

# AIIMS - 1999

## Full Paper

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### Physics

1. Sky appears to be blue in clear atmosphere due to light's :
  - 1) scattering
  - 2) polarization
  - 3) diffraction
  - 4) dispersion
2. The number of electrons for one coulomb of charge are :
  - 1)  $6.25 \times 10^{24}$
  - 2)  $6.25 \times 10^{22}$
  - 3)  $6.25 \times 10^{18}$
  - 4)  $6.25 \times 10^{20}$
3. The dimensional formula of the constant  $a$  in van der Waal's gas equation  $(P + (a/V^2))(V - b) = RT$  is :
  - 1)  $[ML^4T^{-1}]$
  - 2)  $[ML^3T^{-2}]$
  - 3)  $[ML^5T^{-2}]$
  - 4)  $[ML^5T^{-2}]$
4. The angle between  $\vec{P} + \vec{Q}$  and  $\vec{P} - \vec{Q}$  will be :
  - 1)  $90^\circ$  only
  - 2) between  $0^\circ$  and  $180^\circ$
  - 3)  $180^\circ$  only
  - 4) none of the above
5. A horizontal platform with an object placed on it is executing simple harmonic motion in the vertical direction. The amplitude of oscillation is  $3.92 \times 10^{-3}$  m. What should be the least period of these oscillations, so that the object is not detached from the platform ?
  - 1) 0.1256 s
  - 2) 1.256 s
  - 3) 125.6 s
  - 4) 1256 s

6. Energy is not carried by which of the following wave ?

- 1) Progressive
- 2) Electromagnetic
- 3) Transverse
- 4) Stationary

7. Which one of the following affects the elasticity of a substance ?

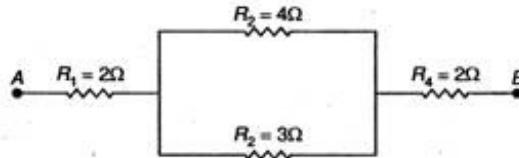
- 1) Change in temperature
- 2) Hammering and annealing
- 3) Impurity in substance
- 4) All of the above

8. In arrangement given in figure, if the block of mass  $m$  is displaced, the frequency is given by :



- 1)  $n = (1/2\pi) \sqrt{((k_1 + k_2)/m)}$
- 2)  $n = (1/2\pi) \sqrt{(m/(k_1 + k_2))}$
- 3)  $n = (1/2\pi) \sqrt{(m/(k_1 - k_2))}$
- 4)  $n = (1/2\pi) \sqrt{((k_1 - k_2)/m)}$

9. In the given figure, the equivalent resistance between two points A and B will be :



- 1) 12 Ω
- 2) 10 Ω
- 3) 8 Ω
- 4) 6 Ω

10. Interference occurs in which of the following waves ?

- 1) Transverse
- 2) Electromagnetic
- 3) Longitudinal
- 4) All of these

11. If a cyclist moving with a speed of 4.9 m/s on levelled road can take a sharp circular turn of radius 4 m, then the coefficient of friction between cycle tyre and road will be :

- 1) 0.91
- 2) 0.71

- 3) 0.65  
4) 0.61
12. The average kinetic energy of a gas molecule at  $27^{\circ}\text{C}$  is  $6.21 \times 10^{-21}$  J, then its average kinetic energy at  $227^{\circ}\text{C}$  is :
- 1)  $10.35 \times 10^{-21}$  J  
2)  $12.35 \times 10^{-21}$  J  
3)  $14.2 \times 10^{-21}$  J  
4)  $16.2 \times 10^{-21}$  J
13. Which one of the following statement is not correct for a particle executing SHM ?
- 1) Acceleration of the particle is maximum at the mean position  
2) Restoring force is always directed towards a fixed point  
3) Total energy of the particle always remains the same  
4) Restoring force is maximum at the extreme position
14. A spring is vibrating with frequency under same mass. If it is cut into two equal pieces and same mass is suspended then the new frequency will be :
- 1)  $n\sqrt{2}$                       2)  $n/\sqrt{2}$                       3)  $n/2$                       4)  $n$
15. A resonance in air column of length 40 cm resonates with a tuning fork of frequency 450 Hz. Ignoring end correction, the velocity of sound in air is :
- 1) 1024 m/s  
2) 720 m/s  
3) 624 m/s  
4) 824 m/s
16. SONAR emits which of the following waves ?
- 1) Ultra sonic waves  
2) Radio waves  
3) Electromagnetic waves  
4) Light waves
17. A 50 turn circular coil has a radius of 3 cm, it is kept in a magnetic field acting normal to the area of the coil. The magnetic field B is increased from 0.10 T to 0.35 T in 2 ms, the average induced emf will be :
- 1) 170 V  
2) 1.70 V  
3) 0.17 V  
4) 17.7 V
18. The moment of inertia of a regular circular disc of mass 0.4 kg and radius 100 cm about

an axis perpendicular to the plane of the disc and passing through its centre is :

- 1)  $0.2 \text{ kg-m}^2$
- 2)  $0.025 \text{ kg-m}^2$
- 3)  $0.002 \text{ kg-m}^2$
- 4)  $20 \text{ kg-m}^2$

19. A particle of mass  $m$  moving with velocity  $v$  collides with a stationary particle of mass  $2m$ . Then, the speed of the system after collision is :

- 1)  $2v$
- 2)  $v/2$
- 3)  $3v$
- 4)  $v/3$

20. Escape velocity of a body when projected from the earth's surface is  $11.2 \text{ km/s}$ . If it is projected at an angle of  $50^\circ$  from the horizontal, then escape velocity is :

- 1)  $15.8 \text{ km/s}$
- 2)  $7.82 \text{ km/s}$
- 3)  $11.2 \text{ km/s}$
- 4)  $22.4 \text{ km/s}$

21. A charged particle enters a magnetic field  $H$  with its initial velocity making an angle of  $45^\circ$  with  $H$ . Then, the path of the particle will be :

- 1) circle
- 2) helical
- 3) a straight line
- 4) a circle

22. A magnet  $10 \text{ cm}$  long and having a pole strength  $2 \text{ Am}$  is deflected through  $30^\circ$  from the magnetic meridian. The horizontal component of earth's induction is  $0.32 \times 10^{-4} \text{ T}$  then the value of deflecting couple is :

- 1)  $32 \times 10^{-7} \text{ Nm}$
- 2)  $12 \times 10^{-7} \text{ Nm}$
- 3)  $24 \times 10^{-7} \text{ Nm}$
- 4)  $36 \times 10^{-7} \text{ Nm}$

23. A  $1 \text{ kg}$  particle strikes a wall with velocity  $1 \text{ m/s}$  at an angle  $30^\circ$  and reflects at the same wall in  $0.1 \text{ s}$ , then the force will be :

- 1)  $20\sqrt{3} \text{ N}$
- 2) Zero
- 3)  $50\sqrt{3} \text{ N}$
- 4)  $10\sqrt{3} \text{ N}$

24. Diode is used as a/an :

- 1) modulator
- 2) rectifier

- 3) oscillator  
4) amplifier
25. Two identical conductors of copper and aluminium are placed in an identical electric field. What is the magnitude of induced charge in the aluminium ?
- 1) Less than that in copper
  - 2) Equal to that in copper
  - 3) Greater than that in copper
  - 4) Zero
26. The activity of a radioactive sample is 1.6 curie and its half-life is 2.5 days. Then, activity after 10 days will be :
- 1) 0.2 curie
  - 2) 0.4 curie
  - 3) 0.1 curie
  - 4) 0.25 curie
27. A particle is thrown vertically upwards velocity at half of the height is 10 m/s, then the maximum height attained by it will be :  
( $g = 10\text{m/s}^2$ )
- 1) 10 m
  - 2) 30 m
  - 3) 60 m
  - 4) 70 m
28. In an adiabatic process the quantity which remains constant is :
- 1) total heat of system
  - 2) temperature
  - 3) volume
  - 4) pressure
29. In  $n$ -type semiconductor, majority charge carriers are :
- 1) electrons
  - 2) neutrons
  - 3) holes
  - 4) protons
30. Two bodies of masses  $m$  and  $4m$  are moving with equal kinetic energy. Then, the ratio of their linear momentum will be :
- 1) 1 : 1
  - 2) 2 : 1
  - 3) 4 : 1
  - 4) 1 : 2
31. A particle executes simple harmonic motion with an angular velocity of 3.5 rad/s and

maximum acceleration  $7.5 \text{ m/s}^2$ . The amplitude of oscillation will be :

- 1) 0.52 cm
- 2) 0.64 cm
- 3) 0.61 cm
- 4) 0.84 cm

32. Frequency of infrared wave is approximately :

- 1)  $10^{16} \text{ Hz}$
- 2)  $10^{14} \text{ Hz}$
- 3)  $10^{12} \text{ Hz}$
- 4)  $10^{20} \text{ Hz}$

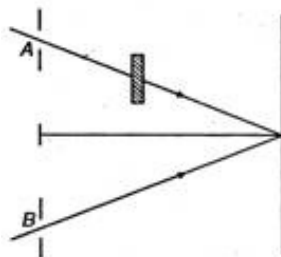
33. An ideal gas at  $27^\circ\text{C}$  is compressed adiabatically to  $(8/27)$  its original volume [ $TV^\gamma = \text{constant}$ ] and  $\gamma = (5/3)$ , then the rise in temperature will be :

- 1)  $\propto (1/n^2)$
- 2)  $r \propto n$
- 3)  $r \propto (1/n)$
- 4)  $r \propto n^2$

46. If the vibrations of a string are to be increased by a factor of two, then tension in the string should be made :

- 1) twice
- 2) four times
- 3) eight times
- 4) half

47. In Young's experiment the monochromatic light is used to illuminate two slits A and B as shown in figure. Interference fringes are observed on a screen placed in front of the slits. Now a thin glass plate is placed normally in the path of beam coming from the slit A, then :



- 1) there will be no change in fringe width
- 2) fringe width will decrease
- 3) fringe width will increase
- 4) fringes will disappear

48. When a solid is converted into a gas, directly by heating then this process is known as :

- 1) sublimation
- 2) vaporization
- 3) condensation
- 4) boiling

49. A triode valve has an amplification factor of 20 and its plate is given a potential of 300 V. The grid voltage to reduce the plate current to zero, is :
- 1) 12 V
  - 2) 15 V
  - 3) 18 V
  - 4) 21 V

50. Boolean algebra is essentially based on :
- 1) numbers
  - 2) symbol
  - 3) logic
  - 4) truth

These questions consist of two statements each as assertion and reason. While answering these questions you are required to choose any one of the five 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.
- D. If both the assertion and reason are false.
- E. If reason is true but assertion is false.

51. **Assertion** : Electron move from a region of lower potential to a region of higher potential.  
**Reason** : An electron has a negative charge.
- 1) A
  - 2) B
  - 3) C
  - 4) D
  - 5) E

52. **Assertion** : Fahrenheit is the smallest unit measuring temperature.  
**Reason** : Fahrenheit was the first temperature scale used for measuring temperature.
- 1) A
  - 2) B
  - 3) C
  - 4) D
  - 5) E

53. **Assertion** : In simple harmonic motion, the velocity is maximum when the acceleration is minimum.  
**Reason** : Displacement and velocity of SHM differ in phase by  $(\pi/2)$ .
- 1) A
  - 2) B

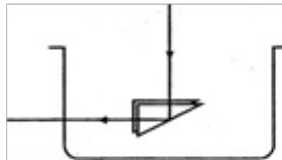
- 3) C
- 4) D
- 5) E

54. **Assertion** : Bodies radiate heat at all temperatures.

**Reason** : Rate of radiation of heat is proportional to the fourth power of absolute temperature.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

55. **Assertion** : The maximum refractive index of liquid for total internal reflection of the ray passing through the prism as shown in figure must be  $\sqrt{2}$ .



**Reason** : Here, critical angle is  $45^\circ$ .

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

56. **Assertion** : A double convex lens ( $\mu = 1.5$ ) has focal length 10 cm. When the lens is immersed in water ( $\mu = 4/3$ ) its focal length becomes 40 cm.

**Reason** :  $(1/f) = ((\mu_g - \mu_a)/\mu_a) ((1/R_1) - (1/R_2))$ .

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

57. **Assertion** : On a rainy day it is difficult to drive a car or bus at high speed.

**Reason** : The value of coefficient of friction is lowered due to wetting of the surface.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E



58. **Assertion** : The specific charge of positive rays is not constant.

**Reason** : The mass of ions varies with speed.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

59. **Assertion** : Separation of isotope is possible because of the difference in electron numbers of isotope.

**Reason** : Isotope of an element can be separated by using a mass spectrometer.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

60. **Assertion** : Kinetic energy of photo electrons emitted by a photosensitive surface depends upon the intensity of incident photon.

**Reason** : The ejection of electrons from metallic surface is possible with frequency of incident photon below the threshold frequency.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

### Chemistry

61. Oxidation number of Os in  $\text{OsO}_4$  :

- 1) + 2
- 2) + 4
- 3) + 8
- 4) + 6

62. The normality of solution obtained by mixing 10 mL of N/5 HCl and 30 mL of N/10 HCl is :

- 1) (N/10)
- 2) (N/12)
- 3) (N/7.5)
- 4) (N/8)

63. The pH of a solution having the  $\text{H}^+$  ion concentration of  $1 \times 10^{-4}$  g ions/L is :

- 1) 2
- 2) 3
- 3) 4
- 4) 5

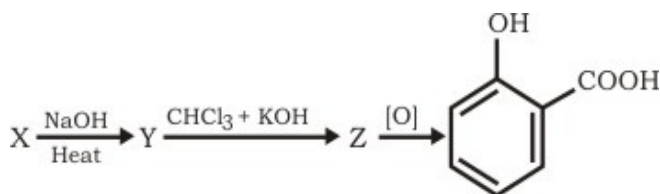
64. Which produce ketone on treatment with Grignard reagent ?

- 1) Methyl cyanide
- 2) Acetaldehyde
- 3) Methyl alcohol
- 4) Acetic acid

65. Iodide of Million's base is :

- 1)  $\text{HIO}_3$
- 2)  $\text{K}_2\text{HgI}_4$
- 3)  $\text{NH}_2\text{HgO} \cdot \text{HgI}$
- 4)  $\text{Hg}(\text{NH}_2)\text{I}$

66.



in the above reaction Z, is :

- 1) phenol
- 2) benzoic acid
- 3) salicylaldehyde
- 4) carbolic acid

67. The process of decomposition of organic compound by the application of heat is :

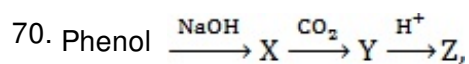
- 1) pyrolysis
- 2) evaporation
- 3) sublimation
- 4) condensation

68. The energy of electron in first energy level is  $-21.79 \times 10^{-12}$  erg per atom. The energy of electron in second energy level is :

- 1)  $-64.47 \times 10^{-12}$  erg atom<sup>-1</sup>
- 2)  $-5.447 \times 10^{-12}$  erg atom<sup>-1</sup>
- 3)  $-0.6447 \times 10^{-12}$  erg atom<sup>-1</sup>
- 4)  $-0.06447 \times 10^{-12}$  erg atom<sup>-1</sup>

69. The monomer of teflon is :

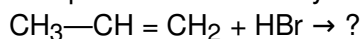
- 1) monofluoroethene
- 2) difluoroethene
- 3) trifluoroethene
- 4) tetrafluoroethene



Z is identified as :

- 1) benzoic acid
- 2) benzaldehyde
- 3) sodium benzoate
- 4) salicylic acid

71. The product obtained by treating :



- 1)  $\text{CH}_3\text{—CH}_2\text{—CH}_2\text{Br}$
- 2)  $\text{CH}_3\text{—CH(Br)—CH}_3$
- 3)  $\text{CH}_2\text{BrCH}_2=\text{CH}_2$
- 4)  $\text{CH}_3\text{—CH}=\text{CH}_2\text{Br}$

72. The empirical formula of a compound is  $\text{CH}_2\text{O}$ . Its molecular weight is 180. The molecular formula of compound is :

- 1)  $\text{C}_4\text{H}_4\text{O}_4$
- 2)  $\text{C}_3\text{H}_6\text{O}_3$
- 3)  $\text{C}_6\text{H}_{12}\text{O}_6$
- 4)  $\text{C}_5\text{H}_{10}\text{O}_5$

73. One mole of  $\text{CH}_3\text{COOH}$  and one mole of  $\text{C}_2\text{H}_5\text{OH}$  reacts to produce  $(2/3)$  mole of  $\text{CH}_3\text{COOC}_2\text{H}_5$ . The equilibrium constant is :

- 1) 2
- 2) + 2
- 3) - 4
- 4) + 4

74. The general molecular formula for disaccharide is :

- 1)  $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
- 2)  $\text{C}_{10}\text{H}_{20}\text{O}_{10}$
- 3)  $\text{C}_{12}\text{H}_{20}\text{O}_{10}$
- 4)  $\text{C}_{12}\text{H}_{22}\text{O}_{10}$

75. The correct decreasing order of basic strength is :

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

76. Benzaldehyde can be prepared by the hydrolysis of :

- 1) benzonitrile
- 2) benzotrichloride
- 3) benzyl chloride
- 4) benzal chloride

77. When two halogen atoms are attached to same carbon atom then it is :

- 1) vic-dihalide
- 2) gem-dihalide
- 3)  $\alpha$ - $\omega$ -halide
- 4)  $\alpha$ - $\beta$ -halide

78. Internal energy does not include :

- 1) rotational energy
- 2) nuclear energy
- 3) vibrational energy
- 4) energy due to gravitational pull

79. Flux is used to remove :

- 1) basic impurities
- 2) acidic impurities
- 3) all type of impurities
- 4) acidic and basic both impurities

80. Purple of cassius is colloidal solution of :

- 1) silver
- 2) lead
- 3) gold
- 4) mercury

81. Gun metal is :

- 1) Cu + Zn
- 2) Cu + Sn + Zn
- 3) Cu + Sn
- 4) Zn + Sn

82. Chemical A is used for softening of water to remove temporary hardness. A reacts with sodium carbonates to produce caustic soda. When  $\text{CO}_2$  is bubble through 'A' it turns cloudy. Chemically 'A' is :

- 1) CaO
- 2)  $\text{CaCO}_3$
- 3)  $\text{Ca}(\text{HCO}_3)_2$

4)  $\text{Ca}(\text{OH})_2$

83. The transition element which shows the highest oxidation state is :

- 1) iron
- 2) vanadium
- 3) manganese
- 4) chromium

84. Turpentine oil can be purified by :

- 1) steam distillation
- 2) sublimation
- 3) vacuum distillation
- 4) fractional distillation

85. Vinegar is represented by :

- 1)  $\text{CH}_3\text{COOH}$
- 2)  $\text{CH}_3\text{CH}_2\text{COOH}$
- 3)  $\text{HCOOH}$
- 4)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

86. The product obtained by treating benzene with chlorine in presence of ultraviolet light :

- 1)  $\text{CCl}_4$
- 2)  $\text{C}_6\text{H}_5\text{Cl}$
- 3)  $\text{C}_6\text{H}_6\text{Cl}_6$
- 4)  $\text{C}_6\text{Cl}_6$

87.  $\text{CuSO}_4$  and KCN reacts to produce :

- 1)  $\text{CuCN}_2$
- 2)  $\text{CuCN}$
- 3)  $\text{K}_3[\text{Cu}(\text{CN})_4]$
- 4)  $\text{K}_4[\text{Cu}(\text{CN})_6]$

88.  ${}_{13}\text{Al}^{27} + {}_2\text{He}^4 \rightarrow {}_{14}\text{Si}^{30} + {}_1\text{H}^1 + \text{Q}$   ${}_{13}\text{Al}^{27} = 26.9815$  amu and mass of  ${}_{14}\text{Si}^{30} = 29.9738$ ,  ${}_1\text{H}^1 = 1.0078$  amu  ${}_2\text{He}^4 = 4.0026$  amu. The Q is equal to :

- 1) 5.437 MeV
- 2) 7.578 MeV
- 3) 9.328 MeV
- 4) 2.329 MeV

89. Gammexane is :

- 1) chloral                      2) BHC                      3) DDT                      4) HCB

90. Which of the following is not the characteristic of interhalogen compounds ?

- 1) They are covalent
- 2) More reactive than halogens
- 3) Have low b.p. and high volatility
- 4) Quite unstable but not explosive

91. Sodium on heating with moist air produce :

- 1) NaO
- 2) NaOH
- 3) Na<sub>2</sub>O
- 4) Na<sub>2</sub>CO<sub>3</sub>

92. Alkynes usually show which type of reaction ?

- 1) substitution
- 2) elimination
- 3) addition
- 4) replacement

93. The chief ore of Hg is :

- 1) pyrolusite
- 2) barunite
- 3) galena
- 4) cinnabar

94. Which cannot displace hydrogen from its compound ?

- 1) Al                      2) Fe                      3) Hg                      4) Pb

95. The transport of matter in the absence of bulk flow is known as :

- 1) diffusion
- 2) transfusion
- 3) translation
- 4) rotation

96. Hydrogen has high ionization energy than alkali metals because it has :

- 1) ionic bond
- 2) covalent bond
- 3) large size
- 4) small size

97. Which shows electrical conductance ?

- 1) Sodium
- 2) Diamond
- 3) Potassium
- 4) Graphite

98. Geometrical isomerism is possible in case of :

- 1) tartaric acid
- 2) 1-butene
- 3) 2-butene
- 4) propene

99. Which compound can be sulphonated easily ?

- 1) Benzene
- 2) Toluene
- 3) Nitrobenzene
- 4) Chlorobenzene

100. The natural gas mainly contains :

- 1) methane
- 2) propane
- 3) butane
- 4) pentane

101. If  $e = 1.60206 \times 10^{-19} \text{ C}$

$$(e/m) = 1.75875 \times 10^{11} \text{ C kg}^{-1}$$

then the mass of electron is :

- 1)  $8.5678 \times 10^{-31} \text{ kg}$
- 2)  $9.1091 \times 10^{-31} \text{ kg}$
- 3)  $10.2531 \times 10^{-31} \text{ kg}$
- 4)  $12.0513 \times 10^{-31} \text{ kg}$

102. Transition elements form coloured ions due to :

- 1) d – d transition
- 2) fully filled d-orbitals
- 3) smaller atomic radii
- 4) availability of s-electrons

103. The value of  $K_p$  for the reaction  $2\text{H}_2\text{S}(\text{g}) \rightleftharpoons 2\text{H}_2(\text{g}) + \text{S}_2(\text{g})$  is  $1.2 \times 10^{-2}$  at  $1065^\circ\text{C}$ . The value of  $K_c$  is :

- 1)  $< 1.2 \times 10^{-2}$

- 2)  $> 1.2 \times 10^{-2}$
- 3)  $1.2 \times 10^{-2}$
- 4)  $0.12 \times 10^{-2}$

104. Nitrolim is :

- 1)  $\text{CaCN}_2$
- 2)  $\text{Ca}(\text{CN})_2$
- 3)  $\text{CaCN}_2 + \text{C}$
- 4)  $\text{Ca}(\text{NO}_3)_2$

105. Oxidation is :

- 1) gain of electrons
- 2) loss of neutrons
- 3) loss of electrons
- 4) decrease in positive valency

106. Which group of periodic table contain no metal ?

- 1) IA
- 2) IIIA
- 3) VIIA
- 4) VIII

107. A gas expands isothermally against a constant external pressure of 1 atm from a volume of  $10 \text{ dm}^3$  to a volume of  $20 \text{ dm}^3$ . It absorbs 300 J of thermal energy from its surroundings. The  $\Delta U$  is :

- 1) - 324 J
- 2) + 223 J
- 3) - 213 J
- 4) + 251 J

108. Bell metal is an alloy of :

- 1) Sn and Pb
- 2) Cu and Pb
- 3) Sn, Zn and Cu
- 4) Sn and Cu

109. Beilstein test is used for the detection of :

- 1)  $\text{N}_2$
- 2)  $\text{CO}_2$
- 3) Na
- 4) Cl

110.  $\text{Al}_2\text{O}_3$  on heating with carbon in an atmosphere of  $\text{N}_2$  at high temperature produce :



- 1)  $\text{Al} + \text{CO}_2$
- 2)  $\text{Al} + \text{CO}_2 + \text{NO}$
- 3)  $\text{Al}_4\text{C}_3 + \text{NO}$
- 4)  $\text{AlN} + \text{CO}$

These questions consists of two statements each printed as assertion and reason. While answering these questions you are required to choose any one of the following five responses.

- A. If both assertion and reason are true and reason is a correct explanation of assertion.
- B. If both assertion and reason are true but reason is not a correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.
- E. If assertion is false but reason is true.

111. **Assertion** : Trichloroacetic acid is stronger than acetic acid.

**Reason** : Electron withdrawing substituents decrease the activity.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

112. **Assertion** : Amines are basic in nature.

**Reason** : Presence of lone pair of electron on nitrogen atom.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

113. **Assertion** : Iodine is more soluble in water than in carbon tetrachloride.

**Reason** : Iodine is a polar compound.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

114. **Assertion** : A small amount of acid or alkali is added before electrolysis of water.

**Reason** : Pure water is weak electrolyte.

- 1) A
- 2) B
- 3) C

- 4) D
- 5) E

115. **Assertion** : Wet air is heavier than dry air.  
**Reason** : The density of dry air is more than density of water.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

116. **Assertion** : Atom are not electrically neutral.  
**Reason** : Number of protons and electrons are different.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

117. **Assertion** : Water is liquid but  $H_2S$  is a gas.  
**Reason** : Oxygen is paramagnetic.

- 1) a
- 2) B
- 3) C
- 4) D
- 5) E

118. **Assertion** : Benzene diazonium chloride does not give tests for nitrogen.  
**Reason** :  $N_2$  gas lose takes place during heating.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

119. **Assertion** : We feel cold on touching the ice.  
**Reason** : Ice is a solid form of water.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

120. **Assertion** : Inert gases are monoatomic.  
**Reason** : Inert gases have stable configuration.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

### Biology

121. Inflorescence of *Ficus* is :

- 1) spike
- 2) hypanthodium
- 3) raceme
- 4) verticillaster

122. XO chromosomal abnormality in humans cause :

- 1) Turner's syndrome
- 2) Down's syndrome
- 3) Drawin's syndrome
- 4) Klinefelter's syndrome

123. Which of the following is present between cell wall of the plant cells ?

- 1) Lomasome
- 2) Microsome
- 3) Lysosome
- 4) Middle lamella

124. Heart beat increases at the time of interview because :

- 1) hypersecretion of rennin
- 2) hyposecretion of rennin
- 3) secretion of adrenaline
- 4) direlic hormone

125. Mycorrhiza help in absorption of :

- 1) calcium
- 2) nutrients
- 3) metals
- 4) none of these

126. Wings of pigeon, mosquito and bat shows :

- 1) atavism
- 2) mutation
- 3) divergent evolution
- 4) convergent evolution

127. The vertebrae in birds are mostly :

- 1) procoelous
- 2) heterocoelous
- 3) amphicoelous
- 4) acoelous

128. If a homozygous tall plant is crossed with homozygous dwarf plant, the offsprings will be :

- 1) all tall plants
- 2) all dwarf plants
- 3) half tall plants
- 4) half dwarf plants

129. Amoebiasis is caused by :

- 1) Entamoeba histolytica
- 2) Taenia solium
- 3) Plasmodium vivax
- 4) E. coli

130. Water current in *Leucosolenia* is produced by :

- 1) pinacocytes
- 2) choanocytes
- 3) archeocytes
- 4) tenocytes

131. The food chain in which microbes breakdown energy rich compounds synthesized by producers is called :

- 1) ecosystem
- 2) parasitic food chain
- 3) detritus level chain
- 4) predator food chain

132. Anemophilous flower have :

- 1) sessile stigma
- 2) small, smooth stigma
- 3) coloured and scented flowers
- 4) large feathery stigma

133. Root cell of wheat has 42 chromosomes. What would be the number of chromosomes in the synergid cell ?
- 1) 7                                      2) 14                                      3) 21                                      4) 28
134. The extra embryonic membranes of mammalian embryo are derived from :
- 1) trophoblast  
2) follicle cells  
3) inner cell mass  
4) formative cell
135. Otorhinolaryngology is the study of :
- 1) brain cells  
2) bird anatomy  
3) locomotary organs  
4) ENT
136. Blood from which of the following blood group can be given to any patient ?
- 1) A                                      2) B                                      3) O                                      4) AB
137. Lateral root in higher plants arise from :
- 1) cortex  
2) pericycle  
3) epidermis  
4) endodermis
138. Sporogony of malarial parasite occur in :
- 1) liver of man  
2) RBCs of man  
3) stomach wall of mosquito  
4) salivary glands of mosquito
139. Endodermis is part of :
- 1) cortex  
2) pericycle  
3) medulla  
4) epidermis
140. Liver in our body stores :
- 1) vitamin A  
2) vitamin D  
3) vitamin B<sub>12</sub>  
4) all of these

141. The heart shaped Fern prothallus is :

- 1) gametophyte
- 2) sporophyte
- 3) saprophyte
- 4) gamete

142. Which gland plays key role in metamorphosis of frog ?

- 1) Adrenal
- 2) Thyroid
- 3) Thymus
- 4) Pancreas

143. Bacterial cell wall is made up of :

- 1) xylan
- 2) chitin
- 3) cellulose
- 4) murein

144. Bryophytes do not possess :

- 1) vascular tissue
- 2) gametophyte
- 3) alternation of generation
- 4) spores

145. Which of the following is responsible for mechanical support and enzyme transport ?

- 1) Dictyosome
- 2) Cell membrane
- 3) E.R.
- 4) Mitochondria

146. The true statement regarding corals is :

- 1) form branch colonies
- 2) solitary or colonial
- 3) grow as massive bodies
- 4) all of the above

147. Basket star belongs to class :

- 1) Ophiuroidea
- 2) Echinoidea
- 3) Crinoidea
- 4) Asteroidea

148. High energy bond of ATP are between :

- 1) C – C
- 2) C – O
- 3) C – N
- 4) O – P

149. Conn's disease is caused by the over secretion of :

- 1) ADH
- 2) ACTH
- 3) Oxytocin
- 4) Aldosterone

150. The function of rennin is :

- 1) vasodiation
- 2) reduce blood pressure
- 3) degradation of angiotensinogen
- 4) none of the above

151. Female gametophyte of angiosperm is :

- 1) 7 celled
- 2) 8 celled
- 3) 11 celled
- 4) 5 celled

152. In *Dryopteris*, the opening mechanism of sporangium is effectively operated by :

- 1) stalk
- 2) stomium
- 3) annulus
- 4) peristome

153. Inflammatory response, in allergy is caused by the release of :

- 1) antigen
- 2) histone
- 3) histamines
- 4) antibodies

154. The plant hormone controlling fruit ripening is:

- 1) IAA
- 2) GA
- 3) KN
- 4) Ethylene

155. Which is the example of conditioned reflex ?

- 1) Eye closed when anything enter into it
- 2) Hand took up when piercing with needle
- 3) Your kneeing took up a stone then dog runs away
- 4) Digestion food goes forward in alimentary canal

156. Which is the example of Platyhelminthes ?

- 1) Entamoeba
- 2) Plasmodium
- 3) Wuchereria
- 4) Schistosoma

157. Linnaeus system of classification is :

- 1) natural
- 2) artificial
- 3) phylogenetic
- 4) progressive

158. The end product of Ornithine cycle is :

- 1) Urea
- 2) Uric acid
- 3)  $\text{NH}_3$
- 4)  $\text{CO}_2$

159. Which is the derivative of amino acid ?

- 1) Epinephrine
- 2) Estrogen
- 3) Progesterone
- 4) All of these

160. Who coined the term zymase ?

- 1) Pasteur
- 2) Buchner
- 3) Kuhne
- 4) Summer

161. Which of the following chamber of heart has the thickest muscular wall ?

- 1) Left auricle
- 2) Left ventricle
- 3) Right ventricle
- 4) Right auricle

162. The correct sequence in cell cycle is :



- 1) S - G<sub>1</sub> - G<sub>2</sub> - M
- 2) S - M - G<sub>1</sub> - G<sub>2</sub>
- 3) G<sub>1</sub> - S - G<sub>2</sub> - M
- 4) M<sub>1</sub> - G<sub>1</sub> - G<sub>2</sub> - S

163. Paired spermathecae occur in *Pheretima* in which of the following segments ?

- 1) 4, 5, 6, 7
- 2) 6, 7, 8
- 3) 6, 7, 8, 9
- 4) 3, 4, 5, 6

164. Which of the following induces dormancy ?

- 1) Auxin
- 2) Cytokinin
- 3) Both (1) and (2)
- 4) Abscisic acid

165. Cork cambium is a :

- 1) lateral meristem
- 2) apical meristem
- 3) intercalary meristem
- 4) primitive meristem

166. Acrosome of sperm is formed by :

- 1) nucleus
- 2) Golgi bodies
- 3) lysosome
- 4) ER

167. Crop rotation is used to increase :

- 1) soil fertility
- 2) pore size and soil particle
- 3) organic content of soil
- 4) viscosity of soil water

168. Obligate parasites live :

- 1) on living host only
- 2) on living host and dead organic matter
- 3) on dead organic matter only
- 4) on artificial liquid medium

169. Cumulus covers :

- 1) ovary
- 2) ovum
- 3) embryo
- 4) sperm

170. Weberian ossicles are found in :

- 1) frog
- 2) snakes
- 3) fishes
- 4) birds

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B. If both the Assertion and the Reason are true but the Reason is not a correct explanation of the Assertion.

C. If the Assertion is true but the Reason is false.

D. If both the Assertion and the Reason are false.

E. If the Assertion is false but the Reason is true.

171. **Assertion** : Transmission of nerve impulse across a synapse is accomplished by neurotransmitters.

**Reason** : Transmission across a synapse usually required neurotransmitter because there is a small space, *i. e.* , synaptic cleft, that separates one neuron from another.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

172. **Assertion** : Enzymes have active sites and substrates reactive sites on their surfaces respectively.

**Reason** : Active and reactive sites push the enzyme and substrate molecules away from each other.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

173. **Assertion** : Muscles fibres of SA node possess the lowest rhythmicity among all cardiac muscles.

**Reason** : Due to this fact, it can initiate excitatory wave at the highest rate.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

174. **Assertion** : The genetic complement of an organism is called genotype.

**Reason** : Genotype has the type of hereditary properties of an organism.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

175. **Assertion** : Mitochondria help in photosynthesis.

**Reason** : Mitochondria have enzymes for dark reaction.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

176. **Assertion** : Birds have one ovary.

**Reason** : This reduces the body weight for flight.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

177. **Assertion** : In hemianatropous ovule, the funicle lies parallel to body of ovule.

**Reason** : Here, body of ovule has rotated by  $90^\circ$ .

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

178. **Assertion** : Light is very important factor in transpiration.

**Reason** : It induces stomatal opening and darkness closing. Therefore, transpiration increases in light and decreases in dark.

- 1) A

- 2) B
- 3) C
- 4) D
- 5) E

179. **Assertion** : Waxy and cutin coating on plant parts reduce the transpiration.

**Reason** : These adaptation are found in xerophytes.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

180. **Assertion** : Higher plants have meristematic region for indefinite growth.

**Reason** : Higher plants have root and shoot apices.

- 1) A
- 2) B
- 3) C
- 4) D
- 5) E

### General Knowledge

181. Which one of the following pair is incorrect ?

- 1) Kapil—Cricket
- 2) M.F. Husain—Actor
- 3) Abul Fazal—Author
- 4) Feroz Gandhi—Politics

182. Hirakud dam is constructed on which of the following river ?

- 1) Mahanadi
- 2) Ganga
- 3) Yamuna
- 4) Kosi

183. Nobel Prize for physiology and medicine for the year 1998 was given for the discovery of :

- 1) Prion
- 2) Viagra
- 3) Streptomycin
- 4) Invading germs

184. Which one of the following country is not the member of SAARC ?

- 1) Maldeiv

- 2) Bangladesh
- 3) Nepal
- 4) Myanmar

185. The person who served as the President of India twice, was :

- 1) Radha Krishnan
- 2) Dr. Rajendra Prasad
- 3) Zakir Hussain
- 4) V.V. Giri

186. Which one of the following is responsible for the disease 'dropsy' ?

- 1) Argemone maxicana
- 2) Brassica oleracea
- 3) Oenothera lamarckiana
- 4) Brassica campestris

187. Which of the following missile of India has the longest range ?

- 1) Akash
- 2) Prithvi
- 3) Pinaka
- 4) Both (2) and (3)

188. Ecology is the branch of science which deals with :

- 1) cell structure
- 2) soils surface
- 3) balance of nature
- 4) human anatomy

189. How many countries adopted Euro currency ?

- 1) 12
- 2) 6
- 3) 9
- 4) 8

190. President of India gives his resignation to the :

- 1) Chief Justice
- 2) Parliament
- 3) Vice President
- 4) Prime Minister

191. The disease rheumatism effects :

- 1) legs
- 2) ears
- 3) lungs
- 4) joints

192. Grand prix is a term associated with :

- 1) Chess
- 2) Table tennis
- 3) Hockey
- 4) Badminton

193. The great poetry 'Madhushala' was composed by :

- 1) Mulk Raj Anand
- 2) Harivansh Rai Bachchan
- 3) Mahadevi Verma
- 4) Surender Sharma

194. Hari Prasad Chaurasia is related to which of the following musical instrument ?

- 1) Tabla
- 2) Flute
- 3) Violin
- 4) Santoor

195. Which one of the following is the cave temple in India ?

- 1) Parasnath
- 2) Ajanta
- 3) Parli
- 4) Tuljapur

196. Seoul is the capital of :

- 1) Japan
- 2) South Korea
- 3) Afganistan
- 4) Philippines

197. Fundamental duties were introduced in the constitution by :

- 1) 42nd amendment
- 2) 40th amendment
- 3) 48th amendment
- 4) 53rd amendment

198. The Fifth Pay commission was headed by justice :

- 1) Pandiyan
- 2) Ahmadi
- 3) Anand
- 4) Vadhwa

199. Which of the following vitamin is required in bone formation ?

- 1) D                                      2) B                                      3) C                                      4) A

200. Present speaker in 12th Lok Sabha is :

- 1) G.M.C. Balyogi  
2) Nazma Haptullah  
3) P.A. Sangama  
4) Murali Manohar Joshi

### Answer Key

1) 1	2) 3	3) 4	4) 2	5) 1,3	6) 4	7) 4	8) 1	9) 4	10) 4
11) 4	12) 1	13) 1	14) 1	15) 2	16) 1	17) 4	18) 1	19) 4	20) 3
21) 2	22) 1	23) 4	24) 2	25) 3	26) 3	27) 1	28) 1	29) 1	30) 4
31) 3	32) 2	33) 3	34) 2	35) 4	36) 2	37) 3	38) 1	39) 2	40) 1
41) 2	42) 3	43) 4	44) 3	45) 4	46) 2	47) 1	48) 1	49) 2	50) 3
51) 1	52) 3	53) 2	54) 5	55) 1	56) 1	57) 1	58) 5	59) 3	60) 4
61) 3	62) 4	63) 3	64) 1	65) 3	66) 3	67) 1	68) 2	69) 4	70) 4
71) 2	72) 3	73) 4	74) 1	75) 3	76) 4	77) 2	78) 4	79) 4	80) 3
81) 2	82) 4	83) 3	84) 1	85) 1	86) 3	87) 3	88) 4	89) 2	90) 3
91) 2	92) 3	93) 4	94) 3	95) 1	96) 4	97) 4	98) 3	99) 2	100) 1
101) 2	102) 1	103) 1	104) 3	105) 3	106) 3	107) 3	108) 4	109) 4	110) 4
111) 3	112) 1	113) 4	114) 1	115) 5	116) 4	117) 2	118) 1	119) 2	120) 1
121) 2	122) 1	123) 4	124) 3	125) 1	126) 4	127) 2	128) 1	129) 1	130) 2
131) 3	132) 4	133) 3	134) 1	135) 4	136) 3	137) 2	138) 3	139) 1	140) 4
141) 1	142) 2	143) 4	144) 1	145) 3	146) 4	147) 1	148) 4	149) 4	150) 3
151) 1	152) 2	153) 3	154) 4	155) 3	156) 4	157) 2	158) 1	159) 1	160) 2
161) 2	162) 3	163) 3	164) 4	165) 1	166) 2	167) 1	168) 1	169) 2	170) 3
171) 1	172) 3	173) 5	174) 1	175) 4	176) 1	177) 5	178) 1	179) 1	180) 1
181) 2	182) 1	183) 2	184) 4	185) 2	186) 1	187) 2	188) 3	189) 1	190) 3
191) 4	192) 1	193) 2	194) 2	195) 2	196) 2	197) 1	198) 1	199) 1	200) 1