SAKSHAM
JEE | NEET | GUJCET | KVPY | FOUNDATION
LEARN TOGETHER, GROW FOREVER

CCT - 14

TOPIC COVERED

Physics:	Full Syllabus (Class 11 &12)
Chemistry:	Full Syllabus (Class 11 &12)
Botany:	Full Syllabus (Class 11 &12)
Zoology:	Full Syllabus (Class 11 &12)

Duration: 3 hr 20 min **Max Marks: 720**

General Instructions:

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

PHYSICS

SECTION - A

1. Three charge $2q$, $-q$, $-q$ are located at the vertices of an equilateral triangle. At the center of the triangle

(1) The field is zero but potential is non-zero
(2) The field is non-zero but potential is zero
(3) Both field and potential are zero
(4) Both field and potential are non-zero

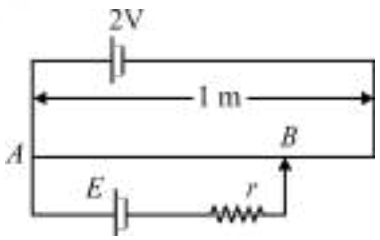
2. Plates of area A are arranged as shown. The distance between each plate is d, the net capacitance is

(1) $\frac{\varepsilon_0 A}{d}$
(2) $\frac{7\varepsilon_0 A}{d}$
(3) $\frac{6\varepsilon_0 A}{d}$
(4) $\frac{5\varepsilon_0 A}{d}$

3. When a piece of aluminium wire of finite length is drawn through a series of dies to reduce its diameter to half its original value, its resistance will become

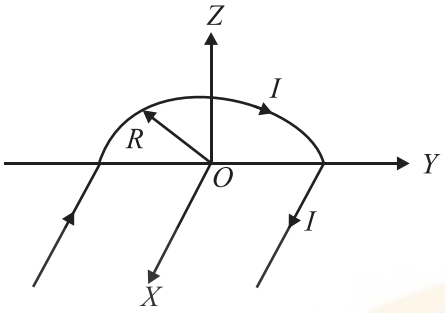
(1) Two times
(2) Four times
(3) Eight times
(4) Sixteen times

4. In the given figure, battery E is balanced on 55 cm length of potentiometer wire but when a resistance of 10 Ω is connected in parallel with the battery then it balances on 50 cm length of the potentiometer then fine the internal resistance.



(1) 1 Ω
(2) 3 Ω
(3) 10 Ω
(4) 5 Ω

5. A wire carrying current I has the shape as shown in adjoining figure. Linear parts of the wire are very long and parallel to *X*-axis while semicircular portion of radius *R* is lying in *Y-Z* plane. magnetic field at point *O* is



(1) $\vec{B} = -\frac{\mu_0}{4\pi}\frac{I}{R}(\pi\hat{i} + 2k)$

(2) $\vec{B} = \frac{\mu_0}{4\pi}\frac{I}{R}(\pi\hat{i} - 2k)$

(3) $\vec{B} = \frac{\mu_0}{4\pi}\frac{I}{R}(\pi\hat{i} + 2k)$

(4) $\vec{B} = -\frac{\mu_0}{4\pi}\frac{I}{R}(\pi\hat{i} - 2k)$

6. A charged particle moving in a magnetic field experience a resultant force

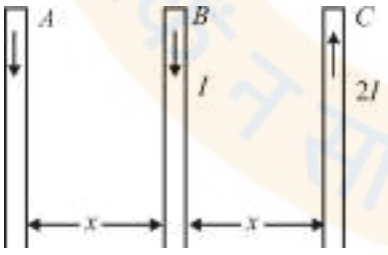
(1) In the direction of field

(2) In the direction opposite to the field

(3) In the direction perpendicular to both the field and its velocity

(4) None of the above

7. A, B and C are parallel conductor of equal length carrying current *I*, *I* and 2*I* respectively. Distance between *A* and *B* is x. Distance between *B* and *C* is also x. F_1 is the force exerted by *B* on *A* and F_2 is the force exerted by *C* on *A*. Choose the correct answer



(1) $F_1 = 2F_2$

(2) $F_2 = 2F_1$

(3) $F_1 = F_2$

(4) $F_1 = -F_2$

8. Two lines of force due to a bar magnet

(1) Intersect at the neutral point

(2) Intersect near the poles of the magnet

(3) Intersect on the equatorial axis of the magnet

(4) Do not intersect at all

9. A diamagnetic material in a magnet field moves

(1) From weaker to the stronger parts of the field

(2) Perpendicular to the field

(3) From stronger to the weaker parts of the field

(4) In none of the above directions

10. A LCR series A.C. circuit is tuned to resonance. The impedence of the circuit is now

(1) R

(2) $\left[R^2 + \left(\frac{1}{\omega C} - \omega L\right)^2\right]^{1/2}$

(3) $\left[R^2 + (\omega L)^2\left(\frac{1}{\omega C}\right)^2\right]^{1/2}$

(4) $\left[R^2 + \left((\omega L + \frac{1}{\omega C}\right)^2\right]^{1/2}$

11. If the threshold wavelength for sodium is 5420 Å, then the work function of sodium is

(1) 4.58 eV (2) 2.28 eV

(3) 1.14 eV (4) 0.23 eV

12. The energy of a hydrogen atom in its ground state is –13.6 eV. The energy of the level corresponding to the quantum number n = 2 (first excited state) in the hydrogen atom is

(1) –2.72 eV (2) –0.85 eV

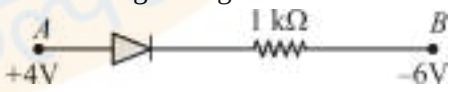
(3) –0.54 eV (4) –3.4 eV

13. If T is the half life of a radioactive material, then the fraction that would remain after a time $T/2$ is

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

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

14. Consider the junction diode as ideal. The value of current flowing through AB is



(1) 0 *A*

(2) 10^{-2} *A*

(3) 10^{-1} *A*

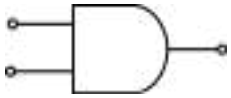
(4) 10^{-3} *A*

15. In a transistor if collector current is 25 mA and base current is 1 mA, then current amplification factor α is

(1) $\frac{25}{24}$ (2) $\frac{24}{25}$

(3) $\frac{25}{26}$ (4) $\frac{26}{25}$

16. Which logic is represented by following diagram



(1) AND (2) OR
(3) NOR (4) XOR

17. A ray of light passes from a medium *A* having refractive index 1.6 to the medium *B* having refractive index 1.5. The value of critical angle of medium *A* is

(1) $\sin^{-1}\left(\frac{16}{15}\right)$ (2) $\sin^{-1}\sqrt{\frac{16}{15}}$

(3) $\sin^{-1}\left(\frac{1}{2}\right)$ (4) $\sin^{-1}\left(\frac{15}{16}\right)$

18. An object has image thrice of its original size when kept at 8 cm and 16 cm from a convex lens. Focal length of the lens is

(1) 8 cm
(2) 16 cm
(3) Between 8 cm and 16 cm
(4) Less than 8 cm

19. Two coherent monochromatic light beams of intensities *I* and 4*I* are superposed. The maximum and minimum possible intensities in the resulting beam are

(1) 5*I* and *I*
(2) 5*I* and 3*I*
(3) 9*I* and *I*
(4) 9*I* and 3*I*

20. A single slit of width 0.02 mm is illuminated with light of wavelength 500 nm. The observing screen is placed 80 cm from the slit. The width of the central bright fringe will be

(1) 1 mm
(2) 2 mm
(3) 4 mm
(4) 5 mm

21. Refractive index of material is equal to tangent of polarising angle. It is called

(1) Brewster s law
(2) Lambert's law
(3) Malus's law
(4) Bragg's law

22. The value of $(\vec{A}+\vec{B})\times(\vec{A}-\vec{B})$ is

(1) 0
(2) $A^2 - B^2$
(3) $\vec{B}\times\vec{A}$
(4) $2(\vec{B}\times\vec{A})$

23. A stone dropped from the top of the tower touches the ground in 4 sec. The height of the tower is about

(1) 80 m
(2) 40 m
(3) 20 m
(4) 160 m

24. A missile is fired for maximum range with an initial velocity of 20m /s. If g = 10 m/s^2, the range of the missile is

(1) 20 m
(2) 40 m
(3) 50 m
(4) 60 m

25. An object start sliding on a frictionless inclined plane and from same height another object start falling freely

(1) Both will reach with same speed
(2) Both will reach with same acceleration
(3) Both will reach in same time
(4) None of above

26. A shell initially at rest explodes into two pieces of equal mass, then the two pieces will

(1) Be at rest
(2) Move with different speed in different direction
(3) Move with the same speed in opposite direction
(4) Move with the same speed in same direction

27. Which of the following is not a perfectly inelastic collision

(1) Striking of two glass balls
(2) A bullet striking a bag of sand
(3) An electron captured by a proton
(4) A man jumping onto a moving cart

28. Moment of inertia of a ring of mass *M* and radius *R* about an axis passing through the centre and perpendicular to the plane is *I*. What is the moment of inertia about its diameter

(1) I (2) $I/2$
(3) $I/\sqrt{2}$ (4) $I + MR^2$

29. If the radius of the earth is suddenly contracts to half of its present value, then the duration of day will be of

(1) 6 hours
(2) 12 hours
(3) 18 hours
(4) 24 hours

30. The principle of conservation of angular momentum, states that angular momentum
(1) Always remains conserved
(2) Is the product of moment of inertia and velocity
(3) Remains conserved until the toque acting on it remains constant
(4) None of these

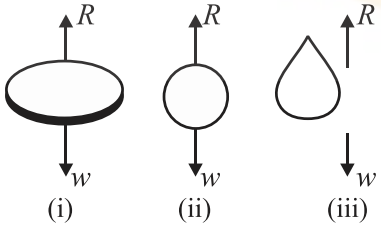
31. The escape velocity of a planet having mass 6 times and radius 2 times as that of the earth is
(1) $\sqrt{3}V_e$ (2) $3\,V_e$
(3) $\sqrt{2}V_e$ (4) $2\,V_e$

32. Which one of the following statements is correct in suspect of a geostationary satellite
(1) It moves in a plane containing the Greenwich meridian
(2) It moves in a plane perpendicular to the celestial equatorial plane
(3) Its height above the earth's about the same as the radius of the earth
(4) Its height above the surface is about six times the radius of the earth

33. Young's modulus of the wire depends on
(1) Length of the wire
(2) Diameter of the wire
(3) Material of the wire
(4) Mass hanging from the

34. Blood is following at the rate of 200 cm^3s^{-1} in a capillary of cross sectional area 0.5 m^2. The velocity of flow, in mms^{-1}, is
(1) 0.1 (2) 0.2
(3) 0.3 (4) 0.4

35. When a body falls in air, the resistance of the body, 3 different shapes are given. Identify the combination of air resistance which truly represents the physical situation. (The cross sectional areas are the same).



(i) Disc
(ii) Ball
(iii) Cigar sheped
(1) 1 < 2 < 3 (2) 2 < 3 < 1
(3) 3 < 2 < 1 (4) 3 < 1 < 2

SECTION - B

(ATTEMPT ANY 10 QUESTIONS)

36. The coefficient of volume expansion of a liquid is $49 \times 10^{-5}\ K^{-1}$. Calculate the fractional change in its density when the temperature is raised by 30°C.
(1) 7.5×10^{-2}
(2) 3.0×10^{-2}
(3) 1.5×10^{-2}
(4) 1.1×10^{-2}

37. If the molecular weight of two gases are M_1 and M_2 then at a temperature the ratio of root mean Square velocity v_1 and v_2 will be
(1) $\sqrt{\frac{M_1}{M_2}}$ (2) $\sqrt{\frac{M_2}{M_1}}$
(3) $\sqrt{\frac{M_1+M_2}{M_1-M_2}}$ (4) $\sqrt{\frac{M_1-M_2}{M_1+M_2}}$

38. When an ideal monoatomic gas is heated at constant pressure, fraction of heat energy supplied which increase the internal energy of gas, is
(1) 2/5 (2) 3/5
(2) 3/7 (4) 3/4

39. According to Wien's law
(1) $\lambda_m T$ (2) $\frac{\lambda_m}{T}$ = constant
(3) $\frac{T}{\lambda_m}$ = constant (4) T + λ_m = constant

40. The velocity of a particle in simple harmonic motion at displacement y from mean position is
(1) $\omega\sqrt{a^2+y^2}$ (2) $\omega\sqrt{a^2-y^2}$
(3) ωy (4) $\omega^2\sqrt{a^2-y^2}$

41. The total energy of the body executing S.H.M is E. Then the kinetic energy when the displacement is
Is half of the amplitude, is
(1) $\frac{E}{2}$ (2) $\frac{E}{4}$
(3) $\frac{3E}{4}$ (4) $\frac{\sqrt{3}}{4}E$

42. A particle executes SHM with amplitude 0.2 m and time period 24 s. The time required for it to move from the mean position to a point 0.1 m is
(1) 2 s (2) 3 s
(3) 8 s (4) 12 s

43. Doppler effect is application for
(1) Moving bodies
(2) One is moving and other are stationary
(3) for relative motion
(4) None of these

44. An object is placed 40 cm from concave mirror of focal length 20cm. The image formed is
(1) Real, inverted and same in size
(2) Real, inverted and smaller
(3) Virtual, erect and larger
(4) Virtual, erect and smaller

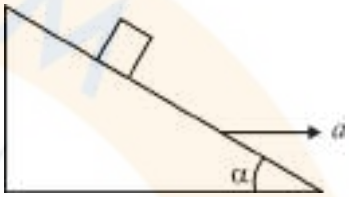
45. A ray of light is incident normally on one of the face of a prism of angle 30° and refractive index $\sqrt{2}$. The angle of deviation will be
(1) 26° (2) 0°
(3) 23° (4) 15°

46. Two slits are separated by a distance of 0.5 mm and illuminated with light of λ = 6000 Å. If the screen is placed 2.5 m from the slits. The distance of the third right fringe from the centre will be
(1) 1.5 mm (2) 3 mm
(3) 6 mm (4) 9 mm

47. Light is incident on a glass surface at polarising angle of 57.5°. Then the angle between the incident ray and the refracted ray is
(1) 57.5° (2) 115°
(3) 205° (4) 145°

48. For a given velocity, a projectile has the same range R for two angles of projection if t_1 and t_2 are the time of flight in the two cases then
(1) $t_1 t_2 \propto R^2$
(2) $t_1 t_2 \propto R$
(3) $t_1 t_2 \propto \frac{1}{R}$
(4) $t_1 t_2 \propto \frac{1}{R^2}$

49. A block is kept on a frictionless inclined surface with angle of inclination 'a'. The incline is given an acceleration 'a' to keep the block stationary. Then a is equal to



(1) g
(2) g tan α
(3) g/tan α
(4) g cosec α

50. When two spheres of equal masses undergo glacing elastic collision with one of them at rest after collision they will move
(1) Opposite to one another
(2) In the same direction
(3) Randomly
(4) At right angle to each other

CHEMISTRY

SECTION - A

51. A solution of sodium sulphate contains 92 g of Na^+ ions per kilogram of water. The molality of Na^+ ions in that solution in mol kg^{-1} is

(1) 16 (2) 4
(3) 132 (4) 8

52. Predict the total spin in Ni^{+2} ion

(1) $\pm\frac{5}{2}$ (2) $\pm\frac{3}{2}$
(3) $\pm\frac{1}{2}$ (4) ± 1

53. The momentum of radiation of wavelength 0.33 nm is …….. kg m/sec.

(1) 2×10^{-24} (2) 2×10^{-12}
(3) 2×10^{-6} (4) 2×10^{-48}

54. If the temperature of gas is increased by 10%, what will be the % decrease in density? (under constant pressure)

(1) 10% (2) 20%
(3) 5% (4) 9.09%

55. Two moles of an ideal gas expanded isothermally and reversibly from 1 litre to 10 litre at 300 K. The enthalpy change (in KJ) for the process is:

(1) 11.4 (2) –11.4
(3) 0 (4) 4.8

56. The heat of neutralization of three monobasic acids HA, HB and HC are –1.5 Kcal, –12.4 Kcal and –12.7 Kcal respectively.
What will be the order of their acidic strength?

(1) A > B > C (2) B > A > C
(3) C > B > A (4) A > C > B

57. $2A(g) + B(s) \rightleftharpoons 3C(g) + Heat$
'B' is added to equilibrium mixture. Predict the direction of change?

(1) Forward (2) Backward
(3) No change (4) Can't be predicted

58. The pH of a monobasic weak acid (Ka = 10^{-5}) is 5. Calculate degree of dissociation.

(1) 1 (2) 0.5
(3) 0.75 (4) 0.25

59. Atomic number 83 belongs to which group in periodic table?

(1) 1st (2) 3rd
(3) 14th (4) 15th

60. The compound which has maximum solubility in water is?

(1) Cs_2SO_4 (2) K_2SO_4
(3) Na_2SO_4 (4) Li_2SO_4

61. Which of the following is responsible for temporary hardness in H_2O?

(1) Cl^- (2) SO_4^{2-}
(3) NO_3^- (4) HCO_3^-

62. Which of the alkali metal on exposure to air forms oxide only?

(1) Li (2) Na
(3) Rb (4) Cs

63. The gas produced when carbide of Be is hydrolyzed is?

(1) CH_4 (2) C_2H_6
(3) C_2H_2 (4) C_2H_4

64. The strongest lewis acid among the following is?

(1) BF_3 (2) BCl_3
(3) BBr_3 (4) BI_3

65. Which oxide of Group-14 is amphoteric in nature?

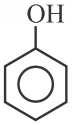
(1) CO (2) SiO
(3) GeO (4) PbO

66. IUPAC name of the following is

$CH_2 = CH - CH_2 - CH_2 - C \equiv CH$

(1) 1, 5-hexenyne (2) 1-hexene-5-yne
(3) 1-hexyne-5-ene (4) 1, 5-hexynene

67. The compound with minimum pKa value is?

(1) $CH_3 - OH$ (2) 
(3) C_2H_2 (4) $CH_3 - \overset{\overset{O}{\|}}{C} - OH$

68. The most stable carbocation among the following is?

(1)  (2) $Ph - \overset{\oplus}{C}H_2$
(3) $Me - \underset{\underset{Me}{|}}{\overset{\overset{Me}{|}}{C^{\oplus}}}$ (4) $Ph - \underset{\underset{Ph}{|}}{\overset{\oplus}{C}} - Ph$

69. The position where the halogen attach after the reaction is?

$$\underset{4}{CH_3}-\underset{3}{CH_2}-\underset{2}{CH}=\underset{1}{CH_2} \xrightarrow[H_2O_2]{HBr}$$

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

70. Green chemistry means such reactions which
(1) produce colour during reactions
(2) reduce the use and production of hazardous chemicals
(3) are related to the depletion of ozone layer
(4) study the reaction in plants

71. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
(1) Fe (2) Zn
(3) Cu (4) Mg

72. Which among the following is paramagnetic?
(1) Cl_2O (2) ClO_2
(3) Cl_2O_7 (4) Cl_2O_6

73. In which of the following pairs are both the ions coloured in aqueous solutions?
(At. No.: Sc = 21, Ti = 22, Ni = 28, Cu = 29, Co = 27)
(1) Sc^{3+}, Ti^{3+} (2) Sc^{3+}, Co^{2+}
(3) Ni^{2+}, Cu^{+} (4) Ni^{2+}, Ti^{3+}

74. Of the following complex ions, which is diamagnetic in nature?
(1) $[NiCl_4]^{2-}$ (2) $[Ni(CN)_4]^{2-}$
(3) $[CuCl_4]^{2-}$ (4) $[CoF_6]^{3-}$

75. Which one of the following is employed as Antihistamine?
(1) Chloramphenicol
(2) Diphenhydramine
(3) Norothindrone
(4) Omeprazole

76. The anions (A) form hexagonal closest packing and atoms (C) occupy only 2/3 of octahedral voids in it. The general formula of the compound is-
(1) CA (2) CA_2
(3) C_2A_3 (4) C_3A_2

77. At 25°C, the vapour pressure of pure liquid A (molecular weight = 40) is 100 torr while that of pure liquid B (molecular weight = 80) is 40 torr. The vapour pressure at 25°C of a solution containing 20 g of each A and B is
(1) 80 torr (2) 59.8 torr
(3) 68 torr (4) 48 torr

78. EMF of cell Reaction
$2\ Ag^+ + Cu \rightarrow 2\ Ag + Cu^{2+}$, is 0.46 V
If $E°Cu^{2+}/Cu$ is +0.34 V, $E°Ag^+/Ag$ is:
(1) 0.80 V (2) 0.12 V
(3) 0.40 V (4) 1.60 V

79. Calculate the time-needed for the 70% completion of a zeroth order reaction. ($t_{1/2}$ = 30 min)
(1) 20 min (2) 30 min
(3) 42 min (4) 60 min

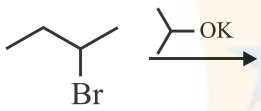
80. Which of the following will have the highest coagulating power for $Fe(OH)_3$ colloid?
(1) PO_4^{3-} (2) SO_4^{2-}
(3) Ca^{2+} (4) Al^{3+}

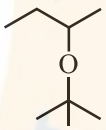
81. The compound formed after completion of the following set of reactions is?

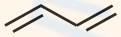
$$CaC_2 \xrightarrow{(1)\,H_2O} \xrightarrow{(2)\,RHT} \xrightarrow[AlCl_3]{(3)\,CH_3Cl}$$

(1) Benzene (2) Toluene
(3) Aniline (4) Pyridine

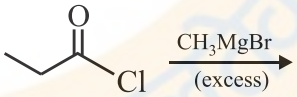
82. Find the major product of the following reaction?



(1) 
(2) 

(3) 
(4) 

83. The degree of alcohol formed after the reaction of given substrate with excess of Grignard reagent followed by hydrolysis is?



(1) 1° (2) 2°
(3) 3° (4) 4°

84. A compound gives positive 2, 4-DNP test but negative Tollen's Test. The given compound is?
(1) Alkyl Halide
(2) Aldehyde
(3) Alcohol
(4) Ketone

85. The basic order strength of given amines is?
(in aqueous medium)

$$\underset{(a)}{CH_3-NH_2} \quad \underset{(b)}{(CH_3)_2NH} \quad \underset{(c)}{(CH_3)_3N}$$

(1) a > b > c (2) c > b > a
(3) b > c > a (4) b > a > c

SECTION – B

(ATTEMPT ANY 10 QUESTIONS)

86. HVZ reaction is used for introduction of halogen at _____ position with respect to –COOH group?

(1) alpha
(2) beta
(3) gamma
(4) delta

87. Cellulose is formed by _____ of two glucose molecules?

(1) $C_1 - C_2$ α glycosidic linkage
(2) $C_1 - C_2$ β glycosidic linkage
(3) $C_1 - C_4$ α glycosidic linkage
(4) $C_1 - C_4$ β glycosidic linkage

88. Buna-S is formed by the combination of?

(1) Butadiene + Acrylonitrile
(2) Butadiene + Teflon
(3) Butadiene + Styrene
(4) Butadiene + Syntha-6

89. The orbital angular momentum of '*p*' orbital is?

(1) 0
(2) $\frac{h}{\sqrt{2}\pi}$
(3) $\sqrt{3}\frac{h}{2\pi}$
(4) $\sqrt{5}\frac{h}{2\pi}$

90. The compressibility factor when the pressure is high takes the form of?

(1) 0 (2) $1-\frac{a}{VRT}$
(3) $1+\frac{Pb}{RT}$ (4) $\frac{PV}{RT}$

91. The coordination number of atom present at corner of a primitive cubic cell is?

(1) 4 (2) 6
(3) 8 (4) 12

92. The vapour pressure, at a given temperature, of an ideal solution containing 0.2 mole of a non-volatile solute and 0.8 mole of solvent is 60 mm of Hg. The vapour pressure of the pure solvent at the same temperature is

(1) 150 mm of Hg (2) 60 mm of Hg
(3) 75 mm of Hg (4) 125 mm of Hg

93. 96.5 A of current was passed through molten NaCl for 1 minute 40 sec. Find out the amount of Na deposited at the cathode?

(1) 46 gm (2) 23 gms
(3) 4.6 gms (4) 2.3 gms

94. How many stereoisomers does this molecule have?

$CH_3CH = CHCH_2CHBrCH_3$

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

95. Ethylene oxide when treated with Grignard reagent yields

(1) Tertiary alcohol
(2) Cyclopropyl alcohol
(3) Primary alcohol
(4) Secondary alcohol

96. Which one of the following can be oxidized to the corresponding carbonyl compound?

(1) 2-hydroxypropane
(2) Ortho-nitrophenol
(3) Phenol
(4) 2-methyl-2 hydroxypropane

97. The compound obtained by heating a mixture of a primary amine and chloroform with ethanolic potassium hydroxide (KOH) is

(1) an alkyl cyanide
(2) a nitro compound
(3) an alkyl isocyanide
(4) an amide

98. In borax bead test which compound is formed?

(1) Ortho-borate
(2) Meta-borate
(3) Double oxide
(4) Tetra-borate

99. Acidity of diprotic acids in aqueous solutions increases in the order:

(1) $H_2S < H_2Se < H_2Te$
(2) $H_2Se < H_2S < H_2Te$
(3) $H_2Te < H_2S < H_2Se$
(4) $H_2Se < H_2Te < H_2S$

100. Artificial sweetner which is stable under cold conditions only is:

(1) Saccharine (2) Sucralose
(3) Aspartame (4) Alitame

BOTANY

SECTION - A

101. Location of NBRI is
(1) Kanpur (2) Lucknow
(3) Delhi (4) Pune

102. Methanogen differ from lactobacillus in
(1) Genetic material nature
(2) Cell wall
(3) Methanogen show aerobic respiration
(4) Methanogen have membrane bound organelle

103. Fungi having conidia but lack perfect stage belong to genus
(1) Rhizopus (2) Trichoderma
(3) Ustilago (4) Claviceps

104. Mark the correctly matched
(1) Chl b – Chlorella
(2) Colonial – Fucus
(3) Algin – Spriogyra
(4) Unicellular – kelp

105. Free living gametophyte which is green and dominant phase is present in
(1) psilopsida (2) Moss
(3) Cycads (4) Monocot

106. Flower with unequal stamen present in
(1) Salvia (2) Solanum
(3) Pea (4) China rose

107. Secondary meristem which give rise to cork in dicot stem develop from
(1) Medullary rays
(2) Cortex
(3) Conjunctive tissue
(4) Pith

108. In Transverse section of ……. we can observe unequal size vascular bundle with water filled cavities in vascular bundle
(1) Sugarcane stem (2) Maize stem
(3) Grass leaf (4) Grass root

109. Mark the incorrect about endomembrane system
(1) Plasma membrane is part of this system
(2) Coordinated organelles like ER. Golgi bodies and lysosome work together
(3) all organelles of endomembrane system have membranes
(4) Peroxisome and mitochondria are not part of this system

110. Mark the correctly matched
(1) Mitochondria - Thylakoid
(2) Chloroplast- Cristae
(3) SER – steroid hormone synthesis
(4) Ribosome – rRNA and lipid

111. Standing crop of any trophic level measure
(1) Productivity
(2) Amount of organic biomass
(3) measure of inorganic nutrient in soil
(4) vertical distribution of species

112. Recombination nodule visible in …. Phase of cell cycle
(1) Pachytene
(2) Diplotene
(3) Diakinesis
(4) Leptotene

113. In tall plants translocation of minerals occur from old leaf to young leaf by
(1) Xylem
(2) Simple diffusion
(3) Phloem
(4) Cytoplasmic streaming

114. Micronutrient which require in maximum amount in plant is involve in
(1) Spindle assembly
(2) ETS
(3) Ribosome assembly
(4) Photolysis of water

115. CO_2 acceptor in Bundle sheath cell of C-4 plants is
(1) RUBP
(2) PEP
(3) PGA
(4) OAA

116. When electron move through ETS in between PSII and PSI then proton move from
(1) Granal thylakoid to stromal thylakoid
(2) Stroma to lumen of Granal thylakoid
(3) Stroma to lumen of Stromal lamellae
(4) Lumen of thylakoid to stroma

117. Number of CO_2 produced during ethanol fermentation per glucose is
(1) Two (2) one
(3) Six (4) three

118. Environmental heterophylly is observed in
(1) Cotton (2) Buttercup
(3) larakspur (4) Coriander

119. Plant hormone involve development of root hair to increase surface area for water absorption
(1) 2, 4-D (2) Ethylene
(3) GA (4) ABA

120. From the following option mark the correctly matched
(1) Neelkuranji – Annual
(2) Amoeba– Cyst in favorable condition
(3) Bony fish– internal fertilization
(4) Primates – Continuous breeder

121. Which of following feature absent in plant pollinated with water
(1) Open flower
(2) Mostly monocot
(3) Ribbon shape pollen
(4) Nectar present

122. Which of the following represents gametophytic generation?
(1) Vegetative cell in pollen
(2) Epidermis in anther
(3) Nucellus in ovule
(4) PMC or Pollen mother cell

123. Endosperm is absent in mature seed of
(1) Castor
(2) Groundnut
(3) Maize
(4) Coconut

124. In …… year chromosomal theory of inheritance was proposed
(1) 1900 (2) 1802
(3) 1865 (4) 1902

125. Mark the correctly matched -
(1) White flower – Dominant trait in pea
(2) Skin colour – Incomplete dominance
(3) Sturtevant – discovered linkage
(4) Colour blindness – X-linked trait

126. Mutation which is responsible for most of the cancers are
(1) Point mutation
(2) Aneuploidy
(3) Chromosomal aberration
(4) Deletion

127. In logistic growth curve proposed by Verhulst pearl, value of population density (N) cannot be
(1) Equal to carrying capacity
(2) Very less to carrying capacity
(3) More than carrying capacity
(4) Half to carrying capacity

128. Peptidyl transferase is ribozyme or enzyme involve in peptide bond formation is located
(1) mRNA
(2) In large subunit of ribosome
(3) both subunit of ribosome
(4) on tRNA

129. Mark the incorrectly matched
(1) Nuclein – Meischer
(2) Adaptor hypothesis – Watson
(3) Polynucleotide phosphorylase – Severo ochoa
(4) Central dogma – Crick

130. In a polypeptide chain total number of amino acids is 10 than minimum number of nucleotides in mRNA from which polypeptide chain form is
(1) 30 (2) 90
(3) 10 (4) 15

131. From the following varieties, which of the following is not improved variety of wheat
(1) Himgiri (2) Atlas 66
(3) Sonlika (4) Pusa komal

132. Biocontrol agent is based on
(1) Chemical method
(2) Direct killing of pest
(3) Predation
(4) Use of chemical and natural means

133. Mark the correctly matched
(1) Species area relationship – Tilman
(2) Joint forest management – 2002
(3) Earth summit– Johannesburg
(4) Biodiversity term – Edward Wilson

134. Which of the following is Xerophytic adaptation in plants
(1) Solid urine (2) CAM pathway
(3) Allen's rule (4) Sweating

135. Ramesh Chandra Dagar develop integrated organic farming with characteristic feature
(1) 60 hectares of marshy land for farming
(2) plastic waste is managed by recycling
(3) zero waste procedure
(4) less use of agrochemicals

SECTION – B

(ATTEMPT ANY 10 QUESTIONS)

136. Unequal size two flagella, unicellular and fresh water organism belong to
(1) Chrysophytes
(2) Euglenoids
(3) Dinoflagellates
(4) Slime moulds

137. Seed bearing plant not showing double fertilization also show feature
(1) Flowering plant
(2) Naked seed
(3) Fruit wall present
(4) Zoospore present

138. Whorled phyllotaxy present in leaf of
(1) Calotropis
(2) Guava
(3) Alstonia
(4) Neem

139. Extrachromosomal DNA present in Bacteria not have feature
(1) Double stranded
(2) Circular
(3) Essential genes present
(4) Self replicating

140. Class of enzymes which introduced double bond and remove water is
(1) Lyase
(2) Oxidoreductase
(3) Isomerase
(4) Ligase

141. Solute potential and water potential of solution in open beaker respectively is
(1) Zero and positive
(2) Zero or negative
(3) Negative in both
(4) Negative and zero

142. Enzyme involve in first step of Amino acid synthesis in plants from ammonium is
(1) Transaminase
(2) Hexokinase
(3) Glutamate dehydrogenase
(4) Nitrogenase

143. Number of ATP form by Oxidative phosphorylation none turn of Krebs cycle is
(1) 11 (2) 1
(3) 12 (4) 10

144. Biomass available for consumption of primary consumer level is
(1) Secondary productivity
(2) Gross primary productivity
(3) Net primary productivity
(4) Respiration rate

145. Process of development of seed which give progeny identical to parent
(1) Autogamy (2) Geitonogamy
(3) Apomixis (4) Xenogamy

146. Biodiversity hot spot present in India is
(1) Sundarbans
(2) Western ghat and Srilanka
(3) Lake Victoria
(4) Aravalli hills

147. Example of biogeochemical cycle having main reservoir is soil is
(1) Oxygen cycle
(2) Phosphorus cycle
(3) Carbon cycle
(4) Water cycle

148. El Nino effect or Abnormal climatic conditions is due to
(1) Ozone hole
(2) Greenhouse effect
(3) Excess greenhouse effect leads to global warming
(4) Nuclear waste

149. Mark the correctly matched
(1) Monascus purpureus – Statins
(2) Lady bird – Kill all insects
(3) Lichen – Glomus
(4) Mycorhizzae – Biocontrol agent

150. Water pollution and prevention act was passed in
(1) 1986 (2) 1974
(3) 1981 (4) 1987

ZOOLOGY

SECTION - A

151. A complete digestive system has
(1) A single opening that serve as both mouth and anus
(2) Two openings, one act as mouth and other act as anus
(3) Single opening that acts as mouth only
(4) Two openings, both act as mouth as well as anus

152. Which of the following cells secrete testicular hormones called androgens and form endocrine part of testis?
(1) Leydig cells
(2) Interstitial cells
(3) Sertoli cells
(4) Both (1) and (2)

153. RNA interference technique has been used to
(1) Make recombinant insulin
(2) Perform gene therapy
(3) To eliminate nematode *Meloidogyne*
(4) Make golden rice

154. Choose the hormones which is only produced during pregnancy in human female
(1) hCG
(2) Estrogen
(3) Progesterone
(4) LH

155. Which is not a part of brain stem?
(1) Pons
(2) Cerebellum
(3) Medulla oblongata
(4) Mid brain

156. Which of the following is a hormone releasing IUD?
(1) Cu-T
(2) LNG – 20
(3) Multiload 375
(4) Implants

157. Which of the following STD is not completely curable?
(1) Gonorrhea (2) Syphilis
(3) Chlamydia (4) HIV

158. What did S.L. Miller observe in his experimental set-up
(1) Formation of sugar and nitrogenous bases
(2) Formation of amino acids
(3) Formation of pigments
(4) Formation of fats

159. In ECG, P-wave represents
(1) Depolarisation of ventricles
(2) Repolarisation of atria
(3) Depolarisation of atria
(4) Repolarisation of ventricles

160. Sea weeds and few plants existed probably around _____
(1) 500 mya (2) 350 mya
(3) 800 mya (4) 320 mya

161. Which of the following is a placental mammal not marsupial?
(1) Numbat
(2) Bobcat
(3) Spotted cuscus
(4) Tasmanian tiger cat

162. The spread of cancerous cells at distant sites is termed as
(1) Metastasis (2) Metachrosis
(3) Metamorphosis (4) Mutagenesis

163. Treatment of snake bite by antivenom is an example of
(1) Artificially acquired passive immunity
(2) Artificially acquired active immunity
(3) Naturally acquired active immunity
(4) Naturally acquired passive immunity

164. Oncogene is another name for
(1) Inducer gene
(2) Jumping gene
(3) Tumor suppressor gene
(4) Cancer causing gene

165. Lecithin and Collagen are examples of:
(1) Wax and Protein
(2) Phospholipid and carbohydrate
(3) Phospholipid and protein
(4) Simple fatty acid and protein

166. Which is the most abundant protein in animal world?
(1) RuBisCO (2) Keratin
(3) Collagen (4) Insulin

167. All of the following are parts of large intestine except
(1) Caecum (2) Colon
(3) Ileum (4) Rectum

168. What would be the correct sequence of path followed by light when it falls on eye and the impulse generated?
(a) Visual cortex (b) Cornea
(c) Vitreous humor (d) Lens
(e) Aqueous humor (f) Retina
(1) b – c – d – e – f – a
(2) b – e – d – c – f – a
(3) a – f – b – e – d – c
(4) d – b – a – c – e – f

169. The wall of alimentary canal from oesophagus to rectum has:
(1) 5 layers (2) 3 layers
(3) 4 layers (4) 6 layers

170. Bile can be prevented to be released into duodenum by
(1) Sphincter of oddi
(2) Cardiac sphincter
(3) Pyloric sphincter
(4) Ileo-caecal valve

171. Consider the following symptoms of a disorder
(a) Mental retardation
(b) Abnormal skin
(c) Deaf and mutism
(d) Stunted growth
Which disorder is correctly described by these symptoms
(1) Acromegaly
(2) Myxoedema
(3) Exophthalmic goitre
(4) Cretinism

172. Cortisol does not cause
(1) Anti inflammatory reaction
(2) Proteolysis
(3) Enhanced RBC production
(4) Decreased gluconeogenesis

173. Choose the hormone which is hyperglycemic in nature.
(1) Insulin (2) ADH
(3) Secretin (4) Glucagon

174. Which of the given disorder is commonly caused by decrease level of estrogen in aged woman?
(1) Arthritis
(2) osteoporosis
(3) Myasthenia gravis
(4) Gout

175. Aldosterone stimulates the reabsorption of
(1) Na^+
(2) K^+
(3) Glucose
(4) Ca^{+2}

176. The Nissl's granules are present in
(a) Cell body
(b) Axon
(c) Dendrites
(d) Glial cells
(1) a only (2) a, b and c
(3) a, c (4) a, b, c, d

177. On application of a stimulus on the axonal membrane,
(1) There is a rapid influx of K^+ at that site
(2) There is a rapid efflux of Na^+ at that site
(3) There is a rapid influx of Na^+ at that site
(4) There is a rapid efflux of K^+ at that site

178. The association areas are present in the
(1) Cerebral cortex
(2) Corpus callosum
(3) Amygdala
(4) Hypothalamus

179. Choose the **incorrect** statement about PCR–
(1) In this reaction, multiple copies of the gene of interest is synthesised in vitro.
(2) One set of primer and RNA polymerase are used.
(3) The thermostable DNA polymerase is obtained from bacterium, *Thermus aquaticus.*
(4) The segment of DNA can be amplified to approximately billion times.

180. The separated DNA fragments can be visualised only after staining the DNA with ____A____ and followed by exposure to ____B____ Choose the option which correctly fill the blanks A and B respectively

	A	**B**
(1)	Ethidium bromide	UV radiations
(2)	Bromophenol blue	UV radiations
(3)	Ethidium bromide	Visible light
(4)	Methylene blue	Visible light

181. The production and ejection of milk by mammary gland require the synergestic effect of the following hormones.
(1) Estrogen, Progesterone
(2) Prolactin, oxytocin
(3) Adrenaline, Noradrenaline
(4) Calcitonin and Parathormone

182. Among following the technique used to develop *Hisardale* is
(1) Interspecific hybridisation
(2) Inbreeding
(3) Cross-breeding
(4) Out-crossing

183. Tendons connects
(1) Muscle to bone
(2) Bone to vertebral column
(3) Bone to bone
(4) Bone to cartilage

184. Which of the protein is not a part of thin filament?
(1) Myosin (2) Actin
(3) Troponin (4) Tropomyosin

185. Restriction endonucleases cut which bonds?
(1) Hydrogen bonds
(2) Phosphodiester bonds
(3) Ionic bonds
(4) Disulphide bonds

SECTION – B
(ATTEMPT ANY 10 QUESTIONS)

186. While isolating DNA from bacteria which of the following enzyme or chemical is not used?
(1) Lysozyme
(2) Cellulase
(3) Ethanol
(4) RNase

187. Parietal cells of stomach secrete
(1) Mucus (2) Pepsin
(3) Trypsinogen (4) HCl

188. Select the treatment method which could be a permanent cure for ADA deficiency in humans
(1) Enzyme replacement therapy
(2) Infusion of genetically engineered lymphocytes having functional ADA cDNA
(3) Bone marrow transplantation after 10 years of age
(4) Introducing ADA gene into cells at early embryonic stages

189. Read the following statements and choose the correct option.
Statement A: Bt toxin gets activated in alkaline pH of insect gut.
Statements B: Activated toxin binds to the surface of midgut epithelial cells
(1) Only statement A is correct
(2) Only statement B is correct
(3) Both A and B statements are correct
(4) Both A and B statements are incorrect

190. Stage of embryonic development at which implantation occurs in human female is:
(1) Morula
(2) Zygote
(3) Completely developed foetus
(4) Blastocyst

191. If frequency of a dominant allele, in a population which is in genetic equilibrium, is 0.6, then calculate frequency of heterozygotes in that population.
(1) 0.4 (2) 0.24
(3) 0.48 (4) 0.36

192. Glisson's capsule is related to
(1) Pancreas
(2) Lungs
(3) Pharynx
(4) Liver

193. Which of the following hormone is maintained at high level while using oral pills
(1) FSH
(2) LH
(3) Progesterone
(4) Relaxin

194. The GFR in a healthy individual is approximately_____
(1) 100 ml/minute
(2) 200 ml/minute
(3) 400 ml/minute
(4) 125 ml/minute

195. Find out the incorrect match in the following:

	Column A		**Column B**
(1)	Thrombocyte	-	Blood clotting
(2)	Neutrophils	-	Phagocytosis
(3)	SA node	-	Pace setter
(4)	LUB heart sound	-	Closure of AV valves

196. The part starting from external nostrils upto terminal bronchioles is not associated with

(1) Gaseous exchange
(2) Clearing air from foreign particles
(3) Humidification of air
(4) Bringing air to body temperature

197. Which one is a vasodilator?

(1) ANF (2) ADH
(3) Angiotensin-II (4) Rennin

198. During contraction and relaxation of skeletal muscle, size of which band remains unchanged?

(1) I-band (2) A-band
(3) H-zone (4) Z-line

199. Which of the following ion is required for muscle contraction

(1) Ca^{+2}
(2) Mg^{+2}
(3) Fe^{+2}
(4) Both (1) and (2)

200. A Drop of each of the following is placed on different slides, which of the them will not coagulate?

(1) Blood
(2) Plasma
(3) Serum
(4) None