ENGLISH

Form Number : _____

ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

path to success

CLASSROOM CONTACT PROGRAMME

(Academic Session : 2019-2020)

MHT-CET: ENTHUSE COURSE

Test Type : ONLINE TEST – 01 **Test Pattern : MHT-CET**

TEST DATE : 15-09-2020

PCM GROUP Paper code: CET2012FSPCB915 **Roll No-** | | | | | | | | |

FULL SYLLABUS:

Important Instructions

Do not open this Test Booklet until you are asked to do so.

1. Immediately fill in the form number on this page of the Test Booklet with *Blue/Black Ball Point Pen. Use of pencil is strictly prohibited*.

2. The candidates should not write their Form Number anywhere else (except in the specified space)on the Test Booklet/Answer Sheet.

3. The test is of **3 hours** duration.

4. The Test Booklet consists of **200** questions. The maximum marks are 2**00.** Duration 180 minutes

5. Question Paper Format :

Physics (50 Questions) Chemistry (50 Questions) carrying 1 mark each questions and **Biology (100 Questions) carrying 2 mark each**.

Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.

Marking scheme: Phy chem. +1 for correct answer and 0 if not Attempted. **No** negative marking.

Biology +1 for correct answer and 0 if not Attempted. **No** negative marking.

6. Use **Blue/Black Ball Point Pen only** for writting particulars/marking responses on **Side–1** and **Side–2** of the Answer Sheet. **Use of pencil is strictly prohibited.**

7. No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone any electronic device etc, except the Identity Card inside the examination hall/room.

8. Rough work is to be done on the space provided for this purpose in the Test Booklet only.

9. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator on duty in the Room/Hall. **However, the candidate are allowed to take away this Test Booklet with them.**

10. Do not fold or make any stray marks on the Answer Sheet.

Your Hard Work Leads to Strong Foundation

PHYSICS

1. A cyclist is moving in a circular track of radius 80m, with a velocity of 36 km/hour. In order to keep his balance, he has to lean inward from the vertical through an angle θ. If g = $10m/s^2$, then θ is given by

a) $\tan^{-1}(2)$ **b)** $\tan^{-1}(4)$ **c)** $\tan^{-1}\left(\frac{1}{4}\right)$ **d)** $\tan^{-1}\left(\frac{1}{8}\right)$

2. At what depth below the surface of the earth, is the value of g same as that at a height of 10 km from the surface of the earth?

a) 5 km **b)** 10 km **c)** 20 km **d)** 40 km

3. The moments of Inertia of two rotating bodies A and B are I_1 and I_2 where $I_1 > I_2$. If K_1 and K_2 are their kinetic energies and if their angular momenta are equal, then

a) $K_1 = K_2$ **b)** $K_1 < K_2$ **c)** $K_1 > K_2$ **d)** $K_1 = \frac{1}{2}K$

4. When the displacement of a simple harmonic oscillator is half of its amplitude, its potential energy is 3J. Its total energy is

a) 6J **b)** 12 J **c)** 15 J **d)** 20 J

5. If the potential energy of a spring is U, on stretching it by 2 cm. What is its potential energy when it is stretched by 10 cm?

a) $\frac{U}{5}$ **b)** $\frac{U}{25}$ **c)** 25 U **d)** 5U

6. If the radius of a soap bubble is four times that of another, then the ratio of their excess pressure will be

a) 4 : 1 **b)** 1 : 4 **c)** 16 : 1 **d)** 1 : 16

7. A whistle tide at the end of a string of length 50cm revolves in a circular path with angular speed w = 20 rad/s using a string of length 50 cm. The frequency of sound from the whistle is 385 Hz. What is the minimum frequency heard by an observer which is far away from the whistle?

(Velocity of sound = 340 m/s)

a) 394 Hz **b)** 385 Hz **c)** 374 Hz **d)** 333 Hz

8. If a resonance tube gives two consecutive resonances at the length of 15 and 48cm, then the velocity of sound in air is [frequency of fork = 500 Hz]

a) 320 m/s **b)** 330 m/s **c)** 340 m/s **d)** 350 m/s

9. What is the mean energy per molecule for a polyatomic gas with n degrees of freedom?

a) $\frac{nKT}{N}$ **b)** $\frac{3KT}{2}$ **c)** $\frac{nKT}{2N}$ **d)** $\frac{nKT}{2}$

10. A ray of light is incident on a medium of refractive index $\sqrt{2}$ at an angle of incidence of 45^0. The ratio of the width of the incident beam is air to that of the refracted beam in the medium is

a) $(3/2)^{1/2}$ **b)** $(2/3)^{1/2}$ **c)** $3/2$ **d)** $2/3$

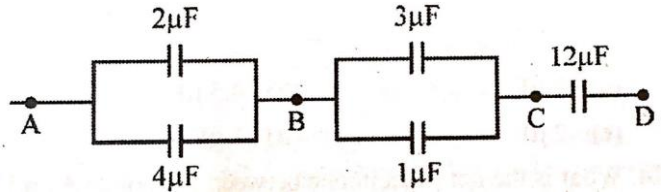
11. The difference between two interfering light waves meetings at a point on the screen is $\left(\frac{87}{2}\right)\lambda$.

The band obtained at that point is

a) 87^{th} bright band **b)** 87^{th} dark band

c) 44^{th} dark band **d)** 44^{th} light band

12. A network of capacitors is as shown in the diagram.



What is the equivalent capacitance between the points A and D

a) C = 3 μ F **b)** C = 4 μ F **c)** C = 2 μ F **d)** C = 5 μ F

13. The resistivity of a potentiometer wire is 40×10^8 ohm-m and its area of cross-section is 8×10^{-6} m^2.If a current of 0.4 A is flowing through the wire, then the potential gradient will be

a) 10^{-2} V/m **b)** 10^{-1} V/m

c) 2×10^{-2} V/m **d)** 1 V/m

14. In an ammeter, 4% of the total current is passing through the galvanometer. If the shunt resistance is 5Ω, then the resistance of the galvanometer will be

a) 30 Ω **b)** 60 Ω **c)** 120 Ω **d)** 240 Ω

15. The susceptibility of a magnetic material is χ at 127^0C. At what temperature, its susceptibility will be reduced to half of its original value?

a) 327^0C **b)** 427^0C **c)** 527^0C **d)** 627^0C

16. In an A.C. circuit, a resistance R = 40Ω and an inductance L are connected in series. If the phase angle between voltage and current is 45^0, then the value of the inductive reactance will be

a) 20 Ω **b)** 40Ω **c)** 10Ω **d)** 50Ω

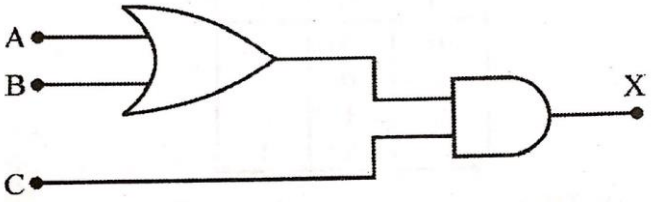
17. For a photocell, the work function is ϕ and the stopping potential is V_s. The wavelength of the incident radiation is

a) $\frac{hc}{\phi}$ **b)** $\frac{hc}{\phi - eV_s}$ **c)** $\frac{hc}{\phi + eV_s}$ **d)** $\frac{hc}{e\phi + V_s}$

18. What is the ratio of the nuclear radii of two elements with mass numbers 27 and 125?

a) $\frac{5}{3}$ **b)** $\frac{2}{3}$ **c)** $\frac{3}{5}$ **d)** $\frac{27}{125}$

19. To get on output X = 1 from the following logic circuit, the input must be



	A	B	C
(a)	0	1	0
(b)	1	1	0
(c)	1	0	0
(d)	1	0	1

20. In short wave communication, waves of which of the following frequencies will be reflected back by the ionosphere, of electron density $10^{11}/m^3$?

a) 2 MHz **b)** 10 MHz

c) 12 MHz **d)** 18 MHz

21. An automobile is turning around a circular road of radius r. The coefficients friction between the tyres and the road is μ.For safety of the vehicle, its velocity should not be more than

a) $\frac{\sqrt{\mu g}}{r}$ **b)** $\sqrt{\mu g r}$ **c)** $\mu r g$ **d)** $\frac{\mu g}{r}$

22. A body weighs W newton at the surface of the earth. Its weight at a height equal to half the radius of the earth will be

a) $\frac{W}{2}$ **b)** $\frac{2W}{3}$ **c)** $\frac{4W}{9}$ **d)** $\frac{8W}{15}$

23. What is the moment of inertia of a solid sphere of radius R and density P about its diameter ?

a) $\frac{8}{3}\pi R^3\rho$ **b)** $\frac{8}{15}\pi R^4\rho$ **c)** $\frac{8}{15}\pi R^5\rho$ **d)** $\frac{15}{8}\pi R^3\rho^2$

24. The differential equation of a particle performing a S.H.M is $\frac{d^2x}{dt^2}+64x=0$. The period of oscillation of the particle is

a) 10 sec **b)** 5 sec **c)** $\frac{\pi}{3}$ sec **d)** $\frac{\pi}{4}$ sec

25. Y is the Young's modulus of the material of a wire of length L and cross-sectional are A. It is stretched through a length *l*. What is the force constant of the wire?

a) $\frac{YA}{L}$ **b)** $\frac{YA}{l}$ **c)** $\frac{YL}{A}$ **d)** $\frac{Yl}{A}$

26. Two parallel glass plates separated by a small distance x are dipped partly in a liquid of 'd' keeping them vertical. The surface tension of the liquid is T and angle of contact is θ. What is the rise of the liquid between the plates due to capillarity?

a) $\frac{2T\cos\theta}{xdg}$ **b)** $\frac{2T}{xdg\cos\theta}$ **c)** $\frac{T\cos\theta}{xdg}$ **d)** $\frac{T\cos\theta}{xd}$

27. In a sinusoisodal wave, the time required by a particular particle to move from maximum displacement to zero displacement is 0.025 sec. The frequency of the wave is

a) 2.5 Hz **b)** 5 Hz **c)** 7.5 Hz **d)** 10 Hz

28. An organ pipe P_1 closed at one end vibrating in its first overtone and another and another pipe P_2 open at both ends, vibrating in its third overtone are in resonance with a given tuning fork. The ratio of the length of P_1 to that of P_2 is

a) $\frac{1}{8}$ **b)** $\frac{1}{2}$ **c)** $\frac{3}{8}$ **d)** $\frac{5}{8}$

29. The value of $\gamma=\frac{C_P}{C_V}$ for a gas is given by $\gamma=1+\frac{2}{f}$ where f is the number of degrees of freedom of a molecule of a gas. What is the ratio of $\frac{\gamma_{monoatomic}}{\gamma_{diatomic}}$?

a) $\frac{25}{21}$ **b)** $\frac{21}{25}$ **c)** $\frac{5}{7}$ **d)** $\frac{3}{5}$

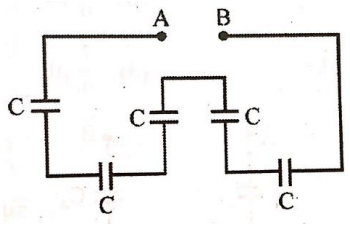
30. A ray of light passes from vacuum into a medium of refractive index n. If the angle of incidence is found to be twice the angle of refraction, then the angle of incidence is

a) $2\sin^{-1}\left(\frac{n}{2}\right)$ **b)** $2\cos^{-1}\left(\frac{n}{2}\right)$ **c)** $\cos^{-1}\left(\frac{n}{2}\right)$ **d)** $2\sin^{-1}(n)$

31. Two coherent sources of intensities, I_1 and I_2 produce an interference pattern. What is the maximum intensity in the interference pattern?

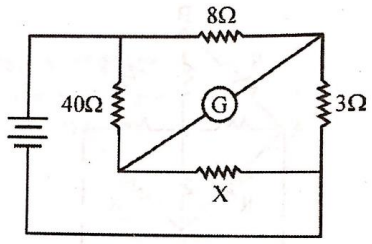
a) $I_1 + I_2$ **b)** $I_1^2+I_2^2$ **c)** $(I_1+I_2)^2$ **d)** $\left(\sqrt{I_1}+\sqrt{I_2}\right)^2$

32. Five capacitors each of capacity C are joined as shown in the following figure. If their resultant capacity $C_R=2\mu F$, then the capacity of each capacitor is



a) $5\mu F$ **b)** $20\mu F$ **c)** $10\mu F$ **d)** $4\mu F$

33. In the given circuit, the galvanometer G gives zero deflection. What is the value of resistance X?



a) 10 Ω **b)** 12 Ω **c)** 15 Ω **d)** 20 Ω

34. A galvanometer of resistance 20 Ω has a current sensitivity of 5 div/mA. The instrument has 50 divisions. How will you convert it into a voltmeter reading upto 25 volt?

a) Join a resistance of 1240 Ω in series **b)** Join a resistance of 2480 Ω in series

c) Join a resistance of 2480 Ω in parallel **d)** Join a shunt of 20 Ω

35. A charge q is circulating with constant speed v in a semicircular loop of wire of radius R. The magnetic moment of this loop is

a) qvR **b)** $\frac{\pi Rqv}{2(\pi+2)}$ **c)** $\frac{qvR}{3}$ **d)** $\frac{qv\pi v}{\pi+2}$

36. The primary winding of a transformer has 50 turns while its secondary has 500 turns. If the primary is connected to an a.c. supply of 220 V, 50Hz, then the output at the secondary will be

a) 220V, 50Hz **b)** 2200 V, 50 Hz **c)** 2200 V, 500 Hz **d)** 22 V, 5 Hz

37. The maximum velocity of an electron emitted by light of wavelength λ incident on the surface of a metal of work function ϕ, is

a) $\left[\frac{2(h\lambda-\phi)}{m}\right]^{1/2}$ **b)** $\left[\frac{2(hC-\lambda\phi)}{m\lambda}\right]^{1/2}$ **c)** $\left[\frac{2(hC+\lambda\phi)}{m\lambda}\right]^{1/2}$ **d)** $\frac{2(hC-\lambda\phi)}{m}$

38. If λ_1 and λ_2 are the wavelengths of the first members of the Lyman and Paschen series respectively, then $\frac{\lambda_1}{\lambda_2}$ is equal to

a) 1: 3 **b)** 30 : 1 **c)** 7 : 50 **d)** 7 : 108

39. If l_1, l_2 and l_3 are the widths of emitter, base and collector regions of transistor, then

a) $l_1 > l_2 > l_3$ **b)** $l_3 < l_2 < l_1$ **c)** $l_3 > l_1 > l_2$ **d)** $l_1 = l_2 = l_3$

40. A signal wave of frequency 12 KHz is modulated with a carrier wave of frequency 2.51 MHz. What are the upper and lower sideband frequencies?

a) 2512 KHz and 2508 KHz **b)** 2522 KHz and 2488 KHz

c) 2502 KHz and 2498 KHz **d)** 2522 KHz and 2498 KHz

41. If error in measuring diameter of a circle is 4%, the error in measuring radius of the cirle would be

a) 2 % **b)** 8 % **c)** 4 % **d)** 1 %

42. What is the unit vector perpendicular to the following vectors $2\hat{i}+2\hat{j}-\hat{k}$ and $6\hat{i}-3\hat{j}+2\hat{k}$?

a) $\frac{\hat{i}+10\hat{j}-18\hat{k}}{5\sqrt{17}}$ **b)** $\frac{\hat{i}-10\hat{j}+18\hat{k}}{5\sqrt{17}}$

c) $\frac{\hat{i}-10\hat{j}-18\hat{k}}{5\sqrt{17}}$ **d)** $\frac{\hat{i}+10\hat{j}+18\hat{k}}{5\sqrt{17}}$

43. A block of mass 20 kg is moving in x-direction with a constant speed of 10 ms^{-1}. It is subjected to a retarding force F = (-0.1x)N during its travel from x = 20 m to x = 30m. Its final kinetic energy will be

a) 975 J **b)** 450 J **c)** 275 J **d)** 250 J

44. An ideal fluid flows through two pipes of circular cross-section with diameters 2.5 cm and 3.75 cm connected one after another. The ratio of the velocities in the two pipes is

a) 9 : 4 **b)** 3 : 2 **c)** $\sqrt{3}:\sqrt{2}$ **d)** $\sqrt{2}:\sqrt{3}$

45. A tank is filled to a height H. The range of water coming out of hole which is a depth H/4 from the from the surface of water level is

a) $\frac{2H}{\sqrt{3}}$ **b)** $\frac{\sqrt{3}H}{2}$ **c)** $\sqrt{3}H$ **d)** $\frac{3H}{4}$

46. A ray of light is incident at 60^0 on one face of a prism of angle 30^0 and the emergent ray makes 30^0 with the incident ray. The refractive index of the prism is

a) 1.732 **b)** 1.414 **c)** 1.5 **d)** 1.33

47. At what distance from a convex lens of focal length 30 cm an object should be placed, so that the size of image be $1/4^{th}$ of the object?

a) 30 cm **b)** 60 cm **c)** 15 cm **d)** 150 cm

48. The focal length of objective and eye lens of a microscope 4 cm and 8 cm respectively. If the least distance of distinct vision is 24 cm and object distance is 4.5 cm from the objective lens, then the magnifying power of the microscope will be

a) 18 **b)** 32 **c)** 64 **d)** 20

49. Current i is carried in a wire of length. If the wire is turned into a circular coil, the maximum magnitude of torque in a given magnetic field B will be

a) $\frac{L^2B^2}{2}$ **b)** $\frac{L^2B}{2}$ **c)** $\frac{L^2iB}{4\pi}$ **d)** $\frac{L^2B}{4\pi}$

50. The length of a magnetised steel wire is l and its magnetic moment is M. It is bent into the shape of L with two sides equal. What will be the new magnetic moment?

a) $2M$ **b)** $M/2$ **c)** $\sqrt{2}\,M$ **d)** $M/\sqrt{2}$

CHEMISTRY

51. In which one of the following the empirical and molecular formulae are same

a) Glucose **b)** Benzene **c)** Acetic acid **d)** Propane

52. The electronic configurations of atoms A and B are as follows $A \rightarrow 2,8,2;\ B \rightarrow 2,8,7$ The molecular formula of their binary compound would by

a) AB **b)** A_2B **c)** A_2B_7 **d)** AB_2

53. In which one of the following molecules, all bonds do not have same lengths?

a) BCl_3 **b)** CCl_4 **c)** PCl_5 **d)** $BeCl_2$

54. In a molecule, the total no.of electrons in bonding M.O and antibonding M.O are 8 and 4 respectively. The bond order is

a) 1 **b)** 4 **c)** 2 **d)** 3

55. The volume strength of 1.5 N H_2O_2 solution is nearly

a) 4.8 **b)** 16.8 **c)** 8.4 **d)** 4.2

56. On dissolving moderate amount of sodium metal in liquid NH_3 at low temperature, which one of the following does not occur?

a) Blue coloured solution is obtained **b)** Na^+ ions are formed in the solution

c) Liquid NH_3 becomes good conductor of electricity **d)** Liquid NH_3 remains diamagnetic

57. The IUPAC name of

a) 1-methyl cyclohex – 2- ene **b)** 6 – methyl cyclohexene

c) 1-methyl cyclohex -5- ene **d)** 3- methyl cyclothexene

58. The molecule having largest dipole moment, among the following is

a) CHI_3 **b)** CH_4 **c)** $CHCl_3$ **d)** CCl_4

59. Which one of the following would give 2,3-dimethylbutane in the Wurtz reaction?

a) n-propyl iodide **b)** 1- Iodobutane

c) 2- Iodobutane **d)** Isopropyl iodide

60. Which of the following exhibits the weakest intermolecular forces?

a) NH_3 **b)** HCl **c)** He **d)** H_2O

61. A binary compound of A and B has fcc lattice in which atoms A occupy the corners of the cube and atoms B occupy the centres of faces. The formula of the compound is

a) AB **b)** A_3B **c)** AB_3 **d)** AB_6

62. An element, with atomic mass equal to 5000 pm. Then density of the element is nearly

a) 7g cm^{-3} **b)** $2g\,cm^{-3}$ **c)** $0.2g\,cm^{-3}$ **d)** 6g cm^{-3}

63. An aqueous dilute solution containing non-volatile solute boils at 100.052^{0}C. What is the molality of solution?

$\left[K_b = 0.52K\,kg\,mol^{-1}, B.pt.of\ water = 100^0C\right]$

a) 0.1 **b)** 0.01 **c)** 0.001 **d)** 1.0

64. The Van't Hoff factor for a dilute aqueous solution of the strong electrolyte, Barium hydroxide, is

a) 0 **b)** 2 **c)** 1 **d)** 3

65. The molarity of a solution obtained by mixing 800 ml of 0.5 M HCl and 200 ml 1.6 M HCl will be

a) 0.72 **b)** 0.36 **c)** 2.1 **d)** 1.05

66. The $\wedge^0$ values for $AgNO_3$, NaCl and $NaNO_3$ are $250\times10^{-4}, 360\times10^{-4}$ and $310\times10^{-4}\,S\,m^2\,equiv^{-1}$ The $\wedge^0$ value for AgCl in S m^2 $equiv^{-1}$ will be

a) 610×10^{-4} **b)** 200×10^{-4} **c)** 300×10^{-4} **d)** 420×10^{-4}

67. When electricity is passed through a solution of $AlCl_3$, 13.5 g of Al (At. Mass 27) is deposited. The number of Faraday passed through the solution must be

a) 0.5 **b)** 1

c) 1.5 **d)** 2

68. Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because

a) Zinc has higher negative electrode potential than iron

b) Zinc is lighter than iron

c) Zinc has lower melting point than iron

d) Zinc has lower negative electrode potential than iron.

69. The rate constant for a reaction is 0.0693 min^{-1} and the initial conc. Of the reactant is 0.5 mol dm^3. The half life period is

a) 400 sec **b)** 800 sec **c)** 1200 sec **d)** 600 sec

70. Foa a reaction $\frac{1}{2}A \rightarrow 2B,$ rate of disappearance of A is related to the rate of appearance of B by the expression.

a) $-\frac{d[A]}{dt}=\frac{1}{2}.\frac{d[B]}{dt}$ **b)** $-\frac{d[A]}{dt}=\frac{d[B]}{dt}$ **c)** $-\frac{d[A]}{dt}=4\frac{d[B]}{dt}$ **d)** $-\frac{d[A]}{dt}=\frac{1}{2}.\frac{d[B]}{dt}$

71. The bond energies of H-H, Cl- Cl and H – Cl bonds are 436, 330 and 430 kJ mol^{-1} respectively. The value of ΔH for the formation of HCl would be

a) – 47 kJ **b)** – 168 Kj **c)** 336 kJ **d)** 47 Kj

72. The amount of work done, when 20 ± 10^{-3} kg of Argon (mol.mass= 40) expands reversibly from a pressure of 10 atm. To 1 atm. At a temperature t^0C is

a) $-\frac{2.303R(273+t)}{2}\times10^3$ **b)** $-\frac{2.303R(273+t)\log 0.1}{2}$

c) $-\frac{2.303Rt}{2}\times10^{-3}$ **d)** $-\frac{2.303R(273+t)}{2}$

73. For a reaction $\Delta G=-2.303$ kcal. The equilibrium constant for the reaction at 500 K would be

a) 100 **b)** 10 **c)** 1 **d)** 0.1

74. Which ore can be best concentrated by froth floatation process?

a) Malachite **b)** Cassiterite **c)** Galena **d)** Magnetite

75. On heating a mixture of $Cu_2S \text{ and } Cu_2O$, we get

a) $Cu + SO_3$ **b)** $CuO + Cus$ **c)** $Cu + SO_2$ **d)** $Cu_2 + SO_3$

76. The state of hybridisation of P-atoms in PCl_3 is

a) sp^2 **b)** dsp^2 **c)** sp^3 **d)** dsp^3

77. Among the following, the oxidation state of N is lowest in

a) NH_3 **b)** HN_3 **c)** N_2H_4 **d)** NO_2

78. In the reaction of NaOH with white P, PH_3 and NaH_2PO_2 are obtained. The reaction is an example of

a) Reduction **b)** Oxidation **c)** neutralisation **d)** disproportionation

79. A gaseous mixture contains O_2 and N_2 is the ratio of 1:2 by mass. The ratio of their number of molecules is

a) 1:2 **b)** 2:1 **c)** 4:7 **d)** 7:16

80. Which one of the following possesses $p^{\pi} - d^{\pi}$ bonding?

a) NO_3^- **b)** BO_3^{3-} **c)** SO_3^{2-} **d)** CO_3^{2-}

81. Which halogen forms an oxyacid that contains the halogen atom in oxidation state?

a) Fluorine **b)** Chlorine **c)** Bromine **d)** Iodine

82. The pair in which phosphorus atoms have formula oxidation state of + 3 is

a) Orthophosphorous and pyrophosphorous acids

b) Pyrophosphorous and hypophosphoric acids

c) Orthophosphorous and hypophosphoric acids

d) Pyrophosphorous and pyrophosphoric acids

83. In which one of the following, the first is more stable than the second?

a) Ti^{+3}, Ti^{+4} **b)** Mn^{+3}, Mn^{+2} **c)** Na, Na^+ **d)** Fe^{+3}, Fe^{+2}

84. Which of the following forms a colourless solution in aqueous medium?

a) Ti^{3+} **b)** Sc^{3+} **c)** V^{3+} **d)** Cr^{3+}

85. The complex ion which has only three d-electrons in the central metal ion is

a) $[Co(NH_3)_6]^{3+}$ **b)** $[MnO_4]^-$ **c)** $[Fe(CN)_6]^{3-}$ **d)** $[Cr(CN)_6]^{3-}$

86. Which one of the following statements about $[Co(CN_6)]^{3-}$ is true?

a) It has no unpaired electrons and will be in a high- spin configuration.

b) It has no unpaired electrons and will be in a low –spin configuration.

c) It has four unpaired electrons and will be in a low- spin configuration.

d) It has hour unpaired electrons and will be in a high-spin configuration.

87. Which one of the following has the highest relative for S_N2 reaction?

a) CH_3CH_2Br **b)** $CH_3-CH_2-CH_2Br$

c) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2Br$ **d)** $CH_3-\underset{\displaystyle CH_3}{\underset{|}{C}}-CH_2Br$

88. Only one monohalogen derivative is possible with

a) neopentane **b)** propane **c)** n-butane **d)** isobutene

89. Reaction of which among the following ethers with HI in cold leads to formation of methyl alcohol?

a) Ethyl methyl ether **b)** Methyl propyl ether

c) Isopropyl methyl ether **d)** Tert-butyl methyl ether

90. An organic compound on treatment with acid dichromate gives a substance which reduces Tollen's reagent. The compound is

a) $CH_3CH_2CH_2OH$ **b)** $CH_3.CHOH.CH_3$ **c)** $(CH_3)_3.COH$ **d)** C_6H_5OH

91. Which of the following acids has the smallest dissociation constant?

a) $CH_3CHFCOOH$ **b)** FCH_2CH_2COOH

c) $BrCH_2CH_2COOH$ **d)** $CH_3CHBrCOOH$

92. In the reaction, $A \xrightarrow{\text{oxid}^n} B \xrightarrow{\text{oxid}^n} C \xrightarrow[\text{distilled}]{\text{Ca salt}} B$; A and B are respectively

a) primary alcohol and aldehyde **b)** primary alcohol and ketone

c) aldehyde and ketone **d)** secondary alcohol and ketone

93. In the reaction, $CH_3CONH_2 + Br_2 + 4NaOH \rightarrow Y + Na_2CO_3 + 2NaBr + 2H_2O$ Y is,

a) CH_3NH_2 **b)** $CH_3CH_2NH_2$ **c)** CH_3COBr **d)** $HCONH_2$

94. Which one of the following statements true about the N-atom in amines?

a) It is sp^3 hybridized with no electrons left uninvolved in bonding.

b) It is sp^2 hybridized with one lone pair of electrons.

c) It is sp^3 hybridized with one lone pair of electrons

d) It is sp^3 hybridized with tetrahedral orientation.

95. The number of possible optical isomers of glucose are

a) 16 **b)** 8 **c)** 12 **d)** 2

96. Which one of the following is not a glyceride?

a) Fat **b)** Oil **c)** Lipid **d)** soap

97. The compounds used in the manufacture of terylene is

a) Phthlic acid **b)** Caprolactum

c) p-benzene dicarboxylic acid **d)** m-phthalic acid

98. Identify the heteropolymer from the list given below

a) Polythene **b)** Nylon -6 **c)** Teflon **d)** Nylon – 6,6

99. Aspirin molecule contains two functional groups in the positions which are

a) Para **b)** ortho **c)** meta **d)** 1 and 4

100. Which one of the following is an antibiotic ?

a) Penicillin **b)** Albumin **c)** Phenyl **d)** Saccharin

BIOLOGY

101. Large, fleshy and edible fruiting bodies are produced by ----------

a) Yeast **b)** bacteria **c)** some fungi **d)** algae

102. Rhizopus arrhizus is used for the industrial production of …….

a) fumaric acid **b)** citric acid **c)** gluconic acid **d)** acetic acid

103. Which of the following vitamins are water soluble?

a) Vit.A and B **b)** Vit. B and C **c)** Vit. A and K **d)** Vit. C and D

104. The antibiotic chloromycetin is obtained from ……

a) Streptomyces erythreus **b)** Penicillium

c) Streomyces venezuelae **d)** Streptomyces griseus

105. Removal of large pieces of floating debris, oily substances, etc. during sewage treatment is called……

a) Primary treatment **b)** Secondary treatment

c) Final treatment **d)** Amplification

106. "Vincristin", a secondary metabolite is obtained from the plant…….

a) Catharanthus roseus **b)** Asparagus racemosus

c) Daucuscarota **d)** Daturastramonium

107. In most of the plants, a part which is free from infections/ diseases is …….

a) apical bud **b)** flower **c)** root **d)** stem

108. An ability of a plant cell by virtue of which it can generate whole plant under suitable conditions is called…….

a) micropropagation **b)** totipotency

c) somatic hybridization **d)** organogenesis

109. An improved insect resistant variety " Pusa Gaurav" is variety of …….

a) Brassica **b)** Flat bean **c)** Cow pea **d)** Bhindi

110. The classical method of plant breeding is …….

a) Hybridization **b)** mutation breeding

c) genetic engineering **d)** tissue culture

111. Oxygen liberated during photosynthesis comes from……..

a) CO_2 **b)** glucose **c)** H_2O **d)** chlorophyll

112 Which of the following is not required for Hill reaction?

a) Sunlight **b)** Chlorophyll **c)** Water **d)** Carbon dioxide

113 PSI gets the de-energized electrons from .....

a) Water **b)** plastoquinone **c)** plastocyanin **d)** cytochrome f

114 Which of the following was used in the study of dark reactions of photosynthesis?

a) Hydrila **b)** Chlorella and Scenedesmus

c) Chlomydomonas **d)** Chlorella and Spirogyra

115 During light reaction of photosynthesis, how many photons are required for evolution of one O_2?

a) Six **b)** eight **c)** four **d)** two

116. One – sixth part of the total PGAL product is used for synthesis of .....

a) Glucose **b)** RUBP **c)** RUMP **d)** DHAP

117. If light is cut CO_2 supply is continued, then which of the following substances will get disappeared from photosynthesizing algal cells?

a) RUBP **b)** PGAL **c)** RUMP **d)** PGA

118. Which of the following shows chloroplast dimorphism?

a) Sugar beet **b)** Sugarcane **c)** Potato **d)** Papaya

119. The internal source of CO_2 in CAM plants is .....

a) OAA **b)** Malic acid **c)** RUBP **d)** PEPA

120. During Krebs cycle, fumaric acid gets converted into malic acid by

a) Decarboxylation **b)** dehydrogenation **c)** dehydration **d)** hydration

121. Each molecule of $NADH_2$ through ETS yields .....

a) 1 ATP **b)** 2 ATPs **c)** 3 ATPs **d)** 4 ATPs

122. The only 5C compound produced in Krebs cycle is .....

a) Citrate **b)** α ketogutara te **c)** Succinate **d)** oxaloacetate

123. In which of the following steps dehydrogenation occurs?

a) glucose $\rightarrow$ glucose $6-$phosphate **b)** 3- PGA $\rightarrow 2-$PGA

c) PEPA $\rightarrow$ pyruvate **d)** PGAL $\rightarrow 1,3$diPGA

124. Mitchondria are regarded as semi autonomous organelles, due to the presence of .....

a) Cristae **b)** RNA **c)** DNA **d)** Ribosomes

125. The amount of energy lost in respiration in the form of heat is about

a) 40% **b)** 50% **c)** 60% **d)** 70%

126. In vegetative reproduction, when two different individuals participate then it is called.....

a) Layering **b)** grafting **c)** cutting **d)** doubling

127. In grafting, the rooted plant is used as a .....

a) Scion **b)** stock **c)** stem **d)** root

128. In Bryophyllum, the vegetative reproduction takes place through the.....

a) Stem **b)** grafting **c)** leaves **d)** root

129. In Angiosperms, free nuclear divisions compulsorily take place during .....

a) endosperm development **b)** embryo development

c) female gametophyte development **d)** male gametophytes development

130. An Angiospermic plant has to produce 88 viable ovules. How many meiotic divisions will be needed to produce equal number of female gametophytes by this plant?

a) 88 **b)** 22 **c)** 44 **d)** 132

131. Secondary nucleus is also known as .....

a) generative nucleus **b)** tube nucleus

c) definitive nucleus **d)** primary endosperm nucleus

132. Albumin is also known as .....

a) Perisperm **b)** synergids **c)** plumule **d)** endodperm

133. The horizontal distribution of trees is studied in .....

a) Scarification **b)** Stratification **c)** Zonation **d)** speciation

134. The ability to produce organic compound in unit time is .....

a) Leaching **b)** Productivity **c)** poaching **d)** conductivity

135. Which harmful radiations are absorbed by ozone layer?

a)UV **b)**X ray **c)**Visible light **d)**Gamma rays

136. In establishing new ecosystem on rock, the pioneers are .....

a) Lichens **b)** phytoplanktons **c)** trees **d)** animals

137. The succession that starts on abandoned cropland is .....

a) Primary succession **b)** Xerach succession

c) Secondary succession **d)** hydrarch succession

138. Gunodeposite are rich in

a) Sulphur **b)** magnesium **c)** phosphorous **d)** calcium

139. Which of the followings is mainly responsible for ozone depletion?

a) Chlorofluorocarbons **b)** Hydrocarbons

c) Carbon monoxide **d)** Carbon dioxide

140. Which of the following is responsible for expression of a trait?

a) Recon **b)** Muton **c)** Cistron **d)** Codon

141. Which of the following is a pyrimidine base?

a) Uracil **b)** Adenine **c)** Guanine **d)** Riboflavin

142. On which strand of DNA, mRNA is constructed?

a) Sense strand **b)** Antisense strand **c)** Both the strands **d)** Any one strand

143. The bonds joining two successive nucleotides of DNA strand are called .....

a) phosphodiester bonds **b)** covalent bonds **c)** hydrogen bonds **d)** glycosidic bonds

144. In which of the following stages, does synthesis of polypeptide take place?

a) Transcription **b)** Translation **c)** Teminism **d)** Replication

145. Unwinding of DNA stands is done by which enzyme?

a) Amylase **b)** Endonuclease **c)** Transcriptase **d)** Helicase

146. Which of the following is a stop codon?

a) AUG **b)** GUG **c)** UAA **d)** GGU

147. Which of the following is the smallest RNA?

a) tRNA **b)** mRNA **c)** rRNA **d)** dsRNA

148. Cloning can be done in vitro, via ……

a) Polymerase Chain Reaction **b)** gel electrophoresis

c) transposons **d)** lambda phage

149. The molecular knives of DNA are ……..

a) ligases **b)** polymerases **c)** endonucleases **d)** transcriptases

150. The first transposons were discovered in …….

a) Corn **b)** wheat **c)** rice **d)** yeast

151. The prebiotic atmosphere of the earth was…….

a) aerobic **b)** anaerobic **c)** partially aerobic **d)** without any gas

152. The sum total of genes present in all individuals of interbreeding or Mendelian population is called….

a) Gene frequency **b)** Gene pool **c)** Gene flow **d)** Gene mutation

153. Which of the following theory states that, the life originated on the earth from non living matter?

a) Theory of Chemical evolution **b)** Physical Theory

c) Mutation Theory **d)** Biognesis

154. The struggle between organisms of different species is called……..

a) Intraspecific struggle **b)** Interspecific struggle

c) Environmental struggle **d)** Struggle against natural calamities

155. India breed of cow is …….

a) Jersey **b)** Gir **c)** Sindhi **d)** Jersey

156. ……. is an exotic breed of cow.

a) Sahiwal **b)** Gir **c)** Sindhi **d)** Jersey

157. The best layer chicken is …….

a) Leghorn **b)** Rhode island Red **c)** Brahma **d)** Kadarnath

158. The lytic enzyme released by the sperm is ……..

a) Acrosome **b)** ligase **c)** androgenase **d)** hyaluronidase

159. Which one of the following is not formed from mesoderm?

a) Blood **b)** Bones and Cartilage **c)** Kidneys **d)**Nervous system

160. Smooth muscles lining the wall of scrotum are called…….

a) deltoid muscles **b)** dartos tunic muscles

c) gluteal muscles **d)** latissimusdoris muscles

161. The role of Leydig cells is ……..

a) nourishment of sperms **b)** to give motility to sperms

c) synthesis of testosterone hormone **d)** to undergo spermatogenesis

162. In human penis, urethra passes through…….

a) Corpus cavernosum **b)** Corpus spongiosum

c) Corpus luteum **d)** Corpus albicans

163. In human being, the type of cleavage is .....

a) holoblastic and equal **b)** meroblastic and equal

c) holoblastic and unequal **d)** meroblastic and unequal

164. Chipcoandolan movement is to protect the

a) flora **b)** fauna **c)** trees **d)** rivers

165. Hot Spots are the examples of .....

a) In situ conservation **b)** Ex situ conservation

c) Wildlife protection **d)** Water conservation

166. The bioaccumulation of pesticides in birds leads to .....

a) weakening of nest **b)** egg shell thinning

c) failure of migration **d)** loss of feather colour

167. .....increases the temperature.

a) H_2 **b)** H_2O **c)** C **d)** CO_2

168. Study of interaction of antigen and antibody in blood is .....

a) Hematology **b)** serology **c)** cryology **d)** antilogy

169. Antigens are found.....

a) Inside cytoplasm **b)** Inside nucleus **c)** On nuclear envelope **d)** on cell surface

170. Nitrogenous waste which is less toxic, soluble in water and formed during ornithine cycle is.....

a) urea **b)** uric acid **c)** ammonia **d)** amino acid

171. Conservation of water is possible in this mode of excretion.....

a) Ureotelism **b)** uricotelism **c)** ammonotelism **d)** guanotelism

172. Retroperitoneal kidney is .....

a) Peritoneum on anterior side **b)** Peritoneum on posterior side

c) Absence of peritoneum **d)** Peritoneum on both anterior and posterior side

173. The part of the cortex continued inside the renal medulla between the pyramid is .....

a) Column of Bellini **b)** Column of Bertini

c) Columnaecarneae **d)** Chordae tendineae

174. Antiserum has .....

a) antigen **b)** antibody **c)** WBC **d)** RBC

175. Following is protozoan disease.....

a) malaria **b)** typhoid **c)** AIDS **d)** cholera

176. In early days, insulin was extracted from .....

a) Liver of pigs **b)** Pancreas of pigs

c) Pancreas of pigs and cattle **d)** Liver of horse

177. Genetically engineered human insulin is obtained by inserting the gene in .....

a) Pancreatic cells **b)** E.coil

c) Agrobacterium tumafaciens **d)** Drosophilla melanogaster

178. in vitro replication of DNA is called …….

a) Polymerization reaction **b)** Polymerase chain reaction

c) DNA fragmentation **d)** Southern blotting

179. Key factor in DNA profiling is …….

a) Sequence of nucleotides **b)** DNA isolation

c) VNTR **d)** RELP

180. Which of the following are called scavengers?

a) Lymphocytes **b)** Thrombocytes **c)** Erythrocytes **d)** Monocytes

181. Plasma protein which initiates blood coagulation is ……..

a) prthrombin **b)** fibrinogen **c)** thrombin **d)** fibrin

182. The covering of the heart is ……

a) perichondrium **b)** pericardium **c)** periosteum **d)** peritoneum

183. Left atrioventricular aperture is guarded by

a) Tricuspid valve **b)** Eustachian valve

c) Bicuspid valve **d)** Semilunar valve

184. If the centromere is situated at the tip of the chromosome it is called ……..

a) metacentric **b)** acrocentric **c)** telocentric **d)** sub metacentric

185. ……. Chromosome appears 'V' shaped during anaphase.

a) Metacentric **b)** Acrocentric **c)** Telocentric **d)** Sub metacentric

186. Sex- linked genes are present on …….

a) homologous region of sex chromosomes **b)** non homologous region of autosomes

c) homologous region of autosomes **d)** non homologous region of X chromosomes

187. Sex determination in human being is ……

a) XY – XX type **b)** XX – XO type **c)** XX – XY type **d)** XO – XX type

188. Colour blindness is a …….. disease.

a) deficiency **b)** X - linked **c)** Y- linked **d)** XY – linked

189. Thermoregulatory centre in the body is ……..

a) hypothalamus **b)** cerebellum **c)** spinal cord **d)** Pituitary

190. Which of the following is a sensory nerve?

a) Vegus **b)** Auditory **c)** Facial **d)** Lumbar

191. Chemical transmission in a synapse is due to ……..

a) cholesterol **b)** ATP **c)** Acetylcholine **d)** cholinesterase

192. Voluntary muscular coordination is under the control of …….

a) medulla **b)** cerebellum **c)** hypothalamus **d)** cerebrum

193. All involuntary activities are under the control of ……

a) Medulla oblongata **b)** cerebellum **c)** cerebral hemisphere **d)** pons varolii

194. Bird flu is caused by …….

a) bacteria **b)** protozoan **c)** fungi **d)** virus

195. Pullorum is a …….disease.

a) viral **b)** bacterial **c)** fungal **d)** parasitic

196. The human Genome Project was initiated by U.S department of .....

a) Agriculture **b)** Energy **c)** Science and Technology **d)** Health

197. Which one of the following is the normal constituent of urine?

a) Blood **b)** Glucose **c)** Protein **d)** Urea

198. Red Data Book is maintained by .....

a) WWF **b)** WHO **c)** IUCN **d)** U.N

199. About 60% of semen is formed by the secretion of .....

a) Cowper's gland **b)** Seminiferous tubule **c)** Prostrate gland **d)** Seminal vesicle

200. Recently, an almost complete lower jaw of a Dryopithecus has been obtained from .....

a) Fayumdeposite of Egypt

b) Cave near Peking in china

c) Neanderthal valley in Germany

d) Haritalyanga in Bilaspur district of Himachal Pradesh

Together, we will make a difference.