

Roll No.:

Test Date: 12-06-2022



Aakash
+ BYJU'S



for

Medical Entrance Exam - 2022

National Eligibility-cum-Entrance Test (NEET)

OPEN MOCK TEST No. 1

(XII Studying / XII Passed Students)

INSTRUCTIONS FOR CANDIDATES

1. Read each question carefully.
2. It is mandatory to use Blue/Black Ball Point Pen to darken the appropriate circle in the answer sheet.
3. Mark should be dark and should completely fill the circle.
4. Rough work must not be done on the answer sheet.
5. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked is allowed.
6. Student cannot use log tables and calculators or any other material in the examination hall.
7. Before attempting the question paper, student should ensure that the test paper contains all pages and no page is missing.
8. Each correct answer carries four marks. One mark will be deducted for each incorrect answer from the total score.
9. Before handing over the answer sheet to the invigilator, candidate should check that Roll No. and Centre Code have been filled and marked correctly.
10. Immediately after the prescribed examination time is over, the answer sheet to be returned to the invigilator.
11. There are two sections in each subject i.e., Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions out of 15 from Section-B.

Note : It is compulsory to fill **Roll No.** and **Test Booklet Code** on answer sheet, otherwise your answer sheet will not be considered.



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Open Mock Test No. 1

TOPICS OF THE TEST

Complete Syllabus of NEET

MM : 720

OPEN MOCK TEST - I

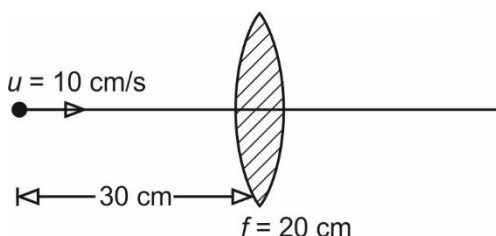
Time : 3 hrs. 20 min

[PHYSICS]

Choose the correct answer :

SECTION-A

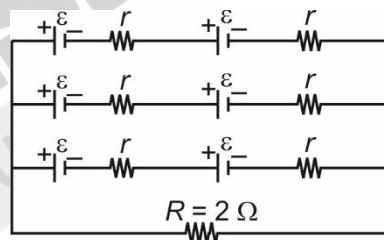
- In case of polarisation, if i is angle of incidence and θ_P is polarising angle then
 - For $i = \theta_P$, refracted light is fully polarised
 - For $i = \theta_P$, refracted and reflected light rays are perpendicular to each other
 - For $i = \theta_P$, reflected light is fully polarised
 - Both (2) and (3) are correct
- The ratio of resolving power of an optical microscope for two wavelengths 600 nm and 450 nm is
 - 3 : 4
 - 1 : 1
 - 9 : 16
 - 16 : 9
- If bichromatic light used in YDSE have wavelengths $\lambda_1 = 700$ nm and $\lambda_2 = 500$ nm, then minimum order of maxima for λ_1 which overlaps with maxima of λ_2 is
 - 4
 - 5
 - 6
 - 7
- A point object is moving with speed of 10 cm/s in front of a converging lens along the principal axis as shown in figure. At this instant, the speed of the image is



- 30 cm/s
 - 32 cm/s
 - 40 cm/s
 - 44 cm/s
- One face of a prism with refracting angle 37° is coated with silver. A light ray incident on other face at an angle of 60° is refracted and reflected back from silver face such that it retraces its path. The refractive index of prism is

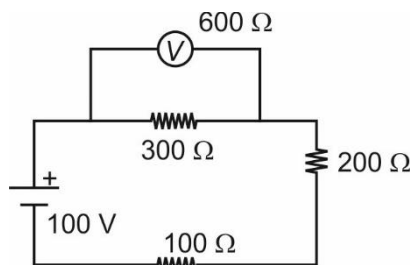
- $\frac{5}{2\sqrt{3}}$
- $\frac{5}{\sqrt{3}}$
- $\frac{4}{3}$
- $\frac{3}{\sqrt{5}}$

- A point object (inside a glass slab) when viewed from two opposite faces of a plane glass slab appears at distance of 9 cm and 5 cm respectively from the surfaces. Thickness of glass slab is (${}^a\mu_g = 1.5$)
 - 21 cm
 - 22.5 cm
 - 10 cm
 - 26.2 cm
- Six 1.1 V cells each with internal resistance $3\ \Omega$ are connected as shown in circuit. The current through external resistance $R = 2\ \Omega$ is

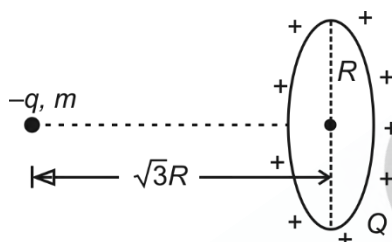


- 0.44 A
 - 0.55 A
 - 0.33 A
 - 0.66 A
- A tap supplies water at 22°C . A person takes 1 kg of water per minute at 42°C from geyser. The power of the geyser is (assuming 100% efficiency)
 - 1600 W
 - 1800 W
 - 2200 W
 - 1400 W
 - Which of the following statement is correct?
 - A charged particle in electric field experiences force in the direction of electric field
 - Electric field lines may form closed loop
 - Electrostatic force of interaction between two charged particles may be affected by the presence of other charges
 - Both (1) and (3) are correct

10. The reading of the voltmeter shown in figure is



- (1) 50 V (2) 60 V
(3) 40 V (4) 80 V
11. A particle having a charge $-q$ and mass m is released from rest on axis of fixed ring of total charge Q and radius R , at a distance $\sqrt{3}R$ from the centre of the ring. Its kinetic energy when it reaches the centre of the ring is



- (1) $\frac{Qq}{2\pi\epsilon_0 R}$ (2) $\frac{Qq}{16\pi\epsilon_0 R}$
(3) $\frac{Qq}{8\pi\epsilon_0 R}$ (4) $\frac{Qq}{\sqrt{3}\pi\epsilon_0 R}$
12. Equipotential surfaces corresponding to electric field due to an infinitely large uniformly charged sheet are
- (1) Spherical (2) Cylindrical
(3) Planar (4) Circular
13. A nucleus of ${}_{84}\text{X}^{210}$ originally at rest emit α -particle with speed v . The recoil speed of the daughter nucleus is

- (1) $\frac{4v}{206}$
(2) $\frac{4v}{210}$
(3) $\frac{v}{84}$
(4) $\frac{v}{214}$

14. A block is placed in a ship which undergoes vertical harmonic oscillations of angular frequency ω . The amplitude of oscillations gradually increases. The block will leave contact with ship surface for the first time

- (1) At mean position of ship going upwards
(2) At bottommost position of ship moving upwards
(3) For an amplitude of g/ω^2 at topmost position
(4) Block will remain in contact with ship for all amplitude

15. The frequency of tuning forks A and B are respectively 5% more and 4% less than frequency of tuning fork C . When A and B are simultaneously excited, 9 beats per second are produced, then frequency of tuning fork B is

- (1) 105 Hz (2) 100 Hz
(3) 96 Hz (4) 104 Hz

16. If de Broglie wavelengths for a proton and an alpha particle are equal, then ratio of their velocities will be

- (1) 1 : 8 (2) 4 : 1
(3) 2 : 1 (4) 1 : 1

17. A ball is thrown vertically upwards with a speed of 68 m/s. The distance travelled by the ball in its seventh second of motion will be ($g = 10 \text{ m s}^{-2}$)

- (1) 3.4 m (2) 2.4 m
(3) 5.2 m (4) 4.8 m

18. In the formula $F = A.e^{-\frac{hc}{x}}$, where h is Planck's constant, and c is speed of light. The dimensional formula for x is

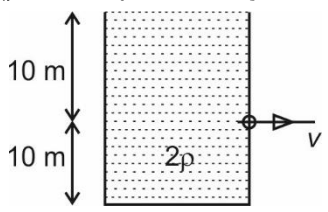
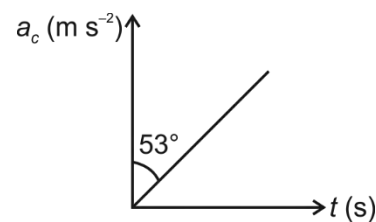
- (1) $[M^0 L^0 T^0]$ (2) $[M^1 L^3 T^{-2}]$
(3) $[M^0 L^1 T^0]$ (4) $[M^1 L^2 T^{-2}]$

19. A force of 10 N is applied horizontally on a block of mass 5 kg placed on horizontal frictionless surface for 4 second. What will be velocity of block after 5 second?

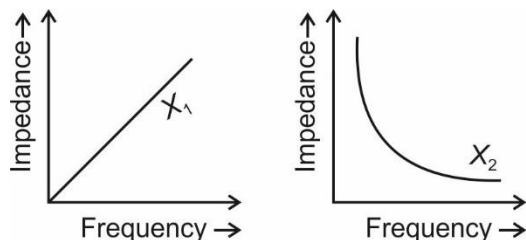
- (1) 5 m/s (2) 4 m/s
(3) 8 m/s (4) 10 m/s

20. Source and sink temperature of a Carnot engine are 327°C and 27°C . Efficiency of the engine is

- (1) 80% (2) 60%
(3) 77% (4) 50%

21. A uniform disc is rotating about its geometrical axis in free space. If its temperature is increased by ΔT on heating, then fractional change in its angular velocity is (α = coefficient of linear expansion)
- $-3\alpha\Delta T$
 - $-2\alpha\Delta T$
 - $-\alpha\Delta T$
 - No change in angular speed
22. An unpolarised beam of light is incident over a polariser and then this beam of light passed through another polariser. If transmission axis of both polariser are at 45° with each other then final intensity of emergent light beam becomes
- 4 times
 - 2 times
 - $\frac{1}{2}$ times
 - $\frac{1}{4}$ times
23. An iron rod and a copper rod lie side by side. As the temperature is changed, the difference in lengths of the rods remains constant at a value of 40 cm. The ratio of original lengths of copper to iron is ($\alpha_{\text{Cu}} = 4.8 \times 10^{-5} / ^\circ\text{C}$, $\alpha_{\text{Fe}} = 1.2 \times 10^{-5} / ^\circ\text{C}$)
- $\frac{1}{2}$
 - $\frac{1}{3}$
 - 2
 - $\frac{1}{4}$
24. Water rises to a height of 40 cm in a capillary tube of cross-sectional area A . If the cross-sectional area of tube is made $4A$, then height to which water will rise in the capillary tube will be
- 80 cm
 - 20 cm
 - 10 cm
 - 40 cm
25. In a transistor used in common emitter mode, current amplification factor is 60 and base current is $50 \mu\text{A}$. The emitter current is
- 2.95 mA
 - 3.00 mA
 - 3.05 mA
 - 3.10 mA
26. A container filled with a liquid of density 2ρ is as shown in figure. The velocity of efflux through orifice is nearly (ρ = density of water, $g = 10 \text{ m s}^{-2}$)
- 
- 14.1 m/s
 - 28 m/s
 - 10 m/s
 - 20 m/s
27. A human heart pumps 60 cc of blood per heart beat at a pressure of 1.5 m of water. If the heart beats are 72 per minute, then average pumping power of heart is nearly ($g = 10 \text{ m s}^{-2}$)
- 3.5 W
 - 1.1 W
 - 2.3 W
 - 5.3 W
28. Which of the following statement is always correct about a planet revolving around sun?
- Potential energy of planet is constant
 - Linear momentum of planet is constant
 - Orbit of a planet must be circular
 - Areal velocity of planet is constant
29. The kinetic energy of a body of mass m at a height $h = \frac{R}{2}$ from earth surface, when body is thrown from surface with speed of $v_0 = \sqrt{gR}$ is (R = Radius of Earth)
- $\frac{mgR}{3}$
 - $\frac{mgR}{6}$
 - $\frac{mgR}{2}$
 - $\frac{mgR}{4}$
30. If $\vec{A} = 4\hat{i} - 2\hat{j} + 6\hat{k}$ and $\vec{B} = -2\hat{j} - 6\hat{k}$, then angle made by vector $\vec{A} + \vec{B}$ with positive y -axis is
- 30°
 - 135°
 - 45°
 - 120°
31. The centripetal acceleration of a particle, moving in a circle of radius 12 m, varies with time t as shown in diagram. If the particle starts from rest then speed of particle after 1 s is
- 
- 3 m/s
 - 4 m/s
 - 5 m/s
 - 6 m/s
32. A swimmer wishes to cross a 600 m wide river flowing at 3 km/h. Speed of swimmer with respect to still water is 5 km/h. Time taken by swimmer to cross river through shortest path is
- 10 minute
 - 12 minute
 - 9 minute
 - 16 minute

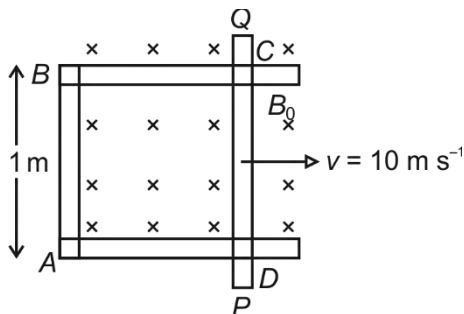
33. The graphs given below depict the dependence of two reactive impedances X_1 and X_2 on frequency of alternating emf applied individually to them. We can conclude that



- (1) X_1 is resistance and X_2 is inductive reactance
 (2) X_1 is capacitive reactance and X_2 is inductive reactance
 (3) X_1 is resistance and X_2 is capacitive reactance
 (4) X_1 is inductive reactance and X_2 is capacitive reactance
34. The natural frequency of an L - C circuit is 125 kHz, then the capacitor C is replaced by another identical capacitor with a dielectric medium of dielectric constant K . In this case, the frequency decreases to 25 kHz. The value of K is
- (1) 5 (2) 25
 (3) 50 (4) 100
35. The velocity acquired by a body, moving with uniform acceleration, is 30 m s^{-1} in 2 s and 60 m s^{-1} in 4 s. The initial velocity of the body is
- (1) Zero (2) 3 m/s
 (3) 6 m/s (4) 9 m/s

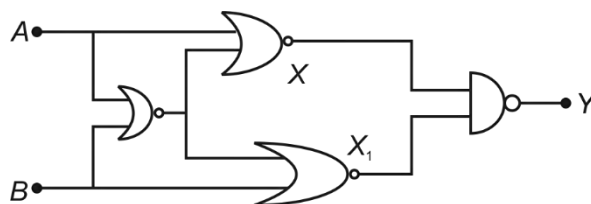
SECTION-B

36. If a rod PQ of length 1.25 m is moving with velocity 10 m s^{-1} on parallel tracks placed in uniform magnetic field $B_0 = 0.2 \text{ T}$. If resistance of $ABCD$ is 100Ω , then current through loop at this instant is



- (1) 10 mA (2) 1.25 mA
 (3) 20 mA (4) 40 mA

37. If $A = 0$ and $B = 1$ for a given logic gate, then value of X and Y respectively are



- (1) 1, 0 (2) 0, 1
 (3) 1, 1 (4) 0, 0

38. In the spectrum of hydrogen atom, the ratio of shortest wavelength in the Lyman series to the longest wavelength of Paschen series is

- (1) $\frac{1}{9}$
 (2) $\frac{27}{4}$
 (3) $\frac{7}{144}$
 (4) $\frac{36}{5}$

39. The depletion layer of silicon diode is $1 \mu\text{m}$ wide and knee potential is 0.6 V. The electric field inside depletion layer is

- (1) 0.6 V/m (2) $6 \times 10^{11} \text{ V/m}$
 (3) $6 \times 10^5 \text{ V/m}$ (4) $6 \times 10^{-6} \text{ V/m}$

40. If two SHMs are represented by equations

$$y_1 = 4 \sin\left(3\pi t + \frac{\pi}{3}\right) \text{ and } y_2 = 4(\sin 3\pi t + \sqrt{3} \cos 3\pi t),$$

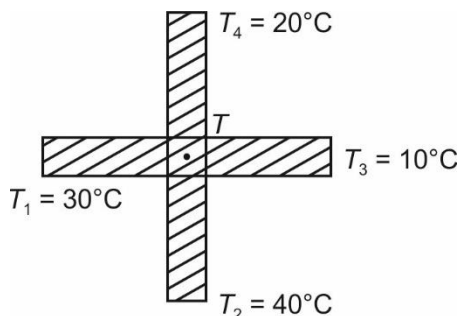
then ratio of their amplitudes is

- (1) $\sqrt{3} : 1$ (2) 1 : 1
 (3) 1 : 2 (4) 3 : 1

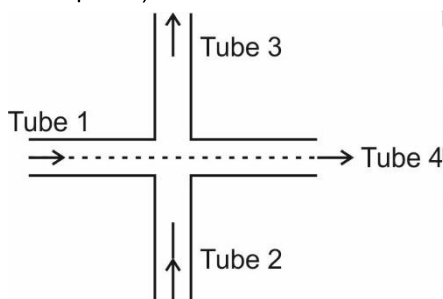
41. The length of sonometer wire is 0.75 m and its material density is $9 \times 10^3 \text{ kg/m}^3$. It can bear maximum stress of $8.1 \times 10^8 \text{ N m}^{-2}$ without exceeding elastic limit. Fundamental frequency that can be produced in the wire is

- (1) 200 Hz
 (2) 230 Hz
 (3) 400 Hz
 (4) 900 Hz

42. Four identical rods of metal are connected as shown in figure. Assuming no heat loss due to radiation from side walls, the junction temperature in steady state will be



- (1) 25°C (2) 18°C
(3) 20°C (4) 16°C
43. The amount of liquid flowing per second in tubes (1), (2) and (3) are $10 \text{ m}^3/\text{s}$, $5 \text{ m}^3/\text{s}$ and $8 \text{ m}^3/\text{s}$ respectively. Velocity of liquid in tube (4) having cross-sectional area 0.7 m^2 is (All tubes are in same horizontal plane)



- (1) 7 m/s (2) 14 m/s
(3) 10 m/s (4) 5 m/s
44. In ground to ground projectile, the horizontal range is 12 m and maximum height reached is 4 m. What is velocity of projection?

- (1) $\frac{1}{3}\sqrt{5} \text{ m/s}$ (2) $\frac{1}{5}\sqrt{5} \text{ m/s}$
(3) $3\sqrt{5} \text{ m/s}$ (4) $5\sqrt{5} \text{ m/s}$

45. Rain is falling vertically downwards with speed 4 km/h. A boy moves on a straight horizontal road with velocity of 4 km/h. What is apparent velocity of rain w.r.t. boy?

- (1) Zero (2) 8 km/h
(3) 5 km/h (4) $4\sqrt{2} \text{ km/h}$

46. Light radiation with energy flux 24 W/cm^2 is incident on a well polished disc of area 20 cm^2 for one hour. The momentum transferred to disc is nearly

- (1) $1.2 \times 10^{-2} \text{ kg m/s}$ (2) $2.6 \times 10^{-2} \text{ kg m/s}$
(3) $2.2 \times 10^{-2} \text{ kg m/s}$ (4) $3 \times 10^{-2} \text{ kg m/s}$

47. A charged particle moves in a circle perpendicular to uniform magnetic field. The time period of revolution of particle is independent of

- (1) Magnetic field (2) Charge of particle
(3) Mass of particle (4) Speed of particle

48. Monochromatic light of frequency f_1 is incident on a photocell and stopping potential is found to be V_1 . What is new stopping potential of the cell if it is irradiated by monochromatic light of frequency f_2 ?

- (1) $(f_2 - f_1)\frac{h}{e} + V_1$ (2) $\frac{h}{e}(f_1 - f_2) + eV_1$
(3) $V_1 - \frac{h}{e}(f_1 + f_2)$ (4) $V_1 - \frac{h}{e}(f_2 - f_1)$

49. Plane microwaves are incident on a long slit having a width of 5 cm. The wavelength of microwaves if the first diffraction minimum is formed at $\theta = 30^\circ$ is

- (1) $\lambda = 2 \text{ cm}$ (2) $\lambda = 2.5 \text{ cm}$
(3) $\lambda = 5 \text{ cm}$ (4) $\lambda = 10 \text{ cm}$

50. The focal lengths of objective and eyepiece lenses of a telescope are respectively 200 cm and 5 cm. Maximum magnifying power of the telescope will be

- (1) 48 (2) 42
(3) 60 (4) 54

[CHEMISTRY]

SECTION-A

51. Crystal field stabilization energy for a high spin d^5 octahedral complex is (P is the pairing energy)
- (1) $0.6\Delta_0 + 2P$ (2) Zero
(3) $-2.4\Delta_0 + 2P$ (4) $1.2\Delta_0 + P$
52. **Statement-I:** Many trivalent lanthanoid ions are coloured both in the solid state and in aqueous solution.

Statement-II: Lanthanoids are good conductors of heat and electricity.

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

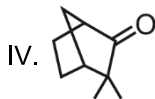
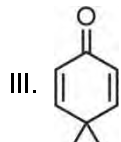
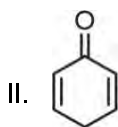
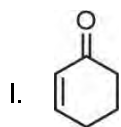
- (1) Statement-I is false but statement-II is true
(2) Both statement-I and statement-II are true
(3) Both statement-I and statement-II are false
(4) Statement-I is true but statement-II is false

53. Aqueous solution of which of the following ions is green coloured?
 (1) Sc^{3+} (2) Ti^{4+}
 (3) V^{3+} (4) Zn^{2+}
54. Compound which has the highest pK_a is
 (1) HF (2) HCl
 (3) HBr (4) HI
55. Ammonium nitrate and lead nitrate on heating separately give colourless neutral gas (X) and brown acidic gas (Y) respectively. The oxidation states of N in X and Y respectively are
 (1) +1 and +3 (2) +2 and +5
 (3) +1 and +4 (4) +2 and +4
56. Which of the following pair of elements can be refined using vapour phase refining method?
 (1) Ni and Zr (2) Ge and Zr
 (3) Cu and Ni (4) Zr and Cu
57. The dispersed phase and the dispersion medium of smoke respectively are
 (1) Liquid and Gas
 (2) Solid and Gas
 (3) Gas and Liquid
 (4) Gas and Solid
58. $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ sol is most easily coagulated by
 (1) Cl^- (2) Al^{3+}
 (3) Na^+ (4) PO_4^{3-}
59. Unit of rate constant for a second order reaction is
 (1) $\text{mol}^2 \text{L}^{-2} \text{s}^{-1}$ (2) s^{-1}
 (3) $\text{mol}^{-1} \text{L} \text{s}^{-1}$ (4) $\text{mol L}^{-1} \text{s}^{-1}$
60. The number of Faraday (F) required to produce 1.35 g of Al from molten AlCl_3 is (Atomic mass of Al = 27 u)
 (1) 1.5 F (2) 0.15 F
 (3) 0.45 F (4) 0.5 F
61. Λ_m° of $(\text{CH}_3\text{COO})_2\text{Ca}$, HCl and CaCl_2 are x, y and z $\text{S cm}^2 \text{mol}^{-1}$ respectively. The Λ_m° for CH_3COOH is
 (1) $x + y + \frac{z}{2}$ (2) $\frac{x}{2} + y - z$
 (3) $\frac{x}{2} + y - \frac{z}{2}$ (4) $x + y - z$
62. A solution of urea has been prepared by dissolving 3 g of urea in 500 g of water. The freezing point of the solution will be (K_f for water = $1.86 \text{ K kg mol}^{-1}$)
 (1) -0.744°C (2) -0.372°C
 (3) 0.372°C (4) -0.186°C
63. Which of the following mixtures show negative deviation from ideal behaviour?
 (1) Chloroform and acetone
 (2) Bromoethane and chloroethane
 (3) Benzene and toluene
 (4) Ethanol and acetone
64. A compound is formed by three elements A, B and C. Atoms of the element A form hexagonal close packed (hcp) lattice, atoms of B occupy $\frac{3}{4}$ th of the tetrahedral voids and atoms of C occupy half of octahedral voids. The formula of the compound is
 (1) AB_3C (2) $\text{A}_2\text{B}_3\text{C}$
 (3) $\text{A}_3\text{B}_2\text{C}_2$ (4) ABC_2
65. Consider the following reaction sequence,

$$\text{CaC}_2 \xrightarrow{\text{H}_2\text{O}} \text{A} \xrightarrow[\text{(1 eqv)}]{\text{Na}} \text{B} \xrightarrow{\text{CH}_3\text{Cl}} \text{C} \xrightarrow[873 \text{ K}]{\text{Red hot Fe tube}} \text{D}$$

 The incorrect statement about the above reaction sequence is
 (1) A is more acidic than C
 (2) B reacts with CH_3Cl via $\text{S}_\text{N}2$ Mechanism
 (3) A on reaction with Na gives H_2 gas as one of the product
 (4) Degree of unsaturation of A and D are 2 and 3 respectively
66. In which of the following reaction(s), methane is formed?
 I. $\text{CH}_3-\text{Br} + \text{Na} \xrightarrow{\text{Dry Ether}}$
 II. $\text{CH}_3\text{COO}^-\text{Na}^+ \xrightarrow[\Delta]{\text{NaOH}+\text{CaO}}$
 III. $\text{CH}_3\text{COO}^-\text{Na}^+(\text{aq}) \xrightarrow{\text{electrolysis}}$
 (1) I only (2) II only
 (3) II and III only (4) I, II and III
67. During estimation of nitrogen present in an organic compound by Kjeldahl's method, the ammonia evolved from 0.2 g of an organic compound, neutralized 10 mL of 0.5 M H_2SO_4 . The percentage of nitrogen in the compound is
 (1) 64% (2) 70%
 (3) 52% (4) 34%

68. The compound(s) which does/do not exhibit tautomerism is/are



- (1) I only (2) II and III only
(3) III and IV only (4) IV only
69. The hybridisation of C in diamond, graphite and Buckminsterfullerene respectively are
- (1) sp^2 , sp^2 and sp (2) sp^3 , sp^2 and sp^2
(3) sp^3 , sp^2 and sp^3 (4) sp^2 , sp^3 and sp^2
70. Consider the following statements

- I. Lithium nitrate decomposes on heating to give lithium nitrite
II. Lithium chloride crystallises as $LiCl \cdot 2H_2O$
III. Lithium hydrogen carbonate is not obtained in the solid form

Correct statement(s) among the following is/are

- (1) II only (2) II and III only
(3) I and II only (4) I, II and III
71. The volume strength of 0.5 M $H_2O_2(aq)$ is
- (1) 5.6 V (2) 11.2 V
(3) 6.72 V (4) 9.2 V
72. Which of the following reactions is a disproportionation reaction?
- (1) $3Mg(s) + N_2(g) \xrightarrow{\Delta} Mg_3N_2(s)$
(2) $CuSO_4(aq) + Zn(s) \longrightarrow Cu(s) + ZnSO_4(aq)$
(3) $2H_2O_2(aq) \longrightarrow 2H_2O(l) + O_2(g)$
(4) $2F_2(g) + 2OH^-(aq) \longrightarrow 2F^-(aq) + OF_2(g) + H_2O(l)$
73. The oxidation state of central bromine atom in Br_3O_8 is
- (1) +4 (2) +6
(3) +2 (4) 0
74. The solubility of $Sn(OH)_2$ in 0.1 M NaOH solution would be (K_{sp} of $Sn(OH)_2$ is 1.4×10^{-28})
- (1) $2.8 \times 10^{-24} \text{ Mol L}^{-1}$ (2) $1.4 \times 10^{-24} \text{ Mol L}^{-1}$
(3) $1.4 \times 10^{-26} \text{ Mol L}^{-1}$ (4) $1.4 \times 10^{-30} \text{ Mol L}^{-1}$

75. The salt which undergoes only anionic hydrolysis is

- (1) NH_4Cl (2) CH_3COONH_4
(3) $NaCl$ (4) $NaCN$

76. The bond dissociation enthalpies of A_2 , B_2 and AB are x , y and z kJ/mol respectively. The enthalpy of formation of AB in kJ/mol is

- (1) $\frac{x}{2} + \frac{y}{2} + z$ (2) $\frac{x+y-z}{2}$
(3) $\frac{x}{2} + \frac{y}{2} - z$ (4) $\frac{x}{2} + y - \frac{z}{2}$

77. Which of the following is the correct option for free expansion of an ideal gas under adiabatic conditions?

- | | | | |
|---------|------------|-------------------|----------------|
| $q = 0$ | $w \neq 0$ | $\Delta U \neq 0$ | $\Delta T = 0$ |
| I | II | III | IV |

- (1) I only (2) I and IV only
(3) I, II and III only (4) I, II, III and IV

78. Total pressure of a mixture of 4.8 g of O_2 and 3.2 g of SO_2 present in a container of volume 2 L at $27^\circ C$ is

- (1) 2.5 atm (2) 2 atm
(3) 3.5 atm (4) 4.2 atm

79. Hybridisation of Xe in XeF_2 , XeO_3 and XeF_6 respectively are

- (1) sp^3 , sp^3 , sp^3d^2
(2) sp , sp^3 , sp^3d^3
(3) sp^3d , sp^3 , sp^3d^3
(4) sp^3d , sp^3d^2 , sp^3d^3

80. In which of the following conversions, the bond order increases and the magnetic behaviour changes?

- (1) $N_2 \rightarrow N_2^-$ (2) $NO \rightarrow NO^+$
(3) $O_2 \rightarrow O_2^+$ (4) $H_2 \rightarrow H_2^-$

81. In which of the following options, the order of arrangement does not agree with the variation of property indicated against it?

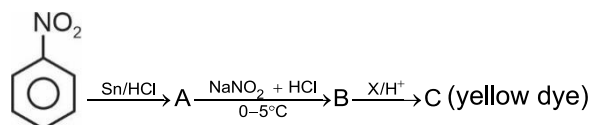
- (1) $B < C < O < N$ (Ionisation enthalpy)
(2) $O < Te < Se < S$ (Electron Gain enthalpy)
(3) $MgO < CaO < SrO < BaO$ (Basic nature)
(4) $Si < Al < C < N$ (Electronegativity)

82. For He^+ ion, the correct order of energy of the atomic orbitals is
- (1) $4d = 3d > 4p = 3p > 5s = 4s = 3s$
 - (2) $5s > 4d > 4p > 4s > 3d > 3p > 3s$
 - (3) $4d > 5s > 4p > 3d > 4s > 3p > 3s$
 - (4) $5s > 4d = 4p = 4s > 3d = 3p = 3s$
83. Which of the following pairs of ions is isoelectronic?
- (1) N^{3-} and S^{2-}
 - (2) Ni^{2+} and Co^{2+}
 - (3) Cr^{3+} and V^{2+}
 - (4) Zn^{2+} and Cu^{2+}
84. An organic compound contains 92.3% (by weight) carbon and remaining percentage of hydrogen. The empirical formula of the compound is
- (1) CH_2
 - (2) CH_3
 - (3) CH
 - (4) CH_4
85. Which of the following has maximum number of atoms?
- (1) 11 g of CO_2
 - (2) 11.2 L of O_2 at STP
 - (3) 12 g of Mg
 - (4) 0.5 mol of H_2O_2

SECTION-B

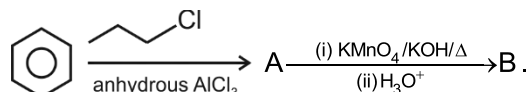
86. An element has a face centred cubic (fcc) structure with a cell edge of 298 pm. The radius of the atom is
- (1) $\sqrt{2} \times 298 \text{ pm}$
 - (2) $\frac{\sqrt{3}}{4} \times 298 \text{ pm}$
 - (3) $\frac{1}{2} \times 298 \text{ pm}$
 - (4) $\frac{1}{2\sqrt{2}} \times 298 \text{ pm}$
87. Maximum prescribed concentration of Cd in drinking water is
- (1) 0.2 ppm
 - (2) 0.005 ppm
 - (3) 0.5 ppm
 - (4) 0.05 ppm
88. Veronal is a/an
- (1) Tranquilizer
 - (2) Analgesic
 - (3) Antibiotics
 - (4) Antiseptic
89. Which of the following is a polyester?
- (1) Nylon 6
 - (2) Terylene
 - (3) Polyacrylonitrile
 - (4) Buna-N
90. The disease caused by the deficiency of thiamine is
- (1) Night blindness
 - (2) Beri-Beri
 - (3) Convulsions
 - (4) Cheilosis

91. Consider the following reaction sequence,



Compounds X and C respectively are

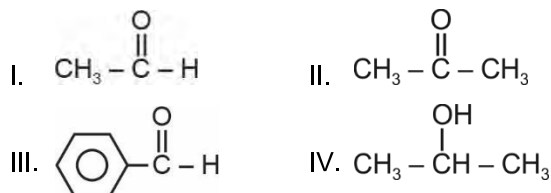
- (1) $\text{C}_6\text{H}_5\text{OH}$ and $\text{C}_6\text{H}_5\text{N}=\text{N}-\text{C}_6\text{H}_4\text{OH}$
 - (2) $\text{C}_6\text{H}_5\text{OH}$ and $\text{C}_6\text{H}_5\text{N}=\text{N}-\text{C}_6\text{H}_3(\text{OH})_2$
 - (3) $\text{C}_6\text{H}_5\text{NH}_2$ and $\text{C}_6\text{H}_5\text{N}=\text{N}-\text{C}_6\text{H}_3(\text{NH}_2)_2$
 - (4) $\text{C}_6\text{H}_5\text{NH}_2$ and $\text{C}_6\text{H}_5\text{N}=\text{N}-\text{C}_6\text{H}_4\text{NH}_2$
92. Which of the following pairs of compounds can be distinguished by carbylamine test?
- (1) CH_3-NH_2 and $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_2$
 - (2) CH_3-NH_2 and $\text{C}_6\text{H}_5\text{NH}_2$
 - (3) $\text{CH}_3-\text{CH}_2-\text{NH}_2$ and $\text{CH}_3-\text{CH}(\text{CH}_3)-\text{NH}-\text{CH}_3$
 - (4) $\text{CH}_3-\text{NH}-\text{CH}_3$ and $\text{CH}_3-\text{N}(\text{CH}_3)_2$
93. Acetone on reaction with ethyl magnesium bromide followed by hydrolysis gives
- (1) 2-Methylbutan-2-ol
 - (2) Butan-2-ol
 - (3) Pentan-2-ol
 - (4) 3-Methylpentan-3-ol
94. Consider the following reaction sequence,



B is

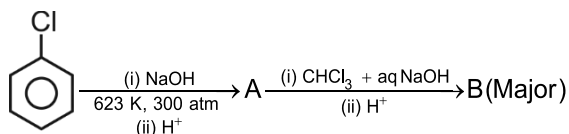
- (1) $\text{C}_6\text{H}_5\text{CH}_2\text{COOH}$
- (2) $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{COOH}$
- (3) $\text{C}_6\text{H}_5\text{COOH}$
- (4) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{COOH}$

95. Which of the following compound(s) give(s) iodoform test but neither give(s) Tollens' nor Fehling's test?



- (1) II only
 (2) II and IV only
 (3) II, III and IV only
 (4) I, II, III and IV

96. Consider the following reaction sequence



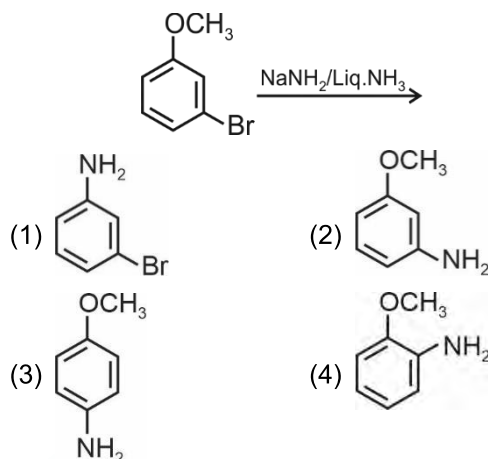
Major product B is

- (1) Cinnamaldehyde (2) Salicylic Acid
 (3) Salicylaldehyde (4) Benzoic Acid

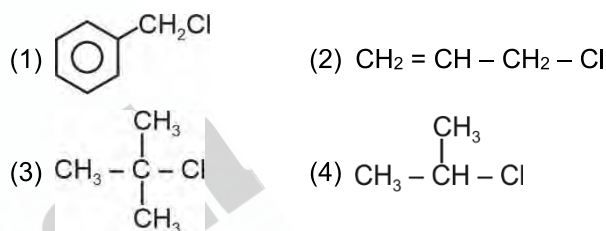
97. Phenetole on heating with HI gives

- (1) Phenol and ethyl iodide
 (2) Ethylbenzene and ethanol
 (3) Phenol and ethanol
 (4) Iodobenzene and ethyl iodide

98. The major product obtained in the following reaction is



99. Compound which is most reactive towards $\text{S}_{\text{N}}1$ reaction is



100. The magnetic moment (in BM) of $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ and $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ respectively are

- (1) 5.92 and 4.90 (2) 5.92 and 1.73
 (3) 1.73 and 4.90 (4) 4.90 and 5.92

[BOTANY]

SECTION-A

101. The main sources of biofertilizers are

- (1) Bacteria, fungi and archaebacteria
 (2) Archaebacteria and mosses
 (3) Bacteria, fungi and cyanobacteria
 (4) Eubacteria, protozoans

102. The BOD test measures the all, **except**

- (1) The rate of uptake of carbon dioxide by micro-organisms in a sample of water
 (2) The amount of biodegradable organic matter present in the water
 (3) The amount of oxygen used to oxidise the organic matter by bacteria
 (4) The polluting potential of a sample of water

103. The IARI released vitamin C enriched vegetable of

- (1) Garden peas (2) Bitter gourd
 (3) Pumpkin (4) Carrot

104. Match the following columns and select the **correct** option.

Column-I (Crop)		Column-II (Resistant variety)	
a.	Cauliflower	(i)	Pusa sem-3
b.	Cowpea	(ii)	Pusa A-4
c.	Flat bean	(iii)	Pusa snowball K-1
d.	Bhindi	(iv)	Pusa Komal

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

105. Introduction of goats in Galapagos islands resulted in exclusion of Abingdon tortoise from the place because
- Of resource partitioning
 - Abingdon tortoise are fast browsers
 - Goats are better browsers
 - Intraspecific competition
106. Choose **correct** statement w.r.t. Species-Area relationship proposed by Alexander von Humboldt.
- With increase in explored area, species richness also increases
 - With decrease in explored area, species richness increases
 - The value of Z lies in range 0.1 to 0.2 for large areas
 - Smaller the explored area, more is the steepness of slope of the line
107. Global warming leads to deleterious changes in the environment and resulting in odd climatic change known as
- Biomagnification
 - El Nino effect
 - Eutrophication
 - Biofortification
108. Read the following statements and select the correct option.
- Statement (A):** GFC is major conduit for energy flow in an aquatic system.
- Statement (B):** DFC begin with dead organic matter.
- Only statement (A) is correct
 - Only statement (B) is correct
 - Both statements are incorrect
 - Both statements are correct
109. 'A' and 'B' have become extinct in the last 500 years due to over exploitation by humans. 'A' and 'B' represents
- Dodo and Nile perch
 - Clarias* and Passenger pigeon
 - Steller's sea cow and Passenger pigeon
 - Passenger pigeon and Nile perch
110. Which one of the following is not true for hotspots?
- High level of species richness
 - High degree of endemism
 - Degree of threat in terms of habitat loss
 - Ex-situ* conservation strategy
111. Valine is coded by more than one codons, hence the code is
- Unambiguous
 - Universal
 - Non-overlapping
 - Degenerate
112. Select the **correct** statement.
- Uracil is present in RNA at the place of guanine
 - In the backbone of DNA, nitrogenous bases project outside
 - DNA is always coiled in left-handed fashion
 - Two chains of DNA have anti parallel polarity
113. In roots, cells are thin walled, very small with dense protoplasm and undifferentiated in the
- Region of meristematic activity
 - Region of elongation
 - Region of root hair
 - Region of maturation
114. Select the correct match.
- | | |
|-----------------------|---------------------|
| (1) Collenchyma | – Monocot root |
| (2) Sclereid | – Fruit wall of nut |
| (3) Phloem parenchyma | – Jute fibres |
| (4) Endarch xylem | – Dicot root |
115. The floral formula $\text{Br} \oplus \text{P}_{(3+3)} \overline{\text{A}_{3+3}} \underline{\text{G}_{(3)}}$ represents
- Fabaceae family
 - Solanaceae family
 - Liliaceae family
 - Brassicaceae family
116. In racemose inflorescence
- The main axis terminates into a flower
 - The flowers are borne in a acropetal order
 - The main axis shows limited growth
 - The flowers are always pentamerous
117. Choose the **correct** statement regarding final stage of meiosis I.
- Sister chromatids start moving towards the pole
 - Dissolution of synaptonemal complex
 - Nucleolus reappears
 - Homologous chromosomes start to separate
118. Which of the following chromosomes appear L-shaped during anaphase stage of cell cycle?
- Telocentric chromosomes
 - Metacentric chromosomes
 - Acrocentric chromosomes
 - Sub-metacentric chromosomes

119. Oils and fats are stored in colourless plastids called
 (1) Amyloplast (2) Elaioplast
 (3) Aleuroplast (4) Chloroplast
120. During which stage of mitosis, chromosomes appear thickest and shortest?
 (1) Prophase (2) Telophase
 (3) Metaphase (4) Anaphase
121. Select the option with same taxonomic categories.
 (1) Diptera and Primata
 (2) Muscidae and Sapindales
 (3) Insecta and Poales
 (4) Mammalia and Arthropoda
122. Seed dormancy can be removed by the application of chemical like
 (1) Para ascorbic acid (2) Phenolic acid
 (3) Nitrate (4) Absciscic acid
123. An organism which completely lack cell wall is
 (1) *Mycoplasma* (2) *Gonyaulax*
 (3) Yeast (4) *Colletotrichum*
124. Match the following columns and select the **correct** option.

Column-I		Column-II	
a.	Carotenoids derivative	(i)	Auxin
b.	Adenine derivative	(ii)	Absciscic acid
c.	Indole compound	(iii)	Cytokinin
d.	Terpenes	(iv)	Gibberellins

- (1) a(ii), b(i), c(iv), d(iii) (2) a(i), b(ii), c(iii), d(iv)
 (3) a(ii), b(iii), c(i), d(iv) (4) a(iv), b(iii), c(ii), d(i)
125. Which of the following intermediates of Krebs cycle is used as raw material for chlorophyll synthesis?
 (1) Succinyl CoA (2) Acetyl CoA
 (3) Oxaloacetic acid (4) α -Ketoglutarate
126. Choose the **incorrect** match.
- (1) Yeast poison themselves – 13% alcohol concentration
 (2) Pyruvic acid – Three carbon compound
 (3) Homofermentive reaction – Lactic acid fermentation
 (4) Protoplasmic respiration – Carbohydrate as respiratory substrate

127. Who revealed the essential role of air in the growth of green plants?
 (1) Jan Ingenhousz (2) Cornelius van Niel
 (3) Joseph Priestley (4) T.W. Engelmann
128. In leaves with Kranz anatomy, the malic acid is formed during carbon assimilation, in the cells of
 (1) Bundle sheath (2) Mesophyll tissue
 (3) Epidermis (4) Vascular bundle
129. Select the **incorrect** statement for stomata.
 (1) Change in turgidity of guard cells causes opening or closing of stomata
 (2) Guard cells are dumb-bell shaped in Poaceae family members
 (3) Microfibrils in cell wall of guard cells are longitudinally oriented
 (4) Transpiration mainly occurs through stomata
130. Match the following columns and select the **correct** option.

Column-I		Column-II	
a.	Manganese	(i)	Pollen germination
b.	Copper	(ii)	Present in vitamins
c.	Boron	(iii)	Splitting of water during photosynthesis
d.	Sulphur	(iv)	Necrosis of leaf tissue

- (1) a(ii), b(iv), c(i), d(iii) (2) a(iv), b(iii), c(ii), d(i)
 (3) a(iii), b(i), c(ii), d(iv) (4) a(iii), b(iv), c(i), d(ii)
131. Which tissue layer of the root is impervious to water due to presence of suberised matrix?
 (1) Epidermis (2) Endodermis
 (3) Cortex (4) Pericycle
132. Read the following statements and select the **correct** option.
Statement (A): The greater the concentration of water in a system, the greater is its kinetic energy.
Statement (B): Solute potential is always positive.
 (1) Both statements are correct
 (2) Only statement (A) is correct
 (3) Both statements are incorrect
 (4) Only statement (B) is correct

133. In which of the following bryophytes, thallus is dorsiventral and closely appressed to the substrate?
 (1) *Marchantia* (2) *Funaria*
 (3) *Polytrichum* (4) *Sphagnum*
134. In which algae, sexual reproduction is oogamous and accompanied by complex post fertilisation development?
 (1) *Dictyota* (2) *Fucus*
 (3) *Sargassum* (4) *Porphyra*
135. G. Bentham and J.D. Hooker classified the plants on the basis of
 (1) Cytological informations only
 (2) Anatomy and phytochemistry
 (3) External features only
 (4) Evolutionary relationship
- SECTION-B**
136. Find **odd** one w.r.t. true fruit.
 (1) Mango and Litchi
 (2) Apple and Strawberry
 (3) Banana and Coconut
 (4) Grape and Papaya
137. The feature not related to heartwood is
 (1) Lignified cell wall
 (2) Hard and durable
 (3) Resistant to insects
 (4) Conduction of water and mineral
138. The flower is perigynous in all, **except**
 (1) Ray florets of sunflower
 (2) Plum
 (3) Peach
 (4) Rose
139. How many chromosomes are present in meiocytes of female honey bee?
 (1) 16 (2) 32
 (3) 13 (4) 26
140. Which among the following is an example of pleiotropy?
 (1) Haemophilia
 (2) Down's syndrome
 (3) Phenylketonuria
 (4) Myotonic dystrophy
141. At which stage splitting of the centromere of each chromosome occurs?
 (1) Anaphase II (2) Anaphase I
 (3) Telophase I (4) Metaphase I
142. Choose the wrong match.
 (1) VNTR – High degree of polymorphism
 (2) Satellite DNA – Repetitive DNA
 (3) Minisatellite DNA – Used as VNTR
 (4) Microsatellite DNA – 11-60 base repeats
143. In Mendelian dihybrid cross, F_2 -generation with the ratio of wrinkled yellow seed is
 (1) $\frac{9}{16}$ (2) $\frac{1}{16}$
 (3) $\frac{1}{2}$ (4) $\frac{3}{16}$
144. Colourblindness is due to mutation in certain genes present on the
 (1) Y-chromosome (2) X-chromosome
 (3) 1st-chromosome (4) 22nd-chromosome
145. RNA is the genetic material in
 (1) M13-phage
 (2) T₄-Bacteriophage
 (3) QB-bacteriophage
 (4) Pox virus
146. Thousands of tiny seeds are produced by fruit of the following plants, **except**
 (1) *Orobancha* (2) Wheat
 (3) *Striga* (4) Orchid
147. In most of the water-pollinated species, pollen grains are protected from wetting by a
 (1) Cellulosic covering
 (2) Proteinaceous covering
 (3) Mucilagenous covering
 (4) Lignified covering
148. Which wall layer of microsporangium possess dense cytoplasm and generally has more than one nucleus?
 (1) Middle layer (2) Tapetum
 (3) Epidermis (4) Endothecium

149. In flowering plants,
- (1) Embryo develops into fruit
 - (2) The ovary develops into seed
 - (3) Ovules matures into pericarp
 - (4) Wall of ovary develops into pericarp
150. Endosperm of apple seed has 51 chromosomes. The number of chromosomes in its meiocyte would be
- (1) 51
 - (2) 17
 - (3) 34
 - (4) 24

[ZOOLOGY]

SECTION-A

151. Read the following statements carefully and choose the option which represents only **correct** statement(s).
- (a) Affinity of foetal hemoglobin for O_2 is more than adult hemoglobin.
 - (b) Oxyhaemoglobin dissociation curve for Hb^F shows shift to right as compared to that of Hb^A .
 - (c) In emphysema, alveolar walls rupture to decrease surface area for gaseous exchange which leads to decrease in residual volume and total lung capacity.
 - (d) Pneumotaxic centre can decrease the duration of inspiration and breathing rate.
- (1) (a) and (b)
 - (2) (b) and (c)
 - (3) (c) and (d)
 - (4) Only (a)
152. Select the **incorrect** match w.r.t. organisms and their respiratory structures.
- (1) *Rana* – Cutaneous respiration
 - (2) *Labeo* – Buccal respiration
 - (3) *Pteropus* – Pulmonary respiration
 - (4) *Periplaneta* – Respiration through tracheal tubes
153. Read the statements given below and select the correct option.
- (1) Lipases are secreted in active form only by pancreas and present in pancreatic juice.
 - (2) Nucleases are present in succus entericus.
 - (3) Mucus secreting cells present in stomach are modified columnar cells.
 - (4) Hepato-pancreatic duct opens into pancreas.
154. Damage to oxyntic cells of gastric mucosa may result in
- (1) Decrease in fat digestion
 - (2) Anaemia
 - (3) Decrease in starch digestion
 - (4) Peptic ulcer
155. Complete the analogy and choose the correct option.
- Aschelminthes : Roundworms :: Platyhelminthes : _____
- (1) Segmented worms
 - (2) Flatworms
 - (3) Filarial worms
 - (4) Hookworms
156. Comprehend the options given below and select the incorrect match.
- (1) *Trygon* – Poison sting
 - (2) *Petromyzon* – Sucking and circular mouth
 - (3) *Exocoetus* – Air sacs
 - (4) *Macaca* – Mammary glands
157. Which of the following organisms possesses incomplete digestive tract?
- (1) *Taenia solium*
 - (2) *Fasciola hepatica*
 - (3) *Wuchereria bancrofti*
 - (4) *Pheretima posthuma*
158. Which of the following statement is **correct** for enzyme carboxypeptidase?
- (1) Magnesium is a cofactor for this enzyme.
 - (2) Its cofactor forms a coordination bond only with the substrate.
 - (3) Its organic cofactor forms one or more coordination bonds only with side chains at active sites.
 - (4) Its cofactor forms coordination bonds with side chains at the active site and at the same time forms one or more coordination bonds with the substrate.
159. The structure of amino acid changes in different solutions having different pH due to
- (1) Presence of peptide bonds
 - (2) Presence of hydrogen bonds
 - (3) Non-ionisable nature of R group
 - (4) Ionisable nature of $-NH_2$ and $-COOH$ groups

160. Choose the **incorrect** match w.r.t. cockroach.

- (1) Hepatic caecae – Present at the junction of foregut and midgut
- (2) Malpighian tubules – Present at the junction of midgut and hindgut
- (3) Mushroom-shaped gland – Present in 6th-7th abdominal segments
- (4) Spermatheca – Present in 6th abdominal segment of male

161. The chitinous mouth part of cockroach having grinding and incising region is

- (1) Labrum (2) Mandible
- (3) Hypopharynx (4) Labium

162. Connective tissue fibres exhibit all of the following properties, except

- (1) Excitability (2) Strength
- (3) Elasticity (4) Flexibility

163. Read the given statements carefully and choose the incorrect statement.

- (1) All voluntary muscle fibres are striated but all striated muscle fibres are not voluntary.
- (2) All smooth muscle fibres are involuntary but all involuntary muscle fibres are not smooth muscle fibres.
- (3) All glandular epithelial cells are columnar in shape but all columnar epithelial cells are not glandular in nature.
- (4) All connective tissues are mesodermal in origin but all mesodermal tissues are not connective tissues.

164. Which of the following biomolecules are responsible for the transitions between the juvenile phase, reproductive phase and senescence phase of life?

- (1) Hormones (2) Enzymes
- (3) Nucleic acids (4) Metal ions

165. In human females, ootid is formed

- (1) During embryonic development
- (2) At puberty, after completion of meiosis-I within tertiary follicle
- (3) After menarche and during fertilization
- (4) After menarche and after fertilization

166. Select the **correct** match.

- (1) Chorionic villi – Chorionic villi appear on trophoblast before implantation
- (2) Implantation – Attachment of foetus with uterus
- (3) Foetal ejection reflex – Triggers the release of oxytocin from maternal adenohypophysis
- (4) Stem cells in inner cell mass – Have the potency to give rise to all the tissues and organs

167. Secretion of LH and FSH hormones remains inhibited during pregnancy mainly due to

- (1) Amenorrhoea during pregnancy
- (2) High secretion of hCG and relaxin
- (3) Embryogenesis within uterus inhibits their secretion
- (4) Increased levels of oestrogens and progestogens during pregnancy which are GnRH inhibitors

168. The nutritive cells of testis which synthesize certain factors for spermiogenesis are present in

- (1) Interstitium of testis (2) Seminiferous tubules
- (3) Vasa efferentia (4) Rete testis

169. Choose the **incorrect** statement w.r.t. GIFT.

- (1) It stands for Gamete Intra Fallopian Transfer.
- (2) Ovum is transferred into the oviduct.
- (3) Zygote is transferred into the fallopian tube.
- (4) Applicable when female cannot produce ovum.

170. Match column-I with column-II and choose the correct option.

Column-I		Column-II	
A.	Non-medicated IUD	(i)	Progestasert and LNG-20
B.	Copper-ions releasing IUD	(ii)	Lippes loop
C.	Hormone releasing IUD	(iii)	Saheli
D.	Non-steroidal oral pills	(iv)	Multiload-375
A	B	C	D
(1)	(i)	(ii)	(iii)
(2)	(ii)	(iv)	(i)
(3)	(iii)	(iv)	(ii)
(4)	(ii)	(iii)	(iv)

171. Read the following statements A and B and choose the correct option.

Statement A: Any population has built-in variations in characteristics.

Statement B: Evolution is not a stochastic process and is based on chance events in organisms and chance mutations in the nature.

- (1) Both statements A and B are correct.
- (2) Both statements A and B are incorrect.
- (3) Only statement A is incorrect.
- (4) Only statement B is incorrect.

172. Cave paintings of prehistoric humans were seen at Bhimbetka rock shelter in Raisen district of

- (1) Uttar pradesh (2) Madhya pradesh
- (3) Bihar (4) Himachal pradesh

173. Which of the following is an incorrect pair?

- (1) Formation of Earth – 4.5 billion years back
- (2) Origin of life – 500 million years after formation of Earth
- (3) First non-cellular forms of life – 3 billion years back
- (4) Dinosaurs – About 65 mya appeared on the Earth

174. Read the following statements and choose the option with all **correct** statements.

- (a) Embryological support for evolution proposed by Ernst Haeckel was disapproved by Karl Ernst von Baer.
- (b) Darwin's finches of Galapagos islands are evolved due to changes brought about by anthropogenic action.
- (c) *Homo erectus* was a hominid fossil discovered in Java in 1891 and had a cranial capacity of about 900 cc.
- (d) Flippers of penguins and dolphins are examples of adaptive radiation.

- (1) (a) and (b) (2) (b) and (c)
- (3) (c) and (d) (4) (a) and (c)

175. Which of the following is the closest living relative of birds?

- (1) Pelycosaurs (2) Therapsids
- (3) Crocodiles (4) Dinosaurs

176. Choose the correct option and complete the analogy.

Cellular barrier : Natural killer cells : : Physiological barrier : _____

- (1) Skin (2) Tears
- (3) Mucus coating (4) Interferons

177. Select the **incorrect** match.

- (1) Humoral immune response – Antibodies
- (2) Anamnestic immune response – Based on memory of 1st encounter with an antigen
- (3) Rheumatoid arthritis – Auto-immune disease
- (4) Natural active immunity – IgA in colostrum

178. Which of the following set of diseases are caused by viruses?

- (1) Syphilis, small pox and gonorrhoea
- (2) Genital warts, trichomoniasis and dengue fever
- (3) Hepatitis-B, herpes and typhoid
- (4) Genital herpes, common cold and chikungunya

179. *Amanita muscaria* contains hallucinogens and is a/an

- (1) Fungus (2) Bacterium
- (3) Alga (4) Plant

180. Choose the correct match w.r.t. drugs, its effect and source from which it is obtained.

	Drug	Effect	Source
(1)	Morphine	Sedative and pain-killer	Obtained from latex of <i>Papaver somniferum</i>
(2)	Cannabinoid	Hallucinations	<i>Erythroxylum coca</i>
(3)	Heroin	Stimulant	Poppy plant latex
(4)	Cocaine	Depressant	<i>Atropa belladonna</i>

181. When there is mating between different breeds, it is called

- (1) Inbreeding
- (2) Out-crossing
- (3) Cross-breeding
- (4) Interspecific hybridization

182. Match the items given in column-I with those in column-II and choose the option with all correct match.

Column-I	Column-II
A. DNA ligase	(i) Insertion of recombinant DNA into host cell
B. Agarose gel electrophoresis	(ii) Ligation of DNA fragment into a vector
C. Downstream processing	(iii) Separation of DNA fragments
D. Transformation	(iv) Separation of the product

	A	B	C	D
(1)	(i)	(ii)	(iii)	(iv)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(ii)	(iii)	(iv)	(i)
(4)	(ii)	(iv)	(iii)	(i)

183. Polymerase chain reaction needs

- (a) DNA template
- (b) Primers
- (c) *Taq* polymerase

Choose the correct option which only includes the requirements to carry out PCR.

- (1) Only a and b
- (2) Only b and c
- (3) Only a and c
- (4) a, b and c

184. Choose the **incorrect** match.

- (1) Rosie – Transgenic cow
- (2) α -1-antitrypsin – Emphysema
- (3) Dolly – Transgenic sheep
- (4) Golden rice – Night blindness

185. The standards required to evaluate the morality of all human activities that might help or harm living organisms are better termed as

- (1) Bioethics
- (2) Biowar
- (3) Biopiracy
- (4) Biopatent

SECTION-B

186. Somatostatin which inhibits secretion of growth hormone is secreted from

- (1) Pancreas
- (2) Hypothalamus
- (3) Pituitary gland
- (4) Pineal gland

187. Which of the following is **correct** sequence of layers present in retina of the eye from outside to inside?

- (1) Ganglionic cells, bipolar cells, photoreceptor cells
- (2) Photoreceptor cells, bipolar cells, ganglionic cells
- (3) Ganglionic cells, photoreceptor cells, bipolar cells
- (4) Bipolar cells, ganglionic cells, photoreceptor cells

188. Choose the **incorrect** statement.

- (1) Pia mater is the innermost brain meninx, present in close contact with brain tissue.
- (2) All parts of hindbrain participate in formation of brain stem except cerebellum.
- (3) Urge for eating and drinking, gastric secretion and cardiovascular reflexes are under the control of medulla oblongata.
- (4) Expression of emotional reactions are under the control of limbic system along with hypothalamus.

189. Each meromyosin has two important parts, a globular head with a A and a B, the former being called the C and the latter, the D. Choose the option which fills the blanks A, B, C and D correctly.

	A	B	C	D
(1)	Short arm	Tail	LMM	HMM
(2)	Tail	Short arm	HMM	LMM
(3)	Short arm	Tail	HMM	LMM
(4)	Cross arm	Tail	LMM	HMM

190. Which of the following hormones is not released when GFR is less than normal?

- (1) Renin
- (2) Aldosterone
- (3) ADH
- (4) ANF

191. Which of the following hormones acts on central neural system and directly influence the male sexual behaviour?

- (1) GnRH
- (2) FSH
- (3) LH
- (4) Testosterone

192. Select the **incorrect** pair from the options given below:

- (1) Diabetes insipidus – Deficiency of ADH
- (2) Graves' disease – Hyperthyroidism
- (3) Gigantism – Hyposecretion of growth hormone
- (4) Acromegaly – Hypersecretion of GH

193. Read the following statements A and B and choose the **correct** option.

Statement A: Light induces dissociation of retinal from opsin resulting in changes in the structure of the opsin.

Statement B: The ear ossicles increase the efficiency of transmission of sound waves to the inner ear.

- (1) Both statements A and B are correct
- (2) Both statements A and B are incorrect
- (3) Only statement A is correct
- (4) Only statement B is correct

194. Which of the following function is not regulated by association areas of forebrain?

- (1) Intersensory association
- (2) Memory
- (3) Communication
- (4) Swallowing

195. All of the following are examples of synovial joints, **except**

- (1) Pubic symphysis
- (2) Shoulder joint
- (3) Knee joint
- (4) Saddle joint

196. Match the disorders listed in column-I with their descriptions in column-II and choose the correct option.

Column-I	Column-II
a. Myasthenia gravis	(i) Wild contractions in muscle due to low Ca^{+2} in body fluids
b. Muscular dystrophy	(ii) Auto immune disorder affecting neuromuscular junction
c. Gout	(iii) Genetic disorder which leads to progressive degeneration of skeletal muscle
d. Tetany	(iv) Inflammation of joints due to accumulation of uric acid crystals

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

197. Select the **incorrect** statement.

- (1) Glomerular filtration is the first step in urine formation.
- (2) About $1/5^{\text{th}}$ part of cardiac output is filtered by each kidney per minute.
- (3) Filtration of blood takes place through 3 layers within kidneys under effective filtration pressure.
- (4) Vasa recta is absent or highly reduced in cortical nephrons.

198. Which of the following is considered as a part of nephron but not a part of renal tubule?

- (1) Collecting duct
- (2) Glomerulus
- (3) Loop of Henle
- (4) DCT

199. Match items in column-I with those in column-II and choose the correct option.

Column-I	Column-II
a. Dub	(i) Open circulation
b. Cockroach	(ii) Diastolic heart sound
c. Earthworm	(iii) Systolic heart sound
d. Lub	(iv) Closed circulation

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

200. Percentage of proteins in blood plasma is nearly equal to the percentage of

- (1) Monocytes in total WBCs
- (2) Neutrophils in formed elements
- (3) Lymphocytes in leucocytes
- (4) Erythrocytes in formed elements

□ □ □

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