

NEET TEST SERIES 2023

TEST CODE : NT - 08

Candidate's Name																				
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PHYSICS				
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Section B (Attempt Any 10)				
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CHEMISTRY				
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BOTANY				
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BIOLOGY				
Section A				
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Section B (Attempt Any 10)				
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NEET Part Test-08

TOPIC COVERED

Physics:	Alternating Current, Electromagnetic Wave, Ray Optics and Optical Instruments, Wave Optics
Chemistry:	Coordination Compounds, Haloalkanes and Haloarenes, Alcohols, Phenols and Ethers, Aldehydes, Ketones and Carboxylic Acids
Botany:	Microbes in Human Welfare Solutions, Organisms and Populations
Zoology:	Human Health and Disease

Duration: 3 hr 20 min

Max Marks: 720

General Instructions:

- The test will contain 200 Questions of Physics, Chemistry, Botany, and Zoology & The test will be objective type. (Attempt only 180).
- Every subject contains two Section A-35 Questions and Section B-15 Questions (Attempt only 10).
- All 35 Questions of Section-A are Compulsory to attempt.
- Time given for test is 200 minutes.
- Marking is +4 for every correct answer, -1 for every wrong answer.
- You can reattempt the test in case of any technical issue.
- Test will start at 2:00 pm and students can attempt test at any time of their own preferences

PHYSICS

SECTION - A

1. According to modified Ampere's circuital law (i_D = displacement current)

$$(1) \oint \vec{B} \cdot d\vec{l} = \mu_0 \left(i_C + \epsilon_0 \frac{d\phi_E}{dt} \right)$$

$$(2) \oint \vec{B} \cdot d\vec{l} = \mu_0 \epsilon_0 \frac{d\phi_E}{dt}$$

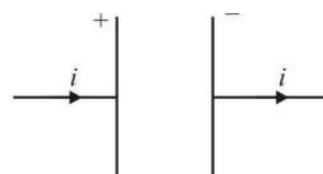
$$(3) \oint \vec{B} \cdot d\vec{l} = \mu_0 j$$

$$(4) \oint \vec{B} \cdot d\vec{l} = \mu_0 \left(i_C \frac{d\phi_E}{dt} + i_D \right)$$

2. Displacement current is set up between the plates of a capacitor when the potential difference across the plates

- (1) Maximum
- (2) Zero
- (3) Minimum
- (4) Varying

3. A parallel plate capacitor with circular plates of radius R is being charged as shown. At the instant shown, the displacement current in the region between the plates enclosed between $\frac{R}{2}$ and R is given by



$$(1) \frac{3}{4}i$$

$$(2) \frac{1}{4}i$$

$$(3) 3i$$

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

4. Velocity of electromagnetic waves in a medium is

$$(1) (\epsilon_0 \mu_0)^{-1/2}$$

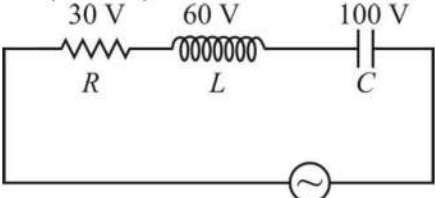
$$(2) (\epsilon_0 \epsilon_r \mu_0 \mu_r)^{-1/2}$$

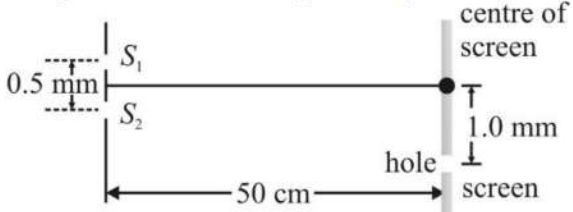
$$(3) 3 \times 10^8 \text{ m/s}$$

$$(4) \left(\frac{\epsilon_0 \epsilon_r}{\mu_0 \mu_r} \right)^{+1/2}$$

5. Which of the following is incorrect about a plane electromagnetic wave?

- (1) The electric field and magnetic field have equal average values
- (2) The electric energy and the magnetic energy have equal average values
- (3) The electric field and magnetic field both oscillate in same phase
- (4) The electric field and magnetic field oscillate in opposite phase

6. In a plane electromagnetic wave, which of the following has/have zero average value in one complete cycle?
 (a) Magnetic field (b) Magnetic energy
 (c) Electric field (d) Electric energy
 (1) (a), (c) (2) (b), (c)
 (3) (a), (d) (4) All of these
7. If \vec{E} and \vec{B} represent the electric and magnetic field vectors of an electromagnetic wave, then the direction of propagation of the electromagnetic wave is in the direction of
 (1) \vec{E} (2) \vec{B}
 (3) $\vec{E} \times \vec{B}$ (4) $\vec{B} \times \vec{E}$
8. If an electromagnetic wave propagating through vacuum is describe by $E_y = E_0 \sin(kx - \omega t)$; $B_z = B_0 \sin(kx - \omega t)$ then
 (1) $E_0 k = B_0 \omega$ (2) $E_0 B_0 = \omega k$
 (3) $E_0 \omega = B_0 k$ (4) $E_0 B_0 = \frac{\omega}{k}$
9. Electromagnetic wave is deflected by
 (1) Electric field
 (2) Magnetic field
 (3) Both (1) & (2)
 (4) Neither electric field nor magnetic field
10. Out of the following, choose the ray which does not travel with the velocity of light
 (1) X-ray (2) Microwave
 (3) γ -rays (4) β -rays
11. Red light differs from blue light in its
 (1) Speed
 (2) Frequency
 (3) Intensity
 (4) Amplitude
12. A 110 V d.c. heater is used on an a.c. source, such that the heat produced is same as it produces when connected to 110 V dc in same time-intervals. What would be the r.m.s. value of the alternating voltage?
 (1) 110 V
 (2) 220 V
 (3) 330 V
 (4) 440 V
13. The peak value of an alternating e.m.f. $E = E_0 \sin \omega t$ is 10 volt and its frequency is 50 Hz. At a time $t = \frac{1}{600\text{s}}$, the instantaneous value of the e.m.f. is
 (1) 1 volt (2) $5\sqrt{3}$ volt
 (3) 5 volt (4) 10 volt
14. A sinusoidal supply of frequency 10 Hz and r.m.s. voltage 12 V is connected to a $2.1 \mu\text{F}$ capacitor. What is r.m.s. value of current?
 (1) 5.5 mA (2) 20 mA
 (3) 26 mA (4) 1.6 mA
15. When 100 volt d.c. is applied across a solenoid, a current of 1.0 A flows in it. When 100 volt a.c. is applied across the same coil, the current drops to 0.5 A. If the frequency of a.c. source is 50 Hz the impedance and inductance of the solenoid is
 (1) 200 ohm and 0.55 henry
 (2) 100 ohm and 0.86 henry
 (3) 200 ohm and 1.0 henry
 (4) 100 ohm and 0.93 henry
16. In a series RLC circuit, potential differences across R , L and C are 30 V, 60 V and 100 V respectively as shown in figure. The e.m.f. of source (in volts) is
- 
- (1) 190 (2) 70
 (3) 50 (4) 40
17. In series LCR circuit, the phase difference between voltage across L and voltage across C is
 (1) Zero (2) π
 (3) $\frac{\pi}{2}$ (4) 2π
18. With increase in frequency of an a.c. supply, the impedance of an LCR series circuit
 (1) Remains constant
 (2) Decreases
 (3) Increases
 (4) Decreases at first, becomes minimum and then increases
19. At resonance, the value of the power factor in an LCR series circuit is
 (1) Zero (2) 1
 (3) $\frac{1}{2}$ (4) Not defined
20. In an a.c. circuit, the instantaneous values of e.m.f. and current are $E = 200 \sin 314 t$ (volt) and $i = \sin(314 t + \pi/3)$ A. The average power consumed in watts is
 (1) 100
 (2) 200
 (3) 50
 (4) 25

21. In an LCR circuit $L = 8.0$ henry, $C = 0.5 \mu\text{F}$ and $R = 100$ ohm are in series. The resonance angular frequency is
 (1) 500 rad/s (2) 600 rad/s
 (3) 800 rad/s (4) 1000 rad/s
22. In series LCR circuit voltage leads the current when (Given that $\omega_0 =$ resonant angular frequency)
 (1) $\omega < \omega_0$ (2) $\omega = \omega_0$
 (3) $\omega > \omega_0$ (4) None of these
23. Power factor of an ideal choke coil (*i.e.*, $R = 0$) is
 (1) Near about zero
 (2) Zero
 (3) Near about one
 (4) One
24. Two waves having intensities in the ratio of 9 : 1 produce interference. The ratio of maximum to minimum intensity is equal to
 (1) 10 : 8 (2) 9 : 1
 (3) 4 : 1 (4) 2 : 1
25. If the light is polarised by reflection, then the angle between reflected and refracted light is
 (1) π
 (2) $\pi/2$
 (3) 2π
 (4) $\pi/4$
26. In an interference pattern produced by two identical slits, the intensity at the site of the central maximum is I . The intensity at the same spot when either of the two slits is closed is I_0 , then
 (1) $I = I_0$
 (2) $I = 2 I_0$
 (3) $I = 4 I_0$
 (4) I and I_0 are not related to each other
27. In Young's double slit experiment, the separation between the slits is halved and the distance between the slits and screen is doubled. The new fringe width is
 (1) Unchanged
 (2) Halved
 (3) Doubled
 (4) Quadrupled
28. Two slits separated by a distance of 1 mm are illuminated with the light of wavelength 6.5×10^{-7} m. The interference fringes are observed on a screen placed 1m from the slits. The distance between the third dark fringe and the fifth bright fringe on the same side of central maxima is
 (1) 0.65 mm (2) 1.62 mm
 (3) 3.25 mm (4) 4.88 mm
29. A double slit interference experiment is carried out in air and the entire arrangement is dipped in water. As a result
 (1) The fringe width decreases
 (2) The fringe width increases
 (3) The fringe width remains unchanged
 (4) Fringe pattern disappears
30. A parallel beam of monochromatic light of wavelength 5000 Å is incident normally on a single narrow slit of width 0.001 mm. The light is focussed by a convex lens on a screen placed on focal plane. The first minimum will be formed for the angle of diffraction equal to
 (1) 0° (2) 15°
 (3) 30° (4) 50°
31. Monochromatic light of wavelength 580 nm is incident on a slit of width 0.30 mm. The screen is 2m from the slit. The width of the central maximum is
 (1) 3.35×10^{-3} m (2) 2.25×10^{-3} m
 (3) 6.20×10^{-3} m (4) 7.7×10^{-3} m
32. In Young's double slit experiment shown in figure. S_1 and S_2 are coherent sources and S is the screen having a hole at a point 1.0 mm away from the central line. White light (400 to 700 nm) is sent through the slits. Which wavelength passing through the hole has strong intensity?
- 
- (1) 400 nm
 (2) 700 nm
 (3) 500 nm
 (4) 667 nm
33. An object is placed symmetrically between two plane mirrors, inclined at an angle of 72° , then the total number of images observed is
 (1) 5
 (2) 4
 (3) 2
 (4) Infinite
34. A person 1.6 m tall is standing at the centre between two walls three metre high. What is the minimum size of a plane mirror fixed on the wall in front of him, if he is to see the full height of the wall behind him?
 (1) 0.8 m
 (2) 1 m
 (3) 1.5 m
 (4) 2.3 m

35. A concave mirror of focal length f produces an image n times the size of the object. If the image is real then the distance of the object from the mirror is

- (1) $(n-1)f$ (2) $\left\{\frac{(n-1)}{n}\right\}f$
 (3) $\left\{\frac{(n+1)}{n}\right\}f$ (4) $(n+1)f$

SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

36. A convex mirror has a focal length f . A real object is placed at a distance f in front of it, from the pole. It produces an image at

- (1) Infinity (2) f
 (3) $f/2$ (4) $2f$

37. The length of a vertical pole at the surface of a lake of water $\left(\mu = \frac{4}{3}\right)$ is 24 cm. Then to an under-water fish just below the water surface the tip of the pole appears to be

- (1) 18 cm above the surface
 (2) 24 cm above the surface
 (3) 32 cm above the surface
 (4) 36 cm above the surface

38. A ray of light strikes a glass plate at an angle 60° . If the reflected and refracted rays are perpendicular to each other, the index of refraction of glass is

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

39. Two transparent media A and B are separated by a plane boundary. The speed of light in medium A is $2.0 \times 10^8 \text{ ms}^{-1}$ and in medium B is $2.5 \times 10^8 \text{ ms}^{-1}$. The critical angle for which a ray of light going from A to B suffers total internal reflection is

- (1) $\sin^{-1} \frac{1}{2}$ (2) $\sin^{-1} \frac{2}{5}$
 (3) $\sin^{-1} \frac{4}{5}$ (4) $\sin^{-1} \frac{3}{4}$

40. Which of the following phenomenon of light forms a rainbow?

- (1) Reflection of light
 (2) Refraction
 (3) Total internal reflection
 (4) Reflection as well as refraction

41. Which of the following is possible application of fibre optics?

- (1) Endoscopy
 (2) High speed internet traffic
 (3) Radio, TV & Telephone signals
 (4) All of the above

42. If in a plano-convex lens, radius of curvature of convex surface is 10 cm and the focal length of lens is 30 cm, the refractive index of the material of the lens will be

- (1) 1.5 (2) 1.66
 (3) 1.33 (4) 3

43. At what angle will a ray of light be incident on one face of an equilateral prism, so that the emergent ray may graze the second surface of the prism ($\mu = 2$)?

- (1) 30° (2) 90°
 (3) 45° (4) 60°

44. A prism of refractive index $\sqrt{2}$ has a refracting angle of 60° . At what angle must a ray be incident on it so that it suffers a minimum deviation?

- (1) 30° (2) 45°
 (3) 60° (4) 75°

45. An astronomical telescope has an objective of focal length 100 cm and an eye piece of focal length 5 cm. The final image of a star is seen 25 cm from the eyepiece. The magnifying power of the telescope is

- (1) 20 (2) 22
 (3) 24 (4) 26

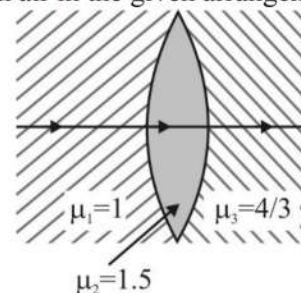
46. When a telescope is adjusted for normal vision, the distance of the objective from the eye-piece is found to be 80 cm. The magnifying power of the telescope is 19. What are the focal length of the lenses?

- (1) 61 cm, 19 cm
 (2) 40 cm, 40 cm
 (3) 76 cm, 4 cm
 (4) 50 cm, 30 cm

47. The focal lengths of the objective and eye lens of a telescope are respectively 200 cm and 5 cm. The maximum magnifying power of the telescope will be

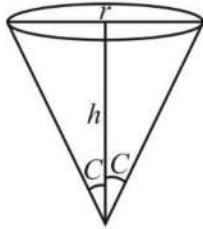
- (1) -40 (2) -48
 (3) -60 (4) -100

48. If radii of curvature of both convex surfaces is 20 cm, then focal length of the lens for an object placed in air in the given arrangement is



- (1) 10 cm (2) 20 cm
 (3) 40 cm (4) 80 cm

49. A fish looking up through the water sees the outside world contained in a circular horizon. If the refractive index of water is $\frac{4}{3}$ and the fish is 12 cm, below the surface. The radius of the circle is



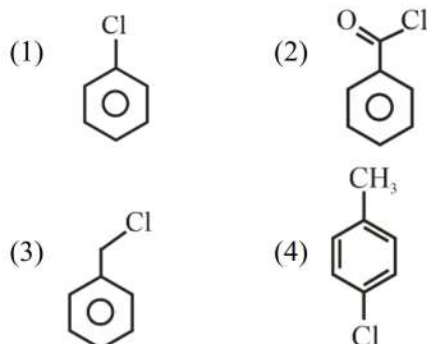
- (1) $\frac{16}{\sqrt{7}}$ cm (2) $\frac{26}{\sqrt{7}}$ cm
 (3) $\frac{36}{\sqrt{7}}$ cm (4) $\frac{46}{\sqrt{7}}$ cm

50. In a medium of refractive index 1.6 and having a convex surface has a point object in it at a distance of 12 cm from the pole. The radius of curvature is 6 cm. Locate the image as seen from air
- (1) A real image at 30 cm
 (2) A real image at 4.28 cm
 (3) A virtual image at 30 cm
 (4) A virtual image at 4.28 cm

CHEMISTRY

SECTION - A

51. When benzyl alcohol is treated with thionyl chloride the product formed is



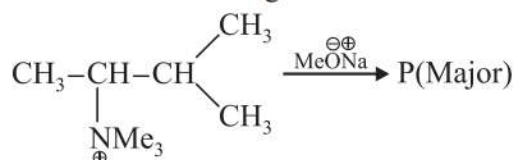
52. Total number of optically active isomers of 2, 3-dibromobutane will be

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

53. The compound having least dipole moment is

- (1) $\text{CH}_3 - \text{Br}$
- (2) $\text{CH}_3 - \text{F}$
- (3) $\text{CH}_3 - \text{Cl}$
- (4) $\text{CH}_3 - \text{I}$

54. Consider the following reaction



Major product (P) is

- (1) $\text{CH}_3 - \text{CH} = \text{C} \begin{matrix} \text{CH}_3 \\ \text{CH}_3 \end{matrix}$
- (2) $\text{CH}_3 - \underset{\text{OMe}}{\text{CH}} - \underset{\text{CH}_3}{\text{CH}} \begin{matrix} \text{CH}_3 \\ \text{CH}_3 \end{matrix}$
- (3) $\text{CH}_2 = \text{CH} - \underset{\text{CH}_3}{\text{CH}} \begin{matrix} \text{CH}_3 \\ \text{CH}_3 \end{matrix}$
- (4) $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{C}} = \text{CH}_2$

55. Among the given substrates which will undergo substitution reaction most easily by $\text{S}_{\text{N}}2$ mechanism?

- (1) $\text{CH}_3\text{CH}_2 - \text{Br}$
- (2) $\text{CH}_3 - \text{Br}$
- (3) $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \text{Br}$
- (4) $(\text{CH}_3)_3\text{C} - \text{Br}$

56. Which among the following will exist as a pair of enantiomers?

- (1) $\text{CH}_3\text{CH}_2\text{CH}_2 - \text{OH}$
- (2) $\text{CH}_3\underset{\text{OH}}{\text{CH}}\text{CH}_3$
- (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2 - \text{OH}$
- (4) $\text{CH}_3\text{CH}_2\underset{\text{OH}}{\text{CH}}\text{CH}_3$

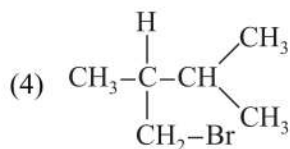
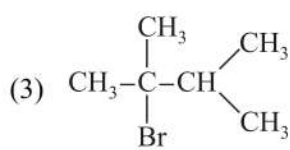
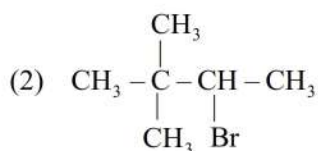
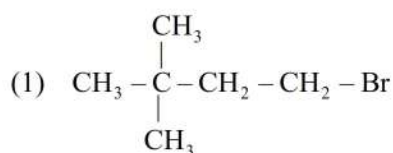
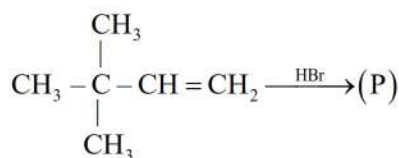
57. Consider the following reactions



Products A and B are respectively

- (1) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CN}$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NO}_2$
- (2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NC}$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NO}_2$
- (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NC}$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{ONO}$
- (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CN}$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{ONO}$

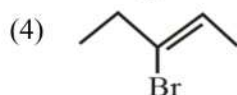
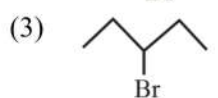
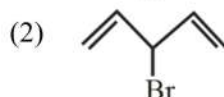
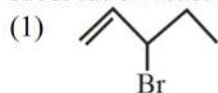
58. Major product (P) of the following reaction is



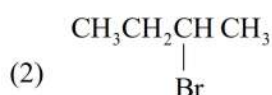
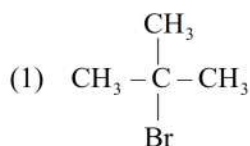
59. In Finkelstein reaction the reagent used is

- (1) NaBr (2) NaCl
(3) NaI (4) Hgl₂

60. Which among the following will undergo substitution reaction most readily via S_N1 mode?



61. Among the given compounds the one which will boil at highest temperature is



62. Incorrect statement among the following is

- (1) In S_N1 reaction carbonium ion intermediate is formed
(2) In S_N2 reaction a five membered transition state is formed
(3) S_N1 reaction is accelerated in polar protic solvent
(4) DMSO is polar protic solvent

63. When 2-bromobutane is heated with alcoholic KOH, the major product formed is

- (1) 1-butene
(2) 2-butene
(3) 1, 3-butadiene
(4) 2-butanol

64. Out of the given nucleophiles, choose the one which gives different substituted products on reaction with R-X because of presence of two nucleophilic centres.

- (1) Alkoxide
(2) Hydroxyl
(3) Cyanide
(4) Ammonia

65. Benzylidene chloride is

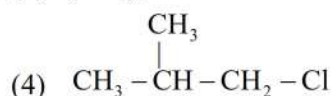
- (1) C₆H₅CH₂Cl
(2) $\text{C}_6\text{H}_5 - \underset{\text{Cl}}{\text{CH}} = \text{CH}$
(3) C₆H₅CHCl₂
(4) C₆H₅CCl₃

66. When isopropyl bromide is reacted with AgCN then the product formed is

- (1) Isopropyl cyanide
(2) Isopropyl isocyanide
(3) Pentanenitrile
(4) Propane isonitrile

67. The alkyl halide that shows least boiling point is

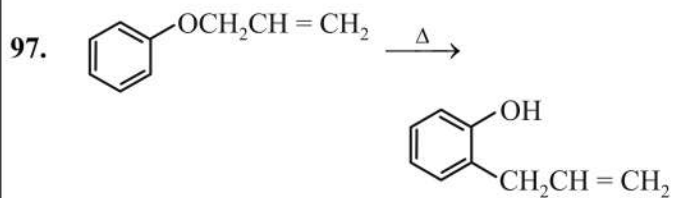
- (1) CH₃(CH₂)₂CH₂Cl
(2) $\text{CH}_3\text{CH}_2\underset{\text{CH}_3}{\text{CH}} - \text{Cl}$



68. IUPAC name of neopentyl bromide is

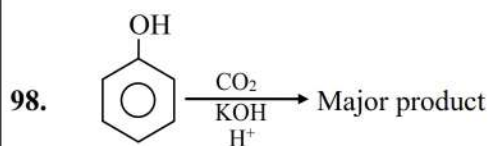
- (1) 1-Bromo-4, 4-dimethylpentane
(2) 1-Bromo-3-methylbutane
(3) 1-Bromo-2, 2-dimethylpropane
(4) 2-Bromo-2methylbutane

69. For metal-carbon bond in the metal carbonyls which is/are correct?
- (1) M-C σ bond is formed by the donation of lone pair of electrons on the carbonyl carbon into a vacant orbital of metal
 - (2) The M-C π bond is formed by the donation of a pair of electrons from a filled orbital of metal into the vacant antibonding π^* orbital of carbon monoxide
 - (3) M-C σ bond is formed by the donation of a pair of electrons from a filled orbital of metal into the vacant antibonding π^* orbital of carbon monoxide
 - (4) Both (1) and (2)
70. The coordination compound that can be used for the hydrogenation of alkene is
- (1) $[\text{Ag}(\text{S}_2\text{O}_3)_2]^{3-}$
 - (2) $[(\text{Ph}_3\text{P})_3\text{RhCl}]$
 - (3) $[\text{PtC}_2\text{H}_4\text{Cl}_3]^-$
 - (4) $[\text{Au}(\text{CN})_2]^-$
71. Consider the given reaction
- $$\text{CH}_3 - \text{CH} = \text{CH}_2 \xrightarrow[\text{(ii) H}_2\text{O}_2/\text{OH}^-]{\text{(i) B}_2\text{H}_6/\text{THF}} \text{'X' (major)}.$$
- Major product (X) will be
- (1) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2\text{BH}_2$
 - (2) $(\text{CH}_3 - \text{CH}_2 - \text{CH}_2)_2\text{BH}$
 - (3) $(\text{CH}_3 - \text{CH}_2 - \text{CH}_2)_3\text{B}$
 - (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
72. The final product for the given reaction is
- $$\text{CH}_3 - \text{O} - \text{CH}_2\text{CH}_3 + \text{HI} \rightarrow$$
- (1) $\text{CH}_3 - \text{CH}_2 - \text{I} + \text{CH}_3\text{CH}_2\text{OH}$
 - (2) $\text{CH}_3 - \text{I} + \text{CH}_3 - \text{CH}_2 - \text{OH}$
 - (3) $\text{CH}_3\text{I} + \text{CH}_2 = \text{CH}_2$
 - (4) $\text{CH}_3 - \text{CH}_2 - \text{I} + \text{HCHO}$
73. Final product (B) obtained in the followed sequence of reactions is
- $$\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CN} \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) DIBAL-H}} \text{A}$$
- $$\xrightarrow[\text{(ii) KOH}\Delta]{\text{(i) NH}_2\text{NH}_2} \text{B}$$
- (1) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
 - (2) $\text{CH}_2 = \text{CH} - \text{CH}_3$
 - (3) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_3$
 - (4) $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$
74. Which of the following compounds will form yellow precipitate when treated with alkaline I_2 solution?
- (1) $\text{C}_2\text{H}_5\text{CHO}$
 - (2) $\text{CH}_3 - \text{O} - \text{CH}_3$
 - (3) $\text{CH}_3 - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_3$
 - (4) $\text{Ph} - \overset{\text{O}}{\parallel} \text{C} - \text{H}$
75. IUPAC name of phthalic acid is
- (1) Benzene -1, 4-dicarboxylic acid
 - (2) Benzene-1, 2-dicarboxylic acid
 - (3) 2-Hydroxy benzoic acid
 - (4) 4-Hydroxy benzoic acid
76. Correct order of reactivity of the following carboxylic acid towards esterification reaction is
- (1) $\text{HCOOH} < \text{CH}_3\text{COOH} < \text{C}_2\text{H}_5\text{COOH}$
 - (2) $\text{CH}_3\text{COOH} < \text{HCOOH} < \text{C}_2\text{H}_5\text{COOH}$
 - (3) $\text{C}_2\text{H}_5\text{COOH} < \text{HCOOH} < \text{CH}_3\text{COOH}$
 - (4) $\text{C}_2\text{H}_5\text{COOH} < \text{CH}_3\text{COOH} < \text{HCOOH}$
77. Rosenmund reduction is used for the preparation of
- (1) Ketone
 - (2) Aldehyde
 - (3) Carboxylic acid
 - (4) Alcohol
78. IUPAC name of the linkage isomer of $[\text{Co}(\text{NH}_3)_5(\text{ONO})]\text{Cl}_2$ will be
- (1) pentaamminenitrito-O-cobalt(III) chloride
 - (2) pentaamminenitrito-N-cobalt(III) chloride
 - (3) cobalt(III) pentaamminenitrito-O-chloride
 - (4) pentaamminenitrito-N-cobalt(III) dichloride
79. Which of the following is not π -acid ligand ?
- (1) CN^-
 - (2) SH^-
 - (3) CO
 - (4) NO^+
80. $[\text{Co}(\text{NH}_3)_4\text{Br}_2]\text{Cl}$ can show
- (1) Geometrical isomerism only
 - (2) Both geometrical and optical isomerism
 - (3) Both geometrical and ionizational isomerism
 - (4) Both optical and ionizational isomerism
81. Which of the following is tetrahedral complex?
- (1) $[\text{Ni}(\text{CO})_4]$
 - (2) $[\text{Ni}(\text{CN})_4]^{2-}$
 - (3) $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]^{2+}$
 - (4) $[\text{Cu}(\text{NH}_3)_4]^{2+}$
82. Which of the following metal carbonyl can act as oxidising agent ?
- (1) $[\text{Ni}(\text{CO})_4]$
 - (2) $[\text{Mn}(\text{CO})_6]$
 - (3) $[\text{V}(\text{CO})_6]$
 - (4) $[\text{Mn}_2(\text{CO})_{10}]$
83. Which is incorrectly matched ?
- (1) $[\text{Ni}(\text{CO})_4] : \text{sp}^3$
 - (2) $[\text{Cr}(\text{NH}_3)_6]^{3+} : \text{d}^2\text{sp}^3$
 - (3) $[\text{Fe}(\text{CN})_6]^{4-} : \text{d}^2\text{sp}^3$
 - (4) $[\text{Cu}(\text{NH}_3)_4]^{2+} : \text{sp}^3$

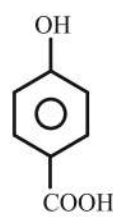
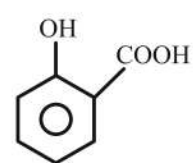
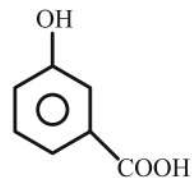
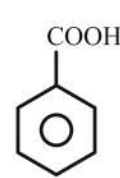


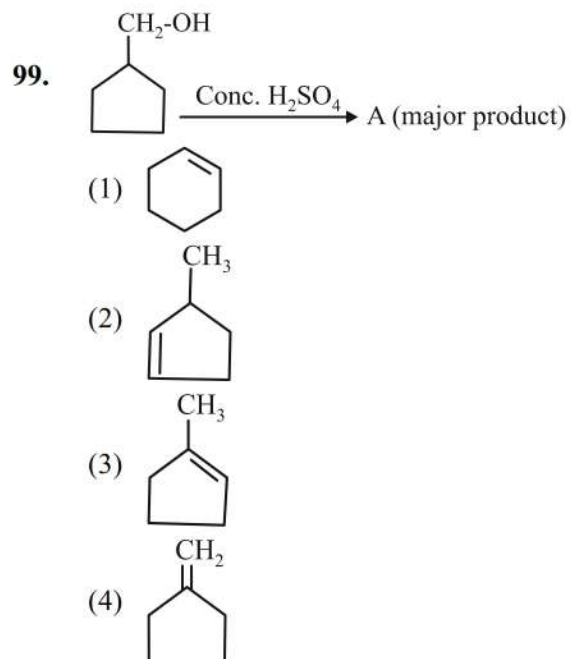
This reaction is called

- (1) Benzilic acid rearrangement
- (2) Claisen rearrangement
- (3) Fries rearrangement
- (4) Schottenbaumann reaction



The major product for the reaction is

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

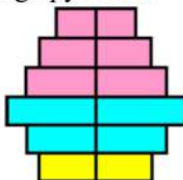


100. Which of the following reagent can be used to oxidize 1° alcohol to aldehyde?

- (1) KMnO_4
- (2) BCC
- (3) H_2O_2
- (4) PCC

BOTANY

SECTION - A

- 101.** Kangaroo rat shows
- (1) adaptation to water scarcity
 - (2) adaptation to cold
 - (3) warning colouration
 - (4) camouflage
- 102.** Which of the following is characteristics of population?
- (1) Density and natality
 - (2) Mortality and dispersal
 - (3) Age distribution and biotic potential
 - (4) All of these
- 103.** Density of a population is expressed as
- (1) the total number of individuals per unit area or volume at a given time
 - (2) the total number of individuals per unit volume only
 - (3) the total number of individuals migrated from native place
 - (4) none of these
- 104.** The size of the population is determined by
- (1) Immigration
 - (2) natality
 - (3) mortality
 - (4) all of these
- 105.** Homeostasis is
- (1) Tendency to change with change in environment
 - (2) Tendency to resist change
 - (3) Disturbance in regulatory control
 - (4) None of these
- 106.** A population interaction where one species is harmed whereas the other is unaffected is called as.
- (1) Mutualism
 - (2) Competition
 - (3) Predation
 - (4) Amensalism
- 107.** Which of the following expresses the population growth?
- (1) $N_t = N_0 + B + I - D - E$
 - (2) $N_t = N_0 + B + E - D - E$
 - (3) $N_t = N_0 + B - I - D - E$
 - (4) $N_t = N_0 + B + I + D + E$
- 108.** The maximum number of individuals of a population that can be sustained indefinitely in a given habitat represents its
- (1) biotic potential
 - (2) metapopulation
 - (3) carrying capacity
 - (4) population density
- 109.** What type of human population is represented by the following age pyramid?
- 
- (1) Expanding
 - (2) Declining
 - (3) Stable
 - (4) None of these
- 110.** The J-shaped growth form is represented by the following exponential equation
- (1) $\frac{dN}{dt} = rN \left(\frac{K - N}{K} \right) = rN \left(1 - \frac{N}{K} \right)$
 - (2) $\frac{dN}{dt} = rN$
 - (3) $N_t = N_0 + B + I - D - E$
 - (4) None of these
- 111.** Which of the following stands for environmental resistance?
- (1) rN
 - (2) $1 - \frac{N}{K}$
 - (3) $rN \left(\frac{K - N}{K} \right)$
 - (4) none of these
- 112.** Which of the following have highest level of BOD
- (1) Primary effluent from sewage
 - (2) Secondary effluent from sewage
 - (3) River water
 - (4) Freshly formed pond
- 113.** Relationship between epiphytes and trees is
- (1) parasitism
 - (2) proto-cooperation
 - (3) commensalism
 - (4) amensalism
- 114.** Interaction between the two organisms in which one organism kills and feeds on the second organism, is called
- (1) scavenging
 - (2) predation
 - (3) parasitism
 - (4) mutualism
- 115.** Which of the following is host specific, smaller in size and have higher biotic or reproductive potential compared to predators?
- (1) Parasite
 - (2) Symbiont
 - (3) Commensals
 - (4) Epiphyte

- 116.** The microbe used in the preparation of butyric acid, is
 (1) *Acetobacter aceti*
 (2) *Penicillium notatum*
 (3) *Aspergillus niger*
 (4) *Clostridium butylicum*
- 117.** Blood cholesterol lowering agent is obtained from
 (1) *Monascus purpureus*
 (2) *Aspergillus*
 (3) *Candida lipolytica*
 (4) *Trichoderma polysporum*
- 118.** Secondary treatment of sewage
 (1) Is physical process
 (2) Involves formation of activated sludge
 (3) Leads to the separation of primary sludge
 (4) Involves process like sequential filtration
- 119.** If the age pyramid of population is declining, it will show
 (1) high percentage of old
 (2) high percentage of children
 (3) low percentage of children
 (4) none of these
- 120.** The association of roots of higher plants with fungi is
 (1) Predator (2) Mutualism
 (3) Parasitism (4) Hyper-parasitism
- 121.** An interaction between two individuals where one is harmed while the other is neither benefited nor harmed is called as
 (1) Predation (2) Symbiosis
 (3) Scavenging (4) Amensalism
- 122.** Organisms which can tolerate and thrive in a wide range of temperature are called
 (1) Eurythermal
 (2) Stenothermal
 (3) Euryhaline
 (4) Stenohaline
- 123.** Birds and mammals are
 (1) conformers (2) suspenders
 (3) regulators (4) cold blooded
- 124.** In an expanding population maximum number of individuals are
 (1) pre reproductive
 (2) reproductive
 (3) post reproductive
 (4) pre or post reproductive
- 125.** $dN / dt = rN \left(\frac{K - N}{K} \right)$ is the equation for
 (1) exponential growth
 (2) negative growth
 (3) logistic growth
 (4) death rate
- 126.** The population of an area tends to decrease by
 (1) Natality (2) Mortality
 (3) Immigration (4) none of these
- 127.** Which of the following bacterium produces Citric acid?
 (1) *Aspergillus Niger*
 (2) *Acetobacter aceti*
 (3) *Lactobacillus*
 (4) None of these
- 128.** The most common fungal partner of mycorrhiza are species.
 (1) *Frankia* (2) *Azotobacter*
 (3) *Azolla* (4) *Glomus*
- 129.** Which of these processes does not give off CO₂
 (1) Lactate fermentation
 (2) Aerobic respiration
 (3) Alcoholic fermentation
 (4) None of these above
- 130.** High biological oxygen demand in a water body means.....
 (1) Water is not polluted
 (2) Water is polluted (More Organic Compound)
 (3) Waterbody contains lots of lifeforms
 (4) None of the above
- 131.** The guts of various ruminants contain
 (1) Acidophiles
 (2) Halophiles
 (3) Methanogens
 (4) All of the above
- 132.** Which of the following microbes are used for the commercial production of Lactic acid?
 (1) *Xanthomonas* (2) *Asparagine*
 (3) *Asparagus* (4) *Lacto Bacillus*
- 133.** *Saccharomyces cerevisiae* is used primarily for
 (1) Baking
 (2) Bleaching
 (3) Biofuel
 (4) None of the above

134. Match the following columns and select the correct option:

	Column – I		Column-II
(a)	Dragonflies	(i)	Biocontrol agents of several plant pathogens
(b)	Bacillus thuringiensis	(ii)	Get rid of mosquitoes
(c)	Glomus insecticidal applications	(iii)	Narrow spectrum
(d)	Baculoviruses	(iv)	Biocontrol agents of lepidopteran plant pests
		(v)	Absorb phosphorus from soil

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

135. Among the following pairs of microbes, which has both the microbes that can be used as biofertilizers?

- (1) Aspergillus and Rhizopus
 (2) Rhizobium and Rhizopus
 (3) Cyanobacteria and Rhizobium
 (4) Aspergillus and Cyanobacteria

SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

136. Higher plants and fungi are living together but one is producer and other is decomposer. Thus higher plants and fungi belong to

- (1) same habitat and same niche
 (2) same habitat and different niche
 (3) same niche and different habitat
 (4) different niche and different habitat

137. Which acts as immunosuppressive agent is

- (1) Fusarium monoliform
 (2) Trichoderma polysporum
 (3) Pencillium
 (4) Clostridium butylicum

138. Trichoderma species are used

- (1) To control several root borne pathogens
 (2) To control of aphids and stem borer
 (3) For control of aphids and stem borer
 (4) For control of Klamath weed

139. Which of the following organisms can increase nitrogen content of the soil?

- (1) Rhizobium and Glomus
 (2) Bacillus anthracis and Salmonella
 (3) Azospirillum and Azotobacter
 (4) Boletus and Glomus

140. Resource partitioning is done to avoid -

- (1) Predation (2) Parasitism
 (3) Competition (4) Commensalism

141. Niche of population is

- (1) set of interaction it has with other populations
 (2) place of its living only
 (3) place of its living and manner of its functioning
 (4) none of these

142. Group of organisms of the same species in a given area at a particular time is called as

- (1) Community (2) Ecosystem
 (3) Biosphere (4) Population

143. Severe competition for food, shelter and space is maximum in

- (1) closely related species occupying the same niche
 (2) closely related species occupying the different niche
 (3) distantly related species occupying the same habitat
 (4) distantly related species occupying the different habitat

144. If decomposers are cleaned totally from any environment which of the following effect will occur?

- (1) Blockage of mineral flow
 (2) Blockage of solar energy
 (3) Blockage of food energy
 (4) Rate of decomposition will increase

145. In increasing order of organizational complexity, which one of the following is in the correct sequence?

- (1) Population, variety, community, ecosystem
 (2) Population, species, community, ecosystem
 (3) Species, population, community, ecosystem
 (4) Species, variety, ecosystem, population

146. In biotic community, which one of the following can be called protective device?

- (1) Symbiosis (commensalisms)
 (2) Camouflage
 (3) Competition
 (4) Parasitism

- 147.** Which of the following utilizes inorganic materials?
- (1) Autotrophs (2) Decomposers
(3) Saprophytes (4) Hetrotrophs
- 148.** Opuntia is a desert plant. It keeps its stomata closed during daytime still it can perform photosynthesis because it
- (1) performs C₄ cycle
(2) lacks leaves
(3) performs CAM cycle
(4) lacks photorespiration
- 149.** Select the true statement when population reaches carrying capacity
- (1) Mortality rate = Birth rate
(2) Mortality rate > Birth rate
(3) Mortality rate < Birth rate
(4) None of these
- 150.** Which is more stable from ecological point of view
- (1) Population (2) Organism
(3) Community (4) Heads

ZOOLOGY

SECTION - A

- 151.** What is Drug Addiction?
(1) Addiction to Food
(2) Dependence on Drugs
(3) Taking medicines with valid medical prescriptions
(4) Not eating a balanced diet
- 152.** In which age group, Drug addiction is a major problem?
(1) Childhood
(2) Adolescence
(3) Adulthood
(4) Old Age
- 153.** Which type of antibodies are produced in allergy?
(1) IgM (2) IgE
(3) IgG (4) IgA
- 154.** Which of the following is not a common problem of Adolescence?
(1) Spirituality
(2) Acne
(3) Post-traumatic Stress Disorder
(4) Mood Swings
- 155.** Which one is not included in cannabinoids?
(1) Marijuana (2) Hashish
(3) Heroin (4) Charas
- 156.** Which of the following infection spread in body through mosquito:
(1) filariasis (2) malaria
(3) amoebiasis (4) both 1 and 2
- 157.** Antibodies are produced by
(1) B-lymphocytes (2) T-lymphocytes
(3) Neutrophils (4) basophils
- 158.** Which cells are responsible in Humoral & cell mediated immunity, respectively
(1) B-cell, T-cell
(2) T-cell, B-cell
(3) T-cell, neutrophils
(4) Neutrophils, Basophils
- 159.** 'NACO' Full form is
(1) Nation AIDS Control Organisation
(2) National AIDS Control Organisation
(3) National AIDS Controller Organisation
(4) None
- 160.** Which of the following immune response is responsible for tissue graft rejection?
(1) Humoral mediated immunity
(2) Auto immunity
(3) Cell mediated immunity
(4) Inflammatory immune response
- 161.** Name the vaccine which is produced by using Recombinant DNA technology?
(1) OPV (2) BCG
(3) Hepatitis B (4) Smallpox vaccine
- 162.** After entering T-cell, HIV first forms
(1) Double stranded DNA
(2) mRNA
(3) Single stranded DNA
(4) Double stranded RNA
- 163.** Choose the correct statement w.r.t. AIDS
(1) It is caused by non-enveloped virus
(2) It is an non immunodeficiency disease
(3) Viral RNA genome is converted into copy DNA by reverse transcriptase
(4) HIV selectively infects and kills B-lymphocytes
- 164.** Which of the following is opportunistic disease associated with HIV?
(1) Toxoplasma (2) Burkitt's lymphoma
(3) Leprosy (4) Tetanus
- 165.** Proto-oncogenes are also known as
(1) V-onc (2) C-onc
(3) Viral oncogenes (4) None of these
- 166.** Which technique uses non ionizing radiation to accurately detect pathological and physiological changes in the living tissue?
(1) CT scan (2) MRI
(3) PET scan (4) Mamography
- 167.** Cocaine is obtained from:
(1) Datura (2) *Erythroxylum coca*
(3) Atropa (4) Opium
- 168.** MALT (Mucosal associated lymphoid tissue) constitutes about _____ percent of lymphoid tissue in human body.
(1) 10 (2) 20
(3) 50 (4) 80

169. Which disease is matched by its correct symptom and test.

- (1) Typhoid – Stomach pain, constipation, Headache, loss of appetite, Test – widal test
- (2) Pneumonia – Alveoli, filled with fluid, test – widal test
- (3) Syphilis – Diarrhea, Indigestion, Test – VDRL test
- (4) Tuberculosis – Cough, bloody sputum, test – Schick test

170. Which fish feeds on mosquito larvae?

- (1) Rohu
- (2) Sardine
- (3) Gambusia
- (4) Catla

171. Which of the following are Bacterial diseases

- (1) Syphilis, Chicken Pox, Dysentery
- (2) Syphilis, Dysentery, Typhoid
- (3) Chicken Pox, Measles, Small Pox
- (4) Typhoid, Chicken Pox, Dysentery

172. Match the correct option regarding Malaria

- p. Toxic substance 1. Sporozoite
 q. Infective stage 2. *Plasmodium*
 r. Vector 3. Female *Anopheles* mosquito
 s. Causative agent 4. Haemozoin

(1)	p-1	q-2	r-3	s-4
(2)	p-4	q-1	r-3	s-2
(3)	p-4	q-3	r-2	s-1
(4)	p-3	q-1	r-2	s-4

173. Which one of the following does not involve in infection of malaria in human?

- (1) *P. vivax*
- (2) *P. falciparum*
- (3) *P. ovale*
- (4) *Wuchereria bancrofti*

174. The rupture of RBC, is associated with release of which toxic substance.

- (1) Haemoglobin
- (2) Hematin
- (3) Haemozoin
- (4) Haemocyanin

175. Enzyme responsible for replication of HIV in macrophages is

- (1) RNA polymerase
- (2) DNA ligase
- (3) DNA polymerase
- (4) Reverse transcriptase

176. The main site that get affected by elephantiasis

- (1) Head
- (2) Lower limbs & genital organs
- (3) Eyes
- (4) Neck & chest

177. Consider the following statements:

- (i) Innate immunity is non specific type of defence, that is present at the time of birth.
- (ii) Acquired Immunity is pathogen specific and is characterized by memory.
- (iii) Memory based acquired immunity developed in higher vertebrates based on ability to distinguish self from non-self

Which of the following statements are true?

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

178. Which one of the following acts as a physiological barrier to the entry of micro-organism in human body?

- (1) Tears
- (2) Monocytes
- (3) Skin
- (4) Epithelium of Urogenital tract

179. *Salmonella* is related to

- (1) Typhoid
- (2) Polio
- (3) TB
- (4) Tetanus

180. Cytokines that provide non-specific immunity against virus are-

- (1) Interleukin
- (2) Tumour necrosis
- (3) Colony stimulating factor
- (4) Interferon

181. When plants/animals are infected with virus, they may produce an anti-viral substance that is capable of inhibiting the multiplication of that virus. Identify the substance-

- (1) Virion
- (2) Antivirion
- (3) Antigen
- (4) Interferon

182. Which species of *Plasmodium* causes malignant malaria?

- (1) *P. vivax*
- (2) *P. ovale*
- (3) *P. falciparum*
- (4) *P. malariae*

183. Among non infectious diseases, which of the following is most common cause of death?

- (1) AIDS
- (2) Cancer
- (3) Malaria
- (4) More than one option is correct

184. The type of immunoglobulin is present in the colostrum secreted by mammary glands

- (1) IgD
- (2) IgG
- (3) IgE
- (4) IgA

185. Which of the following is not a component of innate immunity?
- (1) Interferons
 - (2) Inflammatory barriers
 - (3) Natural killer cells
 - (4) Immunoglobulins

SECTION - B
(ATTEMPT ANY 10 QUESTIONS)

186. Interferon is a protein that
- (1) Kills a virus
 - (2) Protects unattached cells from virus
 - (3) Prevents viruses from taking over the cellular machinery
 - (4) More than one option is correct
187. The genome of HIV, the causative agent of AIDS is made up of two copies of
- (1) ssRNA
 - (2) ssDNA
 - (3) dsRNA
 - (4) dsDNA
188. The treatment of snake bite by antivenom is an example of
- (1) Artificially acquired active immunity
 - (2) Artificially acquired passive immunity
 - (3) Naturally acquired passive immunity
 - (4) Specific natural immunity
189. The sites where B and T lymphocytes mature and acquire their antigen specific receptors are
- (1) Secondary lymphoid organs
 - (2) Thymus gland
 - (3) Primary lymphoid organs
 - (4) Bone marrow
190. Find out the incorrect statement regarding AIDS
- (1) Macrophages act as HIV factory
 - (2) Infection of Mycobacterium, Viruses, fungi and Toxoplasma are common
 - (3) Count of T lymphocyte decreases
 - (4) Anti retroviral drugs are completely effective
191. Ringworm in humans is caused by
- (1) Viruses
 - (2) Bacteria
 - (3) Fungi
 - (4) Nematodes
192. If you are advised to get a ELISA test done for yourself, which disease is your doctor suspecting?
- (1) AIDS
 - (2) Cholera
 - (3) Pneumonia
 - (4) Filariasis
193. In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?
- (1) Elephantiasis
 - (2) Amoebiasis
 - (3) Ascariasis
 - (4) Ringworm disease

194. Which of the following diseases is caused by bacteria?
- (1) Herpes and Influenza
 - (2) Cholera and tetanus
 - (3) Typhoid and smallpox
 - (4) Tetanus and mumps
195. Antivenom injection contains preformed antibodies while polio drops contain drops that are administered into body contain
- (1) Gamma globulins
 - (2) Attenuated pathogens
 - (3) Activated pathogens
 - (4) Harvested antibodies
196. *Entamoeba histolytica* is transmitted through
- (1) Insect bite
 - (2) Sweat
 - (3) Food and water contamination
 - (4) Blood
197. At which stage of HIV infection does one usually show symptoms of AIDS?
- (1) When viral DNA is produced by reverse transcriptase
 - (2) When HIV replicated rapidly in helper T-lymphocytes and damage large number of cells
 - (3) Within 15 days of sexual contact with an infected person
 - (4) When the infecting retrovirus enters host cells
198. Which of the following is not a property of cancer cells?
- (1) They compete with normal cells for vital nutrients
 - (2) They do not remain confined in the area of formation
 - (3) They divide in an uncontrolled manner
 - (4) They show contact inhibition
199. Drug called 'Heroin' is synthesized by
- (1) Glycosylation of morphine
 - (2) Nitration of morphine
 - (3) Methylation of morphine
 - (4) Acetylation of morphine
200. Select the correct statement from the ones given below:
- (1) Barbiturates, when given to criminals, make them tell the truth
 - (2) Morphine is often given to persons, who have undergone surgery, as a pain killer
 - (3) Chewing tobacco lowers blood pressure and heart rate
 - (4) Cocaine is given to patients after surgery as it stimulates recovery

PHYSICS

ANSWERS

Section-A

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Section-B

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49. (3)
50. (3)

CHEMISTRY

ANSWERS

Section-A

- 51. (3)
- 52. (1)
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Section-B

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- 93. (2)
- 94. (1)
- 95. (1)
- 96. (1)
- 97. (2)
- 98. (2)
- 99. (4)
- 100. (1)

BOTANY

ANSWERS

Section-A

- 101. (1)
- 102. (4)
- 103. (1)
- 104. (4)
- 105. (2)
- 106. (4)
- 107. (1)
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Section-B

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ZOOLOGY

ANSWERS

Section-A

- 151. (2)
- 152. (2)
- 153. (2)
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Section-B

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- 193. (1)
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