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**NEET
PRELIMINARY ROUND
2023
SOLUTION**
(with explanation)
Date: 29.04.2023 Saturday

**NEET PERSONAL BATCH BY
EXPERTS @206 Gangotri Icon,
Nilamber Circle, Vasna -Bhayali
Road, Vadodara Gujarat**

Neelesh Upadhyay 9898966050

https://youtu.be/rcO_Zb6oUMY


(Click on the link#SOURAV GANGULI talks about EDify Study Center)



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Important Instructions for Mock test:

1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on OFFICE Copy carefully with **blue/black** ball point pen only.
2. The test is of 3 hours duration and the Test Booklet contains 200 multiple-choice questions (four options with a single correct answer) from Physics, Chemistry and Biology (Botany and Zoology). 50 questions in each subject are divided into two Sections (A and B) as per details given below : (a) Section A shall consist of 35 (Thirty-five) Questions in each subject (Question Nos – 1 to 35, 51 to 85, 101 to 135 and 151 to 185). All questions are compulsory. (b) Section B shall consist of 15 (Fifteen) questions in each subject (Question Nos – 36 to 50, 86 to 100, 136 to 150 and 186 to 200). In Section B, a candidate needs to attempt any 10 (Ten) questions out of 15 (Fifteen) in each subject. Candidates are advised to read all 15 questions in each subject of Section B before they start attempting the question paper. In the event of a candidate attempting more than ten questions, the first ten questions answered by the candidate shall be evaluated.
3. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.
4. **Use Blue/Black Ball Point Pen** only for writing particulars on this page/markings responses on Answer Sheet.
5. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
6. On completion of the test, the candidate must hand over the Answer Sheet (ORIGINAL and OFFICE Copy) to the Invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
7. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/ Answer Sheet.
8. Use of white fluid for correction is NOT permissible on the Answer Sheet.
9. No candidate, without special permission of the centre Superintendent or Invigilator, would leave his/her seat.
10. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign (with time) the Attendance Sheet twice. Cases, where a candidate has not signed the Attendance Sheet second time, will be deemed not to have handed over the Answer Sheet and dealt with as an Unfair Means case
11. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

Physics

SECTION : A

1. If the initial tension on a stretched string is doubled, then the ratio of the initial and final speeds of a transverse wave along the string is

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

2. The velocity v of a particle at time t is given by $v = at + \frac{b}{t+c}$ where a, b and c are constants.

The dimensions of a, b and c are respectively :

- (1) L^2 , T and LT^2
- (2) LT^2 , LT and L
- (3) L , LT and T^2
- (4) LT^{-2} , L and T

3. The displacement of a particle varies with time (t) as: $s = at^2 - bt^3$. The acceleration of the particle at any given time (t) will be equal to

- (1) a/b
- (2) $a/3b$
- (3) $3b/a$
- (4) $2a/3b$

4. The displacement 'x' (in meter) of a particle of mass 'm' (in kg) moving in one dimension under the action of a force, is related to time 't' (in sec) by $t = \sqrt{x} + 3$. The displacement of the particle when its velocity is zero, will be

- (1) 2 m
- (2) 4 m
- (3) zero
- (4) 6 m

5. Two projectiles are fired from the same point with the same speed at angles of projection 60° and 30° respectively. Which one of the following is true?

- (1) Their maximum height will be same
- (2) Their range will be same
- (3) Their landing velocity will be same
- (4) Their time of flight will be same

6. A missile is fired for maximum range with an initial velocity of 20 m/s. If $g = 10 \text{ m/s}^2$, the range of the missile is

- (1) 40 m
- (2) 50 m

- (3) 60 m
- (4) 20 m

7. A person slides freely down a frictionless inclined plane while his bag falls down vertically from the same height. The final speeds of the man (VM) and the bag (VB) should be such that

- (1) $VM < VB$
- (2) $VM = VB$
- (3) they depend on the masses
- (4) $VM > VB$

8. Consider a car moving along a straight horizontal road with a speed of 72 km/h. If the coefficient of static friction between road and tyres is 0.5, the shortest distance in which the car can be stopped is

- (1) 30 m
- (2) 40 m
- (3) 72 m
- (4) 20 m

9. 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^2
- (2) $\frac{1}{2}mv^2$
- (3) $\frac{1}{2}m^2v^2$
- (4) $\frac{1}{2}mv^3$

10. The speed of a homogenous solid sphere after rolling down an inclined plane of vertical height h from rest without sliding is

- (1) $\sqrt{\frac{10}{7}gh}$
- (2) \sqrt{gh}
- (3) $\sqrt{\frac{6}{5}gh}$

- (4) $\sqrt{\frac{4}{3}gh}$

11. A ball rolls without slipping. The radius of gyration of the ball about an axis passing through its centre of mass is K . If radius of the ball be R , then the fraction of total energy associated with its rotational energy will be

- (1) $\frac{K^2}{K^2+R^2}$

- (2) $\frac{K^2+R^2}{R^2}$
 (3) $\frac{K^2}{R^2}$
 (4) $\frac{R^2}{K^2+R^2}$

12. When a mass is rotating in a plane about a fixed point, its angular momentum is directed along:

- (1) a line perpendicular to the plane of rotation
 (2) the line making an angle of 45° to the plane of rotation
 (3) the radius
 (4) the tangent to the orbit

13. The escape velocity on the surface of earth is 11.2 km/s. What would be the escape velocity on the surface of another planet of the same mass but $\frac{1}{4}$ times the radius of the earth?

- (1) 22.4 km/s
 (2) 44.8 km/s
 (3) 5.6 km/s
 (4) 11.2 km/s

14. A particle of mass 'm' is kept at rest at a height $3R$ from the surface of earth, where 'R' is radius of earth and 'M' is mass of earth. The minimum speed with which it should be projected, so that it does not return back, is (g is acceleration due to gravity on the surface of earth)

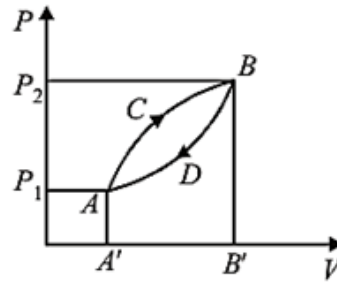
- (1) $\left(\frac{GM}{R}\right)^{\frac{1}{2}}$
 (2) $\left(\frac{GM}{2R}\right)^{\frac{1}{2}}$
 (3) $\left(\frac{gR}{4}\right)^{\frac{1}{2}}$
 (4) $\left(\frac{2g}{4}\right)^{\frac{1}{2}}$

15. Radiation from which of the following sources, approximates black body radiation best?

- (1) A tungsten lamp
 (2) Sodium flame
 (3) Hot lamp black
 (4) A hole in a cavity, maintained at constant temperature

16. A thermodynamic system is taken from state A to B along ACB and is brought back to A along BDA in the PV diagram. The net

work done during the complete cycle is given by the area :



- (1) $P_1 ACBP_2 P_1$
 (2) $ACBB'A'A$
 (3) $ACBDA$
 (4) $ADBB'A'A$

17. During an isothermal expansion, a confined ideal gas does -150 J of work against its surroundings. This implies that

- (1) 150 J heat has been removed from the gas
 (2) 300 J of heat has been added to the gas
 (3) no heat is transferred because the process is isothermal
 (4) 150 J of heat has been added to the gas

18. The amount of heat energy required to raise the temperature of 1g of Helium at NTP, from T_1 K to T_2 K is

- (1) $\frac{3}{2}Nk_B (T_2 - T_1)$
 (2) $\frac{3}{4}Nk_B (T_2 - T_1)$
 (3) $\frac{3}{4}Nk_B \frac{T_2}{T_1}$
 (4) $\frac{3}{8}Nk_B (T_2 - T_1)$

19. There is a body having mass m and performing S.H.M. with amplitude a. There is a restoring force $F = -kx$. The total energy of body depends upon

- (1) k, x
 (2) k, a
 (3) k, a, x
 (4) k, a, v

20. A shell of mass m is at rest initially. It explodes into three fragments having mass in the ratio 2 : 2 : 1. If the fragments having equal mass fly off along mutually perpendicular directions with speed v, the speed of the third (lighter) fragment is

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

21. An organ pipe P1 closed at one end vibrating in its first overtone and another pipe P2, open at both ends vibrating in its third overtone are in resonance with a given tuning fork. The ratio of lengths of P1 and P2 respectively are given by

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

22. Each of the two strings of length 51.6 cm and 49.1 cm are tensioned separately by 20 N force. Mass per unit length of both the strings is same and equal to 1 g/m. When both the strings vibrate simultaneously the number of beats is

- (1) 7
- (2) 8
- (3) 3
- (4) 5

23. Curie is a unit of

- (1) energy of gamma-rays
- (2) half-life
- (3) radioactivity
- (4) intensity of gamma-rays

24. A free neutron decays into a proton, an electron and

- (1) a beta particle
- (2) an alpha particle
- (3) an anti-neutrino
- (4) a neutrino

25. If a soap bubble expands, the pressure inside the bubble

- (1) Decreases
- (2) Increases
- (3) Remains the same
- (4) Is equal to the atmospheric pressure

26. Three copper wires of lengths and cross sectional areas are (ℓ, A) , $(2\ell, A/2)$ and $(\ell/2, 2A)$. Resistance is minimum in:

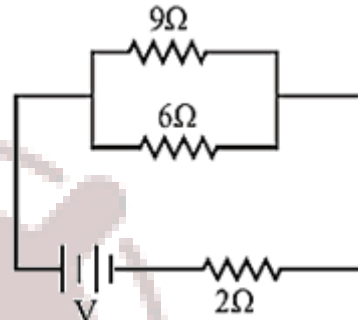
- (1) It is the same in all three cases
- (2) Wire of cross-sectional area $2A$
- (3) Wire of cross-sectional area A
- (4) Wire of cross-sectional area $1/2 A$

27. Resistances n , each of r ohm, when connected in

parallel give an equivalent resistance of R/n . If these resistances were connected in series, the combination would have a resistance in ohms, equal to

- (1) nR
- (2) $n^2 R$
- (3) R/n^2
- (4) R/n

28. If power dissipated in the 9Ω resistor in the circuit shown is 36 watt, the potential difference across the 2Ω resistor is



- (1) 4 volt
- (2) 8 volt
- (3) 10 volt
- (4) 2 volt

29. An electron enters a region where magnetic field (B) and electric field (E) are mutually perpendicular, then

- (1) it will always move in the direction of B
- (2) it will always move in the direction of E
- (3) it always possesses circular motion
- (4) it can go undeflected also

30. The magnetic moment of a diamagnetic atom is

- (1) equal to zero
- (2) much greater than one
- (3) 1
- (4) between zero and one

31. A coil of resistance 400Ω is placed in a magnetic field. If the magnetic flux ϕ (Wb) linked with the coil varies with time t (sec) as $\Phi = 50t^2 + 4$ The current in the coil at $t = 2$ sec is

- (1) 0.5 A
- (2) 0.1 A
- (3) 2 A
- (4) 1 A

32. An electric lift with a maximum load of 2000 kg (lift + passengers) is moving up with a constant speed of 1.5 ms^{-1} . The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is : ($g = 10 \text{ ms}^{-2}$)

- (1) 23000
- (2) 20000
- (3) 34500
- (4) 23500

33. We consider the radiation emitted by the human body. Which of the following statements is true?

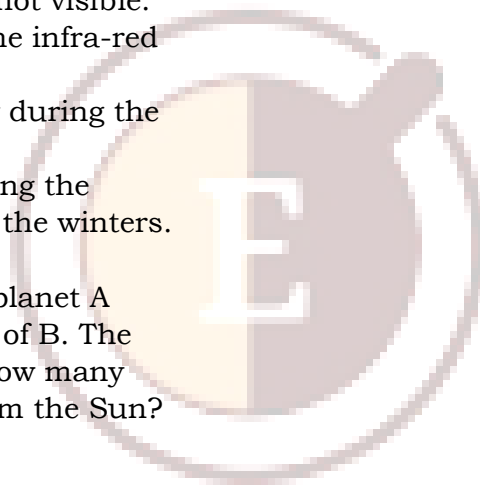
- (1) the radiation emitted lies in the ultraviolet region and hence is not visible.
- (2) the radiation emitted is in the infra-red region.
- (3) the radiation is emitted only during the day.
- (4) the radiation is emitted during the summers and absorbed during the winters.

34. The period of revolution of planet A around the Sun is 8 times that of B. The distance of A from the Sun is how many times greater than that of B from the Sun?

- (1) 2
- (2) 3
- (3) 4
- (4) 5

35. A converging beam of rays is incident on a diverging lens. Having passed through the lens the rays intersect at a point 15 cm from the lens on the opposite side. If the lens is removed the point where the rays meet will move 5 cm closer to the lens. The focal length of the lens is

- (1) - 10 cm
- (2) 20 cm
- (3) -30 cm
- (4) 5 cm



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SECTION : B

36. In Young's double slit experiment, the slits are 0 mm apart and are illuminated by photons of two wavelengths $\lambda_1 = 12000\text{\AA}$ and $\lambda_2 = 10000\text{\AA}$. At what minimum distance from the common central bright fringe on the screen 2 m from the slit will a bright fringe from one interference pattern coincide with a bright fringe from the other?

- (1) 6 mm
- (2) 4 mm
- (3) 3 mm
- (4) 8 mm

37. As the intensity of incident light increases

- (1) photoelectric current increases
- (2) K. E. of emitted photoelectrons increases
- (3) photoelectric current decreases
- (4) K.E. of emitted photoelectrons decreases

38. The angle between the electric lines of force and the equipotential surface is

- (1) 0°
- (2) 45°
- (3) 90°
- (4) 180°

39. An electron changes its position from orbit $n = 2$ to the orbit $n = 4$ of an atom. The wavelength of the emitted radiations is ($R =$ Rydberg's constant)

- (1) $16/R$
- (2) $16/3R$
- (3) $16/5R$
- (4) $16/7R$

40. Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass. The distance of the center of mass of the system from the 10 kg mass is

- (1) 5 m
- (2) $10/3$ m
- (3) $20/3$ m
- (4) 10 m

41. If the potential of a capacitor having capacity $6 \mu\text{F}$ is increased from 10 V to 20 V, then increase in its energy will be

- (1) 4×10^{-4} J
- (2) 4×10^{-4} J
- (3) 9×10^{-4} J
- (4) 12×10^{-6} J

42. In any fission process, the ratio $\frac{\text{mass of fission products}}{\text{mass of parent nucleus}}$ is

- (1) equal to 1
- (2) greater than 1
- (3) less than 1
- (4) depends on the mass of the parent nucleus

43. When two monochromatic lights of frequency, ν and $\nu/2$ are incident on a photoelectric metal, their stopping potential becomes $V_s/2$ and V_s respectively. The threshold frequency for this metal is

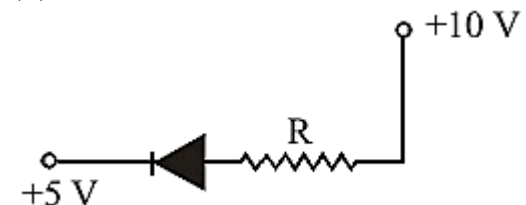
- (1) 2ν
- (2) 3ν
- (3) $2/3\nu$
- (4) $3/2\nu$

44. The transfer ratio β of a transistor is 50. The input resistance of the transistor when used in the common emitter configuration is $1\text{k}\Omega$. The peak value of the collector A.C current for an A.C input voltage of 0.01 V peak is

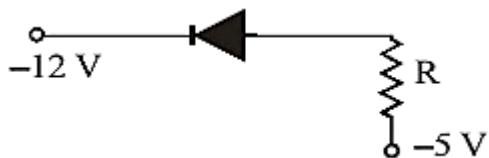
- (1) $100\mu\text{A}$
- (2) $0.01\mu\text{A}$
- (3) 0.25mA
- (4) $500\mu\text{A}$

45. Of the diodes shown in following diagrams, which one is reverse biased?

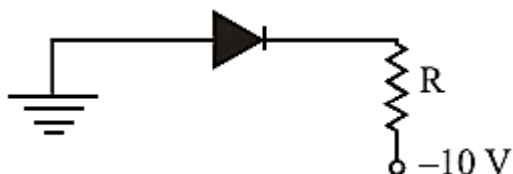
(1)



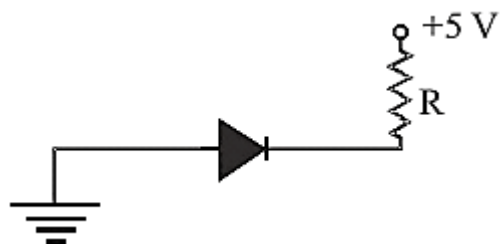
(2)



(3)



(4)



- (1) $\frac{1}{\sqrt{2} n^2 \pi d^2}$
- (2) $\frac{1}{\sqrt{2} n^2 \pi^2 d^2}$
- (3) $\frac{1}{\sqrt{2} n \pi d}$
- (4) $\frac{1}{\sqrt{2} n \pi d^2}$

50. A convex lens 'A' of focal length 20 cm and a concave lens 'B' of focal length 5 cm are kept along the same axis with a distance 'd' between them. If a parallel beam of light falling on 'A' leaves 'B' as a parallel beam, then the distance 'd' in cm will be

- (1) 30
- (2) 25
- (3) 15
- (4) 50

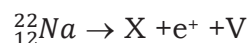
46. A thin prism having refracting angle 10° is made of glass of refractive index 1.42. This prism is combined with another thin prism of glass of refractive index 1.7. This combination produces dispersion without deviation. The refracting angle of second prism should be

- (1) 6°
- (2) 8°
- (3) 10°
- (4) 4°

47. A long solenoid of radius 1 mm has 100 turns per mm. If 1 A current flows in the solenoid, the magnetic field strength at the centre of the solenoid is

- (1) 6.28×10^{-2} T
- (2) 12.56×10^{-2} T
- (3) 12.56×10^{-4} T
- (4) 6.28×10^{-4} T

48. In the given nuclear reaction, the element X is



- (1) ${}_{12}^{22}\text{Mg}$
- (2) ${}_{11}^{23}\text{Mg}$
- (3) ${}_{10}^{23}\text{Mg}$
- (4) ${}_{10}^{22}\text{Mg}$

49. The mean free path for a gas, with molecular diameter d and number density n can be expressed as :

Chemistry
SECTION : A

51. The root mean square speeds at STP for the gases H_2 , N_2 , O_2 and HBr are in the order:

- (1) $H_2 < N_2 < O_2 < HBr$
- (2) $HBr < O_2 < N_2 < H_2$
- (3) $H_2 < N_2 = O_2 < HBr$
- (4) $HBr < O_2 < H_2 < N_2$

52. Identify the incorrect statement from the following.

- (1) The shapes of d_{xy} , d_{yz} and d_{zx} orbitals are similar to each other; and $d_{x^2-y^2}$ and d_{z^2} are similar to each other.
- (2) All the five 5d orbitals are different in size when compared to the respective 4d orbitals.
- (3) All the five 4d orbitals have shapes similar to the respective 3d orbitals.
- (4) In an atom, all the five 3d orbitals are equal in energy in free state.

53. In the photo-electron emission, the energy of the emitted electron is

- (1) greater than the incident photon
- (2) same as than of the incident photon
- (3) smaller than the incident photon
- (4) proportional to the intensity of incident photon.

54. The total number of atomic orbitals in fourth energy level of an atom is:

- (1) 8
- (2) 16
- (3) 32
- (4) 4

55. Correct order of first IP among following elements Be, B, C, N, O is

- (1) $B < Be < C < O < N$
- (2) $B < Be < C < N < O$
- (3) $Be < B < C < N < O$
- (4) $Be < B < C < O < N$

56. In compound X, all the bond angles are exactly $109^\circ 29'$; X is

- (1) Chloromethane
- (2) Carbon tetrachloride
- (3) Iodoform
- (4) Chloroform.

57. The incorrect statement regarding chirality is

- (1) A racemic mixture shows zero optical rotation

(2) S_N1 reaction yields 1 : 1 mixture of both enantiomers

(3) The product obtained by S_N2 reaction of haloalkane having chirality at the reactive site shows inversion of configuration

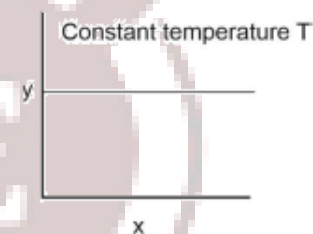
(4) Enantiomers are superimposable mirror images on each other

58. Which of the following is not isostructural with

$SiCl_4$?

- (1) SO_4^{2-}
- (2) PO_4^{3-}
- (3) NH_4^+
- (4) SCl_4

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



The y and x axes for zero and first order reactions, respectively are

- (1) zero order ($y = \text{rate}$ and $x = \text{concentration}$), first order ($y = \text{rate}$ and $x = t_{1/2}$)
- (2) zero order ($y = \text{concentration}$ and $x = \text{time}$), first order ($y = t_{1/2}$ and $x = \text{concentration}$)
- (3) zero order ($y = \text{concentration}$ and $x = \text{time}$), first order ($y = \text{rate constant}$ and $x = \text{concentration}$)
- (4) zero order ($y = \text{rate}$ and $x = \text{concentration}$), first order ($y = t_{1/2}$ and $x = \text{concentration}$)

60. The surface tension of which of the following liquid is maximum?

- (1) C_2H_5OH
- (2) CH_3OH
- (3) H_2O
- (4) C_6H_6

61. Adiabatic expansions of an ideal gas is accompanied by

- (1) decrease in ΔE
- (2) increase in temperature
- (3) decrease in ΔS
- (4) no change in any one of the above properties

62. Given that bond energies of H-H and Cl-Cl are 430 kJ mol^{-1} and 240 kJ mol^{-1} respectively and $\Delta_f H$ for HCl is -90 kJ mol^{-1} . Bond enthalpy of HCl is :

- (1) 380 kJ mol^{-1}
- (2) 425 kJ mol^{-1}
- (3) 245 kJ mol^{-1}
- (4) 290 kJ mol^{-1}

63. The pH value of blood does not appreciably change by a small addition of an acid or a base, because the blood

- (1) is a body fluid
- (2) can be easily coagulated
- (3) contains iron as a part of the molecule
- (4) contains serum protein which acts as buffer

64. Given below are two statements

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

Statement II: Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K . In the light of the above statements, choose the most appropriate answer from the options given below

- (1) Statement I is incorrect but Statement II is correct.
- (2) Both Statement I and Statement II are correct.
- (3) Both Statement I and Statement II are incorrect.
- (4) Statement I is correct but Statement II is incorrect.

65. Identify the correct order of solubility in aqueous medium:

- (1) $\text{ZnS} > \text{Na}_2\text{S} > \text{CuS}$
- (2) $\text{Na}_2\text{S} > \text{CuS} > \text{ZnS}$
- (3) $\text{Na}_2\text{S} > \text{ZnS} > \text{CuS}$
- (4) $\text{CuS} > \text{ZnS} > \text{Na}_2\text{S}$

66. Match List-I with List-II.

List - I	List - II
(Products formed)	(Reaction of
carbonyl compound with)	of
(a) Cyanohydrin	(i) NH_2OH
(b) Acetal	(ii) RNH_2
(c) Schiff's base	(iii) alcohol
(d) Oxime	(iv) HCN

Choose the correct answer from the options given below

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

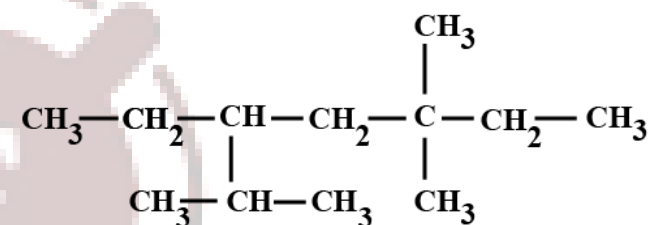
67. Which of the following alkaline earth metal sulphates has hydration enthalpy higher than the lattice enthalpy?

- (1) CaSO_4
- (2) BeSO_4
- (3) BaSO_4
- (4) SrSO_4

68. How many chain isomers could be obtained from the alkane C_6H_{14} ?

- (1) Four
- (2) Five
- (3) Six
- (4) Seven

69. The correct IUPAC name of the structure is:



- (1) 3-isopropyl-5, 5-dimethyl heptane
- (2) 5-Ethyl - 3, 3, 6 - trimethyl heptane
- (3) 3,3-Dimethyl- 5 - isopropyl heptane
- (4) 3- Ethyl-2, 5 - 5- trimethyl heptanes

70. The correct order of reactivity towards the electrophilic substitution of the compounds aniline (i) benzene (II) and nitrobenzene (III) is

- (1) $\text{I} > \text{II} > \text{III}$
- (2) $\text{III} > \text{II} > \text{I}$
- (3) $\text{II} > \text{III} > \text{I}$
- (4) $\text{I} < \text{II} > \text{III}$

71. For a reaction in which all reactants and products are liquids, which one of the following equations is most applicable?

- (1) $\Delta H < \Delta E$
- (2) $\Delta H = \Delta S$
- (3) $\Delta H = \Delta E$
- (4) $\Delta H = \Delta G$

72. When 3, 3-dimethyl 2-butanol is heated with H_2SO_4 , the major product obtained is

- (1) 2,3-dimethyl 2-butene
- (2) 3, 3-dimethyl 1- butene
- (3) 2, 3-dimethyl 1- butene
- (4) cis & trans isomers of 2, 3-dimethyl 2-butene

73. Which of the following is/are the hazardous pollutant present in automobile

exhaust gases? N₂ (ii) CO (iii) CH₄ (iv) Oxides of nitrogen

- (1) (ii) and (iii)
- (2) (I) and (ii)
- (3) (ii) and (iv)
- (4) (I) and (iii)

74. Which of the following anions is present in the chain structure of silicates?

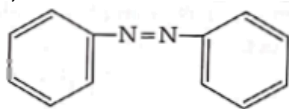
- (1) (Si₂O₅²⁺)_n
- (2) (SiO₃²⁻)_n
- (3) SiO₄⁴⁻
- (4) Si₂O₇⁶⁻

75. A 5% solution of cane sugar (mol. wt. = 342) is isotonic with 1% solution of a substance X. The molecular weight of X is

- (1) 34.2
- (2) 171.2
- (3) 68.4
- (4) 136.8

76. The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds?

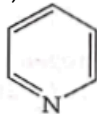
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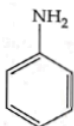
(2)



(3)



(4)



77. The compound A on treatment with Na gives B, and with PCl₅ gives C. B and C react together to give diethyl ether. A, B and C are in the order

- (1) C₂H₅OH, C₂H₆, C₂H₅Cl
- (2) C₂H₅OH, C₂H₅Cl, C₂H₅ONa
- (3) C₂H₅OH, C₂H₅ONa, C₂H₅Cl
- (4) C₂H₅Cl, C₂H₆, C₂H₅OH

78. The plot of concentration of the reactant vs. time for a reaction is a straight line with a negative slope. The reaction follows a

- (1) zero order rate equation
- (2) first order rate equation
- (3) second order rate equation
- (4) third order rate equation

79. The unit of rate constant for a zero order reaction is

- (1) mol L⁻¹ s⁻¹
- (2) L mol⁻¹ s⁻¹
- (3) L² mol⁻² s⁻¹
- (4) s⁻¹

80. The following reactions take place in the blast furnace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag.

- (1) Fe₂O₃(s) + 3CO(g) → 2Fe(l) + 3CO₂(g)
- (2) CaCO₃(s) → CaO(s) + CO₂(g)
- (3) CaO(s) + SiO₂(s) → CaSiO₃(s)
- (4) 2C(s) + O₂(g) → 2CO(g)

81. Sugarcane on reaction with nitric acid gives

- (1) CO₂ and SO₂
- (2) (COOH)₂
- (3) 2HCOOH
- (4) No reaction.

82. Nitrogen forms N₂, but phosphorus is converted into P₄ from P, the reason is

- (1) Triple bond is present between phosphorus atom
- (2) P_π - P_π bonding is strong
- (3) P_π - P_π bonding is weak
- (4) Multiple bond is formed easily.

83. While extracting an element from its ore, the ore is ground and leached with dil. potassium cyanide solution to form the soluble product potassium argento cyanide. The element is

- (1) Lead
- (2) Chromium
- (3) Manganese
- (4) Silver

84. General electronic configuration of lanthanides is

- (1) (n - 2) f¹⁻¹⁴(n - 1) d⁰⁻¹ ns²
- (2) (n - 2) f¹⁰⁻¹⁴(n - 1) d⁰⁻¹ ns²
- (3) (n - 2) f⁰⁻¹⁴(n - 1) d¹⁰ ns²
- (4) (n - 2) d⁰⁻¹(n - 1) f¹⁻¹⁴ ns²

85. Given below are two statements :

Statement I : The boiling points of aldehydes and ketones are higher than hydrocarbons of comparable molecular masses because of weak molecular association in aldehydes and ketones due to dipole – dipole interactions.

Statement II : The boiling points of aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H-bonding.

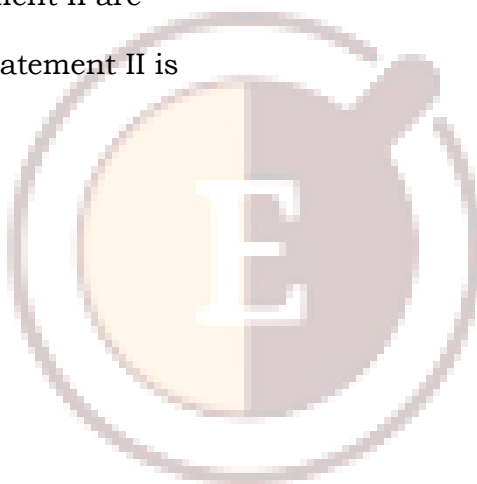
In the light of the above statements, choose the most appropriate answer from the given below

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

(2) Both Statement I and Statement II are correct

(3) Both Statement I and Statement II are incorrect

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



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SECTION B

86. According to IUPAC nomenclature sodium nitroprusside is named as

- (1) Sodium pentacyanonitrosyl ferrate (III)
- (2) Sodium nitroferrocyanide
- (3) Sodium nitroferrocyanide
- (4) Sodium pentacyanonitrosyl ferrate (II)

87. An excess of AgNO_3 is added to 100 mL of a 0.01 M solution of dichlorotetraaquachromium (iii) chloride. The number of moles of AgCl precipitated would be:

- (1) 0.002
- (2) 0.003
- (3) 0.01
- (4) 0.001

88. Lucas reagent is

- (1) Conc. HCl and anhydrous ZnCl_2
- (2) Conc. HNO_3 and hydrous ZnCl_2
- (3) Conc. HCl and hydrous ZnCl_2
- (4) Conc. HNO_3 and anhydrous ZnCl_2

89. When glycerol is treated with excess of HI , it produces:

- (1) glycerol triiodide
- (2) 2-iodopropane
- (3) allyl iodide
- (4) propene

90. $(\text{CH}_3)_3\text{C}-\text{CHO}$ does not undergo Aldol condensation due to

- (1) three electron donating methyl groups
- (2) cleavage taking place between $-\text{C}-\text{CHO}$ bond
- (3) absence of alpha hydrogen atom in the molecule
- (4) bulky $(\text{CH}_3)_3\text{C}-$ group

91. Reduction of aldehydes and ketones into hydrocarbons using zinc amalgam and conc. HCl is called

- (1) Cope reduction
- (2) Dow reduction
- (3) Wolf-Kishner reduction
- (4) Clemmensen reduction.

92. In one molal solution that contains 0.5 mole of a solute, there is

- (1) 1000 g of solvent
- (2) 500 mL of solvent
- (3) 500 g of solvent
- (4) 100 mL of solvent

93. On hydrolysis of starch, we finally get

- (1) Glucose
- (2) Fructose
- (3) Both
- (4) and

94. Chargaff's rule states that in an organism

- (1) Amounts of all bases are equal
- (2) Amount of adenine is equal to that of thymine and the amount of guanine is equal to that of cytosine
- (3) Amount of adenine is equal to that of guanine and the amount of thymine is equal to that of cytosine
- (4) Amount of adenine is equal to that of cytosine and the amount of thymine is equal to that of guanine

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

Assertion (A): ICI is more reactive than I_2 .

Reason (R): $\text{I}-\text{Cl}$ bond is weaker than $\text{I}-\text{I}$ bond.

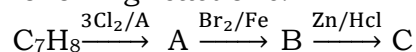
In the light of the above statements, choose the most appropriate answer from the options given below:

- (1) (A) is not correct but (R) is correct
- (2) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- (4) (A) is correct but (R) is not correct

96. An example of a sigma bonded organometallic compound is :

- (1) Grignard's reagent
- (2) Ferrocene
- (3) Cobaltocene
- (4) Ruthenocene

97. The compound C_7H_8 undergoes the following reactions:



The product 'C' is

- (1) m-bromotoluene
- (2) o-bromotoluene
- (3) p-bromotoluene
- (4) 3-bromo-2,4,6-trichlorotoluene

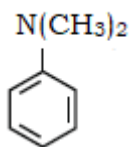
98. Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory?

- (1) O_2
- (2) N_2

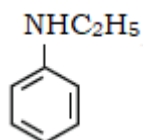
- (3) C_2
(4) Be_2

99. Which of the following amine will give the carbylamine test?

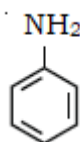
(1)



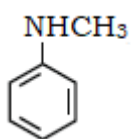
(2)



(3)



(4)



100. The pH of the solution containing 50 mL each of 0.10 M sodium acetate and 0.01 M acetic acid is [Given pK_a of $CH_3COOH = 4.57$]

- (1) 2.57
(2) 5.57
(3) 3.57
(4) 4.57



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BOTANY
SECTION : A

101. Static concept of species was put forward by

- (1) de Candolle
- (2) Linnaeus
- (3) Theophrastus
- (4) Darwin

102. Relative biological effectiveness (RBE) is usually referred to damages caused by

- (1) Low temperature
- (2) High temperature
- (3) Encephalitis
- (4) Radiation

103. Which fungal disease spreads by seed and flowers?

- (1) Loose smut of wheat
- (2) Corn stunt
- (3) Covered smut of barley
- (4) Soft rot of potato

104. Which one is the wrong pairing for the disease and its causal organism?

- (1) Black rust of wheat - *Puccinia graminis*
- (2) Loose smut of wheat - *Ustilago nuda*
- (3) Root-knot of vegetables - *Meloidogyne* sp
- (4) Late blight of potato - *Alternaria solani*

105. Sexual reproduction involving fusion of two cells in *Chlamydomonas* is

- (1) isogamy
- (2) homogamy
- (3) somatogamy
- (4) hologamy

106. Which of the following cannot fix nitrogen?

- (1) *Nostoc*
- (2) *Azotobacter*
- (3) *Spirogyra*
- (4) *Anabaena*

107. Floridean starch is found in

- (1) Chlorophyceae
- (2) Rhodophyceae
- (3) Myxophyceae
- (4) Cyanophyceae

108. *Cycas* and *Adiantum* resemble each other in having:

- (1) Seeds
- (2) Motile Sperms

(3) Cambium

(4) Vessels

109. Photoreceptors of earthworm occur on

- (1) clitellum
- (2) many eyes
- (3) dorsal surface
- (4) lateral sides

110. Plant having column of vascular tissues bearing fruits and having a tap root system is

- (1) monocot
- (2) dicot
- (3) gymnosperm of dicot
- (4) gymnosperm or monocot

111. Pineapple (ananas) fruit develops from

- (1) a multipistillate syncarpous flower
- (2) a cluster of compactly borne flowers on a common axis
- (3) a multilocular monocarpellary flower
- (4) a unilocular polycarpellary flower

112. Inflorescence is racemose in

- (1) Soyabean
- (2) Brinjal
- (3) Tulip
- (4) Aloe

113. Procambium forms

- (1) only primary vascular bundles
- (2) only vascular cambium
- (3) only cork cambium
- (4) primary vascular bundles and vascular cambium

114. Palisade parenchyma is absent in leaves of:

- (1) mustard
- (2) soybean
- (3) gram
- (4) sorghum

115. Electron microscope has a high resolution power. This is due to

- (1) electromagnetic lenses
- (2) very low wavelength of electron beam
- (3) low wavelength of light source used
- (4) high numerical aperture of glass lenses used

116. The function of rough endoplasmic reticulum is

- (1) fat synthesis
- (2) lipid synthesis

- (3) protein synthesis
- (4) steroid synthesis

117. In terrestrial habitats, temperature and rainfall conditions are influenced by

- (1) water transformations
- (2) transpiration
- (3) thermoperiodism
- (4) translocation

118. Which one of the following statements is correct?

- (1) Both Azotobacter and Rhizobium fix atmospheric nitrogen in root nodules of plants.
- (2) Cyanobacteria such as Anabaena and Nostoc are important mobilizers of phosphates and for plant nutrition in soil
- (3) At present it is not possible to grow maize without chemical fertilizers
- (4) Extensive use of chemical fertilizers may lead to eutrophication of nearby water bodies.

119. The deficiencies of micronutrients, not only affects growth of plants but also vital functions such as photosynthetic and mitochondrial electron flow.

Among the list given below, which group of three elements shall affect most, both photosynthetic and mitochondrial electron transport:

- (1) Co, Ni, Mo
- (2) Ca, K, Na
- (3) Mn, Co, Ca
- (4) Cu, Mn, Fe

120. Greatest producers of organic matter are

- (1) crop plants
- (2) forests
- (3) plants of the land area
- (4) phytoplankton of oceans

121. NADPH is generated through

- (1) photosystem I
- (2) photosystem II
- (3) anerobic respiration
- (4) glycolysis

122. The C₄ plants are photosynthetically more efficient than C₃ plants because:

- (1) the CO₂ compensation point is more
- (2) CO₂ generated during photorespiration is trapped and recycled through PEP carboxylase

- (3) the CO₂ efflux is not prevented
- (4) they have more chloroplasts

123. End product of citric acid/Krebs cycle is

- (1) citric acid
- (2) lactic acid
- (3) pyruvic acid
- (4) CO₂ + H₂O

124. The overall goal of glycolysis, krebs cycle and the electron transport system is the formation of

- (1) ATP in one large oxidation reaction
- (2) sugars
- (3) nucleic acids
- (4) ATP in small stepwise units.

125. Apical dominance is caused by

- (1) abscisic acid in lateral bud
- (2) cytokinin in leaf tip
- (3) gibberellin in lateral buds
- (4) auxin in shoot tip

126. Plants deficient of element zinc, show its effect on the biosynthesis of plant growth hormone

- (1) abscisic acid
- (2) auxin
- (3) cytokinin
- (4) ethylene

127. What is common between vegetative reproduction and apomixis?

- (1) Both are applicable to only dicot plants
- (2) Both bypass the flowering phase
- (3) Both occur round the year
- (4) Both produces progeny identical to the parent

128. A population of genetically identical individuals, obtained from asexual reproduction is

- (1) Callus
- (2) Clone
- (3) Deme
- (4) Aggregate

129. A fruit developed from hypanthodium inflorescence is called

- (1) Sorosis
- (2) Syconus
- (3) Caryopsis
- (4) Hasperidium

130. Albuminous seeds store their reserve food mainly in

- (1) Perisperm
- (2) Endosperm
- (3) Cotyledons
- (4) Hypocotyl

131. A man of A-blood group marries a woman of AB blood group. Which type of progeny would indicate that man is heterozygous A?

- (1) AB
- (2) A
- (3) O
- (4) B

132. A fruitfly exhibiting both male and female traits is

- (1) heterozygous
- (2) gynandromorph
- (3) hemizygous
- (4) gynander

133. Phenomenon of 'Industrial melanism' demonstrates

- (1) natural selection
- (2) induced mutation
- (3) geographical isolation
- (4) reproductive isolation

134. Which one of the following traits of garden pea studied by Mendel was a recessive feature?

- (1) Round seed shape
- (2) Axial flower position
- (3) Green seed colour
- (4) Green pod colour

135. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?

- (1) Four
- (2) Nine
- (3) Two
- (4) Three



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SECTION : B

136. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?

- (1) 50%
- (2) 25%
- (3) 100%
- (4) no chance

137. Out of A-T, G-C pairing, bases of DNA may exist in alternate valency state owing to arrangement called

- (1) analogue substitution
- (2) tautomerisational mutation
- (3) frame-shift mutation
- (4) point mutation

138. At time of organogenesis genes regulate the process at different levels and at different time due to

- (1) promoter
- (2) regulator
- (3) intron
- (4) exon

139. In which mode of inheritance do you expect more maternal influence among the offspring?

- (1) Cytoplasmic
- (2) Y-linked
- (3) X-linked
- (4) Autosomal

140. Which of the following is not a property of the genetic code?

- (1) Universal
- (2) Non-overlapping
- (3) Ambiguous
- (4) Degeneracy

141. The new varieties of plants are produced by

- (1) selection and hybridization
- (2) mutation and selection
- (3) introduction and mutation
- (4) selection and intro

142. Compared to a bull a bullock is docile because of

- (1) higher levels of cortisone
- (2) lower levels of blood testosterone
- (3) lower levels of adrenaline/ noradrenaline in its blood
- (4) higher levels of thyroxine.

143. *Trichoderma harzianum* has proved a useful microorganism for

- (1) bioremediation of contaminated soils
- (2) reclamation of wastelands
- (3) gene transfer in higher plants
- (4) biological control of soil-borne plant pathogens

144. Animals that can tolerate a narrow range of salinity are

- (1) stenohaline
- (2) euryhaline
- (3) anadromous
- (4) catadromous

145. Biochemical Oxygen Demand (BOD) in a river water

- (1) has no relationship with concentration of oxygen in the water.
- (2) gives a measure of Salmonella in the water.
- (3) increases when sewage gets mixed with river water.
- (4) remains unchanged when algal bloom occurs.

146. Which one of the following is not used for construction of ecological pyramids?

- (1) Number of individuals
- (2) Rate of energy flow
- (3) Fresh weight
- (4) Dry weight

147. Of the following, which instrument is most commonly used to observe the external features of a grasshopper's abdomen?

- (a) Ultracentrifuge
- (b) Microdissection instrument
- (c) Dissecting microscope
- (d) Electron microscope

148. Which of the following options gives the correct sequence of events during mitosis ?

- (1) Condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase
- (2) Condensation → crossing over → nuclear membrane disassembly → segregation → telophase
- (3) Condensation → arrangement at equator → centromere division → segregation → telophase
- (4) Condensation → nuclear membrane disassembly → crossing over → segregation

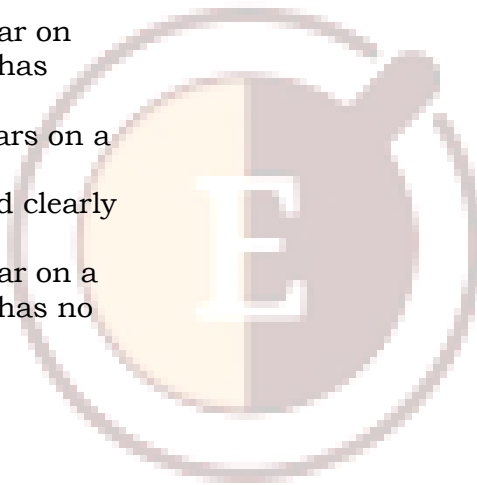
→ telophase

149. Which of the following statements is incorrect?

- (1) Viroids lack a protein coat.
- (2) Viruses are obligate parasites.
- (3) Infective constituent in viruses is the protein coat.
- (4) Prions consist of abnormally folded proteins.

150. Now a days it is possible to detect the mutated gene causing cancer by allowing radioactive probe to hybridise its complimentary DNA in a clone of cells, followed by its detection using autoradiography because :

- (1) mutated gene does not appear on photographic film as the probe has complementarity with it
- (2) mutated gene partially appears on a photographic film
- (3) mutated gene completely and clearly appears on a photographic film
- (4) mutated gene does not appear on a photographic film as the probe has no complementarity with it



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ZOOLOGY

SECTION : A

151. The infective stage of malarial parasite Plasmodium that enters human body is

- (1) merozoite
- (2) sporozoite
- (3) trophozoite
- (4) minuta form

152. Nitrogen fixer soil organisms belong to

- (1) mosses
- (2) bacteria
- (3) green Algae
- (4) soil Fungi

153. Two bacteria found to be very useful in genetic engineering experiments are

- (1) Escherichia and Agrobacterium
- (2) Nitrobacter and Azotobacter
- (3) Rhizobium and Diplococcus
- (4) Nitrosomonas and Klebsiella

154. Ascaris larva is called

- (1) cysticercus
- (2) rhabditiform
- (3) hexacanth
- (4) onchosphere

155. A common characteristic of all vertebrates is

- (1) presence of skull
- (2) division of body into head, neck, trunk and tail
- (3) presence of two pairs of functional appendages
- (4) body is covered with an exoskeleton

156. Which one of the following characters is not typical of the class Mammalia?

- (1) Thecodont dentition
- (2) Alveolar lungs
- (3) Ten pairs of cranial nerves
- (4) Seven cervical vertebrae

157. Which one of the following pairs of animals are similar to each other pertaining to the feature stated against them?

- (1) Pteropus and Ornithorhynchus - Viviparity
- (2) Garden lizard and Crocodile - Three chambered heart
- (3) Ascaris and Ancylostoma - Metameric segmentation
- (4) Sea horse and Flying fish - Cold blooded (poikilothermal)

158. Component of blood responsible for producing antibodies is

- (1) Thrombocytes
- (2) Monocytes
- (3) Erythrocytes
- (4) Lymphocytes

159. The epithelial tissue present on the inner surface of bronchioles and fallopian tube is:

- (1) glandular
- (2) ciliated
- (3) squamous
- (4) cuboidal

160. Cellulose is the major component of cell walls of

- (1) Pythium
- (2) Xanthomonas
- (3) Pseudomonas
- (4) Saccharomyces

161. In double helix of DNA, the two DNA strands are

- (1) coiled around a common axis
- (2) coiled around each other
- (3) coiled differently
- (4) coiled over protein sheath

162. The enormous diversity of protein molecules is due mainly to the diversity of

- (1) amino groups on the amino acids
- (2) R groups on the amino acids
- (3) amino acid sequences within the protein molecule
- (4) peptide bonds

163. An organic substance bound to an enzyme and essential for its activity is called

- (1) Holoenzyme
- (2) Apoenzyme
- (3) Isoenzyme
- (4) Coenzyme

164. Pancreas produces

- (1) three digestive enzymes and one hormone
- (2) three types of digestive enzymes and two hormones
- (3) two digestive enzymes and one hormone
- (4) three digestive enzymes and no hormone

165. The food having fully undergone mechanical and chemical digestion inside the stomach, is called

- (1) Chyle
- (2) Bolus

(3) Amino acid

(4) Chyme

166. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of:

(1) epiglottis

(2) diaphragm

(3) neck

(4) tongue

167. Which of the following are the correct statement for respiration in human

(1) Cigarette smoking may lead of inflammation of bronchi

(2) Neural signals from pneumotaxic centre in pons region of brain can increase the duration of inspiration

(3) Workers in grinding and stone – breaking industries may suffer from lung fibrosis

(4) About 90% of carbon dioxide (CO₂) is carried by haemoglobin as carbamino haemoglobin.

168. The blood cancer is known as

(1) leukaemia

(2) thrombosis

(3) haemolysis

(4) haemophilia

169. The most active phagocytic white blood cells are:

(1) neutrophils and eosinophils

(2) lymphocytes and macrophages

(3) eosinophils and lymphocytes

(4) neutrophils and monocytes

170. In ureotelic animals, urea is formed by the

(1) Arginine cycle

(2) Cori's cycle

(3) Ornithine cycle

(4) EM pathway

171. The maximum amount of electrolytes and water (70 - 80 percent) from the glomerular filtrate is reabsorbed in which part of the nephron?

(1) Ascending limb of loop of Henle

(2) Distal convoluted tubule

(3) Proximal convoluted tubule

(4) Descending limb of loop of Henle

172. Select the correct statement regarding the specific disorder of muscular or skeletal

system :-

(1) Muscular dystrophy - age related shortening of muscles.

(2) Osteoporosis - decrease in bone mass and higher chance of fractures with advancing age.

(3) Myasthenia gravis - Auto immune disorder which inhibits sliding of myosin filaments

(4) Gout - inflammation of joints due to extra deposition of calcium.

173. Neuroglia consist of cells found in the

(1) liver

(2) kidney

(3) central nervous system and ganglia

(4) testes

174. Which hormone possesses anti-insulin effect?

(1) Cortisol

(2) Calcitonin

(3) Oxytocin

(4) Aldosterone

175. Melanocyte stimulating hormone (MSH) is produced by

(1) parathyroid

(2) pars intermedia of pituitary

(3) anterior pituitary

(4) posterior pituitary

176. Which one of the following pairs is incorrectly matched?

(1) Glucagon - Beta cells (source)

(2) Somatostatin - Delta cells (source)

(3) Corpus luteum - Relaxin (secretion)

(4) Insulin - Diabetes mellitus (disease)

177. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy?

(1) Fourth month

(2) Fifth month

(3) Sixth month

(4) Third month

178. Artificial insemination mean:

(1) Transfer of sperms of husband to a test tube containing ova

(2) Artificial introduction of sperms of a healthy donor into the vagina

(3) Introduction of sperms of a healthy donor directly into the ovary

(4) Transfer of sperms of a healthy donor to a test tube containing ova

179. Identify the correct sequence in which the following substances have appeared during the course of evolution of life on earth

- (1) Glucose, amino acids, nucleic acids, proteins
- (2) Ammonia, amino acids, proteins, nucleic acids
- (3) Water, amino acids, nucleic acids, enzymes
- (4) Amino acids, ammonia, phosphates, nucleic Acids

180. In which era reptiles were dominant?

- (1) Coenozoic era
- (2) Mesozoic era
- (3) Palaeozoic era
- (4) Archaeozoic era

181. When two species of different genealogy come to resemble each other as a result of adaptation, the phenomenon is termed

- (1) microevolution
- (2) co-evolution
- (3) convergent evolution
- (4) divergent evolution

182. Cellulose, the most important constituent of plant cell wall is made of

- (1) unbranched chain of glucose molecules linked by α -1, 4 glycosidic bond
- (2) branched chain of glucose molecules linked by β -1, 4 glycosidic bond in straight chain and α -1, 6 glycosidic bond at the site of branching
- (3) unbranched chain of glucose molecules linked by β -1, 4 glycosidic bond
- (4) branched chain of glucose molecules linked by α -1, 6 glycosidic bond at the site of branching.

183. Random unidirectional change in allele frequencies that occurs by chance in all populations and especially in small populations is known as

- (1) Mutation
- (2) Migration
- (3) Natural selection
- (4) Genetic drift

184. Vaccines are

- (1) treated bacteria or viruses or one of their proteins
- (2) MHC (major histocompatibility complex) proteins
- (3) curative medicines
- (4) monoclonal antibodies

185. Increased asthmatics attacks in certain seasons are related to

- (1) eating fruits preserved in tin containers
- (2) inhalation of seasonal pollen
- (3) low temperature
- (4) hot and humid environment.

SECTION : B

186. Which one of the following statements is correct with respect to immunity?

- (1) Preformed antibodies need to be injected to treat the bite by a viper snake.
- (2) The antibodies against small pox pathogen are produced by T – lymphocytes.
- (3) Antibodies are protein molecules, each of which has four light chains.
- (4) Rejection of a kidney graft is the function of Blymphocytes.

187. DNA or RNA segment tagged with a radioactive molecule is called

- (1) Vector
- (2) Probe
- (3) Clone
- (4) Plasmid

188. The genetically-modified (GM) brinjal in India has been developed for:

- (1) insect-resistance
- (2) enhancing shelf life
- (3) enhancing mineral content
- (4) drought-resistance

189. The formula for exponential population growth is

- (1) $dN/rN = dt$
- (2) $rN/ dN = dt$
- (3) $dN/ dt = rN$
- (4) $dt/ dN = rN$

190. Diversification in plant life appeared

- (1) due to long periods of evolutionary changes
- (2) due to abrupt mutations
- (3) suddenly on earth
- (4) by seed dispersal

191. The process of separation and purification of expressed protein before marketing is called :

- (1) Downstream processing
- (2) Bioprocessing
- (3) Postproduction processing
- (4) Upstream processing

192 Which of the following terms describe human dentition?

- (1) Thecodont, Diphyodont, Homodont
- (2) Thecodont, Diphyodont, Heterodont
- (3) Pleurodont, Diphyodont, Heterodont
- (4) Pleurodont, Monophyodont, Homodont

193. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system

- (1) Amphibia
- (2) Reptilia
- (3) Osteichthyes
- (4) Aves

194. Which one of these animals is not a homeotherm?

- (1) Macropus
- (2) Chelone
- (3) Psittacula
- (4) Camelus

195. Which part of the brain is responsible for thermoregulation?

- (1) Cerebrum
- (2) Hypothalamus
- (3) Corpus callosum
- (4) Medulla oblongata

196. Consider following features

- (a) Organ system level of organisation
- (b) Bilateral symmetry
- (c) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics

- (1) Annelida, Arthropoda and Chordata
- (2) Annelida, Arthropoda and Mollusca
- (3) Arthropoda, Mollusca and Chordata
- (4) Annelida, Mollusca and Chordata

197. Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus :

- (1) *Mangifera indica* Car. Linn.
- (2) *Mangifera indica* Linn.
- (3) *Mangifera indica*
- (4) not of the above

198. Following statements describe the characteristics of the enzyme Restriction Endonuclease. Identify the incorrect statement.

- (1) The enzyme cuts DNA molecule at identified position within the DNA.
- (2) The enzyme binds DNA at specific sites and cuts only one of the two strands.
- (3) The enzyme cuts the sugar-phosphate backbone at specific sites on each strand.
- (4) The enzyme recognizes a specific palindromic nucleotide sequence in the DNA.

199. You are required to draw blood from a patient and keep it in a test tube for analysis of blood corpuscles and plasma. You are also provided with the following four types of test tubes. Which of them will you not use for this purpose?

- (1) Test tube containing Calcium Chloride.
- (2) Test tube containing Heparin.
- (3) Test tube containing EDTA.
- (4) Test tube containing Sodium Citrate.

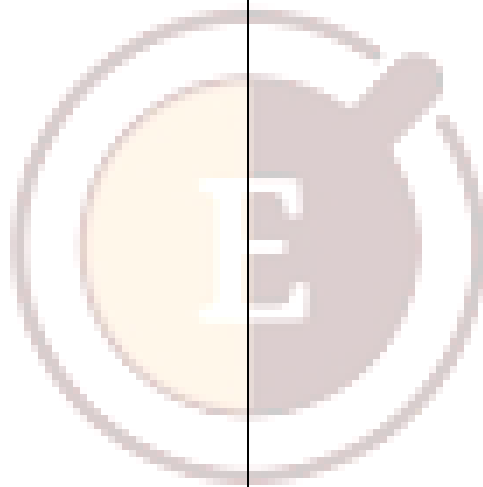
200.

Which one of the following four secretions is correctly matched with its source, target and nature of action?

	Secretion	Source	Target	Action
a	Gastrin	Stomach lining	Oxyntic cells	Production of HCl
b	Inhibin	Sertoli cells	Hypothalamus	Inhibition of secretion of gonadotropin releasing hormone
c	Enterokinase	Duodenum	Gall bladder	Release of bile juice
d	Atrial Natriuretic Factor (ANF)	SA Node	Juxtaglomerular apparatus (JGA)	Inhibition of release of

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

secretion by the oxyntic cells of stomach. This HCl further helps in digestion process. Inhibin is secreted by granulosa and sertoli cells in response to FSH. It inhibits secretion of follicle-stimulating hormone (FSH) by the pituitary gland. Enterokinase hormone is secreted by the duodenum. It converts the inactive trypsinogen into trypsin that helps in digestion of proteins. Atrial natriuretic factor (ANF) is secreted by atrium of heart. It inhibits release of renin by targeting juxtaglomerular apparatus.



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