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MM : 720

REVISION TEST SERIES

(for NEET-2022)

Test - 5

Time : 3 Hrs. 20 Min.

Topics covered :

Physics : Ray Optics and Optical Instruments, Wave Optics

Chemistry : The p-block Elements, Hydrogen

Botany : Organisms and Populations, Ecosystem

Zoology : Strategies for Enhancement in Food Production - Animal Husbandry, Biotechnology-Principles and Processes

Instructions :

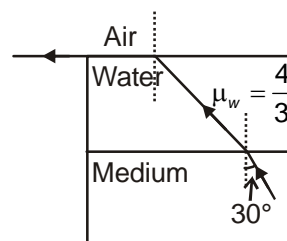
- (i) There are two sections in each subject, i.e., Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.
- (ii) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.
- (iii) Use blue/black ballpoint pen only to darken the appropriate circle.
- (iv) Mark should be dark and completely fill the circle.
- (v) Dark only one circle for each entry.
- (vi) Dark the circle in the space provided only.
- (vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

PHYSICS

Choose the correct answer:

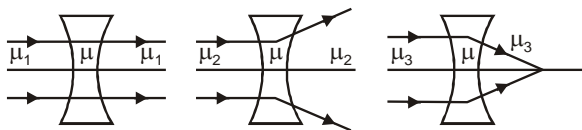
SECTION-A

1. Image of an object approaching a convex mirror of focal length 10 m along its principal axis is observed to move from $\frac{25}{3}$ m to $\frac{50}{7}$ m in 1 minute. The average speed of the object is
 - (1) $\frac{12}{5}$ m/s
 - (2) $\frac{6}{5}$ m/s
 - (3) $\frac{5}{6}$ m/s
 - (4) $\frac{5}{12}$ m/s
2. A ray of light is incident at a transparent medium-water interface at an angle of incidence of 30° , it emerges finally parallel to the surface of water, then the refractive index of transparent medium would be

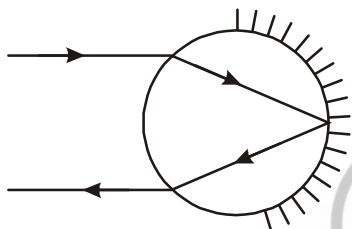


- (1) $\frac{8}{3}$
- (2) $\frac{3}{2}$
- (3) 2
- (4) $\sqrt{3}$

3. What is the relation between the refractive indices μ_2 , μ_1 and μ_3 , if the behaviour of light rays is as shown in figure?



- (1) $\mu_1 = \mu_2 = \mu_3$ (2) $\mu_1 > \mu_3 > \mu_2$
 (3) $\mu_3 > \mu_2 > \mu_1$ (4) $\mu_3 > \mu_1 > \mu_2$
4. A transparent sphere has its right half polished so as to act as a mirror. A paraxial ray incident from left, exits parallel to the incident ray as shown. The refractive index n of the material of the sphere is



- (1) 1.2 (2) 1.5
 (3) 1.8 (4) 2.0
5. A fish looks upwards at an unobstructed overcast sky. What total angle does the sky appear to subtend on fish? (Take refractive index of water as $\sqrt{2}$)
- (1) 180° (2) 90°
 (3) 75° (4) 60°
6. For constructive interference to take place between two monochromatic light waves of wavelength λ , the path difference between two waves should be
- (1) $(2n-1)\frac{\lambda}{4}$ (2) $(2n-1)\frac{\lambda}{2}$
 (3) $n\lambda$ (4) $(2n+1)\frac{\lambda}{2}$
7. Two monochromatic light waves of Intensity I and $4I$ interfering at a point, have a phase difference of 60° . The intensity at that point will be

- (1) $3I$ (2) $5I$
 (3) $7I$ (4) $9I$

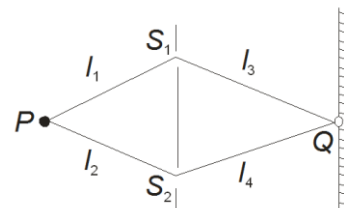
8. Two waves each of amplitude a_0 interfere and the resultant amplitude from their superposition is also a_0 . The phase difference between the waves is

- (1) Zero (2) $\frac{\pi}{2}$
 (3) $\frac{2\pi}{3}$ (4) π

9. The maximum intensity in Young's double slit experiment is I_0 . Distance between the slits is $d = 5\lambda$, where λ is the wavelength of monochromatic light used in the experiment. The intensity of light in front of one of the slits on a screen at a distance $D = 10d$ is

- (1) $\frac{I_0}{2}$ (2) $\frac{3}{2}I_0$
 (3) I_0 (4) $2I_0$

10. Two identical narrow slits S_1 and S_2 are illuminated by light of wavelength λ from a point source P . As shown in the diagram, the light passing through S_1 and S_2 is then allowed to fall on a screen, and if n is a positive integer. Then the condition for destructive interference at Q is that



- (1) $(I_1 - I_2) = (2n+1)\frac{\lambda}{2}$
 (2) $(I_3 - I_4) = (2n+1)\frac{\lambda}{2}$
 (3) $(I_1 + I_2) - (I_3 + I_4) = n\lambda$
 (4) $(I_1 + I_3) - (I_2 + I_4) = (2n+1)\frac{\lambda}{2}$

11. In Young's double slit experiment the two light sources are green and red laser monochromatic sources. In this case there will be

- (1) No interference pattern
 (2) Red and green mixed pattern
 (3) White screen
 (4) Black screen

12. A partially polarised light (after suitable refraction through a glass slab) is analysed through a rotating polaroid. Hence,

- (1) Intensity of light after passing through polaroid is independent of rotation
- (2) There is complete darkness always behind the polaroid
- (3) There is complete darkness only for a particular orientation of polaroid
- (4) Intensity of light behind polaroid is minimum but not zero for two orientations of the polaroid

13. Two thin lenses of power 10 D and 5 D are placed coaxially in contact. The focal length of the combination of lenses will be

- (1) $\frac{20}{3}$ cm
- (2) 20 cm
- (3) 10 cm
- (4) 15 cm

14. A candle is held 3 cm away from a concave mirror of focal length 12 cm, then nature of image formed by mirror is

- (1) Real, inverted
- (2) Virtual, erect
- (3) Real, erect
- (4) Virtual, inverted

15. An object and a screen are fixed at a distance d apart. When a lens of focal length f is moved between the object and the screen, sharp images of the object are formed on the screen for two positions of the lens. The magnifications produced at these two positions are M_1 and M_2 then

(1) $|M_1| = |M_2| = 1$

(2) $d > 4f$

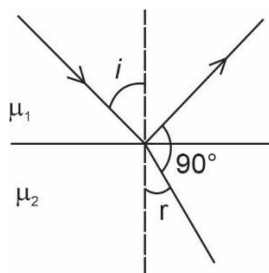
(3) $M_1 = \frac{1}{M_2}$

(4) Both (2) and (3) are correct

16. A diverging lens of focal length 20 cm and a converging mirror of focal length 10 cm are placed 5 cm apart coaxially. Where should an object be placed so that object and its real image coincide?

- (1) 20 cm away from lens
- (2) 60 cm away from lens
- (3) 30 cm away from lens
- (4) 45 cm away from lens

17. If a light is incident on a surface separating two media is partly reflected and partly refracted as shown in figure.



(1) $\tan i = \frac{\mu_1}{\mu_2}$

(2) $\sin i = \tan r$

(3) $\sin i = \frac{\mu_2}{\sqrt{\mu_1^2 + \mu_2^2}}$

(4) $\sin i = \frac{\mu_1}{\mu_2}$

18. A person can see objects clearly only when they lie between 25 cm and 200 cm from his eyes. In order to increase the maximum distance of distinct vision to infinity, the power of correcting lens, the person has to use, will be

- (1) + 0.5 D
- (2) - 0.5 D
- (3) + 0.25 D
- (4) - 0.25 D

19. An air bubble in a glass slab ($\mu = 1.5$) when viewed from one side appears at 9 cm and appears at 5 cm from other side. The thickness of the slab is

- (1) 21 cm
- (2) 9.33 cm
- (3) 14 cm
- (4) 18.5 cm

20. A compound microscope consisting of two convex lenses of focal lengths 3 cm and 5 cm placed 25 cm apart. Where should an object be placed left to objective, so that the final image (virtual) is formed at a distance of 25 cm from the eye?

- (1) 1.5 cm
- (2) 5.5 cm
- (3) 3 cm
- (4) 3.5 cm

21. A mirror produces a magnified and erect image of an object. The nature of mirror will be

- (1) Convex
- (2) Concave
- (3) Plane
- (4) Both (1) and (3)

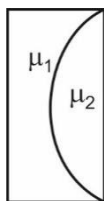
22. The refractive indices of a glass prism for red, yellow and violet colours are, 1.690, 1.695 and 1.705 respectively. The dispersive power of the glass will be (nearly)

- (1) 0.0215
- (2) 0.0115
- (3) 0.0155
- (4) 0.0415

23. Choose the incorrect statement

- (1) In Rayleigh scattering, amount of scattering is inversely proportional to fourth power of wavelength
- (2) Secondary rainbow is fainter than primary rainbow
- (3) Light of red colour is scattered most in atmosphere
- (4) In reflecting telescope, parabolic mirror can be used as an objective to remove the spherical aberration

24. A plano concave lens fits into a plano convex lens. Their plane surfaces are parallel to each other as shown in the figure. If $\mu_1 = 1.4$, $\mu_2 = 1.6$ and radius of curvature $R = 20$ cm, then the focal length of the combination is



- (1) -100 cm
- (2) 50 cm
- (3) $+100$ cm
- (4) -50 cm

25. In YDSE, distance between the slits is 3.73λ , where λ is the wavelength of light. The number of maximum which can be obtained in upper portion of screen excluding central maxima, is

- (1) 3.73
- (2) 3
- (3) 4
- (4) 4.73

26. Two coherent sources with intensity I_0 and $4I_0$ respectively interfere in a medium. The maximum intensity of resultant wave is n times the minimum intensity of resultant wave. The value of n^2 is

- (1) 3
- (2) 9
- (3) 81
- (4) 27

27. In YDSE, the spacing between the slits is 0.03 mm and wavelength of light used is λ . If the angular width of a fringe formed on a distant screen is 1° , then value of λ is

- (1) 5233 \AA
- (2) 5000 \AA
- (3) 5500 \AA
- (4) 6500 \AA

28. Choose the incorrect statement for a good telescope (where symbols have their usual meaning)

- (1) It has high magnifying power
- (2) Resolving power is proportional to $\frac{1}{\lambda}$
- (3) Brightness of image is proportional to square of diameter of objective lens
- (4) Resolving power is larger when red light is used instead of blue light

29. The slit width of a single slit diffraction such that n maxima of double slit interference pattern are obtained within central maxima of the diffraction pattern is (d is distance between slits for YDSE arrangement and screen distance D and light used are same for both arrangements)

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

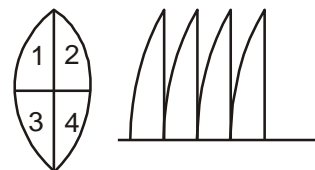
30. A polariser and an analyser are inclined to each other at 45° . The intensity of the polarised light emerging from the analyser is $2I_0$. The intensity of the unpolarised light incident on the polariser would be

- (1) $8I_0$
- (2) $4I_0$
- (3) $2I_0$
- (4) $4\sqrt{2}I_0$

31. The angle of polarisation for a medium is 53° . The critical angle for this medium will be

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

32. The given lens is broken into four parts rearranged as shown. If the initial focal length is f , then after rearrangement the equivalent focal length is

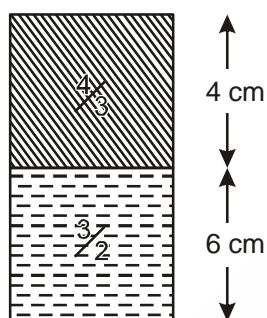


- (1) $\frac{f}{4}$
- (2) $\frac{f}{2}$
- (3) $2f$
- (4) $4f$

33. One face of prism with refracting angle 37° is coated with silver. A light ray incident on other face at angle 60° is refracted and reflected back from the silver coated face such that it retraces its path. The refractive index of prism is

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

34. Two immiscible transparent liquids of refractive indices $\frac{3}{2}$ and $\frac{4}{3}$ are arranged as shown in figure

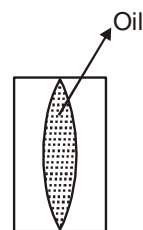


The apparent depth of a mark at the bottom as observed from top surface is

- (1) 10 cm (2) 7 cm
 (3) $\frac{43}{3}$ cm (4) 12 cm
35. An object is placed at distance of 25 cm from the first principal focus of a thin lens. If its real image is formed at distance of 9 cm from second principal focus, then focal length of lens is
- (1) 25 cm (2) 11 cm
 (3) 15 cm (4) 20 cm

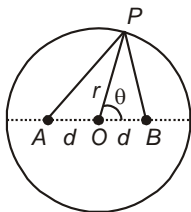
SECTION-B

36. Two thin plano-concave lenses each made of glass of refractive index 1.5 have radii of curvature 10 cm. If space between lens is filled with oil of refractive index $\frac{8}{7}$ as shown in figure, then magnitude of focal length of the combination will be

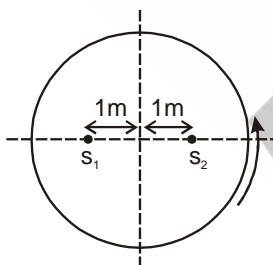


- (1) 14 cm (2) 15 cm
 (3) 18 cm (4) 21 cm
37. A compound microscope has an objective of focal length 2 cm and an eye-piece of focal length 5 cm. An object is placed at a distance 2.4 cm in front of objective lens. If final image forms at infinity then magnifying power of microscope is
- (1) 24 (2) -25
 (3) 5 (4) -30
38. A telescope has an objective lens of focal length 200 cm and an eyepiece of focal length 2 cm. If this telescope is used to see a 50 m tall building at a distance of 2 km, what is the height of the image of the building formed by objective lens?
- (1) 5 cm (2) 10 cm
 (3) 1 cm (4) 2 cm
39. The angle of prism for which there is no emergent ray will be (i_c = critical angle)
- (1) i_c (2) $> i_c$
 (3) $< i_c$ (4) $> 2i_c$
40. A rectangular slit is illuminated by white light for Fraunhofer diffraction. The second secondary maximum in the pattern for light of wavelength 6300 Å coincides with third secondary maximum of light of unknown wavelength. The unknown wavelength is
- (1) 4200 Å (2) 4300 Å
 (3) 4500 Å (4) 6300 Å
41. In Young's double slit experiment, a thin transparent film of refractive index 1.5 is introduced in front of one of the slit, so that the entire fringe pattern shifts by one fringe width. If λ is wavelength of light used then thickness of film is
- (1) $\frac{\lambda}{2}$ (2) 2λ
 (3) $\frac{3\lambda}{2}$ (4) $\frac{\lambda}{4}$

42. Two coherent light sources A and B with separation $2d$ are placed on the x -axis symmetrically about the origin. They emit light of wavelength λ . Condition for maxima on a circle of large radius, lying in the x - y plane and with centre at the origin is



- (1) $2d \cos \theta = n\lambda$
 (2) $2d \sin \theta = n\lambda$
 (3) $2d \cos \theta = (2n-1) \frac{\lambda}{2}$
 (4) $2d \sin \theta = (2n-1) \frac{\lambda}{2}$
43. Two point sources separated by 2.0 m are radiating in phase with $\lambda = 0.50$ m. A detector moves in a circle of large radius around two sources with centre, at the centre of two sources in a plane containing them. How many maxima are detected, by detector?



- (1) 16
 (2) 20
 (3) 24
 (4) 32
44. Light wave travels in vacuum along the y -axis. Which of the following may represent the wavefront?
- (1) $x = \text{Constant}$
 (2) $y = \text{Constant}$
 (3) $z = \text{Constant}$
 (4) $x + y + z = \text{Constant}$

45. On placing a thin sheet of mica of thickness 12×10^{-5} cm in the path of one of the interfering beams in YDSE, the central fringe shifts equal to fringe width. Refractive index of mica is

(Wavelength of light = 600 nm)

- (1) 1.5 (2) 1.48
 (3) 1.61 (4) 1.56
46. When an unpolarised beam of light travelling in air is incident on a glass sheet ($\mu = 1.5$), at polarising angle, then
- (1) Reflected beam is 100% polarised
 (2) Reflected and refracted beams are partially polarised beam
 (3) Refracted 100% unpolarised
 (4) All of these
47. If bichromatic light used in YDSE have wavelengths $\lambda_1 = 500$ nm and $\lambda_2 = 800$ nm, then minimum order maxima of λ_1 which overlaps with maxima of λ_2 is
- (1) 5 (2) 8
 (3) 3 (4) 7
48. In case of polarisation, if i is incidence angle and θ_P is polarising angle, then
- (1) For $i = \theta_P$; refracted light is partially polarised
 (2) For $i = \theta_P$; reflected light is fully polarised
 (3) For, $i = \theta_P$; reflected and refracted lights are perpendicular to normal
 (4) Both (1) and (2)
49. Two coherent sources of light of wavelength 6.2×10^{-6} m produce interference. The path difference corresponding to 10^{th} order maximum will be
- (1) 6.2×10^{-6} m
 (2) 3.1×10^{-6} m
 (3) 1.5×10^{-6} m
 (4) 6.2×10^{-5} m
50. The ratio of maximum and minimum intensities of an interference pattern is 36:1, then ratio of amplitudes of two interfering coherent waves will be

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

CHEMISTRY**SECTION-A**

51. High purity dihydrogen is obtained by
- (1) Electrolysis of acidified water using platinum electrodes
 - (2) Reaction of zinc with aqueous alkali
 - (3) Reaction of granulated zinc with dil. HCl
 - (4) Electrolysis of warm aq. $\text{Ba}(\text{OH})_2$ solution between nickel electrodes
52. Electron precise covalent hydride among the following is
- (1) NaH
 - (2) CaH_2
 - (3) CH_4
 - (4) PH_3
53. Consider the following statements:
- I. Temporary hardness of water is due to bicarbonates of Ca^{2+} and Mg^{2+} .
 - II. Permanent hardness of water is caused due to presence of calcium chloride.
 - III. Calgon is used to remove chloride ions from hard water.
- Which of the above statement(s) is/are correct?
- (1) I only
 - (2) I and II only
 - (3) II and III only
 - (4) I, II and III
54. Among the following oxoacids, the correct decreasing order of acid strength is
- (1) $\text{HOCl} > \text{HClO}_2 > \text{HClO}_3 > \text{HClO}_4$
 - (2) $\text{HClO}_4 > \text{HOCl} > \text{HClO}_2 > \text{HClO}_3$
 - (3) $\text{HClO}_4 > \text{HClO}_3 > \text{HClO}_2 > \text{HOCl}$
 - (4) $\text{HClO}_2 > \text{HClO}_4 > \text{HClO}_3 > \text{HOCl}$
55. Correct order of electron affinities of halogens is
- (1) $\text{F} > \text{Cl} > \text{Br} > \text{I}$
 - (2) $\text{Cl} > \text{Br} > \text{F} > \text{I}$
 - (3) $\text{Cl} > \text{Br} > \text{I} > \text{F}$
 - (4) $\text{Cl} > \text{F} > \text{Br} > \text{I}$
56. When I_2 is passed through KCl, KF and KBr solution
- (1) Cl_2 and Br_2 are evolved
 - (2) Cl_2 is evolved
 - (3) Cl_2 , Br_2 and F_2 are evolved
 - (4) No gas is evolved
57. On complete hydrolysis of XeF_6 , a compound of xenon, A is produced. A is
- (1) XeO_3
 - (2) XeO_2F_2
 - (3) XeOF_4
 - (4) XeO_4
58. Catalyst used in Deacon's process for the manufacture of chlorine gas is
- (1) Mo
 - (2) Fe
 - (3) Cr_2O_3
 - (4) CuCl_2
59. Which compound does not have S-S bond?
- (1) $\text{Na}_2\text{S}_2\text{O}_4$
 - (2) $\text{Na}_2\text{S}_4\text{O}_6$
 - (3) $\text{Na}_2\text{S}_2\text{O}_7$
 - (4) $\text{Na}_2\text{S}_2\text{O}_3$
60. Which of the following oxides is neutral in nature?
- (1) N_2O_5
 - (2) NO_2
 - (3) N_2O_3
 - (4) NO
61. $\text{P}_4 + \text{NaOH} + \text{H}_2\text{O} \rightarrow \text{Products}$
- Products are
- (1) $\text{H}_3\text{PO}_4 + \text{PH}_3$
 - (2) $\text{NaH}_2\text{PO}_2 + \text{PH}_3$
 - (3) $\text{Na}_2\text{HPO}_2 + \text{PH}_3$
 - (4) $\text{Na}_3\text{PO}_4 + \text{PH}_3$
62. Correct order of acidic strength of the given compounds is
- (1) $\text{HF} > \text{HCl} > \text{HBr}$
 - (2) $\text{HBr} > \text{HCl} > \text{HF}$
 - (3) $\text{HCl} > \text{HBr} > \text{HF}$
 - (4) $\text{HF} > \text{HBr} > \text{HCl}$
63. Chlorine on reaction with hot and concentrated caustic soda forms
- (1) ClO_3^-
 - (2) ClO^-
 - (3) ClO_2^-
 - (4) ClO_4^-
64. In which of the given compounds the oxidation state of phosphorous is + 4?
- (1) Pyrophosphoric acid
 - (2) Phosphonic acid
 - (3) Hypophosphoric acid
 - (4) Phosphinic acid
65. Choose the reaction in which $\text{N}_2(\text{g})$ is not obtained as one of the product
- (1) $\text{NH}_3 + \text{Cl}_2 \xrightarrow{\text{excess}}$
 - (2) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \xrightarrow{\Delta}$
 - (3) $\text{NH}_4\text{Cl}(\text{aq}) + \text{NaNO}_2(\text{aq}) \rightarrow$
 - (4) $\text{NH}_4\text{Cl} + \text{Ca}(\text{OH})_2 \rightarrow$

66. Identify the incorrect statement regarding the industrial synthesis of sulphuric acid
- Sulphide ore is burned in air to generate SO_2
 - Oleum upon dilution gives H_2SO_4
 - High temperature and low pressure are favourable condition for maximum yield
 - V_2O_5 is used as catalyst to convert SO_2 to SO_3
67. The compound which is least likely to exist is
- HOI
 - HOIO₂
 - HOIO
 - HOIO₃
68. The compound used for the production of UF_6 in the enrichment of ^{235}U is
- BrF_3
 - SF_6
 - HF
 - BF_3
69. The gases evolved on the reaction of copper and zinc with dilute HNO_3 respectively are
- N_2 and NO
 - NO_2 and NO
 - NO and N_2O
 - N_2O and N_2
70. The compound which is not formed on the reaction of white phosphorous with thionyl chloride is
- SO_2
 - S_2Cl_2
 - PCl_3
 - POCl_3
71. Correct order of bond dissociation enthalpy of the given halogens is
- $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$
 - $\text{Cl}_2 > \text{Br}_2 > \text{F}_2 > \text{I}_2$
 - $\text{Br}_2 > \text{Cl}_2 > \text{F}_2 > \text{I}_2$
 - $\text{Cl}_2 > \text{F}_2 > \text{Br}_2 > \text{I}_2$
72. Orthophosphorous acid on heating forms
- H_3PO_4 and H_3PO_2
 - H_3PO_4 and PH_3
 - H_3PO_2 and PH_3
 - H_3PO_2 and $\text{H}_4\text{P}_2\text{O}_5$
73. The total number of hydrogen bonded water molecules in blue vitriol is
- 4
 - 2
 - 1
 - 3
74. **Statement-I** : Density of ice is less than that of water.
Statement-II : Ice crystallises into cubic form at atmospheric pressure.
In this light of above statements, select the correct option.
- Statement I is correct but statement II is incorrect
 - Both statements I and II are correct
 - Both statements I and II are incorrect
 - Statement I is incorrect but statement II is correct
75. Lewis acid among the following is
- B_2H_6
 - $[\text{B}(\text{OH})_4]^-$
 - CH_4
 - CCl_4
76. The hybridisation of carbon in diamond and graphite is respectively
- sp^3 and sp^3
 - sp^2 only
 - sp^2 and sp^3
 - sp^3 and sp^2
77. The correct order of catenation tendency of 14th group elements is
- $\text{C} > \text{Si} > \text{Ge} > \text{Sn}$
 - $\text{C} > \text{Si} \approx \text{Ge} > \text{Sn}$
 - $\text{C} \approx \text{Si} > \text{Ge} \gg \text{Sn}$
 - $\text{C} \gg \text{Si} > \text{Ge} \approx \text{Sn}$
78. The volume of oxygen gas liberated at NTP from 30 mL of 20 V H_2O_2 solution is
- 0.6 L
 - 0.3 L
 - 0.2 L
 - 1.2 L
79. XeF_2 reacts with PF_5 to form
- $[\text{XeF}_2]^+[\text{PF}_5]^-$
 - $[\text{XeF}]^+[\text{PF}_6]^-$
 - $\text{Xe}^{2+}[\text{PF}_7]^{2-}$
 - $[\text{PF}_4]^+[\text{XeF}_3]^-$
80. Which of the following element forms metallic hydrides with hydrogen?
- Al
 - Cs
 - C
 - V
81. Both dioxides and monoxides of which of the following element is acidic in nature?
- C
 - Ge
 - Sn
 - Pb
82. Syn gas is a mixture of
- $\text{CO} + \text{N}_2$
 - $\text{CO}_2 + \text{H}_2$
 - $\text{CO} + \text{H}_2$
 - $\text{CO}_2 + \text{H}_2\text{O}$
83. The product obtained when equal volumes of Cl_2 and F_2 reacts together at 437 K is
- ClF
 - ClF_3
 - ClF_2
 - ClF_7
84. Which among these is not hydrolysed?
- CCl_4
 - SiCl_4
 - BCl_3
 - GeCl_4

85. Correct order of bond angle for the given compounds is

- (1) $\text{H}_2\text{Te} > \text{H}_2\text{S} > \text{H}_2\text{O}$
 (2) $\text{H}_2\text{O} > \text{H}_2\text{Te} > \text{H}_2\text{S}$
 (3) $\text{H}_2\text{O} > \text{H}_2\text{S} > \text{H}_2\text{Te}$
 (4) $\text{H}_2\text{S} > \text{H}_2\text{O} > \text{H}_2\text{Te}$

SECTION-B

86. Which among the following has the highest ionization enthalpy?

- (1) B (2) Al
 (3) Ga (4) In

87. Which of the following oxoacids of phosphorus has least number of P-OH bond(s)?

- (1) H_3PO_4 (2) H_3PO_3
 (3) $\text{H}_4\text{P}_2\text{O}_7$ (4) H_3PO_2

88. The correct decreasing order of basicity is represented by

- (1) $\text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3$
 (2) $\text{PH}_3 > \text{AsH}_3 > \text{NH}_3 > \text{SbH}_3$
 (3) $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$
 (4) $\text{NH}_3 > \text{SbH}_3 > \text{AsH}_3 > \text{PH}_3$

89. In which of the following reaction, H_2O_2 acts as an oxidising agent?

- (1) $\text{PbS} + 4\text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4 + 4\text{H}_2\text{O}$
 (2) $\text{HOCl} + \text{H}_2\text{O}_2 \rightarrow \text{H}_3\text{O}^+ + \text{Cl}^- + \text{O}_2$
 (3) $2\text{MnO}_4^- + 6\text{H}^+ + 5\text{H}_2\text{O}_2 \rightarrow 2\text{Mn}^{2+} + 8\text{H}_2\text{O} + 5\text{O}_2$
 (4) $\text{I}_2 + \text{H}_2\text{O}_2 + 2\text{OH}^- \rightarrow 2\text{I}^- + 2\text{H}_2\text{O} + \text{O}_2$

90. Permanent hardness of water cannot be removed by

- (1) Treatment with washing soda
 (2) Calgon's method
 (3) Clark's method
 (4) Synthetic resin method

91. The chain length of the silicone polymer can be controlled by adding

- (1) $(\text{CH}_3)_3\text{SiCl}$ (2) $(\text{CH}_3)_2\text{SiCl}_2$
 (3) CH_3SiCl_3 (4) CH_4

92. Number of B – O – B bonds present in structure of Borax is

- (1) 10 (2) 12
 (3) 5 (4) 8

93. The product obtained in the following reaction is
 $\text{Al}_4\text{C}_3 + \text{D}_2\text{O} \rightarrow$

- (1) C_2D_2 (2) CD_4
 (3) C_2D_4 (4) C_2D_6

94. Which of the following is not obtained on heating borax?

- (1) HBO_2 (2) $\text{Na}_2\text{B}_4\text{O}_7$
 (3) B_2O_3 (4) NaBO_2

95. Which of the following halide is least likely to exist?

- (1) PbF_4 (2) PbI_4
 (3) SnF_4 (4) SiCl_4

96. Total number of five membered rings in C_{60} is

- (1) Zero (2) 2
 (3) 6 (4) 12

97. The correct order of boiling point is shown by

- (1) $\text{D}_2 < \text{H}_2 < \text{T}_2$
 (2) $\text{T}_2 < \text{D}_2 < \text{H}_2$
 (3) $\text{H}_2 < \text{T}_2 < \text{D}_2$
 (4) $\text{H}_2 < \text{D}_2 < \text{T}_2$

98. Diborane is _____ hybridized.

- (1) sp (2) sp^2
 (3) sp^3 (4) dsp^2

99. On reaction of methyl chloride with silicon in the presence of copper at 573 K gives

- (1) MeSiCl_3 (2) Me_2SiCl_2
 (3) Me_3SiCl (4) All of these

100. Aluminium chloride in acidified aqueous solution gives

- (1) AlO_2^-
 (2) $[\text{Al}(\text{OH})_4]^-$
 (3) $[\text{Al}(\text{OH})_6]^{3-}$
 (4) $[\text{Al}(\text{H}_2\text{O})_6]^{3+}$

BOTANY**SECTION-A**

101. Which ecological pyramid may usually be inverted?
- Pyramid of number in grassland ecosystem
 - Pyramid of biomass in sea ecosystem
 - Pyramid of energy in tree ecosystem
 - Pyramid of number in pond ecosystem
102. The first biotic community that develops in a bare land during ecological succession is called
- Pioneer community
 - Transitional community
 - Climax community
 - Seral community
103. The pioneer community of hydrarch succession are
- Grasses
 - Mosses
 - Phytoplanktons
 - Free floating plants
104. Which of the following are considered as key industry animals?
- Autotrophs
 - Decomposers
 - Herbivores
 - Top carnivores
105. Which one of the following is called Treeless biome?
- Desert
 - Tropical forest
 - Grassland
 - Temperate forest
106. An ecological niche represents the
- Variation in physical and chemical conditions of a habitat
 - Set of abiotic components of a habitat
 - Functional role of an organism in its ecological system
 - Biotic component of an ecosystem
107. Most ecologically relevant environmental factor is
- Temperature
 - Light
 - Rain
 - Air
108. Polar bears and lizards belong to which of the following categories w.r.t. range of thermal tolerance?
- Stenothermal
 - Euryhaline
 - Eurythermal
 - Stenohaline
109. Plants which grow well in shaded area and require low intensity of light are called
- Sciophytes
 - Heliophytes
 - Halophytes
 - Xerophytes
110. Select the **correct** match, w.r.t. UV radiations and its effects
- | Category | Wavelength | Effect |
|----------|------------|--------------------|
| (1) UV-C | 100-280 nm | lethal |
| (2) UV-B | 90-150 nm | moderately harmful |
| (3) UV-A | 100-280 nm | lethal |
| (4) UV-C | 320-400 nm | Harmless |
111. Those organisms are called conformers who
- Maintain constant internal environment
 - Cannot maintain constant internal environment
 - Migrate to a new habitat when conditions are not favourable
 - Suspend their growth in unfavourable conditions.
112. The process of escaping winters by bears is called
- Aestivation
 - Hibernation
 - Migration
 - Homeostasis
113. Mammals from colder climates generally have shorter ears and limbs to minimise heat loss. This is called
- Homeostasis
 - Allen's rule
 - Chromatic adaptation
 - Competitive exclusion
114. Antarctic fishes can survive below 0°C. This is due to
- Their thick and tough skin
 - Presence of antifreeze solutes in their body fluid
 - Very low rate of metabolism
 - Their large size

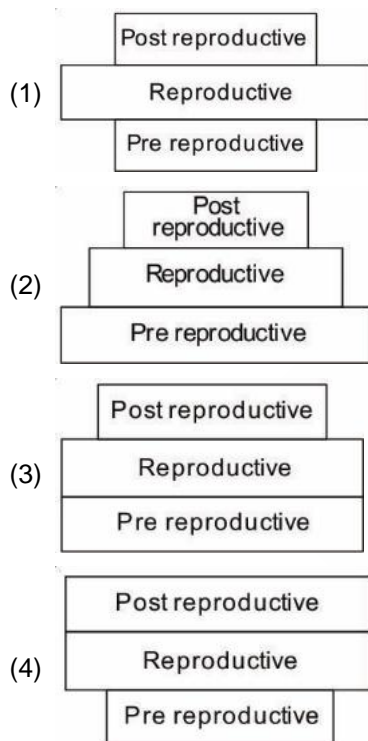
115. Which of the following is **not** an adaptation of xerophytes?

- (1) Scotoactive stomata
- (2) Presence of water storage tissue
- (3) Leaves with large surface area
- (4) Presence of sunken stomata

116. Which of the following is **not** an attribute of population?

- (1) Natality
- (2) Mortality
- (3) Birth of individual
- (4) Population density

117. A population having high birth rate can be represented by which of the following age pyramid?



118. 10 insects in a population of 200 died in a laboratory during a specific unit time interval. What will be the death rate of the population during that period?

- (1) 0.2
- (2) 0.05
- (3) 20
- (4) 1

119. If B and D are number of births and number of deaths respectively, then vital index for the population will be

- (1) $\frac{D}{B} \times 100$
- (2) $(B+D) \times 100$
- (3) $\frac{B}{D} \times 100$
- (4) $(B-D) \times 100$

120. Two equations representing the population growth of different populations are

$$\frac{dN}{dt} = rN \quad \dots(A)$$

$$\frac{dN}{dt} = rN \left(\frac{k-N}{k} \right) \quad \dots(B)$$

Identify the **correct** statement.

- (1) Equation (B) represents the exponential growth
- (2) Equation (A) describes the limited availability of resources
- (3) Equation (A) shows geometric fashion of growth
- (4) Population following equation (B) can reach enormous population densities in a short time as it is independent of carrying capacity

121. Select the **correct** match w.r.t. population interactions.

	Species-A	Species-B	Name of interactions
(1)	+	+	Competition
(2)	+	0	Commensalism
(3)	-	-	Mutualism
(4)	-	0	Protocooperation

122. Relationship between sea anemone and hermit crab is best explained by which of the following interactions?

- (1) Mutualism
- (2) Protocooperation
- (3) Commensalism
- (4) Amensalism

123. Which of the following interactions is the example of commensalism?

- (1) Lichen
- (2) Tiger and Deer
- (3) Barnacles and whale
- (4) Fig and fig wasp

124. Diapause is a stage of

- (1) Significant growth
- (2) High reproductive potential
- (3) Suspension of development under favourable conditions
- (4) Suspension of development under unfavourable conditions

125. 'Sexual deceit' is employed by
 (1) Cynobacteria (2) *Ophrys*
 (3) Lichens (4) Fig wasp
126. Which of the following is an example of anthropogenic ecosystem?
 (1) Forest (2) Wetland
 (3) Estuaries (4) Crop fields
127. Which of the following statements is **not** true for man-made ecosystem?
 (1) This type of ecosystem has simple food chain
 (2) Productivity of this ecosystem is very high
 (3) They are always self regulatory
 (4) The ecosystem has little diversity
128. Find the **correct** match w.r.t. abiotic/biotic components of ecosystem.
 (1) Climatic factor – Soil
 (2) Edaphic factor – Air currents
 (3) Topographic factor – Slope of earth surface
 (4) Primary consumer – Green plant
129. Who gave the concept of ecological niche
 (1) Darwin (2) Mac Arthur
 (3) J. Grinnell (4) Gause
130. Secondary consumers are
 (1) Herbivores
 (2) Primary carnivores
 (3) Secondary carnivores
 (4) Decomposers
131. Transducers in ecosystem are
 (1) Primary consumers
 (2) Producers
 (3) Top consumers
 (4) Decomposers
132. Stratification is
 (1) Vertical distribution of different species occupying different levels
 (2) Horizontal distribution of different species along the equator of earth
 (3) Invasion of a new species in a particular area
 (4) Identification and classification of biological species
133. Select the **correct** equation for net primary productivity (NPP).
 (1) $NPP = \text{Gross primary productivity} + \text{Respiratory loss}$
 (2) $NPP = \text{Gross primary productivity} \times \text{Respiratory loss}$
 (3) $NPP = \text{Gross primary productivity} - \text{Respiratory loss}$
 (4) $NPP = \frac{\text{Gross primary productivity}}{\text{Respiratory loss}}$
134. Which of the following ecosystems has least productivity?
 (1) Coral reef (2) Tropical rain forest
 (3) Sugarcane field (4) Desert
135. Going down of water-soluble substances present in decomposing detritus into the soil horizon is called
 (1) Humification (2) Fragmentation
 (3) Mineralisation (4) Leaching

SECTION-B

136. Two major limiting factors responsible for low productivity of oceans, are
 (1) Light and wind
 (2) Light and nutrients
 (3) Oxygen and nutrients
 (4) Light and oxygen
137. Amount of photosynthetically active radiation is
 (1) More than 50% of solar radiation reaching to earth
 (2) Equal to total (100%) solar radiation
 (3) 70% of solar radiation
 (4) Less than 50% of incident solar radiation
138. Third trophic level in a food chain is formed by
 (1) Primary consumers
 (2) Tertiary consumers
 (3) Secondary consumers
 (4) Decomposers
139. Grazing food chain begins with
 (1) Primary consumers
 (2) Primary producers
 (3) Sunlight
 (4) Dead organic matter

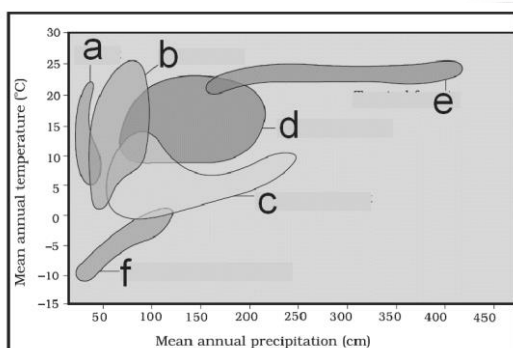
140. Which of the following food chain is a major conduit of energy flow in aquatic ecosystem?

- (1) Grazing food chain
- (2) Detritus food chain
- (3) Parasitic food chain
- (4) Auxilliary food chains

141. Amount of all living material present in different trophic levels at a given time is called

- (1) Standing state
- (2) Standing quality
- (3) Standing crop
- (4) Standing index

142. The figure given below is showing the biome distribution w.r.t. annual temperature and precipitation. Select the right option for **correct** labeling



- (1) a-desert
- (2) f-tropical forest
- (3) d-coniferous forest
- (4) b-temperate forest

143. Snow laden areas in polar regions are called

- (1) Torrential streams
- (2) Deep ocean trenches
- (3) Permafrost
- (4) Stinking compost pits

144. Woody climbers and epiphytes are found in which of the following biomes?

- (1) Tundra
- (2) Grassland
- (3) Deserts
- (4) Tropical rain forest

145. Which of the following statements is **not** correct w.r.t. coniferous forests?

- (1) Evergreen trees are found
- (2) Leaves of trees are needle like
- (3) Characterised by succulent xerophytes
- (4) *Pinus* and *Cedrus* are the important vegetations of this biome

146. Select the **odd one out** regarding the type of population interaction.

- (1) Goat – Plant
- (2) *Cuscuta* – Hedge plant
- (3) Tiger – Deer
- (4) Sparrow – Seed

147. A remarkable point that has evolved in due course of evolution in favour of brood parasitism with respect to the interacting animals is

- (1) Resemblance in size and colour of parasitic eggs to host bird's eggs
- (2) Resemblance of pattern of nests of parasitic and host birds
- (3) Similarity in the mode of nutrition in host and parasitic birds
- (4) Ability to occupy same niche

148. Some organisms breed only once in their life time. One of the examples of such organisms is

- (1) Mammals
- (2) Most birds
- (3) Humans
- (4) Pacific salmon fish

149. Which of the following biogeochemical cycle is called sedimentary cycle?

- (1) Hydrogen cycle
- (2) Carbon cycle
- (3) Phosphorous cycle
- (4) Nitrogen cycle

150. According to Robert Costanza and his colleagues, out of total ecosystem services soil formation costs about

- (1) 90%
- (2) 50%
- (3) 10%
- (4) 6%

ZOOLOGY**SECTION-A**

151. Keeping beehives in crop fields during flowering period increases
- (1) Fertility of soil
 - (2) Honey yield and soil fertility
 - (3) Only crop yield
 - (4) Pollination efficiency, crop yield and honey yield

152. Downstream processing includes
- (a) Separation of the product from the reactor
 - (b) Purification of the product
 - (c) Biological conversion of materials into specific products
 - (d) Clinical trials in case of drugs

Choose the **correct** option.

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

153. Choose the odd one from the following.

- (1) *Hilsa*
- (2) Pomfret
- (3) Sardine
- (4) Rohu

154. Select the option which is the **correct** name for the restriction enzyme isolated from *Haemophilus influenzae*.

- (1) *Bam* HI
- (2) *Pst* I
- (3) *Hind* III
- (4) *Eco* RI

155. Match the following and choose the **correct** option.

a.	Restriction endonuclease	(i)	Creation of rDNA
b.	Bioprocess engineering	(ii)	Collection of unique restriction sites in a vector
c.	Genetic engineering	(iii)	Cuts DNA at specific location
d.	MCS of pBR322	(iv)	Maintenance of sterile ambience

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

156. Choose the **incorrect** statement from the following.

- (1) Stilbestrol tablets are used to induce lactation in sterile and young female cows.
- (2) In MOET, fertilized eggs at 8-32 celled stage are recovered non-surgically and transferred to surrogate mothers.
- (3) Silk is a secretion of caterpillar of silkworm during cocoon formation.
- (4) Improved breed of cattle is Leghorn.

157. Controlled animal breeding experiments that are carried out using artificial insemination is an advantageous approach because

- (1) Semen collected from inferior quality bull can be inseminated into the female
- (2) Collected semen has to be used immediately and can't be used at a later date
- (3) Artificial insemination helps us overcome several problems of normal mating
- (4) It promotes accumulation of recessive genes in a population

158. Vector plays many significant roles in r-DNA technology. Among the following functions listed which role is **not** played by the vector?

- (1) They help in easy transfer of foreign DNA
- (2) Selection of recombinants from non-recombinants
- (3) It helps in gene cloning
- (4) Plays a significant role in conducting Polymerase Chain Reaction

159. *Taq* polymerase enzyme was extracted from

- (1) *Thermococcus litoralis*
- (2) *Thermus aquaticus*
- (3) *Pseudomonas putida*
- (4) *Escherichia coli*

160. 'Ranikhet' in poultry is a

- (1) Viral disease
- (2) Bacterial disease
- (3) Fungal disease
- (4) Parasitic disease

161. *Hisardale* is a
- (1) Transgenic organism developed by CDRI
 - (2) Clone developed by NDRI
 - (3) New breed of goat developed by crossing Marino rams and Bikaneri ewes
 - (4) New breed of sheep developed by crossing Marino rams and Bikaneri ewes
162. Which of the following sequence in pBR322 is involved in producing proteins for replication of the plasmid?
- (1) amp^R
 - (2) tet^R
 - (3) *rop*
 - (4) *lac Z*
163. Inbreeding depression which is a result of continued mating between closely related individuals, results in reduced fertility and productivity, can be overcome by
- (1) Outcrossing
 - (2) Crossbreeding
 - (3) Interspecific hybridisation
 - (4) MOET
164. How many animals among the following can be bred using MOET?
- | |
|---|
| Cow, <i>Hilsa</i> , Sheep, Rabbit, Sardines
Buffaloes, <i>Apis</i> , Mare, <i>Catla</i> , Rohu |
|---|
- (1) Four
 - (2) Six
 - (3) Five
 - (4) Three
165. Polyculture of *Catla*, *Labeo* and *Cirrhina* is possible because
- (1) They show symbiotic association
 - (2) There is no competition of food between them
 - (3) They have different reproductive habits
 - (4) They have different sizes
166. In the recognition sequence of *Bam*HI i.e., 5'GGATCC3' phosphodiester bonds are broken 3'CCTAGG5' between which residues on 5' → 3' strand?
- (1) G and G
 - (2) C and C
 - (3) T and C
 - (4) A and T
167. Which of the following cloning vector is used to deliver desirable genes into animal cells?
- (1) Adenovirus
 - (2) Disarmed Ti plasmid
 - (3) Disarmed retroviruses
 - (4) Bacteriophages only
168. All of the following are included in dairying except
- (1) Cheese
 - (2) Curd
 - (3) Meat
 - (4) Milk
169. Select the incorrect statement regarding dairy farm management.
- (1) Yield is primarily dependent on the quality of breeds in the farm.
 - (2) For the yield potential to be realised, the cattle have to be well looked after, for instance they should have adequate water.
 - (3) The feeding of cattle should be carried out in a scientific manner with special emphasis on only quality of fodder.
 - (4) Regular visits by a veterinary doctor is mandatory.
170. The causative agent of Babesiosis is a
- (1) Bacterium
 - (2) Virus
 - (3) Protozoan
 - (4) Helminth
171. Which of the following is **not** a feature of the plasmid, pBR322?
- (1) It has double stranded circular DNA.
 - (2) It shows autonomous replication.
 - (3) It has *lacZ* gene coding for β -galactosidase enzyme.
 - (4) It is devoid of histones.
172. A group of animals related by descent and similar in most characters like general appearance are said to belong to a
- (1) Breed
 - (2) Species
 - (3) Hybrid
 - (4) Family
173. The two enzymes responsible for restricting the growth of bacteriophage in *E. coli* were isolated in the year.
- (1) 1981
 - (2) 1963
 - (3) 1969
 - (4) 1972

174. Which of the following technique is employed to check the progression of restriction enzyme digestion?

- (1) Polymerase chain reaction
- (2) Agarose gel electrophoresis
- (3) Gene cloning
- (4) Downstream processing

175. Inbreeding helps in accumulation of A genes and elimination of B desirable genes.

Select the option that correctly identifies 'A' and 'B'.

- (1) A – Inferior; B – Less
- (2) A – Superior; B – More
- (3) A – Inferior; B – More
- (4) A – Superior; B – Less

176. **Assertion (A)** : Restriction endonuclease recognises a specific palindromic nucleotide sequence in DNA.

Reason (R) : The palindromic sequence always comprises of six base pairs.

In the light of above statements, select the **correct** option.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (3) (A) is true statement but (R) is false
- (4) Both (A) and (R) are false statements

177. The E.C. number of the enzyme DNA ligase will begin with the number

- (1) 2
- (2) 6
- (3) 5
- (4) 1

178. *Agrobacterium*, containing Ti plasmid, provides a vehicle for introducing foreign DNA into plants, **except** in

- (1) Wheat, rice, corn
- (2) Pea, potato, sunflower
- (3) Gram, bean, potato
- (4) Mustard, tomato, cabbage

179. Read the following statements and select the correct option.

Statement A: Cross-breeds may be subjected to some form of inbreeding and selection to develop new stable breeds that may be superior to the existing breeds.

Statement B: Cross-breeding allows the desirable qualities of two different breeds to be combined.

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

180. Match column-I with column-II and select the **correct** option.

	Column-I		Column-II
a.	DNA probes	(i)	To identify cells that have been transformed
b.	Genetic markers	(ii)	To join DNA fragments together
c.	DNA ligase	(iii)	Complementary DNA, synthesized from mRNA by reverse transcriptase
d.	cDNA	(iv)	To identify and label a piece of DNA containing a certain sequence

Choose the **correct** option.

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

181. The bacterium modifies its own restriction sites for protecting its DNA by

- (1) Acetylation
- (2) Methylation
- (3) Dehydration
- (4) Inactivation of restriction endonuclease

182. The antibiotic resistance gene is linked to the plasmid vector with the help of

- (1) Exonuclease (2) Endonuclease
(3) DNA polymerase (4) DNA ligase

183. Select the **incorrect** statement from the following.

- (1) Agarose gel electrophoresis is used to separate different pieces of DNA on the basis of their size.
(2) Smaller DNA fragments travel more rapidly through gel than larger ones.
(3) DNA can be stained with ethidium bromide to visualize them.
(4) DNA fragments move towards cathode in agarose gel electrophoresis.

184. Which of the following must be present in a vector to facilitate its autonomous replication in the host cell?

- (1) Selectable marker (2) Recognition site
(3) *ori* site (4) Cos site

185. Which method is most preferred for gene transfer in plant cell?

- (1) Retroviral vectors (2) Gene gun
(3) Heat shock (4) Micro-injection

SECTION-B

186. *Hisardale* was developed in which state of India?

- (1) Rajasthan (2) Uttar Pradesh
(3) Himachal Pradesh (4) Punjab

187. **Assertion (A)** : Plasmids are found naturally in bacteria and yeast.

Reason (R) : Plasmids are double stranded DNA molecules found in prokaryotes only.

In the light of above statements, select the **correct** option.

- (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
(2) Both (A) and (R) are true but (R) is not the correct explanation of (A)
(3) (A) is true statement but (R) is false
(4) Both (A) and (R) are false statements

188. A mule is a hybrid of male donkey and mare and the hybrid formed from its reciprocal cross is

- (1) Donkey (2) Horse
(3) Hinny (4) Jackal

189. While constructing the first recombinant DNA molecule, Stanley Cohen and Herbert Boyer isolated plasmid from _____ a _____ while _____ b _____ acted as the host for the recombinant DNA.

Select the option which fill the blanks **correctly**.

	a	b
(1)	<i>Escherichia coli</i>	<i>Salmonella typhimurium</i>
(2)	<i>Salmonella typhimurium</i>	<i>Escherichia coli</i>
(3)	<i>Haemophilus influenzae</i>	<i>Agrobacterium tumefaciens</i>
(4)	<i>Agrobacterium tumefaciens</i>	<i>Haemophilus influenzae</i>

190. Which of the following is a recognition sequence of a restriction enzyme, *EcoRI*?

- (1) 5' GAATTC3'
3' CTTAAG5'
(2) 5'GATG3'
3'CTAC5'
(3) 5'GACCT3'
3'CTGGA5'
(4) 5'CCCGGG3'
3'GGGCCC5'

191. Extraction of DNA fragments from agarose gel is known as

- (1) Elution
(2) Spooling
(3) Electrophoresis
(4) Agglutination

192. If we want to recover more copies of the desired DNA, then it should be cloned in a vector having

- (1) Large number of selectable markers
(2) Large number of cloning sites
(3) Many antibiotic resistance genes
(4) An *ori* site which supports high copy number

193. In which of the following scenario, one **cannot** distinguish between transformed recombinant and non-recombinant cell?

- (1) When foreign DNA is inserted at *Sal*I recognition site in pBR322
- (2) In pBR322, when a foreign DNA is inserted at *Hind*III recognition site
- (3) When recombinant pBR322 was created by inserting foreign DNA at *Pvu*I recognition site
- (4) Recombinant pBR322 which carries foreign DNA at *Pst*I recognition site

194. How many of the animals given below in the box are included in poultry?

Ducks, Turkey, Geese, Chicken, Cow, Hen, Mule

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

195. Select the **incorrect** match w.r.t. the cells and cell wall/membrane degrading enzymes.

- (1) Fungi – Chitinase
- (2) Bacteria – Lysozyme
- (3) Plant cell – Cellulase
- (4) Animal cell – RNase

196. Choose the best breeding method for animals that are below average in growth rate in beef cattle.

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

197. Which of the following is the correct sequence of steps in PCR?

- (1) Denaturation, annealing, extension
- (2) Annealing, denaturation, extension
- (3) Extension, annealing, denaturation
- (4) Denaturation, extension, annealing

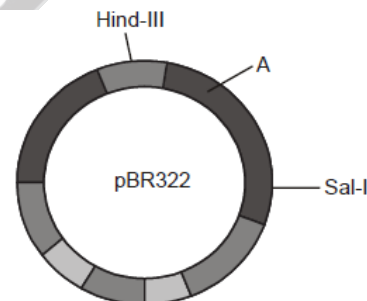
198. Select the term which is **not** associated with MOET.

- (1) Embryo transfer
- (2) Superovulation
- (3) *In vitro* fertilization
- (4) Artificial insemination

199. *Hind*II, the first type II restriction endonuclease, is coded by E.C. number 3.1.21.4. The digit 3 in this number indicates that

- (1) It is a hydrolase enzyme
- (2) It cleaves the phosphodiester sequences
- (3) It denatures the DNA by breaking the three hydrogen bonds between guanine and cytosine bases
- (4) Its endonuclease action does not involve water molecules

200. Identify A in the given diagram of *E.coli* cloning vector pBR322.



- (1) *Pvu*I
- (2) *Pst*I
- (3) *Pvu*II
- (4) *Bam*HI

□ □ □