Common Entrance Examination-2023
(Admission for B. Tech/B. Pharmacy)

Time : 3:15 Hrs. **Booklet No.**

Maximum Marks : 600

READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. Do not open the seal of the question booklet until you are asked to do so by the invigilator.
2. OMR answer-sheet will be supplied by the Centre Superintendent for answering the questions.
3. USE blue/black ink ball pen only to darken the appropriate circle/oval in the OMR answer-sheet. No sophisticated pens are allowed.
4. Darken one circle/oval deeply for each question in the OMR answer-sheet, as faintly darkened circle might be rejected by the scanner. ✗ Wrong ●✓ Correct
5. This question booklet contains **40 pages** including blank pages for rough work. After you are permitted to open the seal, please check all pages and report discrepancies, if any, to the invigilator on duty.
6. Out of total of 180 questions, **150** are to be attempted which shall carry **600** marks. All these questions are of Multiple Choice Questions (MCQs). Each question has only one correct answer.
7. **Examination Pattern: -**

Subjects	Section -A (All 20 Questions are compulsory)	Section-B (Attempt 30 Questions out of 40 Questions)
PHYSICS	Question 1 to 20	Questions 21 to 60
CHEMISTRY	Questions 61 to 80	Questions 81 to 120
MATHEMATCS/BIOLOGY	Questions 121 to 140	Questions 141 to 180

8. Question 1 to 60 pertain to **Physics**, questions 61 to 120 pertain to **Chemistry**, questions 121 to 180 pertain to **Mathematics** or **Biology** and each question carries 4 marks. You are advised to attempt questions from one subject, either **Mathematics** or **Biology**. The question belonging to Physics and Chemistry subjects are compulsory for all. However, Mathematics is also compulsory for B. Tech course.
9. Rough work can be done on the question paper itself. Blank pages are provided at the end of the question booklet for rough work.
10. **Do not fold the OMR answer-sheet and don't put any mark on it to avoid rejection by the scanner**.
11. Write your roll number carefully on the OMR answer-sheet and darken the appropriate circle/oval properly.
12. Before opening the question booklet, fill-up the required information with blue/black ball pen correctly both in the question booklet and the OMR answer-sheet.
13. Mobile phones/electronic devices etc. are not allowed inside the examination hall.
14. The question booklet may be retained by the candidate after the entrance test is over.
15. **Four (+4) marks shall be awarded for each correct answer and one (–1) mark shall be deducted for each wrong answer. Un-answered/ un-marked question will be given no marks (0).**
16. Before the start of the examination, write your name and registration number in the space provided below using a blue/black ink ball point pen.

Name									
Registration Number									

PHYSICS-Part A

(Attempt all 20 Questions Compulsory)

1. If the distance between two masses is doubled, the gravitational attraction between them

   (A) Is doubled (B) Becomes four times

   (C) Is reduced to half (D) Is reduced to a quarter

2. If the Kinetic energy of a particle in linear motion is doubled, then its momentum will

   (A) Remain unchanged (B) Increase $\sqrt{2}$ times

   (C) Be quadrupled (D) Be doubled

3. Rate of doing work is called

   (A) Force (B) Acceleration

   (C) Power (D) Displacement

4. SI unit of angular momentum is

   (A) rad/s^2 (B) $kg.m^2.s$

   (C) $kg.m^2/s$ (D) rad/s

5. A concave lens is kept in contact with a convex lens of focal length 20 cm. The combination acts as a convex focal length of 50 cm. The power of concave lens is

   (A) –3D (B) +3D

   (C) 5D (D) 6D

6. What is the critical angle for a material for refractive index $\sqrt{2}$.

   (A) 30° (B) 45°

   (C) 60° (D) 90°

7. Focal length (F) and power (P) of plane glass plate is

   (A) F=0, P=∞ (B) F=∞, P=0

   (C) 4 F=1, P=1 (D) F=0, P=0

8. Which color deviates (i) most (ii) least, on passing through a prism

   (A) Most for red and least for violet

   (B) Most for violet and least for red

   (C) same for both

   (D) None for above

9. Ratio of slit width, when amplitude of light waves emanates from them have a ratio of $\sqrt{7}:\sqrt{3}$, is

(A) 3:7 (B) $\sqrt{7}:3$

(C) 7:3 (D) $7:\sqrt{3}$

10. When a wave undergoes a reflection from rarer to denser medium, the phase changes by

(A) 0° (B) π

(C) $\pi/2$ (D) $-\pi$

11. Distance covered by a missile fired with initial velocity of 300 m/s at an angle of 45° (take g=10m/s^2) is

(A) 90 km (B) 9 km

(C) 81 km (D) 30 km

12. Dielectric constant of a medium is 10. Its permittivity will be

(A) $8.854\times10^{-12}C^2N^{-1}m^{-2}$ (B) $88.54\times10^{-12}C^2N^{-1}m^{-2}$

(C) $0.8854\times10^{-12}C^2N^{-1}m^{-2}$ (D) None of the above

13. The Kinetic energy and potential energy of a particle executing S.H.M. will be equal, when displacement is (amplitude = a)

(A) $a^2/2$ (B) $a/\sqrt{2}$

(C) $a^2/\sqrt{2}$ (D) $a^2/4$

14. A simple pendulum when placed on a different planet with its acceleration due to gravity (g_P) equal to 0.01 times that of earth i.e $g_P = (1/100)\, g_E$, then the time period of pendulum will become

(A) 100 times (b) 10 times

(C) 1/10 times (d) 1/100 times

15. The equation of wave is $y = 2 \sin \pi(0.5x - 200t)$ where x and y are expressed in cm and t in sec. The wave velocity is

(A) 100 cm/sec (B) 200 cm/sec

(C) 300 cm/sec (D) 400 cm/sec

16. Work done in moving the test charge from one point of equipotential surface to other is

(A) infinite (∞) (B) zero

(C) Unity (D) None of these

17. Which of following has maximum penetrating power?

(A) UV radiation (B) Microwaves

(C) Gamma rays (D) Radio waves

18. A voltage of 200V is applied across a color-coded carbon resistor with first, second and third ring of blue, black and yellow colors. The current flowing through the resistor is

(A) 0.333×10^{-4} A (B) 3.33×10^{-4} A

(C) 33.3×10^{-4} A (D) 333×10^{-4} A

19. Two equations of two S.H.M. are $x = a \sin(\omega t - \alpha)$ and $y = b \cos(\omega t - \alpha)$. The phase differene between the two is

(A) 0° (B) $\alpha°$

(C) 90° (D) 180°

20. Two satellites S1 and S2 following Kepler's laws are revolving around a planet in coplanar circular orbits in same sense. Their periods of revolutions are one hour and 8 hours respectively. If radius of S1 is 10000 km, then radius of second satellite is

(A) 4×10^4 km (B) 0.4×10^4 km

(C) 40×10^4 km (D) 4×10^4 m

PHYSICS - Part-B

(Attempt any 30 Questions)

21. Out of speed (c), frequency (ν) and wavelength (λ) on reflection

(A) Speed varies while frequency and wavelength remain same

(B) frequency and wavelength vary while Speed remains same

(C) frequency varies while Speed and wavelength remain same

(d) All remain same

22. In simple harmonic motion, which of following is true

(A) Kinetic energy is maximum at mean position and minimum at extreme positions

(B) Potential energy is maximum at extreme positions and minimum at mean position

(C) Total energy always remains constant.

(D) All of the above

23. If the radius of a planet is R, and its density is ρ, then escape velocity will be proportional

(A) ρR (B) $R\sqrt{\rho}$

(C) $\sqrt{\rho / R}$ (D) $1/\rho R$

24. The force between two free electrons spaced 1Å apart is

(A) 2.3×10^{-8} N (B) 0.23×10^{-8} N

(C) 4.6×10^{-8} N (D) 230×10^{-8} N

25. A surface element $\vec{ds} = 5\hat{i}$ is placed in an electric field $\vec{E} = 4\hat{i} + 4\hat{j} + 4\hat{k}$. The electric flux emanating from the surface is

(A) 40 units (B) 200 units

(C) 20 units (D) 400 units

26. If 20 J of work has to be done to move an electric charge of 4C from a point where potential is 10 V to another point, where potential is V volt. The value of V is

(A) 40 V (B) 200 V

(C) 15 V (D) 400 V

27. If charge Q is placed at a distance a/2 above the center of a horizontal square, then the flux of the electric field through the square surface is

(A) $\frac{5Q}{6\varepsilon_0}$ (B) $\frac{7Q}{6\varepsilon_0}$

(C) $\frac{11Q}{6\varepsilon_0}$ (D) $\frac{Q}{6\varepsilon_0}$

28. A sphere S_1 of radius r_1 encloses a total charge Q. There is another concentric sphere S_2 of radius r_2 ($>r_1$) and there are no additional charges between S_1 and S_2. The ratio of electric flux through S_1 and S_2 is

(A) 1:1 (B) 2:1

(C) 1:2 (C) 2:2

29. When 1.0×10^{12} electrons are transferred from one conductor to another, a potential difference of 10 V appears between the conductors. The capacitance of the conductor system is

(A) 16×10^{-8} F (B) 0.16×10^{-8} F

(C) 1.6×10^{-8} F (D) None of the above

30. What is the color code for a resistor of resistance 5.3 $k\Omega$ with 5% tolerance?

(A) Green, Orange, Red-gold (B) Orange, Green, Red-silver

(C) Red, Green, Red-gold (D) Orange, yellow, Red-gold

31. Bernoulli's theorem is applicable in the case of

(a) The compressible liquid in a turbulent flow

(b) The incompressible liquid in a turbulent flow

(c) The compressible liquid in a streamline flow

(d) The incompressible liquid in a streamline flow

32. The current in mA if 2×10^{20} electrons pass through a lamp in one minute is

(A) 0.533 mA (B) 5.33 mA

(C) 533 mA (D) 53.3 mA

33. In Bohr model of hydrogen atom, the electron revolving around the nucleus in a circular orbit of radius 5.1×10^{-11}m at a frequency of 6.8×10^{15} revolution per second. The equivalent current at any point on the orbit of the electron is

(A) 1.088×10^{-3} A (B) 1.088×10^{-4} A

(C) 1.088×10^{-5} A (D) 1.088×10^{-6} A

34. A bulb of 100W is operated for 6 hours a day. The units of energy consumed in 7 days are

(A) 4.2 unit (B) 42 unit

(C) 420 unit (D) none of the above

35. If the mass of proton is approx. 1840 times mass of electron, then the ratio of their radius of path (R_e/R_p) followed in a direction perpendicular to 'B' will be

(A) 1:1840 (B) 1840:1

(C) 2:1840 (D) 1840:2

36. When distance between two given magnetic poles is halved, force between them become 'k' times, where 'k' is

(A) 1 (B) 2

(C) 4 (D) ¼

37. Magnetic moment of a current loop becomes k times when diameter of the loop is made twice and number of turns is made three-fold, where 'k='

(A) 2 (B) 3

(C) 6 (D) 12

38. The storage battery of a car has an emf of 12 V. If the internal resistance of the battery is 4Ω. The maximum current that can be drawn from the battery is

(A) 300 A (B) 0.3 A

(C) 30 A (D) 60 A

39. Which of the following characteristics of electrons determine the current in a conductor?

(A) Drift velocity alone (B) Thermal velocity alone

(C) Both drift and thermal velocities (D) Neither drift nor thermal velocity

40. In a half wave rectifier, the r.m.s. value of the a.c, component of the wave is

(A) equal to d.c. value (B) more than d.c. value

(C) less than d.c. value (D) zero

41. C_P and C_V denote the molar specific heats of a gas at constant pressure and at constant volume respectively. If $\frac{C_P}{C_V} = \gamma$ and $C_P - C_V = R$. then C_V is equal to

(A) $\frac{R}{\gamma - 1}$ (B) $\frac{\gamma - 1}{R}$

(C) $\frac{\gamma R}{\gamma - 1}$ (D) $\sqrt{\frac{R}{\gamma - 1}}$

42. For a common base amplifier, the values of resistance gain and voltage gain are 3000 and 2800 respectively. The current gain will be

(A) 1.1 (B) 0.98

(C) 0.93 (D) 0.83

43. The gate for which output is high if at least one input is low

(A) NAND (B) NOR

(C) OR (D) AND

44. The following four wires are made of the same material. Which of them will have the largest extension when the same tension is applied?

(A) Length=100 cm, diameter=1 mm

(B) Length=200 cm, diameter=2 mm

(C) Length=50 cm, diameter=0.5 mm

(D) Length=300 cm, diameter=3 mm

45. A unit mass of solid is converted to liquid at its melting point. Heat required for this process is

(A) Specific heat (B) Latent heat of vaporization

(C) External latent heat (D) Latent heat of fusion

46. Let n_h and n_e be the number of holes and conduction electrons in an extrinsic semiconductor. Then

(A) $n_h > n_e$ (B) $n_h = n_e$

(C) $n_h < n_e$ (D) $n_h \neq n_e$

47. For a diamagnetic material, which of the following statement is correct?

(A) Magnetic susceptibility > 0 (B) Magnetic susceptibility < 0

(C) Magnetic susceptibility = 0 (D) Magnetic susceptibility = 1

48. Two nuclei have their masses in the ratio of 1:3. The ratio of their nuclear densities would be

(A) 1:3 (B) 1: $\sqrt{3}$

(C) 1:1 (D) 3:1

49. Bohr's atomic model explains the

(A) spectrum of hydrogen atom only

(B) spectrum of an atom and/or ions of one electron only

(C) spectrum of hydrogen molecule

(D) none of these

50. The radius of the Bohr orbit depends on which of the following?

(A) 1/n (B) n

(C) $1/n^2$ (D) n^2

51. The smallest de-Broglie wavelength among the Four particles moving with same velocity is

(A) N_2 molecule (B) O_2 molecule

(C) Electron (D) Proton

52. According to de Broglie's relation if velocity of particle is infinite, wavelength will be

(A) infinite (B) small

(C) large (D) zero

53. The number of ejected photoelectrons from a metal surface increase when

(A) the energy of incident photon increases

(B) the frequency of incident radiation increases

(C) the intensity of incident radiation increases

(D) the stopping potential for ejected electrons increases

54. The minimum energy required for a photoelectron to escape from a metal surface in a photocell is called

(A) Stopping voltage (B) Planck's constant

(C) Threshold wavelength (D) Work function

55. Which of the following is a state function in thermodynamics?

(A) Work (B) Heat

(C) Enthalpy (D) None of the above

56. Which of the following statements about the first law of thermodynamics is true?

(A) lt gives the law of conservation of energy

(B) It gives the direction of flow of heat

(C) lt introduces the concept of entropy

(D) It gives the concept of temperature

57. Which of the following is a measure of a material's resistance to deformation under a load?

(A) Hardness (B) Elasticity

(C) Toughness (D) Ductility

58. What is the average velocity of the molecules of an ideal gas?

(A) Infinity (B) Constant

(C) Zero (D) Unstable

59. A rod of radius 10 cm and length one meter is held by a clamp at one end and the force of 100 kN stretches it along its length, then the stress on the rod is

(A) $3.18\times10^{6}\ Nm^{-2}$ (B) $318\times10^{6}\ Nm^{-2}$

(C) $3.18\times10^{-6}\ Nm^{-2}$ (D) $318\times10^{-6}\ Nm^{-2}$

60. Energy associated with a one kilogram of matter is

(A) 9×10^{-16} J (B) 9×10^{16} J

(C) 90×10^{16} J (D) 0.9×10^{16} J

Values

c	velocity of light in vacuum	$2.997\ 924\ 58 \cdot 10^{8}$ m/s
h	Planck's constant	$6.626\ 069 \cdot 10^{-34}$ J/s
$\hbar$	$(=h/2\pi)$	$1.054\ 571 \cdot 10^{-34}$ J/s
e	electronic charge	$1.602\ 176 \cdot 10^{-19}$ C
μ_e	electron magnetic moment	$-928.476\ 362 \cdot 10^{-26}$ J/T
μ_B	Bohr magneton	$927.400\ 899 \cdot 10^{-26}$ J/T
μ_N	nuclear magneton	$5.050\ 783\ 17 \cdot 10^{-27}$ J/T
m_e	electron mass	$9.109\ 381\ 88 \cdot 10^{-31}$ kg
m_p	proton mass	$1.672\ 621\ 58 \cdot 10^{-27}$ kg
m_N	neutron mass	$1.674\ 927\ 16 \cdot 10^{-27}$ kg
k_B	Boltzmann's constant	$1.380\ 650 \cdot 10^{-23}$ J/K
N_A	Avogadro's constant	$6.022\ 142 \cdot 10^{23}$
R	molar gas constant	$N_A \cdot k_B = 8.314\ 472$ J/mol·K
F	Faraday constant	96 485.3415 C/mol

CHEMISTRY-Part A

(Attempt all 20 Questions Compulsory)

61. In the modern periodic table, the period indicates the value of

(A) atomic number (B) atomic mass

(C) principal quantum number (D) azimuthal quantum number.

62. Which one of the following is an amphoteric oxide?

(A) Na_2O (B) SO_2

(C) B_2O_3 (D) ZnO

63. Determine the total number of neutrons in three isotopes of hydrogen

(A) 1 (B) 2

(C) 3 (D) 4

64. The synonym for water gas, when used in the production of methanol, is

(A) fuel gas (B) natural gas

(C) laughing gas (D) syn gas

65. Which of the alkali metal is having least melting point?

(A) Na (B) K

(C) Rb (D) Cs

66. Calculate the number of atoms in 52 moles of Ar

(A) 52 (B) 3.131×10^{25}

(C) 31.31×10^{25} (D) 1

67. Calculate the molar mass of H_2O in g/mol

(A) 18 (B) 32

(C) 34 (D) 16

68. Which one of the following is temperature independent unit of concentration?

(A) Molality (B) Molarity

(C) Normality (D) All of the above

69. Number of unpaired electrons in Mn^{3+} ion is/are:

(A) 1 (B) 2

(C) 3 (D) 4

70 Magnetic moment shown by Cr^{2+} is:

(A) 4.80 (B) 3.90

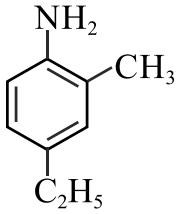
(C) 0 (D) 2.70

71. In the structure of diborane the terminal B—H bonds are:

(A) 3-centre-2-electron bond (B) 2-centre-2-electron bond

(C) 3-centre-4-electron bond (D) 2-centre-4-electron bond

72. Which one of the following is the correct IUPAC nomenclature of the compound:



(A) 4-Ethyl-2-methylaminobenzene

(B 1-Methyl-3-ethyl-6-aminobenzene

(C) 1-Methyl-2-amino-5-ethylbenzene

(D) 4-Ethyl-6-methyl-aniline

73. Which one of the following compounds will not be soluble in sodium bicarbonate?

(A) Benzene sulphonic acid (B) Benzoic acid

(C) o-Nitrophenol (D) 2, 4, 6 – Trinitrophenol

74. In the hydroboration-oxidation reaction of propene with diborane, H_2O_2 and NaOH, the organic compound formed is

(A) $(CH_3)_3COH$ (B) $CH_3CHOHCH_3$

(C) CH_3CH_2OH (D) $CH_3CH_2CH_2OH$

75. Basicity of H_3PO_4 is:

(A) 2 (B) 3

(C) 4 (D) 1

76. Which of the following has the second highest electronegativity in the periodic table:

(A) F (B) O

(C) N (D) C

77. Highest positive oxidation state of Iodine is:

(A) +3 (B) +5

(C) +7 (D) +9

78. Which one has the highest boiling point?

(A) Kr (B) Xe

(C) He (D) Ne

79. Which of the following is an intensive property?

(A) Mass (B) Volume

(C) Enthalpy (D) Temperature

80. Molality of 2.5 g of ethanoic acid (CH_3COOH) in 75 g of benzene.

(A) 0.556 mol kg^{-1} (B) 55.6 mol kg^{-1}

(C) 0.227 mol kg^{-1} (D) 2.5 mol kg^{-1}

CHEMISTRY-Part B

(Attempt any 30 Questions)

81. Which one of the following alkali metals has the highest tendency of formation of hydrated salts?

(A) Li (B) Na

(C) K (D) Cs

82. Which alkaline earth metal ion has the highest hydration enthalpy?

(A) Be^{2+} (B) Mg^{2+}

(C) Ca^{2+} (D) Sr^{2+}

83. Which of the following is called Caustic Soda ?

(A) NaOH (B) NaCl

(C) $Na_2CO_3.10H_2O$ (D) $CaSO_4$

84. Value of gas constant R is

(A) 0.082 L atm (B) 0.987 cal $mol^{-1}K^{-1}$

(C) 8.3 J $mol^{-1}K^{-1}$ (D) 83 erg $mol^{-1}K^{-1}$

85. Which one of the following is the wrong assumption of the kinetic theory of gases?

(A) All the molecules move in a straight line between collision and with the same velocity.

(B) Molecules are separated by great distances compared to their sizes.

(C) Pressure is the result of the elastic collision of molecules with the container's wall.

(D) Momentum and energy always remain conserved.

86. How many electrons an atom may have if the quantum numbers are: $n = 3, l = 0$

(A) 6 (B) 10

(C) 2 (D) 3

87. In the spectrum of electromagnetic radiation which one have the longest wavelength:

(A) gamma-rays (B) visible rays

(C) radio waves (D) UV rays

88. Which statement is incorrect about the Rutherford Nuclear Model of the atom?

(A) most of the α-particles passed through the gold foil undeflected.

(B) a small fraction of the α-particles were deflected by small angles.

(C) Most of the α-particles bounced back, that is, were deflected by nearly 180°.

(D) The thin foil used in the experiment was made up of gold.

89. Geometry of the Molecule $CHCl_3$ will be:

(A) Bent (B) T-shape

(C) Tetrahedral (D) Square-Pyramidal

90. Using MO theory, predict which of the following species has the longest bond length?

(A) O_2^- (B) O_2^{2-}

(C) O_2^{2+} (D) O_2^+

91. On treating phenol with chloroform in the presence of sodium hydroxide, a –CHO group is introduced at the ortho position of the benzene ring. This reaction is known as:

(A) Reimer-Tiemann Reaction (B) Kolbe's Reaction

(C) Aldol- Condensation (D) Wurtz Reaction

92. In Victor-Meyer's test, the colour given by 1°, 2° and 3° alcohols are respectively:

(A) Red, blue, colourless (B) Colourless, red, blue

(C) Red, blue, violet (D) Red, colourless, blue

93. An ether is more volatile than alcohol having the same molecular formula. This is due to:

(A) alcohols having resonance structures

(B) inter-molecular hydrogen bonding in ethers

(C) dipolar character of ether

(D) inter-molecular hydrogen bonding in alcohols

94. In which of the following ionization processes the bond energy has increased and also the magnetic behaviour has changed from paramagnetic to diamagnetic?

(A) $NO \rightarrow NO^+$ (B) $O_2 \rightarrow O_2^+$

(C) $N_2 \rightarrow N_2^+$ (D) $C_2 \rightarrow C_2^+$

95. The full form of VSEPR Theory is:

(A) Valence shell electron pair rate theory

(B) Valence shell electron proton rate theory

(C) Valence shell electron pair repulsion theory

(D) Valence shell electronegative pair repulsion theory

96. For the process to occur under adiabatic conditions, the correct condition is:

(A) $\Delta T = 0$ (B) $\Delta p = 0$

(C) $q = 0$ (D) $W = 0$

97. Which of the following has the highest bond enthalpy?

(A) C—C (B) Si—Si

(C) Ge—Ge (D) Sn—Sn

98. An aqueous solution of borax is

(A) neutral (B) amphoteric

(C) basic (D) acidic

99. The pH of a sample of vinegar is 3.76. Calculate the concentration of hydrogen ion in it;

(A) 1.7×10^{-4} M (B) 2.7×10^{-4} M

(C) 3.76×10^{-4} M (D) 2.3×10^{-8} M

100. The reaction $3ClO^-(aq) \rightarrow ClO_3^-(aq) + 2Cl^-(aq)$ is an example of

(A) Oxidation (B) Reduction

(C) Disproportionation (D) Decomposition reaction

101. The pair of compounds having metals in their highest oxidation state is:

(A) MnO_2, $FeCl_3$ (B) $[MnO_4]^-$, CrO_2Cl_2

(C) $[Fe(CN)_6]^{3-}$, $[Co(CN)_3]$ (D) $[NiCl_4]^{2-}$, $[CoCl_4]^-$

102. EMF of a cell in terms of the reduction potential of its left and right electrodes is

(A) $E = E_{left} - E_{right}$ (B) $E = E_{left} + E_{right}$

(C) $E = E_{right} - E_{left}$ (D) $E = -(E_{right} + E_{left})$

103. Which of the following is the chemical formula of sulphurous acid:

(A) H_2SO_3 (B) H_2SO_4

(C) $H_2S_2O_7$ (D) $H_2S_2O_8$

104. Which of the following are Lewis acids?

(A) $AlCl_3$ and $SiCl_4$ (B) PH_3 and $SiCl_4$

(C) BCl_3 and $AlCl_3$ (D) PH_3 and BCl_3

105. Which one of the following types of drugs reduces fever?

(A) Analgesic (B) Antipyretic

(C) Antibiotic (D) Tranquiliser

106. Which one of the following is the sweetest artificial sweetner?

(A) Aspartame (B) Saccharin

(C) Sucralose (D) Alitame

107. Units of a first-order reaction is:

(A) mol L^{-1} s^{-1} (B s^{-1}

(C) mol^{-1} L s^{-1} (D) unitless

108. Which type of 'defect' has the presence of cations in the interstitial sites?

(A) Vacancy defect (B) Frenkel defect

(C) Metal deficiency defect (D) Schottky defect

109. The hydrocarbon which can react with sodium in liquid ammonia is

(A) $CH_3CH_2C \equiv CCH_2CH_3$

(B) $CH_3CH_2CH_2C \equiv CCH_2CH_2CH_3$

(C) $CH_3CH_2C \equiv CH$

(D) $CH_3CH \equiv CHCH_3$

110. The reaction: $CH_3CH_2I + KOH(aq) \rightarrow CH_3CH_2OH + KI$ is classified as :

(A) electrophilic substitution (B) nucleophilic substitution

(C) elimination (D) addition

111. The bond order in the molecule NO^+ will be:

(A) 2 (B) 1.5

(C) 2.5 (D) 3

112. The compound with two lone pairs of electrons on the central atom is:

(A) BrF_5 (B) ClF_3

(C) CH_4 (D) SF_4

113. Which one of the following compounds is polar:

(A) O_2 (B) CCl_4

(C) Benzene (D) NH_3

114. During dehydration of alcohols to alkenes by heating with conc. H_2SO_4 the initiation step is

(A) formation of carbocation

(B) elimination of water

(C) formation of an ester

(D) protonation of the alcohol molecule

115. In the presence of a small amount of phosphorous, aliphatic carboxylic acids react with chlorine or bromine to yield a compound in which α – hydrogen has been replaced by halogen. This reaction is known as:

(A) Etard reaction

(B) Hell-Volhard-Zelinsky reaction

(C) Wolff-Kishner reaction

(D) Rosenmund reaction

116. Which of the following is not an example of a heterogeneous catalytic reaction?

(A) Haber's process

(B) Hydrogenation of vegetable oils

(C) Combustion of coal

(D) Ostwald's process

117. Which of the following forms the most acidic dioxide?

(A) Si (B) C

(C) Ge (D) Pb

118. Which one of the following antibiotic is bacteriostatic ?

(A) Penicillin

(B) Erythromycin

(C) Aminoglycosides

(D) Ofloxacin

119. RNA is different from DNA because RNA contains:

(A) ribose sugar and thymine

(B) ribose sugar and uracil

(C) deoxyribose sugar and thymine

(D) deoxyribose sugar and uracil

120. Nylon threads are made of

(A) Polyester polymer

(B) Polyamide polymer

(C) Polyethylene polymer

(D) Polyvinyl polymer

MATHEMATICS-Part A

(Attempt all 20 Questions Compulsory)

121. The contrapositive of the statement: "If p then q" is

(A) If ~p then q (B) If p then ~p

(C) If q then p (D) If ~q then ~p

122. The range of the function $f(x) = \frac{2+x}{2-x}, x \neq 2$ is

(A) R (B) R-{-1}

(C R-{1} (D) R-{2}

123. The function $f : \mathbb{R} \to \mathbb{R}$ given by $f(x) = -|x-1|$ is

(A) continuous as well as differentiable at x = 1

(B) not continuous but differentiable at x = 1

(C) continuous but not differentiable at x = 1

(D) neither continuous nor differentiable at x = 1

124. If A is a 3×3 matrix such that | A | = 8, then |3A| equals

(A) 8 (B) 24

(C) 72 (D) 216

125. The maximum number of equivalence relations on the set A= {1,2,3) is

(A) 1 (B) 2

(C) 3 (D) 5

126. $\lim_{x \to \frac{5}{2}} [x]$ is

(A) 2 (B) 3

(C) 5/2 (D) 5

127. In the arithmetic progression – 3, $-\frac{1}{2}$, 2, ..., the 11th term is

(A) 40 (B) – 12

(C) 22 (D) 42

128. If α and β are roots of $x^2 + px + q = 0$ then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

(A) $\frac{p^2 - 2q}{q}$ (B) $\frac{2q - p^2}{q}$

(C) $\frac{(p^2 + 2q)}{q}$ (D) None of these

129. Let $A = \{x : x \in \mathbb{R}, x < 10\}$ and $B = \{x : x \in \mathbb{R}, x > 9\}$

Then $A \cap B$ equals to

(A) (9, 10] (B) (9, 10)

(C) [9, 10) (D) [9, 10]

130. At point $x = 0$, the function $f(x) = |x|$ has

(A) Neither minimum nor maximum (B) A maxima

(C) Point of inflexion (D) A minima

131. The degree of the differential equation $x^2 \frac{d^2y}{dx^2} = \left[x\frac{dy}{dx} - y \right]^3$ is

(A) 1 (B) 2

(C) 3 (D) 6

132. Which of the following is not a measure of central tendency?

(A) Mean (B) Median

(C) Standard Deviation (D) Mode

133. If q is the inclination of a line from x-axis, then its slope is

(A) tan q (B) cot q

(C) cos q (D) sin q

134. Solution of the differential equation $xdy - ydx = 0$ represents a

(A) parabola (B) circle

(C) hyperbola (D) straight line

135. The point which does not lie in the half plane $2x + 3y - 12 \leq 0$ is

(A) (1, 2) (B) (2, 1)

(C) (2, 3) (D) (–3, 2)

136. A die is thrown once. Let A be the event that the number obtained is greater than 3. Let B be the event that the number obtained is less than 5. Then $P(A \cup B)$ is

(A) 2/5 (B) 3/5

(C) 0 (D) 1

137. $\int x^2 e^{x^3} dx$ equals

(A) $\frac{1}{3}e^{x^3} + C$ (B) $\frac{1}{3}e^{x^4} + C$

(C) $\frac{1}{2}e^{x^3} + C$ (D) $\frac{1}{2}e^{x^2} + C$

138. If ${}^{16}P_{r-1} : {}^{15}P_{r-1} = 16 : 7,$ then r is

(A) 10 (B) 12

(C) 8 (D) 7

139. If $\vec{a} \cdot \vec{b} = \frac{1}{2} |\vec{a}| \, |\vec{b}|,$ then the angle between $\vec{a}$ and $\vec{b}$ is

(A) 0° (B) 30°

(C) 60° (D) 90°

140. The number of tangents that can be drawn from (1,2) to the circle $x^2 + y^2 = 5$ is

(A) 0 (B) 1

(C) 2 (D) more than 2

MATHEMATICS-Part B

(Attempt any 30 Questions)

141. The relation R in the set {1, 2, 3} given by R= {(1, 2), (2, 1), (1, 1)} is

(A) Symmetric and transitive but not reflexive

(B) Reflexive and symmetric but not transitive

(C) Symmetric but neither reflexive nor transitive

(D) An equivalence relation

142. If $g(x) = 1 + x - [x]$ and $f(x) = \begin{cases} -1, & x < 0 \\ 0, & x = 0 \\ 1, & x > 0 \end{cases}$ then for all x.

$f(g(x))$ is

(A) x (B) 1

(C) $f(x)$ (D) $g(x)$

143. If X and Y are two sets then $X \cap (X \cup Y)^C$ equals

(A) X (B) Y

(C) ϕ (D) None of these

144. The least value of n for which $[(1 + i)/(1 - i)]^n$ is real is

(A) 1 (B) 2

(C) 3 (D) 4

145. If the roots of the equation $px^2 + qx + 2 = 0$ are reciprocals of each other, then

(A) $p = 0$ (B) $p = -2$

(C) $p = \pm 2$ (D) $p = 2$

146. If the complex number $z = x + iy$ satisfies the condition $|z + 1| = 1$, then z lies on

(A) x-axis

(B) circle with centre (1,0) and radius 1

(C) circle with centre (–1, 0) and radius 1

(D) y-axis

147. If ${}^{n}P_{r} = 3024$ and ${}^{n}C_{r} = 126$, then n and r are

(A) 9, 4 (B) 10, 4

(C) 12, 3 (D) 11, 3

148. For every natural number k, which of the following statement is true?

(A) $(mn)^{k} = m^{k}n^{k}$ (B) $m^{k}n = mn^{k}$

(C) $(m + n)^{k} = m^{k} + n^{k}$ (D) $(m - n)^{k} = m^{k} - n^{k}$

149. The greatest coefficient in the expansion of $(1 + x)^{10}$ is

(A) $\frac{10!}{5!}$ (B) $\frac{10!}{(5! \times 4!)}$

(C) $\frac{10!}{(5!)^{2}}$ (D) $\frac{10!}{(4! \times 4!)}$

150. The principal value of $\cot^{-1}(-\sqrt{3})$ is

(A) $-\frac{\pi}{6}$ (B) $\frac{\pi}{6}$

(C) $\frac{2\pi}{3}$ (D) $\frac{5\pi}{6}$

151. If $\int_{0}^{a} \frac{dx}{1+4x^{2}} = \frac{\pi}{8}$, then the value of a is

(A) 4 (B) 2

(C) $\frac{1}{2}$ (D) $\frac{1}{4}$

152. $\int_{0}^{\pi/8} \tan^{2}(2x)\, dx$ is equal to

(A) $\frac{4-\pi}{8}$ (B) $\frac{4+\pi}{8}$

(C) $\frac{4-\pi}{4}$ (D) $\frac{4-\pi}{2}$

153. The interval in which the function f given by $f(x) = x^2e^{-x}$ is strictly increasing is

(A) $(-\infty, \infty)$ (B) $(-\infty, 0)$

(C) $(2, \infty)$ (D) $(0, 2)$

154. An urn contains 6 balls of which two are red and four are black. Two balls are drawn at random. Probability that they are of different colours is

(A) 2/5 (B) 1/15

(C) 8/15 (D) 4/15

155. If A and B are two events such that $P(A) = 0.2$, $P(B) = 0.4$ and $P(A \cup B) = 0.5$, then the value of $P(A/B)$ is

(A) 0.1 (B) 0.25

(C) 0.5 (D) 0.08

156. If $\begin{vmatrix} 2 & 3 & 2 \\ x & x & x \\ 4 & 9 & 1 \end{vmatrix} + 3 = 0,$ then the value of x is

(A) 3 (B) 0

(C) –1 (D) 1

157. If $A\ [a_{ij}]$ is a 2×2 matrix where $a_{ij} = i + j$, then A is equal to

(A) $\begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 2 \\ 1 & 2 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$

158. Inverse of the matrix $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$ is

(A) $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$ (B) $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{bmatrix}$

(C) $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{bmatrix}$ (D) $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{bmatrix}$

159. The existence of the unique solution of the system of equations

$x + y + z = \beta$

$5x - y + \alpha z = 10$

$2x + 3y - z = 6$

depends on

(A) α only (B) β only

(C) Both α and β (D) Neither β nor α

160. If $f(x) = \begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix}$, then

(A) $f(a) = 0$ (B) $f(b) = 0$

(C) $f(0) = 0$ (D) $f(1) = 0$

161. If $P(n)$ is a statement such that $P(3)$ is true. Assuming $P(k)$ is true implies $P(k+1)$ is true for any integer $k \geq 3$, then $P(n)$ is true for

(A) For all $n \in N$ (B) For all $n \geq 3$

(C) For all $n \leq 3$ (D) For all $n > 3$

162. If $f(x) = \begin{cases} ax + 3, & x \leq 2 \\ a^2x - 1, & x > 2 \end{cases}$, then the values of a for which f is continuous for all x are

(A) 1 and – 2 (B) 1 and 2

(C) –1 and 2 (D) –1 and –2

163. $\lim\limits_{x \to 0} \left(\dfrac{e^{1/x} - 1}{e^{1/x} + 1} \right)$ is

(A) 1 (B) 0

(C) –1 (D) Does not exist

164. The maximum value of the slope of the curve $y = -x^3 + 3x^2 + 12x - 5$ is

(A) 15 (B) 12

(C) 9 (D) 0

165. The points of discontinuity of tan x are

(A) $n\pi, n \in I$

(B) $2n\pi, n \in I$

(C) $(2n+1)\frac{\pi}{2}, n \in I$

(D) None of these

166. The condition that $f(x) = ax^3 + bx^2 + cx + d$ has no extreme value is

(A) $b^2 > 3ac$

(B) $b^2 = 4ac$

(C) $b^2 = 3ac$

(D) $b^2 < 3ac$

167. If the first term of a geometric series is 20 and common ratio is 4, then the fifth term is

(A) 4020 (B) 10240

(C) 2560 (D) 5120

168. The sum of the series $1 + \frac{1}{2} + \frac{1}{4} + \ldots$ upto 6^{th} term is

(A) $\frac{63}{32}$ (B) $\frac{32}{63}$

(C) $\frac{26}{53}$ (D) $\frac{53}{26}$

169. If $y = Ae^{5x} + Be^{-5x}$, then $\frac{d^2y}{dx^2}$ is equal to

(A) 25y (B) 5y

(C) –25y (D) 15y

170. If x^3 is an integrating factor of the differential equation $\frac{dy}{dx} + Py = Q,$ then P can be

(A) $\frac{1}{x}$ (B) $\frac{3}{x}$

(C) $3x$ (D) $\frac{2}{x}$

171. The solution of $e^{\frac{dy}{dx}} = x,$ when $x = 1$ and $y = 0$ is

(A) $y = x(\log x - 1) + 4$

(B) $y = x(\log x - 1) + 3$

(C) $y = x(\log x + 1) + 2$

(D) $y = x(\log x - 1) + 1$

172. The value of p for which $p(\hat{i} + \hat{j} + \hat{k})$ is a unit vector is

(A) 0 (B) $\frac{1}{\sqrt{3}}$

(C) 1 (D) $\sqrt{3}$

173. The two lines $x = ay + b, z = cy + d$ and $x = a'y + b', z = c'y + d'$ are perpendicular to each other, if

(A) $\frac{a}{a'} + \frac{c}{c'} = 1$

(B) $\frac{a}{a'} + \frac{c}{c'} = -1$

(C) $aa' + cc' = 1$

(D) $aa' + cc' = -1$

174. $ABCD$ is a rhombus whose diagonal intersect at E, then $\overrightarrow{EA} + \overrightarrow{EB} + \overrightarrow{EC} + \overrightarrow{ED}$ equals

(A) $\vec{0}$ (B) $\overrightarrow{AD}$

(C) $2\overrightarrow{BC}$ (D) $2\overrightarrow{AD}$

175. If the line $2x - y + a = 0$ is a diameter of the circle $x^2 + y^2 + 6x - 6y + 5 = 0$ then a is

(A) 5 (B) 6

(C) 11 (D) 9

176. The distance of the point (2,3) from the line $x + y = 1$ is

(A) 2 (B) $2\sqrt{2}$

(C) $4\sqrt{2}$ (D) $3\sqrt{2}$

177. If $|\overrightarrow{a}| = 4$ and $-3 \le \lambda \le 2$, then $|\lambda \vec{a}|$ lies in

(A) [0, 12] (B) [2, 3]

(C) [8, 12] (D) (–12, 8]

178. In an ellipse the distance between the foci is 6 and its minor axis is 8 then its eccentricity is

(A) $\frac{4}{5}$ (B) $\frac{1}{\sqrt{52}}$

(C) $\frac{3}{5}$ (D) $\frac{1}{2}$

179. If the mean of the observations: x, 5, 6, 1, 2 is 4 then x is

(A) 4 (B) 6

(C) 3 (D) 10

180. If μ and σ are the mean and standard deviation of the set of observations. If each observation is increased by 5, let the new mean and standard deviation be μ_1 and σ_1, then the correct option is

(A) $\mu > \mu_1$ and $\sigma = \sigma_1$ (B) $\mu < \mu_1$ and $\sigma = \sigma_1$

(C) $\mu = \mu_1$ and $\sigma = \sigma_1$ (D) $\mu_1 = \mu_1$ and $\sigma < \sigma_1$

BIOLOGY-Part A

(Attempt all 20 Questions Compulsory)

121. Basic unit of classification is

(A) Species (B) Genus

(C) Family (D) Phylum

122. Aestivation is

(A) Arrangement of flowers

(B) Arrangement of sepals and petals in flower

(C) Arrangement of leaf on stem

(D) All of the above

123. Wood is

(A) Cambium (B) Phloem

(C) Primary xylem (D) Secondary xylem

124. The presence of large central vacuole and cell wall is the feature of

(A) Animal cell (B) Plant cell

(C) Bacteria (D) Virus

125. Polypeptide chain is made up of following monomer units

(A) Glucose (B) Fatty acids

(C) Amino acids (D) Nitrogenous bases

126. Plasmolysis occurs when cell is placed in

(A) Hypotonic solution

(B) Hypertonic solution

(C) Pure water

(D) Isotonic solution

127. Which of the following have the capacity to fix atmospheric Nitrogen (N_2)?

(A) Angiosperms

(B) Gymnosperms

(C) Bryophytes

(D) Blue Green Algae

128. Which of the following is considered as a compatible solute in plants?

(A) NaCl (B) Proline

(C) Both A and B (D) None of these

129. Cold treatment required to induce flowering in plants is called

(A) Vernalization

(B) Stratification

(C) Etiolation

(D) None of these

130. Which of the following ion plays major role in the stomatal movement?

(A) Fe++ (B) Na+

(C) K+ (D) Zn++

131. Shivering and sweating are body's way of regulating

(A) Temperature

(B) Water loss

(C) Growth

(D) Metabolism

132. What is the evolutionary benefit of light skin in the northern latitude?

(A) Skin cancer protection

(B) Folate protection

(C) Easier vitamin D production

(D) No evolutionary relationship

133. The chemicals that can cause cancer are called

(A) Neurotoxins (B) Carcinogens

(C) Cytotoxins (D) Poisons

134. Condyloid is an example of which type of joint?

(A) Cartilaginous (B) Synovial

(C) Fibrous (D) None of these

135. Which of the following will have the maximum heart beat rate?

(A) Human (B) Horse

(C) Elephant (D) Mouse

136. The nature of nerve impulse conduction is

(A) Mechanical (B) Thermal

(C) Electrochemical (D) Chemical

137. Replicate the following strand of DNA: AATCATGGA

(A) UUAGUACCU (B) TTAGTACCT

(C) AATCATGGA (D) GGATAUCUA

138. Following is the example of sex-linked inheritance

(A) Colour blindness (B) Haemophilia

(C) Both A and B (D) None of the above

139. Great Himalayan national park and Pin Valley National park are situated at

(A) Kullu and Spitti (B) Lahaul and Shimla

(C) Mandi and Kangra (D) Chamba and Kullu

140. Pyramid of energy of an ecosystem will always be

(A) Upright (B) Inverted

(C) Spindle shaped (D) None of these

BIOLOGY-Part B

(Attempt any 30 Questions)

141. In five kingdom classification system, Monera includes

(A) All unicellular eukaryotes

(B) All prokaryotes

(C) Both A and B

(D) None of the above

142. Which of the following is called as the amphibian of the plant kingdom?

(A) Algae (B) Bryophytes

(C) Pteridophytes (D) Gymnosperms

143. Lichens are

(A) Bryophytes

(B) Algae

(C) Fungi

(D) An association between algae and fungi

144. Which of the following is an example of "living fossil"?

(A) *Gnetum* (B) *Ginkgo*

(C) *Pinus* (D) *Taxus*

145. The largest phylum in the kingdom Animalia is

(A) Mollusca (B) Annelida

(C) Nematoda (D) Arthropoda

146 Canal system is present in phylum

(A) Porifera (B) Echinodermata

(C) Protozoa (D) Cnidaria

147. Which of the following is a vertebrate?

(A) Cuttle fish (B) Cray fish

(C) Trout fish (D) Silver fish

148. The edible part of Litchi is

(A) Ovary (B) Thalamus

(C) Aril (D) Cotyledons

149. Cotyledons are main food storing organ in which of the following

(A) Wheat (B) Maize

(C) Bean (D) Barley

150. Chemiosmotic hypothesis of ATP synthesis was given by

(A) Robert Hill (B) Calvin

(C) Peter Mitchell (D) Levitt

151. ABA is an example of

(A) Plant Growth regulator

(B) Anti-transpirant

(C) Plant stress hormone

(D) All of the above

152. In tissue culture 'Callus' refers to

(A) Mass of undifferentiated cells

(B) Differentiated cells

(C) Root formation

(D) Shoot formation

153. Crossing over occurs between

(A) Non-sister chromatids during leptotene

(B) Non-sister chromatids during Pachytene

(C) Sister chromatids during Pachytenie

(D) Sister chromatids during Zygotene

154. The two strands of DNA double helix are attached to each other through

(A) Covalent bond (B) Hydrogen bond

(C) Ionic bond (D) Disulfide bond

155. The concept of Operon model was given by

(A) Hershey and Chase

(B) Jacob and Monod

(C) Ruben and Kamen

(D) Lwaff and Went

156. What part of a nucleotide accounts for the genetic variation between individuals?

(A) Nitrogenous base

(B) Deoxyribose

(C) Phosphate

(D) All of above

157. Nobel Prize for the discovery of double helix of DNA molecule was awarded to

(A) Watson and Crick

(B) Watson and Wilkins

(C) Wilkins and Crick

(D) Watson, Crick and Wilkins

158. Which of the following is a characteristics of smooth muscle cells?

(A) Voluntary (B) Striated

(C) Non-striated (D) Multinucleate

159. Which of the following is common to aerobic and anaerobic respiration?

(A) Glycolysis

(B) Krebs cycle

(C) Electron transport chain

(D) All of above

160. Starch is digested by

(A) Protease (B) Amylase

(C) Lipase (D) Catalase

161. Vermiform appendix is a part of

(A) Liver (B) Stomach

(C) Intestine (D) Rectum

162. One molecule of haemoglobin carries how many molecules of oxygen?

(A) Two (B) Four

(C) Six (D) Eight

163. The end product of ornithine cycle is

(A) Ammonia (B) Urea

(C) Uric acid (D) Ethanol

164. Osmoregulation is the function of

(A) Oxytocin (V) Prolactin

(C) Insulin (D) Vasopressin

165. Which of the following organelle helps the sperm to penetrate the ovum?

(A) Acrosome (B) Zona pellucida

(C) Glyoxysome (D) Ribosome

166. Which of the following process is related to ATP synthesis?

(A) Substrate level phosphorylation

(B) Photophosphorylation

(C) Oxidativephosphorylation

(D) All of these

167. Chiropterophily refers to

(A) Insect pollination (B) Bat pollination

(C) Water pollination (D) Air pollination

168. Which of the following is related to silk production?

(A) Silviculture (B) Tissue culture

(C) Sericulture (D) None of these

169. The theory of 'Natural selection' was given by?

(A) Lamarck (B) Darwin

(C) Wallace (D) Spencer

170. Homologous organs are

(A) Similar in origin but different in function

(B) Dissimilar in origin but similar in function

(C) Similar in structure and function

(D) Dissimilar in origin and function

171. Individual with Turner's syndrome is

(A) Normal male

(B) Normal female

(C) A male with rudimentary testis and underdeveloped penis

(D) A female with rudimentary ovaries and underdeveloped breasts

172. Which of the following study provides evidences in favour of biological evolution?

(A) Archaeology (B) Paleontology

(C) Phycology (D) Mycology

173. Non-sense codon codes for

(A) Proline (B) Lysine

(C) Tryptophan (D) None of these

174. The strength of linkage depends on the

(A) Distance between linked genes

(B) Length of chromosomes

(C) Size of genes

(D) None of these

175. Minamata disease is caused by

(A) Lead (B) Silver

(C) Mercury (D) Nitrogen

176. Heterocyst is a specialized cell present in

(A) *Nostoc* (B) *Azolla*

(C) *Cycus* (D) *Pinus*

177. Chemotherapy and radiation therapy are generally used to treat

(A) AIDS (B) Cancer

(C) Haemophilia (D) Tuberculosis

178. Which of the following gases cause Greenhouse effect?

(A) Carbon dioxide

(B) Methane

(C) Nitrous oxide

(D) All of these

179. Golden rice is a genetically modified rice variety developed to overcome the deficiency of dietary

(A) Protein (B) Iron

(C) Vitamin A (D) All of the above

180. Which of the following indicates the higher level of population threat status of a species?

(A) Critically Endangered

(B) Endangered

(C) Vulnerable

(D) Low risk near threatened

Rough Work

Rough Work

Rough Work