more than 17,500 cells.
(ii) A cell in watermelon can increase in size upto 3,50,000 times
(iii) The growth of pollen tube is measured in terms of length.
(iv) The growth of the leaf is measured in term of surface area

(1) Statements (i) and (ii) are correct

(2) Statements (iii) and (iv) are correct

(3) Statements (i) and (iii) are correct

(4) Statements (i), (ii), (iii) and (iv) are correct

133. Which of the following features are correct for algae?
I. Unicellular and non-jacketed sex organs.
III. Well developed and differentiated sporophyte.
III. Presence of embryo.
IV. Presence of motile male gametes.

(1) I and II

(2) I and III

(3) I and IV

(4) III and IV

134. Members of liverworts
A. Grow usually in moist and shady habitats.
B. Have free living sporophyte.
C. Reproduce asexually by fragmentation of protonema.
D. Reproduce asexually by gemmae.

Choose the correct option to complete the sentence.

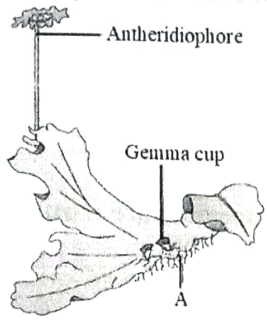
(1) Only (D) is correct

(2) (A) and (D) are correct

(3) (A), (C) and (D) are correct

(4) (A), (B), (C) and (D) are correct

135. Identify the structure labelled as 'A'.



Choose the correct option.
(1) Rhizoids

(2) Mycorrhiza

(3) Adventitious roots

(4) Root hairs

136. Pinctada and Aplysia belongs to :

(1) Largest phylum.

(2) Phylum having spiny bodies animals.

(3) Phylum having animals with water transport system,

(4) Phylum having animals with distinct head, muscular foot and visceral hump.

137. **Assertion :-** At tissue level, first diffusion of CO_2 occurs inside RBC from tissue.
Reason :- RBC's contain a very high concentration of enzyme carbonic anhydrase & minute quantity of same is present in plasma too.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

138. Which one of the following statements is **true**?

(1) Head of humerus bone articulates with acetabulum of pectoral girdle.

(2) Head of humerus bone articulates with glenoid cavity of pectoral girdle.

(3) Head of humerus bone articulates with a cavity called acetabulum of pelvic girdle.

(4) Head of humerus bone articulates with a glenoid cavity of pelvic girdle

139. Consider the following four statements (i -iv) and select the correct option stating which ones are true (T) and which ones are false (F).

(i) Vital capacity is a measure of maximum inspiration after normal expiration.

(ii) During gaseous exchange the gases diffuse from high partial pressure to low partial pressure.

(iii) Carbon dioxide cannot be transported with haemoglobin.

(iv) Earthworm respires through parapodia.

(1) (i)-T, (ii)-F, (iii)-T, (iv)-F

(2) (i)-F, (ii)-F, (iii)-T, (iv)-F

(3) (i)-T, (ii)-T, (iii)-F, (iv)-F

(4) (i)-F, (ii)-T, (iii)-F, (iv)-F

140. Which of the following will excrete by malpighian tubules?

(1) Apis

(2) Ophiura

(3) Balanglossus

(4) Dentalium

141. **Statement-I:** Inflammation of Joints due to accumulation of uric acid crystals is Gout.
Statement-II : Rapid spasms in muscle due to low Ca++ in body fluid is muscular dystrophy.

(1) Both statements **I** and **II** are correct.

(2) Both statements **I** and **II** are incorrect.

(3) Only statement **I** is correct.

(4) Only statement **II** is correct.

142. Female frog can be distinguished from male frog by the absence of-

(1) More mascular hind limbs.

(2) Copulatory pad on first digit of fore limb

(3) Vocal sac

(4) Both (2) & (3)

143. Match column I with column II w.r.t. pO_2 and pCO_2 and choose the correct option.

	Column-I		Column II
a.	pO_2 in tissues	(i)	95 mm Hg
b.	pO_2 in oxygenated blood	(ii)	159 mm Hg
c.	pCO_2 in deoxygenated blood	(iii)	40 mm Hg
d.	pO_2 in atmospheric air	(iv)	104 mm Hg
		(v)	45 mm Hg

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

(2) a-(iii), b-(i), c-(v), d-(ii)

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

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

144. Select the **correct** matching of the type of the joint with the example in human skeletal system-

	Type of Joints	Example
(a)	Cartilaginous joint	Between frontal and parietal
(b)	Pivot joint	Between third and fourth cervical vertebrae
(c)	Hinge joint	Between humerus and pectoral girdle
(d)	Gliding joint	Between carpals

(1) (a)

(2) (b)

(3) (c)

(4) (d)

145. In the given table which animal is **correctly** matched with its taxon group and character.

(1) **Animal**-Balanoglossus, **Taxon**-Hemichordata, **Character**-Circulatory system is absent

(2) **Animal** - Hippocampus, **Taxon** - Chondrichthyes, **Character** - Air bladder is present

(3) **Animal** - Chameleon, **Taxon** - Amphibia, **Character** - Epidermal scales

(4) **Animal** - Canis, **Taxon** - Mammalia, **Character** - Possessing Hair

146. Match the Column I with Column II-

	Column-I		Column-II
A.	Heart failure	I.	Heart muscle is suddenly damaged by an inadequate blood supply
B.	Cardiac arrest	II.	Chest pain due to inadequate O_2 reaching the heart muscles
C.	Heart attack	III.	Atherosclerosis
D.	Coronary Artery Disease (CAD)	IV.	Heart not pumping blood effectively enough to meet the needs of the body
E.	Angina pectoris	V.	Heart stops beating

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

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

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

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

147. **Assertion:** Contraction of a muscle fibre takes place by the sliding of the thin filaments over the thick filaments.
Reason: The central part of thick filament is not overlapped by thin filaments in a resting stage.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

148. Digestive tract with additional chamber crop and gizzard is a feature of:

(1) Columba

(2) Hemidactylus

(3) Calotes

(4) Exocoetus

149. Consider the following four statements **(A-D)** and select the correct option stating which ones are true **(T)** and which ones are false **(F)**?

(A)Erythroblastosis foetalis can be avoided by administering anti-Rh antibodies to the mother immediately after the delivery of the first child.
(B) Glucose, amino acids, lipids etc. are also present in the plasma as they are always in transit in the body.
(C) A special case of Rh incompatibilty has been observed between the Rh +ve blood of a pregnant mother with Rh –ve blood of the foetus.
(D) During coagulation, Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin.

(1) A- **F**, B - **T**, C - **T**, D - **F**

(2) A- **T**, B - **F**, C - **T**, D - **F**

(3) A- **T**, B - **T**, C - **F**, D - **T**

(4) A- **F**, B - **T**, C - **F**, D - **T**

150. Total number of vertebro-sternal ribs are :

(1) 7

(2) 6

(3) 14

(4) 4

151. In the axonal membrane, $Na^+ - K^+$ pumps-

(1) Operate during repolarization and transport $2K^+$ outwards and $3Na^+$ inwards

(2) Operate during depolarization and transport $2Na^+$ outwards and $3K^+$ inwards

(3) Operate during resting state and transport $3Na^+$ outwards and $2K^+$ inwards

(4) Operate during resting state and transport $2Na^+$ outwards and $3K^+$ inwards

152. Given below are two statements :

Statement I : A soft and spongy layer of skin forms a mantle over the visceral hump.

Statement II : The space between the calcareous shell and the mantle is called the mantle cavity.

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 incorrect.

(2) Statement I is correct but statement II is incorrect.

(3) Statement I is incorrect but statement II is correct.

(4) Both statement I and statement II are correct.

153. **Assertion:** The T-wave' represent return of the ventricle from excited to normal state.
Reason: The end of T-wave' marks the end of diastole.

(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 statement but **(R)** is false.

(4) Both **(A)** and **(R)** are false.

154. In which of the following animals is correctly matched with its waste product and excretory structures ?

(1)

Animal	Waste product	Excretory structure
Frog	NH_3	kidney

(2)

Animal	Waste product	Excretory structure
Earthworm	Urea	Protonephridia

(3)

Animal	Waste product	Excretory structure
Cockroach	Uric acid	Malpighian tubules

(4)

Animal	Waste product	Excretory structure
Prawn	NH_3	Nephridia

155. **Assertion** : Prothrombinase enzymes converts prothrombin into active thrombin.
Reason : Thromboplastin react with plasma protein in the presence of Ca^{+2} ions to form prothrombinase.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

156. Association areas of Cerebral hemisphere is?

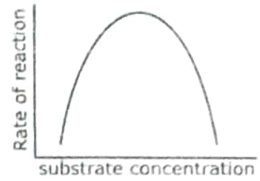
(1) Large regions which are located in cerebral cortex

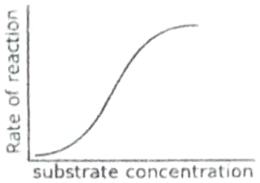
(2) Large regions which are made up of white matter

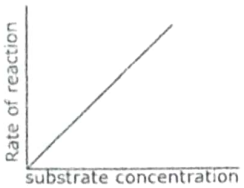
(3) Located in inner part of cerebral hemisphere

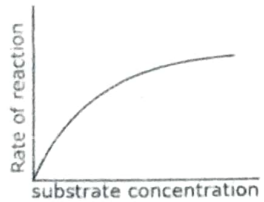
(4) Small regions which are located in cerebral cortex.

157. Which of the following graphs show the relationship between the rate of an enzymatic activity and substrate concentration (S)-

(1) 

(2) 

(3) 

(4) 

158. Which among following is **true** for **Arthropoda**-

(A) Chitinous exoskeleton
(B) Mostly unisexual animals
(C) Open type of blood vascular system
(D) Excretion by nephridia
(E) Metamerically segmented body
(F) Solid, Dorsal single nerve cord

Correct answer is:

(1) A, B, E, F

(2) D, E, C, F

(3) A, B, C, E

(4) A, C, E, F

159. Which one of the following statement is **not** true about the resting potential :-

(1) The Neuron's plasma, membrane is much more permeable to potassium than to sodium

(2) The concentration of sodium is higher inside the cell than outside

(3) The sodium potassium pump play a role in maintaining the resting potential

(4) Inside the cell the concentration of potassium is much higher than the concentration of sodium

160. Match the column-I with Column-II

	Column-I		**Column-II**
(a)	Obelia	(i)	Shows metagenesis
(b)	Aurelia	(ii)	Sessile and cylindrical
(c)	Hydra	(iii)	Medusae form
(d)	Meandrina	(iv)	Brain coral

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

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

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

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

161. Select correct statement regarding enzyme inhibition-

(1) All enzyme inhibitions are allosteric inhibition

(2) All non competitive enzyme inhibitions are reversible type

(3) All competitive inhibitions are reversible type

(4) All allosteric modulations are allosteric inhibitions

162. Damage to thymus gland in a child may lead to-

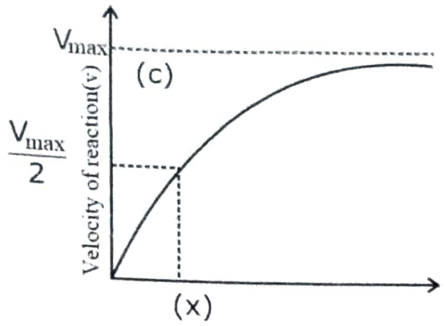
(1) A reduction in haemoglobin content of blood

(2) A reduction in stem cell production

(3) Loss of antibody mediated immunity

(4) Loss of cell mediated immunity

163. In the graphical representation of Michaelis-Menten kinetic **X** represent :-



(1) Concentration of active mass of the substrate at which the rate of reaction is 1/2 V_{max}

(2) Concentration of enzyme-substrate complex at which the rate of reaction is 1/2 V_{max}

(3) Concentration of product at which the rate of reaction is V_{max}

(4) Concentration of enzyme at which the rate of reaction is 1/2 V_{max}

164. Given below are two statements regarding cockroach:

Statement I : Respiratory system consists of network of trachea which open through 10 small holes called spiracles.

Statement II : Blood from sinuses enter heart through ostia and is pumped posteriorly to sinuses again.

(1) Both statement I and statement II are incorrect.

(2) Statement I is correct but statement II is incorrect.

(3) Statement I is incorrect but statement II is correct.

(4) Both statement I and statement II are correct.

165. Match the List-I with List-II

	List-I		List-II
(a)	Insulin	(i)	Stimulates glycogenolysis
(b)	Catecholamines	(ii)	Stimulate lipolysis and proteolysis
(c)	Cortisol	(iii)	Influences menstrual cycle
(d)	Melatonin	(iv)	Stimulates glycogenesis

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

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

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

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

166. Identify incorrect statement in frog :-

(i) Ovary is paired and fuctionally connected to kidneys.

(ii) A mature female lays 1500-2000 ova at a time.

(iii) Fertilization is internal with indirect development.

(iv) Development includes tadpole larval stage.

(1) (i) & (iii) is correct.

(2) (ii) & (iv) is correct.

(3) (ii), (iii) & (iv) is incorrect.

(4) (i), (ii) & (iii) is incorrect.

167. Identify the correct statement regarding amino acid:-

(1) Based on number of amino and carboxyl groups, there are acidic or basic.

(2) If two carboxylic groups and one amino group are present in an amino acid, it is called acidic amino acid.

(3) If one carboxylic and two amino groups are present in an amino acid, it is called basic amino acid.

(4) All of these

168. Match the column I with appropriate in coloum II

	Column -I		Column-II
(a)	Emergency Hormone	(i)	Progesterone
(b)	Life saving Hormone	(ii)	Thyroxine
(c)	Child Birth Hormone	(iii)	Cortisol
(d)	Metabolic Hormone	(iv)	Epinephrine
(e)	Pregnancy Hormone	(v)	Oxytocin

(1) a-(iv), b-(iii), c-(v), d-(ii), e-(i)

(2) a-(ii), b-(iii), c-(v), d-(iv), e-(i)

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

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

169. **Statement-I :** Cyclostomates are endoparasite in some fishes and bear 4 pairs of gill slits.

Statement-II : Chondrichthyes are fresh water animals and their skin is covered with ctenoid scales.

(1) Both statements I and II are incorrect

(2) Statement I correct and II incorrect

(3) Statement I incorrect and II correct

(4) Both statements I and II are correct

170. Which of the following **structure** is present in **6th - 7th** abdominal segment and function as accessory reproductive gland in **cockroach?**

(1) Testis

(2) Ommatidia

(3) Mushroom shaped gland

(4) Pseudopenis

171. Chronic disorder in which alveolar wall are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking :-

(1) Asthma

(2) Emphysema

(3) Bronchitis

(4) Fibrosis

172. Which of the following bone is not a part of **Appendicular skeleton**?

(1) Humerus

(2) Tibia

(3) Scaphoid

(4) Sternum

173. Find the correct descending order of percentage proportion of leucocytes in human blood.

(1) Neutrophils → Basophils → Lymphocytes → Acidophils (Eosinophils) → Monocytes

(2) Monocytes → Neutrophils → Lymphocytes → Acidophils →Basophils

(3) Neutrophils → Lymphocytes → Monocytes → Acidophils →Basophils

(4) Lymphocytes → Acidophils → Basophils → Neutrophils → Monocytes

174. Consider the following four statements (a-d) and select the option which includes all the correct ones:
(a) Skeletal muscle fibre is a syncitium as the sarcoplasm contains many nuclei.
(b) In the centre of each "I band" is an elastic fibre called H-line which bisects it.
(c) In the resting state a subunit of Troponin masks the active binding sites for myosin on the actin filaments.
(d) The contraction of a muscle fibre takes place by the sliding of the thick filaments over the thin filaments.

(1) b, c and d

(2) b and d

(3) a and c

(4) a, c and d

175. **Assertion :** Frog show camouflage.
Reason : Frog have ability to change their body colour to hide themselves from enemies.

(1) If both assertion and reason are true and reason is the correct explanation of assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of assertion.

(3) If assertion is true but reason is false.

(4) If both assertion and reason are false.

176. A protein is imagined as a line, the left end represented by the first amino acid and the right end represented by the last amino acid. The first amino acid is also called as _____A_____. The last amino acid is called the _____B_____.

(1) A - N-terminal amino acid, B- C terminal amino acid

(2) A - C terminal amino acid, B- N-terminal amino acid

(3) A - N-terminal amino acid, B- N-terminal amino acid

(4) A - C terminal amino acid, B- C terminal amino acid

177. Column 'I' list the parts of human brain and column 'II' lists the functions. Match the two columns and identify the correct choice from those given-

	Column-I		**Column-II**
(A)	Cerebrum	(i)	Controls the pituitary
(B)	Cerebellum	(ii)	Controls vision and hearing reflexes
(C)	Hypothalamus	(iii)	Controls the rate of heart beat
(D)	Midbrain	(iv)	Seat of intelligence
		(v)	Maintains body posture

(1) A = v, B = iv, C = ii, D = i

(2) A = iv, B = v, C = ii, D = i

(3) A = v, B = iv, C = i, D = ii

(4) A = iv, B = v, C = i, D = ii

178. Identify the **correct** set of statements:

(a) Glomerulus is a tuft of capillaries formed by the afferent arteriole.

(b) Counter current mechanism helps to maintain a concentration gradient in medullary interstitium.

(c) On an average 1100-1200 ml blood is filtered by the kidneys per minute.

(d) GFR in a healthy individual is approx 180 litres per day.

(e) In case of Renal calculi, stone or insoluble mass of crystallised salts (oxalates) formed within the kidney.

(1) a, b, c and d only

(2) a, c and e only

(3) a, b d and e only

(4) All are correct

179. The 24 hour (diurnal) rhythm of our body such as the sleep wake cycle is regulated by the hormone :

(1) Melatonin

(2) Calcitonin

(3) Prolactin

(4) Adrenaline

180. Read the following statement carefully and. find out which one is True and false ?

(a) **Kidney** is situated between the level of last thoracic and third lumbar vertebra close to the dorsal inner wall of the Abdominal Cavity.

(b) Vasa recta is absent or highly reduced in, cortical Nephron.

(c) Inside the kidney there are two zones-an outer medulla and inner cortex.

(d) Uric acid being the most toxic, can be removed with a minimum loss of water.

(1) a-T, b-F, c-T, d-T

(2) a-F, b-T, c-F, d-T

(3) a-T, b-T, c-F, d-F

(4) a-T, b-F, c-T, d-F

MOTION

Answer Key [CODE - 27561]

NEET PATTERN TEST Brahmastra Semi Major Test-05 (New pattern)

12th + 13th NEET [KOTA]

Date:23-Feb-2025 | **Duration: 3 Hours** | **Max Marks:720**

Physics - Section A

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

Chemistry - Section A

46.(3)	47.(1)	48.(2)	49.(1)	50.(2)	51.(3)	52.(3)	53.(4)
54.(1)	55.(1)	56.(2)	57.(2)	58.(2)	59.(2)	60.(4)	61.(2)
62.(4)	63.(4)	64.(1)	65.(3)	66.(1)	67.(4)	68.(4)	69.(3)
70.(2)	71.(3)	72.(3)	73.(1)	74.(3)	75.(1)	76.(3)	77.(3)
78.(1)	79.(4)	80.(3)	81.(4)	82.(3)	83.(4)	84.(2)	85.(1)
86.(3)	87.(3)	88.(2)	89.(1)	90.(4)			

Biology - Section A

91.(2)	92.(3)	93.(4)	94.(2)	95.(2)	96.(1)	97.(1)	98.(4)
99.(4)	100.(3)	101.(3)	102.(4)	103.(1)	104.(2)	105.(1)	106.(2)
107.(2)	108.(2)	109.(4)	110.(1)	111.(3)	112.(3)	113.(3)	114.(4)
115.(4)	116.(4)	117.(2)	118.(1)	119.(3)	120.(2)	121.(1)	122.(4)
123.(1)	124.(4)	125.(3)	126.(1)	127.(2)	128.(4)	129.(4)	130.(2)
131.(2)	132.(4)	133.(3)	134.(2)	135.(1)	136.(4)	137.(2)	138.(2)
139.(4)	140.(1)	141.(3)	142.(4)	143.(2)	144.(4)	145.(4)	146.(1)
147.(2)	148.(1)	149.(3)	150.(3)	151.(3)	152.(2)	153.(3)	154.(3)
155.(2)	156.(1)	157.(4)	158.(3)	159.(2)	160.(3)	161.(3)	162.(4)
163.(1)	164.(1)	165.(1)	166.(4)	167.(4)	168.(1)	169.(1)	170.(3)
171.(2)	172.(4)	173.(3)	174.(3)	175.(1)	176.(1)	177.(4)	178.(4)
179.(1)	180.(3)						