

KELVIN

IIT-JEE | PMT (NEET)

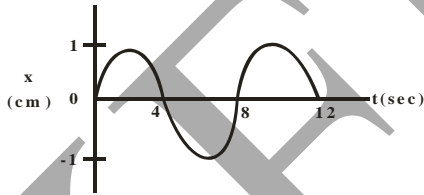
Maximum Marks: 800 (+4, -1)

Test Time: 3 1/2 Hrs.

1. An object initially at rest explodes, disintegrating into 3 parts of equal mass. Parts 1 and 2 have the same initial speed 'v', the velocity vectors being perpendicular to each other. Part 3 will have an initial speed of

- (a) $\sqrt{2}v$ (b) $v/2$
 (c) $\frac{v}{\sqrt{2}}$ (d) $\sqrt{2}v$

2. The x-t graph of a particle undergoing simple harmonic motion is shown in figure. Acceleration of particle at $t = 4/3$ s is



- (a) $\frac{\sqrt{3}}{32}\pi^2 cm/s^2$ (b) $-\frac{\pi^2}{32} cm/s^2$
 (c) $\frac{\pi^2}{32} cm/s^2$ (d) $-\frac{\sqrt{3}}{32}\pi^2 cm/s^2$

3. Two particles are executing SHM in a straight line with same amplitude A and time period T. At time $t = 0$, one particle is at displacement $x_1 = +A$ and the other at $x_2 = -A/2$ and they are approaching towards each other. After what time they cross each other?

- (a) $\frac{T}{3}$ (b) $\frac{T}{4}$
 (c) $\frac{5T}{6}$ (d) $\frac{T}{6}$

4. A particle is placed at rest inside a hollow hemisphere of radius R. The coefficient of friction between the particle and the hemisphere is $\mu = \frac{1}{\sqrt{3}}$. The maximum height up to which the particle can remain stationary is

- (a) $\frac{R}{2}$ (b) $(1 - \frac{\sqrt{3}}{2})R$
 (c) $\frac{\sqrt{3}}{2}R$ (d) $\frac{3R}{8}$

5. A simple pendulum is oscillating with an angular amplitude 90° . If the direction of resultant acceleration of the bob is horizontal at a point where angle made by the string with vertical is

- (a) $\sin^{-1}(\frac{1}{3})$ (b) $\cos^{-1}(\frac{1}{3})$
 (c) $\sin^{-1}(\frac{1}{\sqrt{3}})$ (d) $\cos^{-1}(\frac{1}{\sqrt{3}})$

6. Four identical particles each of mass "m" are arranged at the corners of a square of side length "L". If one of the masses is doubled, the shift in the centre of mass of the system. w.r.t. diagonally opposite mass

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- (a) $\frac{L}{\sqrt{2}}$ (b) $\frac{3\sqrt{2}L}{5}$
 (c) $\frac{L}{4\sqrt{2}}$ (d) $\frac{L}{5\sqrt{2}}$

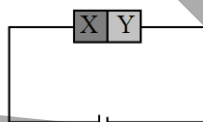
7. A satellite moving in a circular path of radius 'r' around earth have a time period T. If its radius slightly increase by Δr , the change in its time period is

- (a) $\frac{3}{2} \left(\frac{T}{r}\right) \Delta r$ (b) $\left(\frac{T}{r}\right) \Delta r$
 (c) $\frac{3}{2} \left(\frac{T^2}{r^2}\right) \Delta r$ (d) $\frac{3}{2} \left(\frac{T^2}{r}\right) \Delta r$

8. Light of wavelength 6000 Å is incident on a single slit. The first minimum of the diffraction pattern is obtained at 4mm from the centre. The screen is at a distance of 2m from the slit. The slit width will be

- (a) 0.3 mm (b) 0.2 mm
 (c) 0.15 mm (d) 0.1 mm

9. A semiconductor X is made by doing a germanium crystal with arsenic ($Z = 33$). A second semiconductor Y is made it doping germanium with indium ($Z = 49$). The two are joined end to end and connected to a battery as shown. Which is the following statements is correct



- (a) X is P-type, Y is N-type and the junction is forward biased
 (b) X is N-type, Y is P-type and the junction is forward biased

- (c) X is P-type, Y is N-type and the junction is reverse biased
 (d) X is N-type, Y is P-type and the junction is reverse biased

10. A uniform cylindrical rod of mass m and length L is rotating with an angular velocity ω . The axis of rotation is perpendicular to its axis of symmetry and passes through one of its edge. If the room temperature increases by 't' and the coefficient of linear expansion is α , the change in its angular velocity is

- (a) $2\alpha\omega t$ (b) $\alpha\omega t$
 (c) $\frac{3}{2}\alpha\omega t$ (d) $\frac{\alpha\omega t}{2}$

11. Some physical constants are given in List – I and their dimensional formulae are given in List-2. Match the following

List – I

List – II

- | | |
|------------------------------|-------------------------|
| (A) Planck's constant | (e) $[ML^{-1}T^{-2}]$ |
| (B) Gravitational constant | (f) $[ML^{-1}T^{-1}]$ |
| (C) Bulk modulus | (g) $[ML^2T^{-1}]$ |
| (D) Coefficient of Viscosity | (h) $[M^{-1}L^3T^{-2}]$ |

- | A | B | C | D |
|-------|---|---|---|
| (a) g | h | e | f |
| (b) h | e | g | f |
| (c) e | f | h | g |
| (d) f | e | g | h |

12. A car, starting from rest, accelerates at the rate of 'f' through a distance S, then continues at constant speed for time t and then decelerate at the rate (f/2) to come to rest. If the total distance travelled is 15S, then

- (a) $S = ft$ (b) $S = \frac{1}{6}ft^2$

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- (c) $S = \frac{1}{72}ft^2$ (d) $S = \frac{1}{4}ft^2$
13. A projectile is given an initial velocity $(\hat{i} + 2\hat{j})$. The cartesian equation of its path is ($g = 10\text{ms}^{-2}$)
- (a) $y = 2x - 5x^2$ (b) $9y = 12x - 5x^2$
 (c) $y = 9x - 5x^2$ (d) $5y = x - 9x^2$
14. The energy required to shift the body revolving around a planet from r to $2r$ is E (measured from centre of planet). The energy required to shift it from $2r$ to $4r$ is
- (a) E (b) $\frac{E}{2}$
 (c) $\frac{E}{3}$ (d) $\frac{E}{4}$
15. The velocity of a ball of mass 'm' density ' d_1 ' when dropped in a container filled with glycerin of density ' d_2 ' becomes constant after sometimes. The viscous force acting on the ball will be
- (a) $mg \left(\frac{d_1}{d_2}\right)$ (b) $mg \left(1 - \frac{d_2}{d_1}\right)$
 (c) $mg \left(\frac{d_1+d_2}{d_1}\right)$ (d) $mg \left(\frac{d_1+d_2}{d_2}\right)$
16. A uniform pressure 'P' is exerted on all sides of a solid cube at temperature 0°C . In order to bring the volume of the cube to the original volume, the temperature of the cube must be increased by $t^\circ\text{C}$. If α is the linear coefficient and K be the bulk modulus of the material of the cube, then t is equal to
- (a) $\frac{3P}{K\alpha}$ (b) $\frac{P}{2\alpha K}$
 (c) $\frac{P}{3\alpha K}$ (d) $\frac{P}{\alpha K}$
17. An open pipe resonates to a frequency f_1 and a closed pipe resonates to a frequency f_2 . If they are joined together to form a longer tube, then it will resonate to a frequency of (neglect end corrections)
- (a) $\frac{f_1 f_2}{2f_2 + f_1}$ (b) $\frac{f_1 f_2}{f_2 + 2f_1}$
 (c) $\frac{2f_1 f_2}{f_2 + f_1}$ (d) $\frac{f_1 + 2f_2}{f_1 f_2}$
18. In a resonance air column experiment, first and second resonance are obtained at lengths of air columns l_1 and l_2 , the third resonance will be obtained at a length of
- (a) $2l_2 - l_1$ (b) $l_2 - 2l_1$
 (c) $l_2 - l_1$ (d) $3l_2 - l_1$
19. One train is approaching an observer at rest and another is receding him with same velocity 4m/s . Both the trains blow whistles of same frequency of 243 Hz . The beat frequency in Hz as heard by the observer is: (Speed of sound in air = 320 m/s)
- (a) 10 (b) 6
 (c) 4 (d) 1
20. A vessel of volume 4 litres contains a mixture of 8g of O_2 , 14g of N_2 and 22g of CO_2 at 27°C . The pressure exerted by the mixture is
- (a) 10 atmosphere (b) $5 \times 10^6\text{ N/m}^2$
 (c) $7.69 \times 10^5\text{ N/m}^2$ (d) $6 \times 10^5\text{ N/m}^2$
21. Three rods A, B and C have the same dimensions. Their conductivities are K_A , K_B and K_C respectively. A and B are placed end to end, with their free ends kept at certain temperature difference. C is placed separately

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with its ends kept at same temperature difference. The two arrangements conduct heat at the same rate K_c must be equal to

- (a) $K_A + K_B$ (b) $\frac{K_A + K_B}{K_A K_B}$
 (c) $\frac{1}{2}(K_A + K_B)$ (d) $\frac{K_A K_B}{K_A + K_B}$

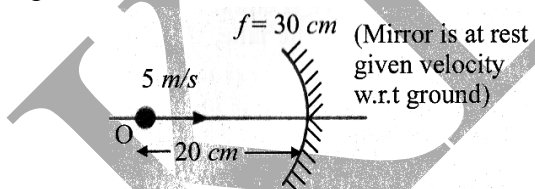
22. According to Bohr's theory of hydrogen atoms, the product of the binding energy of the electron in the n th orbit and its radius in then n the orbit

- (a) is proportional to n^2
 (b) is inversely proportional to n^3
 (c) has a constant value of $10.2\text{eV}\text{-\AA}$
 (d) has constant value $7.2\text{ eV}\text{-\AA}$

23. A radioactive nucleus undergoes a series of decays according to the sequence $A \xrightarrow{\beta} A_1 \xrightarrow{\alpha} A_2 \xrightarrow{\alpha} A_3$. If the mass number and atomic number of A_3 are 172 and 69 respectively, then the mass number and atomic number of A is

- (a) 56, 23 (b) 180, 72
 (c) 120, 52 (d) 84, 38

24. The velocity of image w.r.t ground in the below figure is



- (a) 45 m/s and approaches the mirror
 (b) 45 m/s and moves away from the mirror
 (c) 60 m/s and approaches the mirror
 (d) 60 m/s and moves away from the mirror

25. Three charges $-q$, $+q$ and $-q$ are placed at the corners of an equilateral triangle of side 'a'. The resultant electric force on a charge $+q$ placed at the centroid O of the triangle is

- (a) $\frac{3q^2}{4\pi\epsilon_0 a^2}$ (b) $\frac{q^2}{4\pi\epsilon_0 a^2}$
 (c) $\frac{q^2}{2\pi\epsilon_0 a^2}$ (d) $\frac{3q^2}{2\pi\epsilon_0 a^2}$

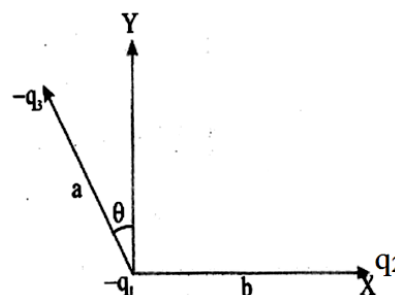
26. If the electric flux entering and leaving an enclosed surface respectively is ϕ_1 and ϕ_2 , the electric charge inside the surface will be

- (a) $(\phi_1 + \phi_2)/\epsilon_0$ (b) $(\phi_1 - \phi_2)/\epsilon_0$
 (c) $(\phi_1 + \phi_2)\epsilon_0$ (d) $(\phi_2 - \phi_1)\epsilon_0$

27. Two condensers of capacity C and $2C$ are connected in parallel and are charged upto V volt. If the battery is removed and dielectric medium of constant K is put between the plates of first condenser, then the potential at each condenser is

- (a) $\frac{V}{k+2}$ (b) $2 + \frac{k}{3V}$
 (c) $\frac{2V}{k+2}$ (d) $\frac{3V}{k+2}$

28. Three charges $-q_1$, $+q_2$ and $-q_3$ are placed as shown in figure. The X-component of the force on $-q_1$ is proportional to

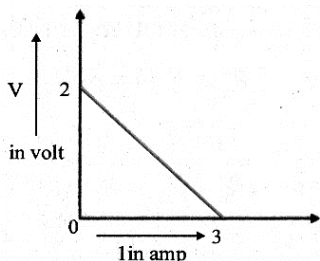


- (a) $\frac{q_2}{b^2} - \frac{q_3}{a^2} \cos \theta$ (b) $\frac{q_2}{b^2} + \frac{q_3}{a^2} \sin \theta$

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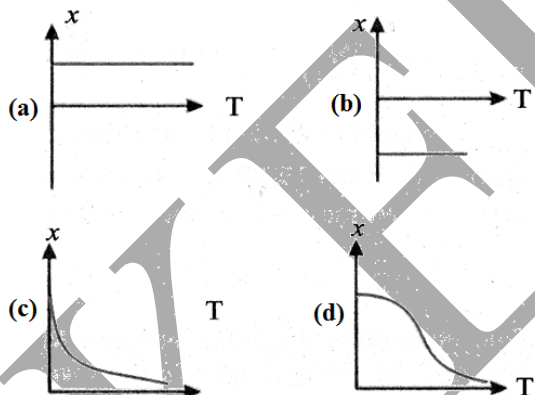
(c) $\frac{q_2}{b^2} + \frac{q_2}{a^2} \cos \theta$ (d) $\frac{q_2}{b^2} - \frac{q_2}{a^2} \sin \theta$

29. For a cell the graph between the p.d(v) across the terminals of the cells and the current (I) drawn from the cell is as shown in figure. The emf and internal resistance is

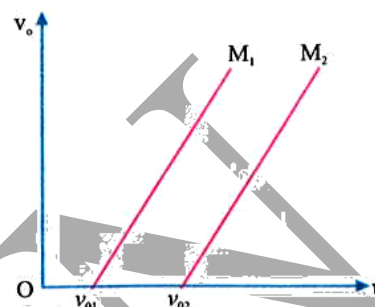


- (a) $\frac{3}{2} \Omega$ (b) $\frac{1}{3} \Omega$
 (c) 3Ω (d) $\frac{2}{3} \Omega$

30. The variation of magnetic susceptibility (χ) with temperature for a diamagnetic substance is best represented by

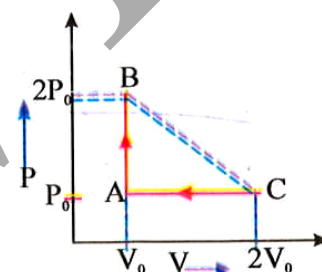


31. Figure shows the variation of the stopping potential (V_0) with the frequency (ν) of the incident radiations for two different photosensitive material M_1 and M_2 . What are the value of work functions for M_1 and M_2 respectively



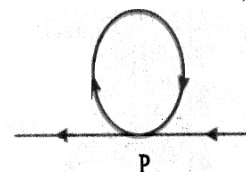
- (a) $h\nu_{01}, h\nu_{02}$ (b) $h\nu_{02}, h\nu_{01}$
 (c) $h\nu_{01}, h\nu_{01}$ (d) $h\nu_{02}, h\nu_{02}$

32. The figure shows P-V graph of an ideal one mole gas undergone to cyclic process ABCA, then the process $B \rightarrow C$ is



- (a) Isobaric (b) Adiabatic
 (c) Isochoric (d) None of these

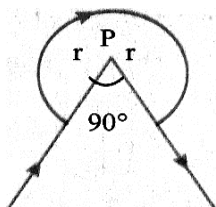
33. The magnetic field at the centre of the coil in the figure shown below is (the wires crossing at a P are insulated from each other)



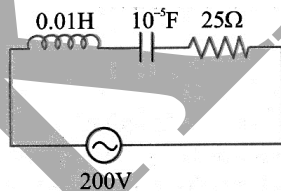
- (a) $\frac{\mu_0 2I}{4\pi r} (1 + \pi)$ (b) $\frac{\mu_0 2I}{4\pi r} (\pi - 1)$
 (c) $\frac{\mu_0 2I}{4\pi r} (\pi^2 + 1)$ (d) $\frac{\mu_0 2\pi I}{4\pi r}$

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34. The wire shown in figure carries a current of 40A. If $r = 3.14$ cm the magnetic field at point p will be



- (a) 1.6×10^{-3} T (b) 3.2×10^{-3} T
 (c) 6×10^{-4} T (d) 4.8×10^{-3} T
35. A magnetic field in a certain region is given by $B = (40\hat{i} - 15\hat{k}) \times 10^{-4} T$. The magnetic flux passes through a loop of area 5.0cm^2 is placed flat on xy plane is
- (a) 750nWb (b) -750nWb
 (c) 360nWb (d) -360nWb
36. The average current of a sinusoidally varying alternating current of peak value 5A with initial phase zero, between the instants $t = T/8$ to $t = T/4$ is (Where 'T' is time period)
- (a) $\frac{10}{\pi} \sqrt{2} A$ (b) $\frac{5}{\pi} \sqrt{2} A$
 (c) $\frac{20\sqrt{2}}{\pi} A$ (d) $\frac{10}{\pi} A$
37. In the following circuit, the values of current flowing in the circuit at $f = 0$ and $f = \infty$ will respectively be



- (a) 8A and 0A (b) 0A and 0A
 (c) 8A and 8A (d) 0A and 8A

38. An infinitely long rod lies along the axis of a concave mirror of focal length 'f'. The near end of the rod is at a distance $u > f$ from the mirror. Its image will have a length.

- (a) $\frac{uf}{u-f}$ (b) $\frac{uf}{u+f}$
 (c) $\frac{f^2}{u+f}$ (d) $\frac{f^2}{u-f}$

39. The angle of minimum deviation measured with a prism is 30° and the angle of prism is 60° . The refractive index of prism material is

- (a) $\sqrt{2}$ (b) 2
 (c) $\frac{3}{2}$ (d) $\frac{4}{3}$

40. The maximum intensity in Young's double slit experiment is I_0 . What will be the intensity of light in front of one of the slits on a screen where path difference is $\frac{\lambda}{4}$?

- (a) $\frac{I_0}{2}$ (b) $\frac{3}{4} I_0$
 (c) I_0 (d) $\frac{I_0}{4}$

Assertion and Reasoning Questions

Options:

- (a) **A and R are correct and R is correct explanation of A**
 (b) **A and R are correct and R is not correct explanation of A**
 (c) **A is true and R is false**
 (d) **A is false and R is true**

41. **A:** A piece of ice floats in water. The level of water remains unchanged when the ice melts completely.

R: According to Archimedes' principle, the loss in weight of the body in the liquid is equal to

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the weight of the liquid displaced by the immersed part of the body.

42. **A:** The phase difference between displacement and velocity in SHM is 90° .

R: The displacement is represented by $y = A \sin \omega t$ and $V = A\omega \cos \omega t$.

43. **A:** According to the principle of conservation of energy total heat can be converted into mechanical work

R: Due to various losses, it is impossible to convert total heat into mechanical work

44. **A:** Woolen clothes keep the body warm in winter

R: Air is a bad conductor of heat

45. **A:** If three capacitors of capacitance $C_1 < C_2 < C_3$ are connected in parallel then their equivalent capacitance $C_p > C_3$

R: $\frac{1}{C_p} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$

46. **A:** The drift velocity of electrons in a metallic wire will decrease, if the temperature of the wire is increased.

R: On increasing temperature, conductivity of metallic wire decreases.

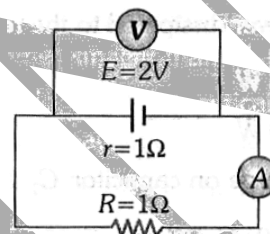
47. **A:** Microwave communication is preferred over optical communication.

R: Microwaves provide large number of channels and band width compared to optical signals.

48. **A:** In the following circuit emf is 2V and internal resistance of the cell is 1Ω and $R = 1\Omega$, then reading of the voltmeter is 1V.

R: $V = E - ir$ where $E = 2V$, $i = \frac{2}{2} 1A$ and $R = 1\Omega$

49. **A:** Cyclotron is a device which is used to accelerate the positive ion.



R: Cyclotron frequency depends upon the velocity.

50. **A:** At a point in space, the electric field points towards north. In the region, surrounding this point the rate of change of potential will be zero along the east and west.

R: Electric field due to a charge is the space around the charge.

51. **A:** The magnetic field produced by a current carrying solenoid is independent of its length and cross-sectional area.

R: The magnetic field inside the solenoid is uniform.

52. **A:** By roughening the surface of a glass sheet its transparency can be reduced.

R: Glass sheet with rough surface absorbs more light.

53. **A:** The quantity $\frac{e^2}{\epsilon_0 ch}$ is dimensionless

R: $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$ has the dimensions of velocity and is numerically equal of velocity of light.

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54. **A:** On a curved path average speed of a particle can never be equal to average velocity.

R: Average speed is total distance travelled divided by total time. Whereas average velocity is, final velocity plus initial velocity divided by two.

55. **A:** When the velocity of projection of a body is made n times, its time of flight becomes n times.

R: Range of projectile does not depend on the initial velocity of a body.

56. **A:** If net force on a rigid body is zero, it is either at rest or moving with a constant linear velocity.

R: Constant velocity means linear acceleration is zero

57. **A:** No work is done by the centripetal force acting on a body moving along the circumference of a circle

R: At any instant, the motion of the body is along the tangent to the circle whereas the centripetal force is along the radius vector towards the centre of the circle.

58. **A:** Escape velocity is independent of the angle of projection.

R: Escape velocity from the surface of earth is $\sqrt{2gR}$ where R is radius of the earth.

59. **A:** The resolving power of a telescope is more if the diameter of the objective lens is more.

R: Objective lens of large diameter collects more light.

60. **A:** Isobars are the element having same mass number but different atomic number.

R: Neutrons and protons are present inside nucleus.

61. Equivalent weight of KMnO_4 in acidic medium is

(a) $\frac{\text{Mol wt}}{7}$ (b) $\frac{\text{Mol wt}}{5}$

(c) $\frac{\text{Mol wt}}{3}$ (d) Mol wt

62. If carbon dioxide is 2% dissociated at equilibrium $2\text{CO}_{2(g)} \rightleftharpoons 2\text{CO}_{(g)} + \text{O}_{(g)}$. The mole fraction of CO_2 at equilibrium is

(a) $\frac{1.01}{0.98}$ (b) $\frac{0.98}{1.01}$

(c) $\frac{0.01}{0.98}$ (d) $\frac{0.098}{0.01}$

63. Benzyl alcohol is obtained from benzaldehyde by

(a) Cannizzaro's reaction

(b) Fitting reaction

(c) Kolbe reaction

(d) Wurtz reaction

64. Which of the following is most reactive towards diazo methane?

(a) $\text{CH}_3 - \text{CH}_2 - \text{COOH}$

(b) $\text{CH}_3 - \text{CH}_2 - \text{OH}$

(c) $\text{C}_6\text{H}_5 - \text{OH}$

(d) CO_2

65. Heat of hydrogenation of ethene is ΔH_1 and for benzene is ΔH_2 . Resonance energy of benzene will be

(a) $\Delta H_1 - \Delta H_2$ (b) $3\Delta H_2 - \Delta H_1$

(c) $3\Delta H_1 / \Delta H_2$ (d) $3\Delta H_1 - \Delta H_2$

66. oxidation number Cr in CrO_5 is


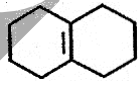
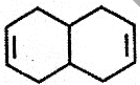
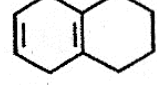
(a) +10

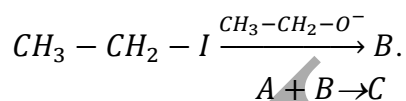
(b) +6

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- (c) +4 (d) -3
67. A sample of compound AB_3 contains 3.0×10^{18} B ions. The number of formula units of this sample are
 (a) 9.0×10^{18} (b) 0.6×10^{18}
 (c) 1×10^{18} (d) 2.0×10^{18}
68. pH of 10^{-10} M NaOH is
 (a) 10 (b) 4
 (c) 7 (d) 8
69. For the cell $Tl/Tl^+(0.001M)/Cu^{2+}(0.1M)/Cu$. E_{cell} at 298 K is 0.83 V which can be increased
 (a) by increasing $[Cu^+]$
 (b) by increasing $[Tl^+]$
 (c) by decreasing the concentration of Cu^{2+} ion
 (d) by decreasing the $[Tl^+]$
70. NiO adopts the rock-salt structure. the coordination number of Ni^{2+} ion is
 (a) 2 (b) 6
 (c) 12 (d) 8
71. A fcc lattice is formed by atoms A and B. if atom A is present at the corner of the cube and the atom B at the face of the cube. The formula of the compound is
 (a) AB (b) AB_3
 (c) AB_2 (d) A_3B
72. The number of spectral line observed in the visible region when an electron return from 6th Bohr's orbit to 2nd Bohr's orbit are
 (a) 10 (b) 4
 (c) 5 (d) None of these
73. If the specific conductivity of N/50 KCl solution at 298 K is $0.003285 \text{ ohm}^{-1} \text{ cm}$ and resistance of a cell containing this solution is 100 ohm. The cell constant of the cell is
 (a) $0.3285 \text{ ohm}^{-1} \text{ cm}^{-1}$ (b) 0.3285 ohm^{-1}
 (c) 0.3285 cm^{-1} (d) 0.03285 cm^{-1}
74. Which is the best reducing agent in water?
 (a) Li (b) Na
 (c) Cs (d) K
75. Which of the following has highest dipole moment?
 (a) CH_4 (b) CH_2Cl_2
 (c) $CH_3 - Cl$ (d) $CHCl_3$
76. Mohr's salt is a solution of
 (a) Solid in liquid (b) Liquid in solid
 (c) Solid in solid (d) Liquid in gas
77. Critical compressibility factor for a gas is
 (a) $\frac{3}{8}$ (b) $\frac{8}{3}$
 (c) more than 3 (d) one
78. Van't Hoff factor for 0.1 M $[CO(NH_3)_5Cl]Cl_2$ is 2.74. The degree of dissociation is
 (a) 90% (b) 87%
 (c) 78% (d) 46%
79. Which of the following series does not end in lead?
 (a) 4n (b) 4n + 1
 (c) 4n + 3 (d) 4n + 2
80. Alums purify muddy water by
 (a) Dialysis (b) Adsorption
 (c) Coagulation (d) None of these
81. Which of the following is an incorrect statement for physisorption?

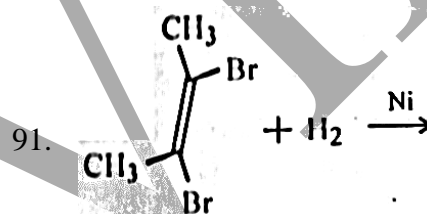
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- (a) It is a reversible process
 (b) It requires less heat of adsorption
 (c) It increasing with increasing pressure
 (d) It requires activation energy
82. Oxidation number of carbon in CH_2Cl_2 is
 (a) -4 (b) +4
 (c) -2 (d) zero
83. Which of the following is the strongest acid?
 (a) HOCl (b) HOClO_2
 (c) HOClO_3 (d) HOClO
84. H_2O_2 oxidises benzene to
 (a) Benzoic acid (b) Phenol
 (c) Oxalic acid (d) Formic acid
85. What is the product when calcium carbide reacts with heavy water?
 (a) CaD_2 (b) C_2D_2
 (c) C_2H_2 (d) CD_2
86. Potassium hydroxide can react with
 (a) Na_2O (b) BaO
 (c) $\text{Ca}(\text{OH})_2$ (d) SO_3
87. Hydrazine reduces Fehling solution to form
 (a) CuO (b) Cu_2O
 (c) Cu (d) $\text{Cu}(\text{OH})_2$
88. An alkene (A) $\text{C}_{10}\text{H}_{16}$ on reaction with H_2 in presence of adam's catalyst gives a saturated hydrocarbon (B) $\text{C}_{10}\text{H}_{18}$. (A) on ozonolysis gives a symmetrical diketone (C). (A) will be
 (a)  (b) 
 (c)  (d) 
89. $\text{CS}_2 + \text{Cl}_2 \rightarrow \text{A} + \text{CCl}_4$

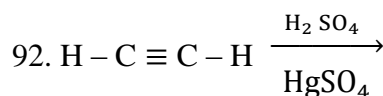


C will be

- (a) Benzene (b) Lewisite
 (c) Mustard gas (d) Methane
90. Terylene is a condensation polymer of ethylene glycol and
 (a) Acetic acid (b) phthalic acid
 (c) Fumaric acid (d) Terephthalic acid

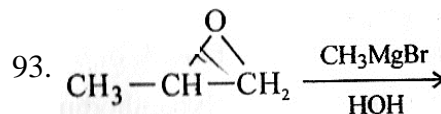


- (a) Racemic -2, 3-dibromo butene
 (b) Meso-2, 3-dibromo butane
 (c) Dextro-2, 3-dibromo butane
 (d) Racemic-2, 3-dibromo butane



'A' will be

- (a) $\text{CH}_2 - \text{CH}_2 - \text{OH}$ (b) $\text{CH}_3 - \text{CH} = \text{O}$
 (c) $\text{CH}_3 - \text{COOH}$ (d) CH_4



- gives which of the following as the major product
 (a) Butanol -1

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- (b) Butanal-1
 (c) Butanal -2
 (d) 2-Methyl propanol-1
94. In tollen's reagent the oxidation number coordinates number and effective atomic number of central metal ion are respectively
 (a) +1, 2, 50 (b) +2, 2, 50
 (c) +2, 1, 40 (d) +1, 1, 50
95. Which of the following represents the uncertainly principle ?
 (a) $E = mc^2$ (b) $\Delta x. \Delta p = \frac{h}{4\pi}$
 (c) $\Delta x. \Delta p = \frac{h}{\pi}$ (d) $\Delta x. 4\pi = h$
96. The name of the blue product of the reaction between ferrous ion and ferricyanide ion is
 (a) Thenard blue (b) Turn bull's blue
 (c) Prussian blue (d) Ultramarine blue
97. Orthoboric acid on dehydration at 373 K gives
 (a) metaboric acid (b) boric anhydride
 (c) boron (d) Pure boric acid
98. Corundum is an ore of
 (a) Copper (b) Boron
 (c) Aluminium (d) Sodium oil
99. Potassium is stored under
 (a) Water (b) Alcohol
 (c) Ammonia (d) Kerosene
100. Which of the following is incorrect?
 (a) Phenol is more acidic than ethanol
 (b) Γ^- is stronger nucleophile than F^-
 (c) CH_4 is more acidic than NH_3
 (d) H_3^+ does not exist

Assertion and Reasoning

In each of the following questions two statements are given one labelled as the Assertion (A) and the other labelled as the Reason (R). Examine these statements carefully and mark the correct choice as per following instructions.

- (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true but R is not a correct explanation of A
 (c) A is true but R is false
 (d) A is false but R is true.
- 101.A: 1 gm O_2 and O_3 have equal number of atoms.
 R: Mass of 1 mole molecules is equal to its gram molecular mass.
102. A: Cannizzaro's reaction is an example of disproportionation reaction.
 R: $CCl_3 - CH = O$ gives Cannizzaro's reaction with concentrated NaOH.
- 103.A: Best Projection for artificial transmutation of elements is neutron
 R: Neutrons are chargeless but heavy particles
- 104.A: The gases which possess low value of critical temperature can be liquefied very easily
 R: Critical temperature is a measure of ease of liquefaction
- 105.A: Lyophilic colloid such as gums, cellulose acid act as a protective colloid.
 R: Protective power of a lyophilic colloid is expressed in terms of gold number.

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106.A: LiOH is a strong base.

R: Li is S-Block element.

107.A: H_3PO_3 is dibasic acid

R: H_3PO_3 is mono reducing acid

108.A: K_c increase with temperature for endothermic reaction.

R: Kinetic energy of gaseous molecules increase with temperature.

109.A: O -atom has less electron affinity than S-atom.

R: Additional electron is repelled more effectively by 3p electrons in S than by 2p electrons in O-atom.

110.A: The value of the vander wall's constant 'a' is higher for $NH_3(g)$ in comparison to $PH_3(g)$.

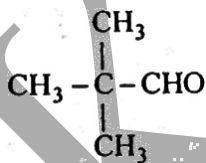
R: Hydrogen bonding is present in ammonia.

111.A: Dehydration of alcohols gives alkene.

R: Alcohol is more acidic than alkenes.

112.A: For endothermic reactions, by rise of temperature, equilibrium shifts in forward direction.

R: For endothermic reaction, K increases by rise of temperature.



113.A: will give cannizzaro's reaction with conc. NaOH.

R: It does not contains α - H atom.

114.A: The bond angle in Cl_2O is lower than that of F_2O


R: O-F bond is more polar than O-Cl bond

115.A: Tertiary alcohol is most acidic in nature among 1°, 2° and 3° alcohols.

R: Tertiary alkyl group exerts higher +I effect.

116.A:  can be more easily dehydrated than

R: Intermediate carbonation obtained from

 is more resonance stabilised than

117.A: At equilibrium neither forward reaction is spontaneous nor backward reaction is spontaneous

R: At equilibrium there is neither a forward shift nor a backward shift

118.A: When a curve is drawn between equivalent conductance and concentration of KCl and CH_3COOH then curve for KCl lies above the curve for CH_3COOH

R: KCl is a strong electrolyte therefore its equivalent conductance is more than that of CH_3COOH

119.A: Rearrangement of carbonation can lead to a change in ring size

R: A relief in ring strain occurs

120.A: Ice on hill side road is melted by spraying salt.

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- R: Addition of salt to ice elevates its melting point.
121. Which one of the following belong to the same category?
- Cashewnut, coconut and chestnut
 - Coconut, orange and tomato
 - Betelnut chestnut and coconut
 - Mango, almond and coconut
122. The conservation of reduced species "The need of time" at lower temperature called
- Cryopreservation
 - Chemical preservation
 - Cryoprotection
 - Cooling
123. Which one cycle is directly driven by solar radiations?
- phosphorus
 - Carbon
 - Water
 - Nitrogen
124. Carrying capacity of a population is determined by its:
- Population growth rate
 - Birth rate
 - Death rate
 - Limiting resource
125. Ovule is inverted with body fused to funicle micropyle lying close to hilum and facing the placenta it is:
- hemitropous
 - Orthotropous
 - anatropous
 - campylotropous
126. During elongation of polypeptide chain the sigma factor:
- Is released to take part again
 - Is retained and performs special function
 - Its function is not known
 - Is used during the closing of chain
127. Operon unit consists of:
- Regulator, operator and repressive gene
 - Regulator, structural and operator gene
 - Regulator, structural, operator and promoter gene
 - Regulator, structural and promoter gene
128. Succession is:
- Gradual convergent directional and continuous process
 - Series of biotic communities that appear gradually in a barren area
 - Orderly process of community change till stability
 - All of the above
129. Site of formation of ribosomal precursor or ribosomal subunits in cell is:
- Nucleus
 - Nucleolus
 - Nucleus body
 - stroma
130. The Leghaemoglobin which imparts pink – red colour to the root nodules is located in:
- The wall of bacteria
 - The wall of host cell
 - The cytoplasm of host cell
 - In between bacteria and surrounding
131. Which type of forests are found near equator?
- Deciduous
 - Tropical
 - Coniferous
 - Grasslands
132. A Test cross distinguished between:
- Two homozygous forms

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- (b) Homozygous dominant and heterozygous form
 (c) A homozygous recessive and heterozygous form
 (d) Two heterozygous form
133. Besides giving out vesicles Golgi bodies are concerned with:
 (a) Plastids (b) Lysosomes
 (c) grana (d) Cell plate
134. The principle agent of alcoholic fermentation and bread making is:
 (a) *Schizosaccharomyces octosporus*
 (b) *Saccharomyces cerevisiae*
 (c) *Saccharomyces ellipsideus*
 (d) None of the above
135. Artificial application of auxins like IAA, IBA and NAA to unpollinated pistils can from:
 (a) Fruits with much flash
 (b) Larger fruits
 (c) Sweet fruits
 (d) Seed less fruits
136. The basic unit of classification is:
 (a) species (b) taxon
 (c) category (d) sub - species
137. Which type of respiration probably arose first?
 (a) Aerobic as it releases more energy
 (b) Anaerobic as it releases more energy
 (c) Aerobic as it is more complex
 (d) Anaerobic as early atmosphere contained little or no oxygen
138. *Beggiatoa* oxidises:
 (a) H_2S

- (b) S to SO_4
 (c) Both (a) and (b)
 (d) Fe^{++} to Fe^{+++}
139. A pathogen which cannot be cultured on artificial medium is:
 (a) Bacterium (b) Protozoans
 (c) virus (d) fungus
140. Match column I with column II and choose the correct option from below.

Column I		Column II	
A.	Marginal Placentation	I.	Sunflower
B.	Axile Placentation	II.	Mustard
C.	Parietal Placentation	III.	Lemon
D.	Basal Placentation	IV.	Pea

- (a) A – IV, B – III, C – II, D – I
 (b) A – IV, B – III, C – I, D – II
 (c) A – IV, B – I, C – II, D – III.
 (d) A - III, B – IV, C – II, D – I

Directions: *These questions consist of two statements each printed as Assertion and Reason. While answering this question you are required to choose any one of the following responses.*

- A.** If both assertion and reason are true and reason is the correct explanation of assertion.
B. If both assertion and reason are true but reason is not the correct explanation of assertion
C. If assertion is true but reason is false.

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D. If both assertion and reason are false.

141. Assertion: The food web is very important in maintaining the stability of an ecosystem in nature.

Reason: The decrease in population of rabbit would naturally cause an increase in population of alternative herbivores *e.g.*, Mouse.

- (a) A (b) B
(c) C (d) D

142. Assertion: Stile roots are common in sugarcane

Reason: in sugarcane these roots are stout which grow straight from lower internodes.

- (a) A (b) B
(c) C (d) D

143. Assertion: In alcoholic drink the alcohol is converted into glucose in liver.

Reason: Liver cells are able to produce glucose form alcohol by fermentation.

- (a) A (b) B
(c) C (d) D

144. Assertion: Bacteria do not produce diploid zygotes inspite of their capacity to show sexuality.

Reason: Bacterial Possess plasmids.

- (a) A (b) B
(c) C (d) D

145. Assertion: Gibberellic acid when added to isolated aleurone layer induces Alfa amylase activity. It act at gene level.

Reason: GA may act at the gene level or just activation the inactive enzyme or interact to remove enzyme inhibitor.

- (a) A (b) B
(c) C (d) D

146. Assertion: DNA is associated with proteins.

Reason: DNA winds around histone proteins that form a pool and the entire structure is called a Nucleosome.

- (a) A (b) B
(c) C (d) D

147. Assertion: Prokaryotic cells do not contain repressor protein

Reason: The do not function as genetic valves by combining with specific genes to turn off their activity

- (a) A (b) B
(c) C (d) D

148. Assertion: Phytoplanktons are the chief producer of ocean.

Reason: Being microscopic they have larger photosynthetic.

- (a) A (b) B
(c) C (d) D

149. Assertion: Quinine is obtained from the bark of *Cinchona*.

Reason: Roots of *Cinchona* do not contain alkaloids.

- (a) A (b) B
(c) C (d) D

150. Assertion: Wax, resin sobering coating on the surface of plant parts reduce the rate of transpiration.

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- Reason: These adaptations are mostly found in xerophytes.
- (a) A (b) B
(c) C (d) D
151. A student wishes to study the cell structure under $45\times$ objective. He should illuminate the object by which one of the following colours of light so as to get the best possible resolution?
(a) Blue (b) Green
(c) Red (d) Yellow.
152. At a particular locus. Frequency of A allele is 0.6 and that of a is 0.4. what would be the frequency of heterozygotes in a random mating population at equilibrium?
(a) 0.36 (b) 0.16
(c) 0.24 (d) 0.48
153. The main organelle involved modification and routing of newly synthesised proteins to their destination is
(a) Chloroplast
(b) Endoplasmic reticulum
(c) Mitochondria
(d) Lysosome.
154. Chlorophyll in chloroplast is located in
(a) Grana
(b) Pyrenoid
(c) Stroma
(d) Both grana and stroma.
155. Which one of the following statement regarding enzyme inhibition is correct?
(a) Competitive inhibition is seen when the substrate and the inhibitor compete for the active site on the enzyme
(b) Competitive inhibition is seen when a substrate competes with enzyme for binding to an inhibitor protein
(c) Noncompetitive inhibition of an enzyme can be overcome by adding large amount of substrate.
(d) Noncompetitive inhibitors often bind to the enzyme irreversibly.
156. An important step in the manufacture of pulp of paper industry from the woody tissues of the plants is the
(a) Preparation of pure cellulose by removing lignin
(b) Treatment of wood with chemicals that break down cellulose
(c) Removal of oils present in the wood by treatment with suitable chemicals
(d) Removal of water from the wood by prolonged heating at approximately 50°C .
157. Which of the following is relatively most accurate method for dating of fossils?
(a) Radio – carbon method
(b) Potassium – argon method
(c) Electron spin resonance method
(d) Uranium – lead method.
158. In contrast to annelids the platyhelminthes show
(a) Absence of body cavity
(b) Bilateral symmetry
(c) Radial symmetry
(d) Presence of pseudocoel.
159. Which of the following is the simplest amino acid?
(a) Alanine (b) Asparagine
(c) Glycine (d) Tyrosine.
160. At which stage of the cell cycle are histone proteins synthesised in a eukaryotic cell ?
(a) During G_2 stage of interphase
(b) During S – Phase
(c) During entire prophase

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- (d) During telophase.
161. Production of human protein in bacteria by genetic engineering is possible because
- The human chromosome can replicate in bacterial in human and bacteria
 - The mechanism of gene regulation is identical in humans and bacteria
 - Bacterial cell can carry out the RNA splicing reactions
 - The genetic code is universal.
162. Which one of the following experiments suggests that simplest living organisms could not have originated spontaneously from nonliving matter?
- Larvae could appear in stored meat.
 - Microbes did not appear in stored mat
 - Microbes appeared in unsterilized organic matter
 - Meat was not spoiled, when heated and kept sealed in a vessel.
163. Which one of the following characters is not typical of the class mammalia?
- Thecodont dentition
 - Alveolar lungs
 - Ten pairs of cranial nerves.
 - Seven cervical vertebrae.
164. Which group of three of the following five statements (*i* – *v*) contain all three correct statement regarding beri – beri?
- A crippling disease prevalent among the native population of Sub – Saharan Africa
 - A deficiency disease caused by lack of thiamine (Vit B₁).
 - A nutritional disorder in infants and young children when the diet is persistingly deficient in essential protein
- Occurs in those countries where the staple diet is polished rice
 - The symptoms are pain from neuritis, paralysis, muscle wasting, progressive oedema, mental deterioration and finally heart failure
- ii, iv, v*
 - i, ii, iv*
 - i, iii, v*
 - ii, iii, v.*
165. A patient is generally advised to specially consume more meat, lentils, milk and eggs in diet only when he suffers from
- Scurvy
 - Kwashiorkor
 - Rickets
 - Anaemia.
166. Which of the following pairs is correctly matched?
- Hinge joint – Between vertebrae
 - Gliding joint – Between zygapophyses of the successive vertebrae
 - Cartilaginous joint – Skull bones
 - Fibrous joint – Between phalanges.
167. Parkinson's disease (characterized by tremors and progressive rigidity of limbs) is caused by degeneration of brain neurons that are involved in movement control and make use of neurotransmitter
- Acetylcholine
 - Norepinephrine
 - Dopamine
 - GABA.
168. AIDS is caused by HIV that principal infect
- All lymphocytes
 - Activator B – cells
 - Cytotoxic T – cells
 - T₄ lymphocytes.
169. From the following statements select the wrong one
- Prawn has two pairs of antennae
 - Millepedes have two pairs of appendages in each segment of the body
 - Nematocysts are characteristic of phylum

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Cnidaria

- (d) Animals belonging to phylum porifera are exclusively marine.

170. The world's highly prized wool yielding "Pashmina" breed is

- (a) Goat
(b) Sheep
(c) Goat – sheep cross
(d) Kashmir sheep – Afgan sheep cross.

Given below are assertion and reason. Point out if both are true with reason being correct explanation (A), both true but reason is not correct explanation (B), assertion true but reason is wrong (C), and both are wrong (D).

171. Assertion. In recombinant DNA technology human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryote).

Reason. Both bacteria and yeast multiply very fast to form huge populations which express the desired gene.

- (a) (b)
(c) (d)

172. Assertion. Comparative biochemistry provides a strong evidence in favour of common ancestry of living beings.

Reason. Genetic code is universal.

- (a) (b)
(c) (d)

173. Assertion. Human ancestors never used their tails and so the tail expression gene has disappeared in them.

Reason. Lamarck theory of evolution is popularly called theory of continuity of germplasm.

- (a) (b)
(c) (d)

174. Assertion. *Agrobacterium tumefaciens* is popular in genetic engineering because this bacterium is associated with roots of all cereals and pulse crops.

Reason. Agene incorporated in the bacterial chromosomal genome gets automatically transferred to the crop with which the bacterium is associated.

- (a) (b)
(c) (d)

175. Assertion. Darwin's finches show a variety of beaks suited for eating large seeds, flying insects and cactus seeds.

Reason. Ancestral seed eating stock of Darwin's finches radiated out from south American mainland to different geographical areas of Galapagos islands, where they found competitor free new habitats.

- (a) (b)
(c) (d)

176. Assertion. The duck billed platypus and the spiny anteater, both are egg laying animals yet they are grouped under mammals.

Reason. Both of them have seven cervical vertebrae and 12 pairs of cranial nerves.

- (a) (b)
(c) (d)

177. Assertion. Interferons are a type of antibodies produced by body cells infected by bacteria.

Reason. Interferons stimulate inflammation at the site of injury.

- (a) (b)
(c) (d)

178. Assertion. Organ transplanation patients are given immunosuppressive drugs.

Reason. Transplanted tissue immune response of the recipient

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- (a) (b)
(c) (d)
179. Assertion. Mitochondria and chloroplasts are semiautonomous organelles.
Reason. They are formed by division of preexisting organelles as well as contain DNA but lack protein synthesising machinery.
(a) (b)
(c) (d)
180. Assertion. Senescence is the time, when age associated defects are manifested.
Reason. Certain genes may be undergoing sequential switching on the off during one's life.
(a) (b)
(c) (d)
181. India's famous Peacock Throne and the diamond Kohinoor were taken away by
(a) Ahmad Shah Abdali
(b) Mohammad Ghori
(c) Nadir Shah
(d) Robert Clive
182. The most literate union territory in India is
(a) Delhi (b) Lakshdweep
(c) Chandigarh (d) Pondichery
183. What is the fixed strength of Rajya Sabha ?
(a) 210 (b) 220
(c) 230 (d) 250
184. 'Mahatma Gandhi' returned to India leaving South Africa forever in
(a) 1915 (b) 1919
(c) 1914 (d) 1916
185. How many languages are there in the Eight Schedule of the Constitution of India ?
(a) 22 (b) 16
- (c) 18 (d) 20
186. CDMA stands for
(a) Code Division Multiple Access
(b) Code Divide Multiple Access
(c) Code Division Multiple Area
(d) Code Division Modify Access
187. With which game does Davis cup is associated ?
(a) Hockey (b) Table Tennis
(c) Lawn Tennis (d) Polo
188. How many languages feature on the language panel of contemporary Reserve Bank of India currency notes ?
(a) 12 (b) 15
(c) 13 (d) 11
189. 2018 FIFA World Cup would be held in
(a) Russia (b) Qatar
(c) France (d) Netherlands
190. On which day is annual 'Pravasi Bharatiya Divas' celebrated to commemorate the day when Mahatma Gandhi returned from South Africa in 1915 ?
(a) Jan 7 (b) Jan 8
(c) Jan 9 (d) Jan 10
191. Who is known as 'Little Corporal' ?
(a) Adolf Hitler
(b) Napoleon Bonaparte
(c) William E. Cladstone
(d) None of the above
192. The one rupee note bears the signature of
(a) Secretary, Ministry of Finance
(b) Governor, Reserve Bank of India
(c) Finance Minister

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- (d) None of the above
193. How many articles and schedule are there in originally constitution ?
 (a) 391 articles and 7 schedules
 (b) 395 articles and 8 schedules
 (c) 400 articles and 10 schedules
 (d) 444 articles and 12 schedules
194. In Internet what does 'http' mean ?
 (a) High Transfer Text Protocol
 (b) Highest Transfer Text Protocol
 (c) Hyper Text Transfer Protocol
 (d) Hyper Transfer Text Protocol
195. Who was the last Viceroy of India ?
 (a) Lord David (b) Lord Wavell
 (c) Lord Mountbatten (d) Wellington
196. From where did Mahatma Gandhi start the famous Dandi March ?
 (a) Surat (b) Mumbai
 (c) Bardoli (d) Ahmedabad
197. The oath of office to a Supreme Court judge is administered by :
 (a) The Chief Justice
 (b) The President of India
 (c) The Chief Justice of India
 (d) The Law minister
198. Currency note bears the signature of the :
 (a) Finance Minister
 (b) Governor, Reserve Bank of India
 (c) Cabinet Secretary
 (d) President
199. Who discovered the sea route to India ?
 (a) Vasco de Gama (b) Columbus
 (c) Magellan (d) Hopkins
200. July 11 is celebrated as :
 (a) Doctor's Day
 (b) Van Mahotsava Day
 (c) AIDS Day
 (d) World Population Day

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