TECHNO INDIA GROUP PUBLIC SCHOOL

NEET

Mock Test - 1 (2025)

Time Allowed: **3 hours**　　　　　　　　　　　　　　　Maximum Marks: **720**
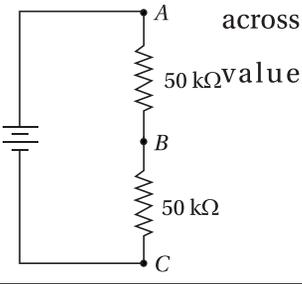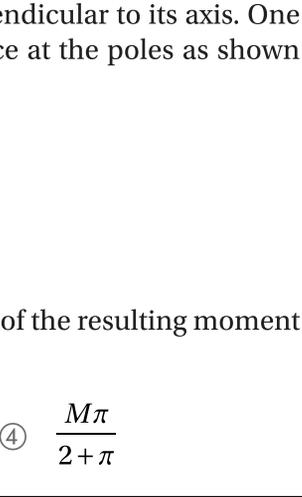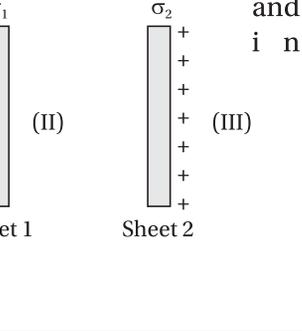
General Instructions:

1. This test will be a 3 hours Test, Maximum Marks 720.

2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt.

3. Each question is of 4 marks.

4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).

5. There will be only one correct choice in the given four choices for each question. For each question <u>4 marks will be</u> awarded for correct choice, <u>1 mark will be deducted</u> for incorrect choice and zero mark will be awarded for unattempted question.

6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.

7. All calculations / written work should be done in the rough sheet provided.

PHYSICS

1.	If the dimensions of a physical quantity are given by $M^a L^b T^c$, then the physical quantity will be ① velocity if $a = 1, b = 0, c = -1$ ② acceleration if $a = 1, b = 1, c = -2$ ③ force if $a = 0, b = -1, c = -2$ ④ pressure if $a = 1, b = -1, c = -2$
2.	A bus is moving with a speed of 10 ms^{-1} on a straight road. A scooterist wishes to overtake the bus in 100 s. If the bus is at a distance of 1 km from the scooterist, with what speed should the scooterist chase the bus? ① 40 ms^{-1} ② 25 ms^{-1} ③ 10 ms^{-1} ④ 20 ms^{-1}
3.	A particle starts its motion from rest under the action of a force (constant). If the distance covered in first 10 seconds is S_1 and that covered in the first 20 seconds is S_2, then ① $S_2 = 3S_1$ ② $S_2 = 4S_1$ ③ $S_2 = S_1$ ④ $S_2 = 2S_1$
4.	A body, under the action of a force $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$, acquires an acceleration of 1 m/s^2. The mass of the body must be ① 10 kg ② 20 kg ③ $10\sqrt{2}$ kg ④ $2\sqrt{10}$ kg
5.	The mass of a lift is 2000 kg. When the tension in the supporting cable is 28000 N, then its acceleration is ① 4 ms^{-2} upwards ② 4 ms^{-2} downwards ③ 14 ms^{-2} upwards ④ 30 ms^{-2} downwards
6.	An engine pumps water continuously through a hose. Water leaves the hose with a velocity v and m is the mass per unit length of the water jet. What is the rate at which kinetic energy is imparted to water? ① mv^3 ② $\dfrac{1}{2}mv^2$ ③ $\dfrac{1}{2}m^2v^2$ ④ $\dfrac{1}{2}mv^3$
7.	An explosion blows a rock into three parts. Two parts go off at right angles to each other. These two are 1 kg first part moving with a velocity of 12 ms^{-1} and 2 kg second part moving with a velocity 8 ms^{-1}. If the third part flies off with a velocity of 4 ms^{-1}, its mass would be ① 7 kg ② 17 kg ③ 3 kg ④ 5 kg
8.	A body of mass 1 kg is thrown upwards with a velocity 20 m/s. It momentarily comes to rest after attaining a height of 18 m. How much energy is lost due to air friction? ($g = 10$ ms^{-2}) ① 30 J ② 40 J ③ 10 J ④ 20 J
9.	A block of mass M is attached to the lower end of a vertical spring. The spring is hung from a ceiling and has force constant value k. The mass is released from rest with the spring initially unstretched. The maximum extension produced in the length of the spring will be ① $2Mg/k$ ② $4Mg/k$ ③ $Mg/2k$ ④ Mg/k
10.	A thin circular ring of mass M and radius R is rotating in a horizontal plane about an axis vertical to its plane with a constant angular velocity ω. If two objects each of mass m be attached gently to the opposite ends of a diameter of the ring, the ring will then rotate with an angular velocity ① $\dfrac{\omega M}{M + 2m}$ ② $\dfrac{\omega(M + 2m)}{M}$ ③ $\dfrac{\omega M}{M + m}$ ④ $\dfrac{\omega(M - 2m)}{M + 2m}$

11.	A circular disc rolls down an inclined plane. The ratio of rotational kinetic energy to total kinetic energy is
	① 1/2 ② 1/3 ③ 2/3 ④ 3/4
12.	The escape velocity of 10 g body from the earth is $11.2\,\text{km s}^{-1}$. Ignoring the air resistance, the escape velocity of 10 kg of the iron ball from the earth will be
	① $0.0012\,\text{km s}^{-1}$ ② $0.112\,\text{km s}^{-1}$ ③ $11.2\,\text{km s}^{-1}$ ④ $0.56\,\text{km s}^{-1}$
13.	A metallic rod of length l and cross-sectional area A is made of a material of Young modulus Y. If the rod is elongated by an amount y, then the work done is proportional to
	① y ② $1/y$ ③ y^2 ④ $1/y^2$
14.	The radius of the rear wheel of bicycles is twice that of the front wheel. When the bicycle is moving, the angular speed of the rear wheel compared to that of the front is
	① greater ② smaller ③ same ④ exact double
15.	A small spherical ball falling through a viscous medium of negligible density has terminal velocity v. Another ball of the same mass but of radius twice that of the earlier falling through the same viscous medium will have terminal velocity
	① v ② $v/4$ ③ $v/2$ ④ $2v$
16.	The excess pressure inside a spherical drop of water is four times that of another drop. Then their respective mas ratio is
	① $1:16$ ② $8:1$ ③ $1:4$ ④ $1:64$
17.	In a capillary rise experiment, the water level rises to a height of 5 cm. If the same capillary tube is placed in water such that only 3 cm of the tube projects outside the water level then
	① water will begin to overflow through the capillary
	② angle of contact decreases
	③ angle of contact increase
	④ the meniscus completely vanishes
18.	A diatomic gas is heated at constant pressure. What fraction of the heat energy is used to increase the internal energy?
	① 3/5 ② 3/7 ③ 5/7 ④ 5/9
19.	The tungsten filament of an electric lamp has a surface area A and a power rating P. If the emissivity of the filament is ε and σ is Stefan's constant, the steady temperature of the filament will be $T =$
	① $\left(\dfrac{P}{A\varepsilon\sigma}\right)^4$ ② $\left(\dfrac{P}{A\varepsilon\sigma}\right)$ ③ $\left(\dfrac{A\varepsilon\sigma}{P}\right)^{1/4}$ ④ $\left(\dfrac{P}{A\varepsilon\sigma}\right)^{1/4}$
20.	For free expansion of an ideal gas under adiabatic condition, its temperature
	① decrease ② increase
	③ does not change ④ depends upon the nature of gas
21.	An electric current passes through a long straight wire. At a distance 5 cm from the wire, the magnetic field is B. The field at 20 cm from the wire, the magnetic field is B'. The field at 20 cm from the wire will be
	① $2B$ ② $B/4$ ③ $B/2$ ④ B

22.	Two similar heater coils separately take 10 minutes to boil a certain amount of water. If both coils are connected in series, time taken to boil the same amount of water will be
	① 15 minutes ② 20 minutes ③ 7.5 minutes ④ 25 minutes
23.	In a potentiometer of one metre length, an unknown emf voltage source is balanced at 60 cm length of potentiometer wire, while a 3 volt battery is balanced at 45 cm length. Then the emf of the unknown voltage source is
	① 3 V ② 2.25 V ③ 4 V ④ 4.5 V
24.	In the circuit shown, a voltmeter of internal resistance R when connected across B and C, reads $\dfrac{100}{3}$ Volts. Neglecting the internal resistance of the cell, the value of R is ① 100 kΩ ② 75 kΩ ③ 50 kΩ ④ 25 kΩ
25.	A magnet of length L and moment M is cut into two halves (A and B) perpendicular to its axis. One piece A is bent into a semi-circle of radius r and is joined to the other piece at the poles as shown in the figure below. Assuming that the magnet is in the form of a thin wire initially, the moment of the resulting moment is given by ① $\dfrac{M}{2\pi}$ ② $\dfrac{M}{\pi}$ ③ $\dfrac{M(2+\pi)}{2\pi}$ ④ $\dfrac{M\pi}{2+\pi}$
26.	Two parallel plane sheets 1 and 2 carry uniform charge densities σ_1 and σ_2 as shown in the figure. The magnitude of the resultant electric field in the region marked 1 is ($\sigma_1 > \sigma_2$) ① $\dfrac{\sigma_1}{2\varepsilon_0}$ ② $\dfrac{\sigma_2}{2\varepsilon_0}$ ③ $\dfrac{\sigma_1+\sigma_2}{2\varepsilon_0}$ ④ $\dfrac{\sigma_1-\sigma_2}{2\varepsilon_0}$
27.	A parallel plate capacitor with air as dielectric is charged to a potential V using a battery. Removing the battery, the charged capacitor is then connected across an identical uncharged parallel plate capacitor filled with wax of dielectric constant k. The common potential of both the capacitors is
	① V volts ② kV volts ③ $(k+1)V$ volts ④ $\dfrac{V}{k+1}$ volt

28.	In Millikan's oil drop experiment, a charged oil of mass 3.2×10^{-14} kg is held stationary between two parallel plates 6 mm apart, by applying a potential difference of 1200 V between them. How many electrons does the oil drop carry? ($g = 10$ ms^{-2})
	① 7 ② 8 ③ 9 ④ 10
29.	A charged particle with velocity $\vec{v} = x\hat{i} + y\hat{j}$ moves in a magnetic field $\vec{B} = y\hat{i} + x\hat{j}$. Magnitude of the force acting on the particle is F. The correct option for F is
	① No force will act on particle if $x = y$ ② Force will act along y axis if $y < x$
	③ Force is proportional to (x^2y^2) if $y > x$ ④ Force is proportional to $(x^2 + y^2)$ if $y > x$
30.	A bar magnet of 10 cm long is kept with its N-pole pointing north. A neutral point is formed at a distance of 15 cm from each pole. Given the horizontal component of earth's field is 0.4 Gauss. The pole strength of the magnet is
	① 9 amps-m ② 6.75 amps-m ③ 27 amps-m ④ 13.5 amps-m
31.	A water molecule has an electric dipole moment 6.4×10^{-30} cm when it is in vapour state. The distance in metre between the centre of positive and negative charge of the molecule is
	① 4×10^{-10} m ② 4×10^{-11} m ③ 4×10^{-12} m ④ 4×10^{-13} m
32.	The gyro magnetic ratio of an electron of charge e and mass m is equal to
	① $\dfrac{e^2}{2m}$ ② $\dfrac{e^2}{2m^2}$ ③ $\dfrac{e}{4m}$ ④ $\dfrac{e}{2m}$
33.	A progressive wave $y = A\sin(kx - \omega t)$ is reflected by a rigid wall at $x = 0$. Then the reflected wave can be represented by
	① $y = A\sin(kx + \omega t)$ ② $y = A\cos(kx + \omega t)$
	③ $y = -A\sin(kx - \omega t)$ ④ $y = -A\sin(kx + \omega t)$
34.	When a wave travels in a medium, the wave equation is given by $y = a\sin 2\pi(bt - cx)$, where a, b and c are constants. The maximum particle velocity will be twice the wave velocity if
	① $c = \dfrac{1}{\pi a}$ ② $c = \pi a$ ③ $b = ac$ ④ $b = \dfrac{1}{ac}$
35.	An observer is approaching a stationary source with a velocity $\dfrac{1}{4}$th of the velocity of sound. Then the ratio of the apparent frequency to actual frequency of source is
	① $4 : 5$ ② $5 : 4$ ③ $2 : 3$ ④ $3 : 2$
36.	The value equal to the velocity of light in vacuum is
	① $\dfrac{\sqrt{\mu_0}}{\varepsilon_0}$ ② $\dfrac{1}{\sqrt{\mu_0\varepsilon_0}}$ ③ $\sqrt{\mu_0\varepsilon_0}$ ④ $\dfrac{\mu_0}{\sqrt{\varepsilon_0}}$
37.	The net magnetic flux through only closed surface, kept in a magnetic field is
	① Zero ② $\dfrac{\mu_0}{4\pi}$ ③ $4\pi\mu_0$ ④ $\dfrac{4\mu_0}{\pi}$
38.	The least angle of deviation for a glass prism is equal to its refracting angle. The refractive index of glass is 1.5. Then the angle of prism is
	① $2\cos^{-1}\left(\dfrac{3}{4}\right)$ ② $\sin^{-1}\left(\dfrac{3}{4}\right)$ ③ $2\sin^{-1}\left(\dfrac{3}{2}\right)$ ④ $\cos^{-1}\left(\dfrac{3}{2}\right)$

39.	The critical angle of the medium with respect to vacuum is 30°. If the velocity of light in vacuum is 3×10^8 m/s⁻¹, the velocity of light in medium is
	① 2×10^8 m/s ② 1.5×10^8 m/s ③ 3×10^8 m/s ④ $\sqrt{2} \times 10^8$ m/s

40.	On introducing a thin film in the path of one of the two interfering beam, the central fringe will shift by one fringe width. If $\mu = 1.5$, the thickness of the film is (wave length of monochromatic light is λ)
	① 4λ ② 3λ ③ 2λ ④ λ

41.	In nuclear decay, the activity R_1 is at time T_1, and activity R_2 at time T_2. If T is the half life time, then number of nucleus decayed during $(T_2 - T_1)$ time is proportional to
	① $R_1 T_1 - R_2 T_2$ ② $R_1 T_1 + R_2 T_2$ ③ $(R_1 + R_2) T$ ④ $(R_1 - R_2) T$

■ Assertion Reason based Questions:

Directions: Read the following questions and choose any one of the following four responses.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.

C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

42.	**Assertion:** The energy gap between the valence band and conduction band is greater in silicon than in germanium.
	Reason: Thermal energy produces fewer minority carriers in silicon than in germanium.
	① A ② B ③ C ④ D

43.	**Assertion:** The value of current through p-n junction shown below will be 10 mA.
	Reason: In the above figure, the p-side is at higher potential than n-side.
	① A ② B ③ C ④ D

44.	**Assertion:** The photoelectrons produced by a monochromatic light beam incident on a metal surface, have their kinetic energy.
	Reason: The work function of the metal varies as a function of depth from the surface.
	① A ② B ③ C ④ D

45.	**Assertion:** In an hydrogen atom the force acting on the electron is proportional to n^{-4}. (n is the principal quantum number)
	Reason: As $F = \dfrac{mv_n^2}{r_n}$ where $v_n \propto \dfrac{1}{n}$ and $r_n \propto n^2$
	① A ② B ③ C ④ D

CHEMISTRY

46.	Hybridisation and shape of $XeOF_4$ are
	① sp^3d^3 and pentagonal bipyramidal ② sp^3d^2 and square pyramidal
	③ sp^3d and Trigonal bipyramidal ④ sp^3d^3 and Distorted octahedral
47.	Producer gas is mixture of
	① CO and H_2 ② CO and N_2 ③ CO and CO_2 ④ N_2 and H_2
48.	Oxidation state of sulphur in Caro's acid is
	① +4 ② +5 ③ +6 ④ +8
49.	Thermal decomposition of NH_4NO_3 will produce
	① N_2O ② NO ③ N_2 ④ NH_3
50.	For a reversible reaction, A (g) $\rightleftharpoons$ 2B (g), if volume of the container is halved, then equilibrium constant will
	① Becomes 2 times ② Becomes 4 times ③ Becomes 1/2 ④ Remain same
51.	If equilibrium constants of reactions A $\rightleftharpoons$ B and C $\rightleftharpoons$ D are k_1 and k_2 respectively, then the equilibrium constant for the reaction D + B $\rightleftharpoons$ A + C will be
	① $\dfrac{1}{k_1+k_2}$ ② $\dfrac{1}{k_1 \cdot k_2}$ ③ $\dfrac{k_1}{k_2}$ ④ $k_1 \cdot k_2$
52.	Incorrect statement among the following is
	① Thermal stability of calcium carbonate is more than magnesium carbonate
	② Beryllium nitrate on heating gives O_2 and NO_2 gases.
	③ BeO is an amphoteric oxide.
	④ $MgSO_4$ is insoluble in water.
53.	Oxide of Nitrogen which is blue solid and is acidic in nature is
	① N_2O ② N_2O_4 ③ N_2O_5 ④ N_2O_3
54.	Complex formed in brown ring test for nitrates is
	① $[Fe(H_2O)_5(NO)]^{2+}$ ② $[Fe(H_2O)_5(NO)]^{3+}$ ③ $[Fe(H_2O)_4(NO)_2]^+$ ④ $[Fe(H_2O)_6]^{3+}$
55.	The molar ratio of H_2 and O_2 gases in a mixture which contains these two gases in mass ratio of 1 : 4 will be
	① 16 : 1 ② 4 : 1 ③ 1 : 8 ④ 2 : 1
56.	What weight of 70% (w/w) HNO_3 is required to prepare of 2 molar aqueous HNO_3?
	① 22.5 g ② 45 g ③ 90 g ④ 180 g
57.	Correct order of negative electron gain enthalpy of the given elements is
	① Cl < F < O < S ② O < S < F < Cl ③ F < S < O < Cl ④ S < O < Cl < F
58.	Which of the following species has only π bonds according to MOT?
	① C_2 ② N_2 ③ O_2 ④ F_2
59.	Homolytic fission of C—C bond in ethane gives an intermediate in which carbon is
	① sp^3—hybridised ② sp^2—hybridised ③ sp—hybridised ④ sp^2d—hybridised

60.	Which among the following will show keto-enol tautomerism?
61.	Acetaldehyde and acetone can be distinguised by
	① Iodoform test ② Nitroprusside test
	③ Fehling's solution test ④ Any of these
62.	Under identical condition of temperature and pressure, which among the following gases has lowest density?
	① CH_4 ② He ③ N_2 ④ CO_2
63.	$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$
	The above reaction will occur at fastest rate in
	① Ethanol ② Water ③ Methanol ④ DMF
64.	Which of the following is most difficult to protonate?
	① H_2O ② CH_3OH ③ $(CH_3)_2O$ ④ (phenol, OH on benzene)
65.	The product of the following reaction is
66.	Least reactive alkene forwards dilute HCl will be
	① $CH_2{=}CH_2$ ② $CH_3CH{=}CH_2$
	③ $CH_3{-}CH_2{-}CH{=}CH_2$ ④ $CH_3CH_2CH{-}CH{=}CH_2$ with CH_3 branch
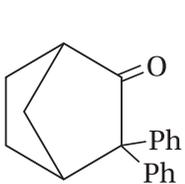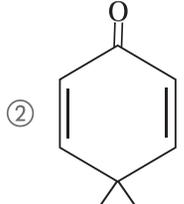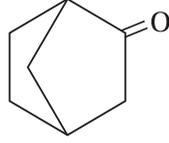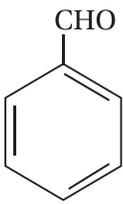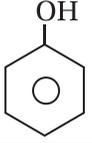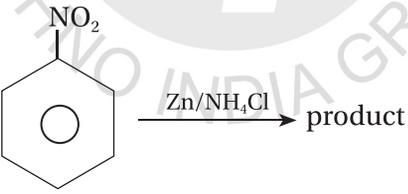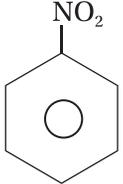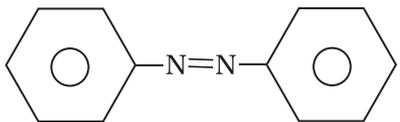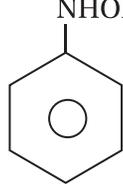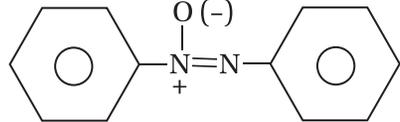
67.	The correct order of stability of the given carbocation will be

I. $NH_2—CH_2—\overset{+}{C}H_2$

II. $CH_3—O—\overset{+}{C}H_2$

III. $NO_2—\overset{+}{C}H_2$

① III > I > II   ② I > II > III   ③ II > I > III   ④ II > III > I

---

68. The correct order of reactivity of the given chlorides towards SN_1 reaction is
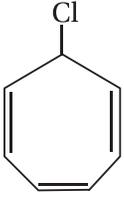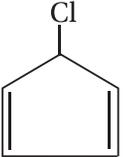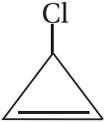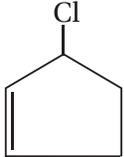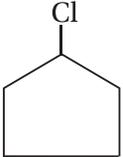
(I)   (II)   (III)   (IV)   (V)

① I > III > IV > V > II   ② I > II > IV > III > V

③ V > IV > III > II > I   ④ II > I > III > IV > V

---

69. Which compound on reaction with copper at 573 K forms ketone as major product?
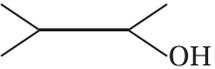
①   ② CH_3CH_2OH

③ $CH_3CH_2CH_2CH_2 \cdot OH$ ④ None of these

---

70. Correct order of acidic strength of the given compound is
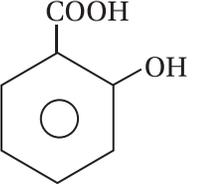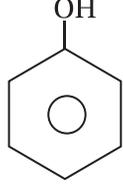
(a)   (b)   (c)   (d)

① a > b > c > d   ② c > d > a > b   ③ b > a > c > d   ④ b > a > d > c

---

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

① It is sp^3d^2 hybridised and octahedral   ② It is sp^3d^2 hybridised and tetrahedral

③ It is d^2sp^3 hybridised and octahedral   ④ It is dsp^2 hybridised and square planar

---

72.

D is a/an

① Hemiacetal   ② Ester   ③ Ether   ④ α-hydroxy acid

---

73. Mass in grams of copper deposited by passing 9.6487 $\overset{\circ}{A}$ current through a voltmeter containing copper sulphate solution for 100 seconds is (Given mass of Cu = 63 g(mol)$^{-1}$, 1 F = 96487 C)

① 3.15 g   ② 0.315 g   ③ 31.5 g   ④ 0.0315 g

74.	The compound which will not reduce Tollen's reagent is

74. The compound which will not reduce Tollen's reagent is

① Benzaldehyde   ② Acetaldehyde

③ Acetone   ④ Formic acid

---

75. Consider the following reaction sequence

$$\text{Aniline} \xrightarrow[\substack{HCl \\ (0-5)°C}]{NaNO_2} A \xrightarrow[\Delta]{H_2O} B \xrightarrow[\substack{(ii) CO_2 \\ (iii) H^+}]{(i) NaOH} C\ (Major) \xrightarrow[Pyridine]{CH_3COCl} D$$

Product D is

① (OH, COOH, with COCH₃ acetyl and CH₃ ketone)

② (OH with OCOCH₃)

③ (COOH with OCOCH₃)

④ (phthalic anhydride structure)

---

76. Find out the incorrect match

① (naphthyl NH₂) (Primary amine)

② (naphthyl N(CH₃)₂) (Tertiary amine)

③ $CH_3-\overset{\overset{CH_2}{|}}{\underset{\underset{CH_2}{|}}{C}}-NH_2$ (tertiary amine)

④ $(C_2H_5)_2NH$ (Secondary amine)

---

77. Conjugate base for Bronsted acids H_2O and HF are

① H_3O^+ and F^-, respectively   ② OH^- and F^-, respectively

③ H_3O^+ and H_2F^+, respectively   ④ OH^- and H_2F^+, respectively

---

78. Deficiency of which vitamin causes scurvy?

① Vitamin A   ② Vitamin B   ③ Vitamin C   ④ Vitamin D

79.

$\xrightarrow[Heat]{KMnO_4, H_2SO_4}$ Product. Product is

① Oxalic acid   ② Adipic acid   ③ Acetic acid   ④ Sebacic acid

---

80. If the rate constant of a first order reaction is $9.212 \times 10^{-3}\ s^{-1}$, then the time required for the completion of 75% of the reaction will be

① 250 s   ② 150 s   ③ 450 s   ④ 500 s

81.	Arrange the following complexes in correct order of crystal field splitting energy $[Fe(H_2O_6)]^{2+}$, $[FeCl_6]^{-4}$, $[Fe(H_2O)_6]^{3+}$ (I) (II) (III) ① III > I > II ② I > II > III ③ III > II > I ④ II > I > III
82.	A gas is allowed to expand in an insulated container against a constant external pressure of 5 atm from an initial volume of 1.75 L to a final volume of 6.75 L. The change in internal energy (ΔU) of the gas will be ① –2.5 kJ ② –4.5 kJ ③ –1.25 kJ ④ –3.2 kJ
83.	pH of 0.2 M aqueous solution of sodium benzoate will be (pK_a of benzoic acid = 4.2) ① 9.50 ② 8.75 ③ 10.25 ④ 7.50
84.	Which among the following is smallest in size? ① Tm ② Ce ③ Eu ④ Tb
85.	How much time is required to decompose 18 g water electrolytically into H_2 and O_2 by passing 3 A current? ① 8.93 hours ② 17.87 hours ③ 35.74 hours ④ 22.89 hours
86.	Calculate the pH of CH_3COOH solution, if equivalent conductance of $1\,M\,CH_3COOH$ is $10\,ohm^{-1}cm^2eq^{-1}$ and at infinite dilution is $200\,ohm^{-1}cm^2eq^{-1}$ (Given : $\log 5 = 0.7$) ① 2.7 ② 1.3 ③ 1.7 ④ 3
87.	Percentage ionization of $K_3[Fe(CN)_6]$ whose decimolar solution shows an osmotic pressure of 3.94 atm at 300 K is ① 50% ② 35% ③ 20% ④ 10%
88.	The electronegativity difference between N and F is greater than that between N and H yet the dipole moment of NH_3 (1.5 D) is larger than that of NF_3 (0.2 D). This is because ① in NH_3 as well as in NF_3, the atomic dipole and bond dipole are in the same direction ② in NH_3, the atomic dipole and bond dipole are in the same direction whereas in NF_3 these are in opposite directions ③ in NH_3 as well as NF_3, the atomic dipole and bond dipole are in opposite directions ④ in NH_3 the atomic dipole and bond dipole are in the opposite directions whereas in NF_3 these are in the same directions
89.	Solubility of AgI in presence of 0.2 M NaI solution will be (Ksp of AgI = 8.3×10^{-17}) ① 8.3×10^{-16} M ② 4.15×10^{-17} M ③ 4.15×10^{-16} M ④ 8.3×10^{-17} M
90.	How much charge is present on 3 grams of CO_3^{2-} ions? ① 600 C ② 9650 C ③ 96 C ④ 1000 C

BIOLOGY

Botany

91.	Which of the following statements with regards to photosynthesis is/are correct?

91. Which of the following statements with regards to photosynthesis is/are correct?

I. In C_4 plants, the primary CO_2 acceptor is PEP.

II. In the photosynthetic process, PS–II absorbs energy at or just below 680 nm.

III. The pigment present in PS–I is P_{683}.

① II and III   ② Only I   ③ I and III   ④ I & II

92. The linking of antibiotic resistance gene with the plasmid vector became possible with:

① DNA ligase   ② Endonuclease   ③ DNA polymerase   ④ Exonuclease

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

Choose the correct option:

Assertion (A): *Chlorella* could serve as a potential source of food and energy.

Reason (R): When dried, *Chlorella* has 15% protein, 45% fat, 10% carbohydrate, 20% fibre and 10% minerals and vitamins.

① Both A and R are correct and R is the correct explanation of A.

② Both A and R are correct but R is not the correct explanation of A.

③ A is correct but R is not correct

④ A is not correct but R is correct

94. Sickle cell anaemia has not been eliminated from the African population because it

① is controlled by recessive genes   ② is not a fatal disease

③ provides immunity against malaria   ④ is controlled by dominant genes

95. The thickness of ozone in a column of air in the atmosphere is measured in terms of:

① Dobson units   ② Decibels   ③ Decameter   ④ Kilobase

96. A plant hormone used for inducing morphogenesis in plant tissue culture is _____

① ethylene   ② gibberellin   ③ cytokinin   ④ abscisic acid

97. In nature, cleistogamous flowers are

① self-pollinated   ② insect pollinated   ③ wind-pollinated   ④ bird pollinated

98. Frequeney of recombination between gene pairs on some chromosome, as a measure of the distance between genes to map their positions on chromosome, was used for the first time by

① T.H. Morgan   ② Sutton and Boveri   ③ Alfred Sturtevant   ④ Henking

99. The phragmoplast is organised at the

① beginning of anaphase   ② end of anaphase

③ beginning of telophase   ④ end of telophase

100. During transcription, RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle-like structure. What is its DNA-binding sequence?

① TTAA   ② AATT   ③ CACC   ④ TATA

101.	Given below are two statements A and B. Choose the correct answer related to the statements. A–Amino acids are amphoteric in their function. R–All amino acids are necessary for our body. ① A is correct, B is wrong ② B is correct, A is wrong ③ Both A and B are correct ④ Both A and B are wrong
102.	Given below are two statements. One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option: **Assertion (A):** The quiscent centre acts as a reservoir of relatively resistant cells, which constitute permanent source of active initials. **Reason (R):** The cells of the inactive region of the quiscent centre become active, when the previous active initials get damaged. ① Both A and R are correct and R is the correct explanation of A. ② Both A and R are correct but R is not the correct explanation of A. ③ A is correct but R is not correct ④ A is not correct but R is correct
103.	In barley stem, vascular bundles are ① open and scattered ② closed and scattered ③ open and in a ring ④ closed and radial
104.	One gene – one enzyme relationship was established for the first time in— ① *Neurospora erassa* ② *Salmonella typhimurium* ③ *Escherichia coli* ④ *Diplococcus pneumoniae*
105.	The outermost layer of maize endosperm is called ① perisperm ② aleurone ③ tapetum ④ endothelium
106.	During seed germination, its stored food is mobilized by ① ethylene ② cytokinin ③ ABA ④ gibberellin
107.	In an aquatic ecosystem, the trophic level equivalent to cows in grassland is ① phytoplankton ② zooplankton ③ top carnivore ④ decomposer
108.	Dry indehiscent single seeded fruit formed from bicarpellary syncarpous inferior ovary is ① caryopsis ② cypsella ③ berry ④ cremocarp
109.	Through which cell of the embryo sac, does the pollen tube enter the embryo sac? ① egg cell ② central cell ③ persistent synergid ④ degenerated synergid
110.	Which hormone promotes internode/petiole elongation in deep water rice? ① GA3 ② Kinetin ③ Ethylene ④ 2, 4–D
111.	Given below are two statements, one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option: **Assertion (A):** Thick cuticle is mostly present in disease resistant plants. **Reason (R):** Disease causing agents cannot grow on the cuticle nor invade the cuticle. ① Both A and R are correct and R is the correct explanation of A. ② Both A and R are correct but R is not the correct explanation of A. ③ A is correct but R is not correct ④ A is not correct but R is correct

112.	Given below are two statements, one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option: **Assertion(A):** Two turns of Kreb's cycle occurs per glucose molecule used. **Reason (R):** Each turns of Kreb's cycle produces 3NADH, 1FADH$_2$ and 1ATP molecule. ① Both A and R are correct and R is the correct explanation of A. ② Both A and R are correct but R is not the correct explanation of A. ③ A is correct but R is not correct ④ A is not correct but R is correct
113.	Consider the following statement about food chains— I. Removal of 80% tigers from an area resulted in greatly increased growth of vegetation. II. Removal of most of the carnivores resulted in an increased population of deers. III. The length of food chain is generally limited to 3–4. IV. The length of food chains may vary from 2–8 trophic levels. Which two of the given statements are correct? ① II & III ② III & IV ③ I & IV ④ I and II
114.	In meiosis–I, a bivalent is an association of— ① four chromatids and four centromeres ② two chromatids and two centromeres ③ two chromatids and one centromere ④ four chromatids and two centromeres
115.	All enzymes of the TCA cycle are located in the mitochondrial matrix, except one, which is located in the inner mitochondrial membranes in eukaryotes and cytosol in prokaryotes. This enzyme is ① lactate dehydrogenase ② isocitrate dehydrogenase ③ malate dehydrogenase ④ succinate dehydrogenase
116.	The distance between the genes on the chromosomes is measured by using ① Pleiotropy ② Allele frequency ③ Codominance ④ Recombination frequency
117.	Restriction enzymes are used to cut ① single stranded RNA ② double stranded DNA ③ single stranded DNA ④ double stranded RNA
118.	In C$_4$ plants, the bundle sheath cells ① have thin walls to facilitate gaseous exchange ② have large intercellular spaces ③ are rich in PEP carboxylase ④ have a high density of chloroplasts
119.	During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out ① RNA ② Histones ③ Polysaccharides ④ DNA

120.	Which element plays a vital role in splitting of water to liberate oxygen during photosynthesis?
	① Copper ② Chlorine ③ Manganese ④ Magnesium
121.	One of the commonly used plant growth hormone in tea plantation is
	① IAA ② Ethylene ③ Zeatin ④ ABA
122.	During DNA replication, Okazaki fragments are formed in the direction:
	① $3´ \rightarrow 3´$ ② $5 \rightarrow 3´$ ③ $3´ \rightarrow 5´$ ④ $5´ \rightarrow 5´$
123.	Which nitrogen base is this?
	① Adenine ② Thymine ③ Uracil ④ Cytosine
124.	'Kyoto protocol' is a multinational international treaty for
	① conservation of biodiversity ② management of hazardous wastes
	③ controlling ozone depleting substances ④ phasing out green house gases
125.	In which of the following features, Cycas resembles with angiosperms?
	① Presence of vessels ② Circinate venation
	③ Pollen tube is the carrier of male gametes ④ Dichotomously branched leaves
126.	Identify the correct statements:
	Suckers are
	I. formed from the internode of underground stem
	II. formed from the node of underground stem
	III. roots, which are formed from upper portion of nodes
	IV. roots, which are formed from lower portion of nodes
	Codes
	① I, II and III ② I and II ③ II and IV ④ I and III
127.	Match the following columns:
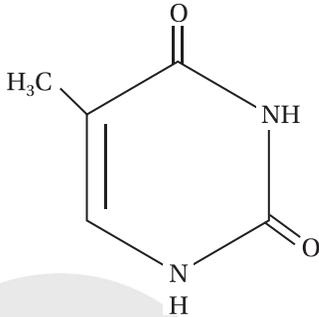
For question 123, the structure shown:

Column matching table for question 127:

	Column I		Column II
A.	Endodermis	1.	Companion cells
B.	Stomata	2.	Lenticels
C.	Sieve tubes	3.	Palisade cells
D.	Periderm	4.	Passage cells
E.	Mesophyll	5.	Accessory cells

Codes

	A	B	C	D	E
①	4	5	2	1	3
②	5	3	1	2	4
③	4	5	1	2	3
④	2	5	3	4	1

128. Match List I with List II.

List I		List II	
A.	G_1 – phase	1.	Replication of DNA
B.	S – phase	2.	Quiscent stage
C.	G_2 – phase	3.	Condensation of chromatin
D.	G_0 – phase	4.	Protein synthesis
		5.	Interval between mitosis and initiation of DNA replication

Codes

	A	B	C	D
①	3	5	1	2
②	5	4	1	3
③	5	1	4	2
④	5	2	3	4

129. How many different proteins does the ribosome consist of?

① 80 ② 60 ③ 40 ④ 20

130. Given below are two statements:

Statement I: The rate of decomposition of detritus is reduced in the regions of high altitude.

Statement II: It happens due to immobilisation of nutrients.

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 II is false but Statement I is true

131. A person is suffering from the disease phenylketonuria, which is an autosomal recessive disease. Which of these in lacking in the person?

① Homogentisic acid ② Phenylalanine hydroxylase

③ Ceruloplasmin ④ Cystine

132. A small protein attached to the outer surface of the inner mitochondrial membrane and which acts as a mobile carrier for transfer of electrons between complex III and IV is—

① cytochrome–d ② cytochrome–c ③ cytochrome–b ④ cytochrome–a

133. Pyramid of energy in an aquatic ecosystem is

① always upright ② always inverted

③ bell-shaped ④ sometimes upright, sometimes inverted

134. Match the following columns:

Column I (Population Interaction)		Column II (Examples)	
A.	Mutualism	1.	Ticks on dogs
B.	Commensalism	2.	*Balanus* and *Chathamalus*
C.	Parasitism	3.	Sparrow and any seed
D.	Competition	4.	Epiphyte on a mango branch
E.	Predation	5.	Orchid, *Ophrys* and bee

Codes

	A	B	C	D	E
①	2	1	5	4	3
②	3	2	1	5	4
③	4	3	2	1	5
④	5	4	1	2	3

135. In recombinant DNA technique, the term 'vector' refers to

① donor DNA, is identified and picked up through electrophoresis.

② plasmid, transfers DNA into living cell.

③ collection of entire genome in the form of plasmid.

④ enzyme, cuts the DNA at specific sites.

Zoology

136. After drinking alcohol, a person walks clumsily because the alcohol affects his

① cerebellum ② cerebrum ③ medulla oblongata ④ spinal cord

137. Industrial melanism, as observed in the pepper moth, proves that the

① true black melanic forms arose by a recurring random mutation

② melanic form of the moth has no selective advantage over the lighter forms in industrial areas

③ lighter form moth has no selective advantage, neither in polluted industrial areas nor in non polluted areas

④ melanism is a pollution generated feature

138. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because

① there is a negative pressure inside the lungs

② there is a negative intrapleural pressure pulling at the lung walls

③ there is a positive intrapleural pressure

④ pressure in the lungs is higher than the atmospheric pressure

139.	Name the pulmonary disease in which alveolar surface area, involved in gas inchange, is drastically reduced due to damage to the alveolar walls.
	① Pleurisy ② Emphysema ③ Pneumonia ④ Asthma

140.	In a standard ECG, which one of the following alphabets is the correct representation of the respective activity of the human heart?
	① R–repolarisation of ventricles ② S–start of systole
	③ T–end of diastole ④ P–depolarisation of the atria

141.	In mammals, the opening of the post caval in the right auricle is guarded by
	① Mitral valve ② Thesbian valve
	③ Eustachian valve ④ Tricuspid valve

142.	Smell of urine is due to
	① urochrome ② urinod ③ urea ④ glucose

143.	What will happen if, the stretch receptors of urinary bladder wall are totally removed?
	① Urine will not collect in the bladder
	② Micturition will continue
	③ Urine will continue to collect normally in the bladder
	④ Urine will not form

144.	The sensation of fatigue in the muscles after prolonged strenous physical work, is caused by
	① a decrease in the supply of oxygen ② minor wear and tear of muscle fibres
	③ the depletion of glucose ④ the accumulation of lactic acid

145.	Which one of the following pairs is correctly matched?
	① Cartilaginous joint – skull bones
	② Hinge joint – Between vertebrae
	③ Fibrous joint – Between phalanges
	④ Gliding joint – Between zygapophysis of the successive vertebrae

146.	Which one of the following regions of the brain is incorrectly paired with its function?
	① Medulla oblongata – Homeostatic control
	② Cerebellum – Language comprehension
	③ Corpus callosum – Communication between left and right cerebral cortices
	④ Cerebrum – Calculation and contemplation

147.	The bundle of axons totally present in the CNS is called
	① nerve ② ganglion ③ tract ④ neuron

148.	In human adult females, oxytocin —
	① is secreted by anterior pituitary
	② stimulates growth of mammary glands
	③ stimulates pituitary to secrete vasopressin
	④ causes strong uterine contractions during parturition

149.	Given below are two statements. One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option:

149. Given below are two statements. One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option:

   Assertion (A): Diabetes insipidus is marked by excessive urination and too much thirst for water.

   Reason (R): ADH is secreted by the posterior lobe of pituitary.

  ① Both A and R are correct and R is the correct explanation of A.

  ② Both A and R are correct but R is not the correct explanation of A.

  ③ A is correct but R is not correct

  ④ A is not correct but R is correct

150. Sperm acrosome is derived from

  ① Golgi bodies   ② endoplasmic reticulum

  ③ lysosome   ④ mesosome

151. Given below are two statements. One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option:

Assertion (A): Generally a woman does not conceive during the lactation period.

Reason (R): The hormone prolactin initiates and maintains lactation in a woman.

  ① Both A and R are correct and R is the correct explanation of A.

  ② Both A and R are correct but R is not the correct explanation of A.

  ③ A is correct but R is not correct

  ④ A is not correct but R is correct

152. Which of the following is a hormone releasing IUD?

  ① LNG – 20   ② Multiload – 375   ③ Lippes loop   ④ Cu – 7

153. MTPs are considered relatively safe during the

  ① first trimester   ② second trimester   ③ third trimester   ④ none of these

154. 'Ontogeny recapitulates phylogeny' is narrated in which of the evidences of organic evolution?

  ① Palaentological evidence   ② Physiological evidence

  ③ Embryological evidence   ④ Anatomical evidence

155. Which of the following is not vestigeal in man?

  ① Tail vertebrae   ② Nails

  ③ Nictitating membrane   ④ Vermiform appendix

156. Name the respiratory disorder caused mainly by the body's response to too much of CO_2 in the lungs.

  ① Asthma   ② Respiratory acidosis

  ③ Respiratory alkalosis   ④ Emphysema

157. Match the following columns

	Column I		Column II
A.	*Haemophilus influenza*	1.	Malignant malaria
B.	*Entamoeba histolytica*	2.	Elephantiasis
C.	*Plasmodium falciparum*	3.	Pneumonia
D.	*Wuchereria bancrofti*	4.	Typhoid
E.	*Salmonella typhi*	5.	Amoebiasis

Codes

	A	B	C	D	E
①	1	5	3	2	4
②	3	5	1	2	4
③	5	1	3	4	2
④	1	3	2	5	4

158. The skin of frog does which of the following specifically?

① gaseous exchange but not water absorption

② absorption of water but not gaseous exchange

③ both absorption of water and gaseous exchange

④ excretion of harmful wastes

159. Primates which existed 15 mya were

I. *Dryopithecus* II. *Homo habilis* III. *Ramapithecus*

IV. *Australopithecus* V. *Homo erectus* VI. *Neanderthal man*

Choose the correct answer from the options given below:

① I & II only ② I & III only ③ V & VI only ④ III & IV only

160 Number of chromatids in each chromosome at anaphase is—

① One in mitosis, in meiosis I and one in meiosis II

② One in mitosis, one in meiosis I and two in meiosis II

③ Two in mitosis, one in meiosis I and two in meiosis II

④ Two in mitosis, one in meiosis I and two in meiosis II

161. Hyposecretion of which hormone decreases calcium level in blood?

① Parathormone ② Thyroxine ③ Melatonin ④ GTH

162. Select the option with the correct statements for white muscle fibres.

I. Sarcoplasmic reticulum are abundant

II. Myoglobin content is high

III. Sarcoplasmic reticulum are moderate

IV. Aerobic muscles

V. Depends on anaerobic respiration for energy

VI. Less myoglobin content

① I, II & IV ② I, II & V ③ II, III & IV ④ I, V & VI

163. Match List I with List II

	List I		List II
A.	Typhoid	1.	Fungal disease
B.	Ringworm	2.	Vector borne disease
C.	Malaria	3.	Air borne disease
D.	Pneumonia	4.	Through contaminated water and food

Codes

	A	B	C	D
①	1	2	3	4
②	4	3	2	1
③	4	1	3	2
④	4	1	2	3

164. Which one of the following will mRNA not translate completely?

① AUG CCC CCA UAA

② AUG AAA CCA UGA

③ AUG UAC UAA UCC

④ All of these

165. Match List I with List II

	List I		List II
A.	Total lung capacity	(i)	1500 – 1600 mL
B.	Vital capacity	(ii)	3400 – 4800 mL
C.	Inspiratory capacity	(iii)	5000 – 6000 mL
D.	Expiratory capacity	(iv)	3000 – 3500 mL

① A–(iii); B–(ii); C–(iv); D–(i)

② A–(iii); B–(i); C–(iv); D–(ii)

③ A–(ii); B–(iii); C–(iv); D–(i)

④ A–(i); B–(ii); C–(iii); D–(iv)

166. RNA interference, which is employed in making tobacco plant resistant to *Meloidogyne incognita,* is essentially involved in

① Preventing the process of transcription

② Preventing the process of splicing of hnRNA

③ Preventing the process of translation of mRNA

④ Preventing the process of replication of DNA

167. Depolarization of nerve membrane occurs through influx of _____ ions.

① Calcium   ② Potassium   ③ Sodium   ④ Magnesium

168. Which one of the following statement is incorrect about a bioreactor?

① Most common type of bioreactor is 'stirring type'.

② In bioreactors, large volumes (100 – 1000L) of cultures can be processed.

③ In bioreactors, raw materials are chemically converted into specific products.

④ Sampling port is one of the components of bioreactors.

169. Which one of the following is not a method of contraception?

① Condoms

② Pills containing oxytocin and vasopressin

③ Lippes loop

④ Vasectomy

170.	Given below are two statements. One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**. Choose the correct option:
	Assertion (A): Arthropoda is the most successful of all known animal groups.
	Reason (R): Arthropoda exhibits the greatest adaptive radiations and have adapted to diverse habitats.
	① Both A and R are correct and R is the correct explanation of A.
	② Both A and R are correct but R is not the correct explanation of A.
	③ A is correct but R is not correct
	④ A is not correct but R is correct
171.	A frog must swallow air to expand the lungs because frog
	① has no diaphragm ② has no vagus nerve
	③ is relatively a primitive vertebrate ④ normally breathe through its skin
172.	Given below are two statements:
	Statement–I: Atherosclerosis reduces the blood supply to the heart muscles.
	Statement–II: Atherosclerosis is caused by hardening of arteries.
	① Both statements are correct
	② Both statements are incorrect
	③ Statement I is correct but statement II is incorrect
	④ Statement II is correct but statement I is incorrect
173.	Read the following statements regarding echinoderms—
	I. Echinoderms live in fresh water
	II. An excretory system is absent
	III. Sexes are separate
	IV. They are bilaterally symmetrical and diploblastic
	Choose the correct answer from the options given below:
	① I and IV ② II and III ③ I and II ④ I, II and III
174.	Which of the following is true regarding partial pressures of O_2 and CO_2 in different regions?
	① pO_2 in alveoli is 40 mm Hg ② pCO_2 in alveoli is 104 mm Hg
	③ pCO_2 in tissues is 45 mm Hg ④ pO_2 in deoxygenated blood is 90 mm Hg
175.	Given below are two statements:
	Statement I: Some species of insects and frogs are cryptically coloured to avoid being detected easily by the predator.
	Statement II: Camouflage is a method to acquire body colour blending with the surroundings.
	Choose the correct option.
	① Both statements I & II are correct
	② Both statements I & II are incorrect
	③ Statement I is correct, but statement II is incorrect
	④ Statement II is correct, but statement I is incorrect

176.	Choose the incorrect statement:
	① Flow of filtrate in two tubes of Henle's loop occurring in opposite directions have counter current.
	② The flow of blood in the two limbs of vasa recta also occurs in a counter current pattern
	③ Flow of filtrate and blood in Henle's loop and vasa recta, respectively, occur in counter current pattern
	④ The counter current mechanism maintains decreasing osmomolarity towards inner medullary interstitium
177.	Which one is an example of living fossil?
	① Coral ② Ascidia ③ Octopus ④ King Crab
178.	Which hormone of the pituitary gland regulates Sertoli cells?
	① LH ② FSH ③ GH ④ Prolactin
179.	The human liver fluke, a parasite, depends on two intermediate hosts to complete its life cycle. They are, in correct order:
	① man and snail ② snake and snail ③ snail and fish ④ man and fish
180.	An autoimmune neuromuscular disorder, leading to fluctuating muscle weakness and fatiguability is
	① Osteoporosis ② Gout ③ Myasthenia gravis ④ Tetany