



(2016-17)

Time: 180 Min.

Maximum Marks: 720

Student's Name _____

INSTRUCTIONS

1. This booklet contains 90 questions (45 Physics + 45 Chemistry + 90 Biology) M.C.Q. (Multiple Choice Questions).
2. Answer sheet has been provided separately. Before you start fill up the particulars. Please ensure that booklet contains requisite no. of pages & these are not torn or mutilated. If it is so you may request to the invigilator to change the booklet likewise answer sheet also.
3. Write you name, Address, Contact no. & other particulars. Apart put your signature on the answer sheet.
4. **You must darken the appropriate circles with a pen related to the answers on the OMR sheet.**
5. Each correct answer will be awarded 4 marks & wrong answer will be awarded negative marking of 1.
6. Use of any Electronic Gadgets like pager, calculator, and Cell phone etc. is prohibited.
7. After the test hand over the question paper & OMR sheet to invigilator.

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1. A physical quantity x is given by $x = \frac{2k^3l^2}{m\sqrt{n}}$ the percentage error in measurements of k, l, m and n are 1%, 2%, 3%, and 4% respectively. The value of x is uncertain by –

- (A) 8% (B) 10%
(C) 12% (D) None

2. When a current of (2.5 ± 0.5) "A" flows through a wire it develops a potential difference of (20 ± 1) v the resistance of the wire is –

- (A) $(8 \pm 2) \Omega$ (B) $(8 \pm 1.6) \Omega$
(C) $(8 \pm 1.5) \Omega$ (D) $(8 \pm 3) \Omega$

3. The position x of particle varies with time t as $x = 6 + 12t - 2t^2$ where x is in meter and t is in seconds. The distance travelled by the particle in first five seconds is –

- (A) 16 m (B) 26 m
(C) 10 m (D) 36 m

4. A body falls freely for 10 sec. Its average velocity along this journey ($g = 10\text{ms}^{-2}$)

- (A) 100 ms^{-1} (B) 10 ms^{-1}
(C) 50 ms^{-1} (D) 5 ms^{-1}

5. If $\vec{A} = i + j + k$ and $B = -i + (-j) - k$. Then angle made by $(\vec{A} - \vec{B})$ with \vec{A} is –
Note { i, j, k are unit of vector (^) }

- (A) 0° (B) 180°
(C) 90° (D) 60°

6. River is flowing with velocity $2i + 3j$ and boat is moving with $4i + j$ respect to ground. Then relative velocity of boat with respect - Note { i, j , are unit of vector (^) }

- (A) $6i + 2j$ (B) $2i - 2j$
(C) $i + j$ (D) $4i - 3j$

7. The angle between the velocity and acceleration at the highest point of a particle projected upwards at an angle of 30° with the horizontal is –

- (A) 0° (B) 45°
(C) 90° (D) 180°

8. A ball is projected horizontally with a velocity of 5 m/s from top of a building 19.6 m high. How long will the ball take to hit the ground?

- (A) $\sqrt{2}$ s (B) 2 s
(C) $\sqrt{3}$ s (D) 3 s

9. A particle is moving with a uniform speed V in a circular path of radius r with center at O . When the particle moves from a point P to Q on the circle such that $\angle POQ = \theta$ then the magnitude of change in velocity is –

- (A) $2V \sin(2\theta)$ (B) Zero
(C) $2V \sin(\theta/2)$ (D) $2V \cos(\theta/2)$

10. A body of mass 10 kg moves at a constant speed of 10 m/s. A constant force then acts for 4 seconds on the body on gives it a speed of 2 ms^{-1} in opposite direction. Magnitude of the force acting on the body is –

- (A) 30 N (B) 20 N
(C) 15 N (D) 10 N

11. A bullet emerges from a barral of length 1.2 m with a speed of 640 ms^{-1} . Assuming constant acceleration the approximate time that it spends in the barral after the gun is fired is –

- (A) 4 ms (B) 40 ms
(C) 400 ms (D) 1 s

12. A shell of mass 10 kg is moving with a velocity of 10 m/s when it blasts and forms two parts of mass 9 kg and 1 kg respectively is the 1st mass is stationary, the velocity of 2nd is –

- (A) 1 m/s (B) 10 m/s
(C) 100 m/s (D) 1000 m/s

13. A mass M is tied to the top of two identical poles of height H using massless strings of equal length. The mass is at height h above the ground at equilibrium is the distance between poles is L the tension in each string will be –

- (A) $\frac{mg\sqrt{(L/2)^2 + (H-h)^2}}{2(H-h)}$ (B) $\frac{mg\sqrt{L^2 + H^2}}{2(H-h)}$
(C) $\frac{mg\sqrt{L^2 + H^2}}{2H}$ (D) $\frac{mg\sqrt{h^2 + L^2}}{2L}$

14. A Conveyor belt is moving at a constant speed of 2 ms^{-1} . A box is gently dropped on it. The coefficient of friction between them $\mu = 0.5$. The distance that box will move relative to belt before coming to rest on it, taking $g = 10 \text{ ms}^{-2}$ is –

- (A) 0.4 (B) 1.2 m
(C) 0.6 m (D) Zero

20. A solid of density D is floating in a liquid of density d . If V' is the volume of solid submerged in the liquid and V is the total volume of the solid, then V'/V is equal to –

- (A) d/D (B) D/d
(C) $\frac{D}{d+D}$ (D) $\frac{D+d}{D}$

21. The quantities of heat required to raise the temperature of two copper spheres of radii r_1 and r_2 ($r_1 = 1.5 r_2$) through 1 K are in ratio of –

- (A) 27/8 (B) 9/4
(C) 3/2 (D) 1

22. An experiment takes 10 minutes to raise temperature of water from 0°C to 100°C and another 55 minutes to convert it totally into steam by a stabilized heater. The latent heat of vapouration comes out to be –

- (A) 530 cal/g (B) 540 cal/g
(C) 550 cal/g (D) 560 cal/g

23. Hot water cools from 60°C to 50°C in the first 10 minutes and 42°C in the next 10 minutes then the temperature of the surroundings is –

- (A) 20°C (B) 30°C
(C) 15°C (D) 10°C

24. For one mole of monoatomic gas, work done at constant pressure is W . The heat supplied at constant volume for the same rise in temperature of the gas is –

- (A) $W/2$ (B) $3W/2$
(C) $5W/2$ (D) W

25. One mole of oxygen of volume 1 litre at 4 atm pressure to attain 1 atm pressure by result of isothermal expansion. The work done by the gas during expansion is nearly –

- (A) 155 J (B) 255 J
(C) 355 J (D) 555 J

26. If maximum speed of a particle in SHM is given by V_m , what is its average speed?

- (A) $\frac{\pi}{2} V_m$ (B) $\frac{2}{\pi} V_m$
(C) $\frac{\pi}{4} V_m$ (D) $\frac{V_m}{\sqrt{2}}$

27. A particle is executing linear simple harmonic motion of amplitude A. At what displacement is the energy of the particle half potential and half kinetic?

- (A) $A/4$ (B) $A/2$
(C) $\frac{A}{\sqrt{2}}$ (D) $\frac{A}{\sqrt{3}}$

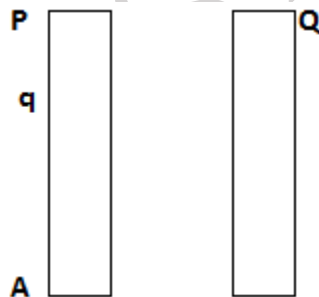
28. The small charged spheres A and B have charges $10 \mu\text{C}$ and $40 \mu\text{C}$ respectively and are held at separation of 90 cm from each other. At what distance from A electric field intensity would be zero?

- (A) 22.5 cm (B) 18 cm
(C) 30 cm (D) 36 cm

29. Electric field E at board side on position due to electric dipole varies with distance r as –

- (A) $E \propto \frac{1}{r^2}$ (B) $E \propto \frac{1}{r}$
(C) $E \propto r$ (D) $E \propto \frac{1}{r^3}$

30. Two conducting plates P and Q with large surface area A are placed as shown. A charge q is given to plate P. The electric field between the plates at any point is –

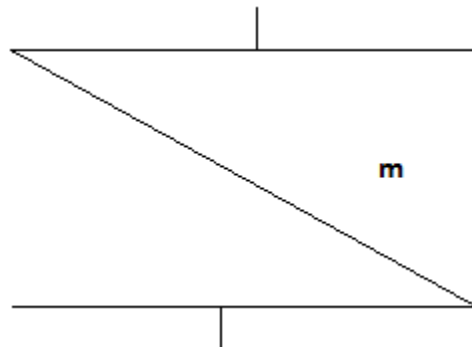


- (A) $\frac{q}{3A\epsilon_0}$ (B) $\frac{Q}{2A\epsilon_0}$
(C) $\frac{Q}{A\epsilon_0}$ (D) $\frac{2q}{A\epsilon_0}$

31. n identical droplets are charged to v volt each. If they coalesce to form a single drop, then its potential will be –

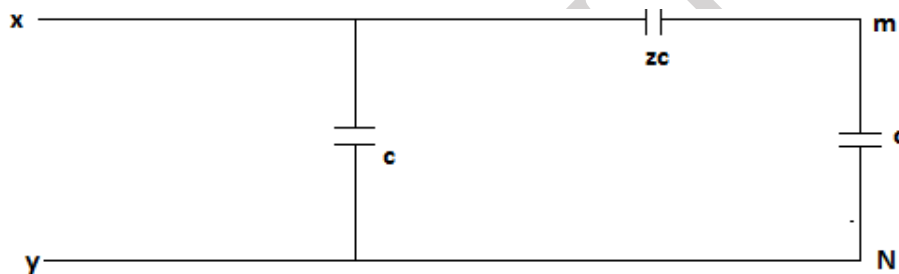
- (A) $n^{2/3}v$ (B) $n^{1/3}v$
(C) nv (D) v/n

32. A thin metal plate m is inserted between the plates of a parallel plate capacitor as shown. The new capacitance in terms of initial capacitance c is –



- (A) $2c$ (B) $c/2$
 (C) c (D) Infinity

33. In the adjoining figure the potential difference between x and y is 60 v . The potential difference between the points m and N will be –



- (A) 10 v (B) 15 v
 (C) 20 v (D) 30 v

34. The current flowing through a wire depends on time as $I = 3t^2 + 2t + 5$. The charge flowing through the cross section of the wire in time from $t = 0$ to $t = 2\text{ sec}$ is –

- (A) 22 c (B) 20 c
 (C) 18 c (D) 5 c

35. A wire of resistance 5Ω is drawn out so that its new length is 3 times its original length. What is the resistance of the new wire?

- (A) 45Ω (B) 15Ω
 (C) $5/3\Omega$ (D) 5Ω

36. Three bulbs rating 60 w each are joined in series and then connected to the mains. The power consumed by these bulbs will –

- (A) 180 w (B) 60 w
 (C) 20 w (D) $20/3\text{ w}$

$$(A) \frac{\mu_0 I}{g} \left(\frac{R_1 - R_2}{R_1 R_2} \right)$$

$$(B) \frac{\mu_0 I}{8} \left(\frac{R_1 + R_2}{R_1 R_2} \right)$$

$$(C) \frac{\mu_0 I}{8} \left(\frac{R_1 R_2}{R_1 + R_2} \right)$$

(D) Zero

42. The magnetic induction and intensity of magnetic field inside an iron core of an electromagnet are 1 Wb m^{-2} and 150 Am^{-1} respectively. The relative permeability of iron is $[\mu_0 = 4\pi \times 10^{-7} \text{ henry m}^{-1}]$

$$(A) \frac{10^6}{4\pi}$$

$$(B) \frac{10^5}{6\pi}$$

$$(C) \frac{10^3}{4\pi}$$

$$(D) \frac{10^3}{6\pi}$$

43. Which of the following does not use the principle of electromagnetic induction?

(A) Room heater

(B) Transformer

(C) Choke coil

(D) Ac generator

44. If angle of prism is 60° and refractive index $\sqrt{2}$ then angle of minimum deviation is –

(A) 30°

(B) 45°

(C) 60°

(D) 90°

45. In the Bohr's model of hydrogen atom the ratio of kinetic energy to the total energy electron in the n^{th} quantum state is –

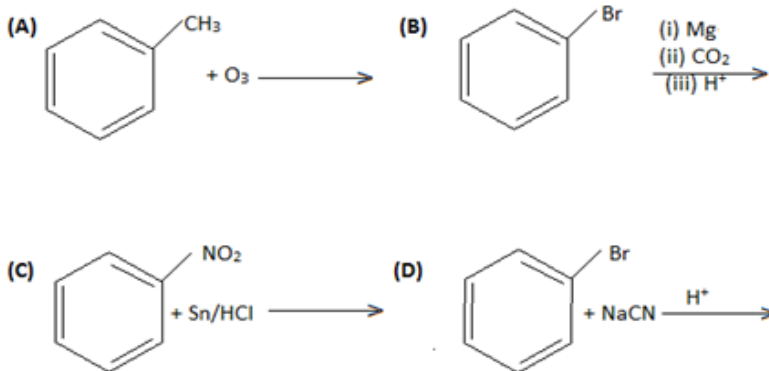
(A) -1

(B) -2

(C) $+1$

(D) 2

46. Which of the following reaction shall produce benzoic acid?



47. The strongest base in liquid ammonia is –

(A) NH_2^-

(B) NH_4^+

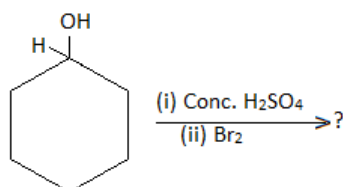
(C) N_2H_4

(D) NH_3

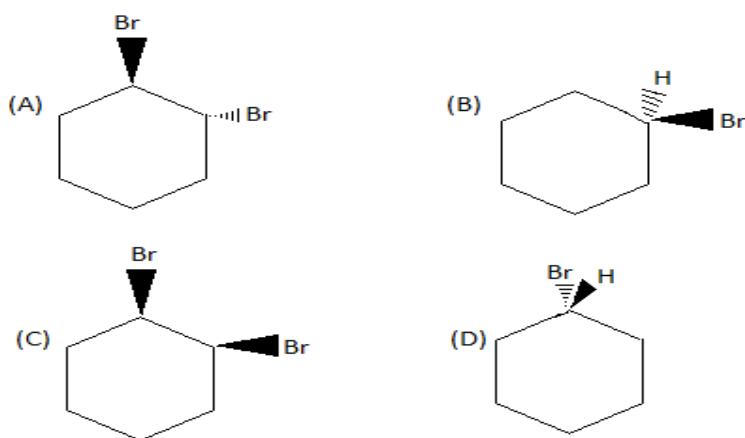
48. Which of the following statements is not correct?

- (A) Relative lowering of vapour pressure is a dimensionless quantity
- (B) The value of Henry's constant, K_H increases with increase in temperature
- (C) The value of Henry's constant K_H is greater for gases with higher solubility
- (D) The value of molal depression constant depends on the nature of solvent

49. The product formed in the reaction sequence



is -



50. Among the following which is the most commonly used reducing agent?

- (A) AlCl_3
- (B) PbCl_2
- (C) SnCl_2
- (D) BeCl_2

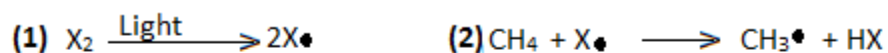
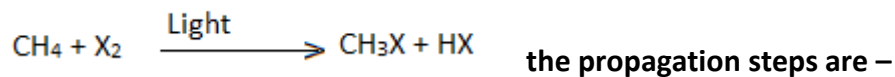
51. In Bosch's process for production of hydrogen the gas used is -

- (A) Coal gas
- (B) Natural gas
- (C) Water gas
- (D) Producer gas

52. Molecular weight of oxalic acid is 126. The weight of oxalic acid required to neutralise 100 mL of normal solution of NaOH is -

- (A) 126 g
- (B) 530 g
- (C) 63 g
- (D) 6.3 g

53. In the free radical halogenation –



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

54. In the brown ring test in the complex $\text{Fe}(\text{H}_2\text{O})_5(\text{NO})\text{SO}_4$, nitric oxide behaves as –

- (A) NO^- (B) Neutral NO molecule
(C) NO^{2-} (D) NO^+

55. 50 mL water is added to a 50 mL solution of $\text{Ba}(\text{OH})_2$ of strength 0.01 M. The pH of the resulting solution will be –

- (A) 8 (B) 10
(C) 12 (D) 6

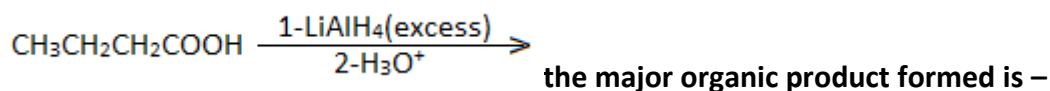
56. Ammonia is a Lewis base. It forms complexes with cations. Which one of the following cations does not form complex with ammonia?

- (A) Cu^{2+} (B) Cd^{2+}
(C) Pb^{2+} (D) Ag^+

57. In Lassaigne's test to detect the presence of sulphur in an organic compound, the sodium fusion extract on acidification with acetic acid and lead acetate gives a black precipitate due to –

- (A) Lead Sulphate (B) Lead Sulphide
(C) Sodium Sulphide (D) Lead Sulphite

58. In the reaction



- (A) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2\text{OH}$ (B) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
(C) $\text{CH}_3\text{CH}_2\text{C} \equiv \text{CH}$ (D) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CHO}$

59. Which of the following ions has largest heat of hydration?

- (A) K^+ (B) Li^+
(C) Be^{2+} (D) Ba^{2+}

60. Which of the following pairs will have effective magnetic moment equal?

- (A) Cr^{2+} and Fe^{2+} (B) V^{2+} and Sc^{3+}
(C) Ti^{2+} and V^{2+} (D) Cr^{3+} and Mn^{2+}

61. In Rosenmund's reduction, the compound reduced is –

- (A) Acid chloride (B) Alkyl cyanide
(C) Amide (D) Aldehyde

62. By which method is a ketone converted into a hydrocarbon?

- (A) Cannizzaro's reaction (B) Aldol condensation
(C) Wolff – Kishner reduction (D) Reimer – Tiemann reaction

63. The decomposition of HI into H_2 and I_2 is an example of –

- (A) Pseudo first order reaction (B) First order reaction
(C) Second order reaction (D) Zero order reaction

64. Which one of the following first series of transition elements has 5 unpaired electrons in its +2 oxidation state?

- (A) Cr(24) (B) Mn(25)
(C) Co(27) (D) V(23)

65. The solubility of Aniline in water is increased by adding –

- (A) 1 M NaOH (B) diethyl ether
(C) toluene (D) 1 M HCl

66. In which of the following, concentration value for a solution changes with change in temperature?

- (A) Molarity (B) Mole fraction
(C) Molality (D) Mass percentage

67. Atomic numbers of Cr and Fe are 24 and 26 respectively. Which of the following is paramagnetic with the spin of electrons?

- (A) $[Fe(CO)_5]$ (B) $[Fe(CN)_6]^{4-}$
(C) $[Cr(CO)_6]$ (D) $[Cr(NH_3)_6]^{3+}$

68. The compound which gives off oxygen on moderate heating is –

- (A) Cupric oxide (B) Zinc oxide
(C) Aluminium oxide (D) Mercuric oxide

69. Solubility product (K_{sp}) of $BaSO_4$ is 1.1×10^{-10} . What will be molar solubility of barium sulphate in 0.05 M barium chloride solution?

- (A) 2.2×10^{-9} (B) 1.2×10^{-8}
(C) 2.8×10^{-9} (D) 2.2×10^{-8}

70. Fehling solution A and Fehling solution B are respectively –

- (A) Alkaline sodium potassium tartarate and aqueous copper sulphate
(B) Ammoniacal silver nitrate and aqueous copper sulphate
(C) Aqueous copper sulphate and alkaline sodium potassium tartarate
(D) Aqueous copper sulphate and ammoniacal silver nitrate

71. The products formed by reaction between H_2S and fluorine are –

- (A) SF_6 , S and HF (B) SF_2 and HF
(C) SF_4 and HF (D) SF_6 and HF

72. In the reaction –



How many molecules of H_2 would be needed to consume 2 mol of CO ?

- (A) 2.4×10^{24} molecules (B) 4 molecules
(C) 2 molecules (D) 1.2×10^{24} molecules

73. Which reagent is used in catalytic amount in an esterification reaction?

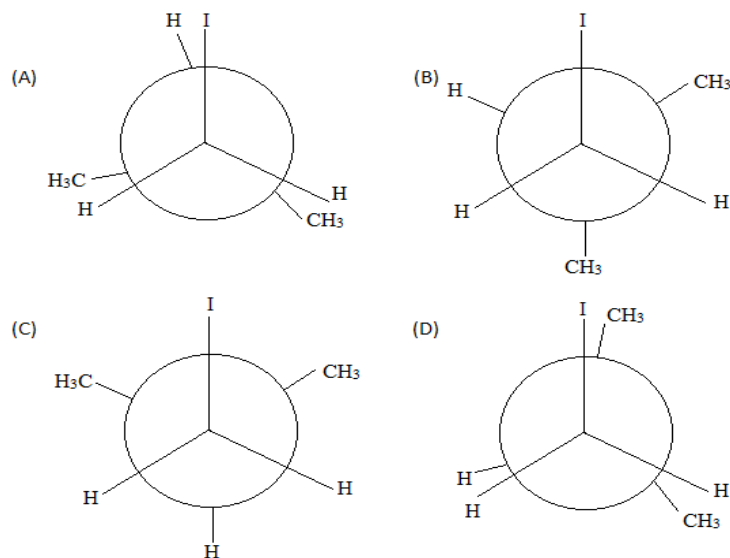
(1). Aq. NaOH (2). Conc. H_2SO_4

- (A) 2 only (B) both (1) and (2)
(C) Neither (1) nor (2) (D) 1 only

74. Reaction of acetic acid with sodium bicarbonate, gives CO_2 . The C of CO_2 comes from –

- (A) – COOH group in CH_3COOH (B) HCO_3^- group**
(C) H - $\underline{CH_2}$ - methylene group (D) – CH_3 group of CH_3COOH

75. In 1-iodo-2-methylpropane, which of the below given Newman projections is most stable?



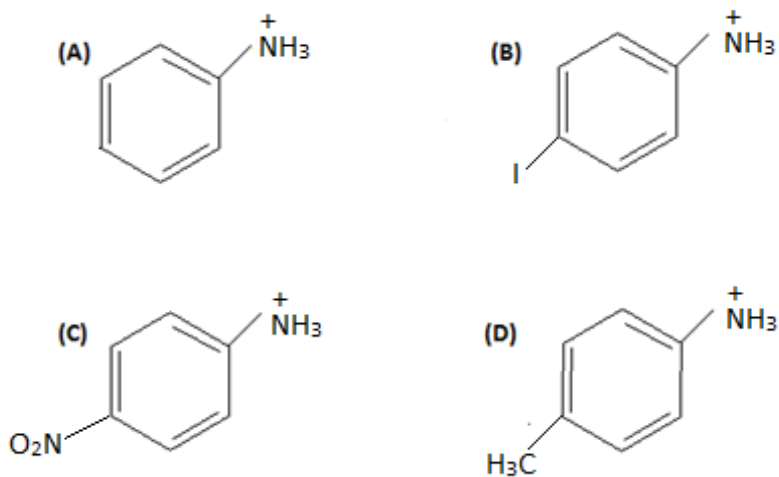
76. For which one of the following properties of halogens, the sequence $F > Cl > Br > I$ holds good?

- (A) Electronegativity
 (B) Atomic radius
 (C) Boiling point
 (D) Electron affinity

77. Stereo isomers which are not mirror images and are not superimposable to one and another, are called –

- (A) Enantiomers
 (B) Mesomers
 (C) Tautomers
 (D) Diastereomers

78. Which one of the following is the strongest acid?



79. Isoprene (2 – methyl – 1, 3 – butadiene) is a basic unit of the polymer rubber –

- (A) Natural rubber (B) Buna N rubber
(C) Buna S rubber (D) Neoprene rubber

80. The rate constant for a first order reaction is 60 s^{-1} . How much time will it take to reduce the initial concentration of the reactant to $\frac{1}{16}$ value?

- (A) 3.2×10^{-2} seconds (B) 2.3×10^{-2} seconds
(C) 4.6×10^{-2} seconds (D) 6.9×10^{-2} seconds

81. Which of the following statement is not correct to explain the effect of catalyst on rate of reaction?

- (A) A catalyst provides an alternate reaction mechanism
(B) A catalyst alters the Gibbs energy of a reaction
(C) A catalyst does not change equilibrium constant of a reaction
(D) A catalyst reduces the activation energy between reactants and products

82. Benzoic acid on treatment with HNO_3 in the presence of H_2SO_4 gives –

- (A) Nitrobenzene (B) O – nitrobenzoic acid
(C) Benzene sulphonic acid (D) m – nitrobenzoic acid

83. For the process – $\text{Br}_2(l) \rightarrow \text{Br}_2(g)$, $\Delta H^0 = 31 \text{ KJ mol}^{-1}$ and $\Delta S^0 = 90 \text{ JK}^{-1}\text{mol}^{-1}$. The temperature at which gaseous and liquid bromine will coexist in equilibrium will be –

- (A) 300 K (B) 500 K
(C) 666 K (D) 333 K

84. In the formation of methane from water gas $\text{CO}(g) + 3\text{H}_2(g) \rightleftharpoons \text{CH}_4(g) + \text{H}_2\text{O}(g)$, if the water vapour is removed from the reaction mixture –

- (A) The reaction will move in forward direction but there will be effective decrease in the yield of methane.
(B) The reaction will move in reverse direction and there will be effective decrease in the yield of methane
(C) The reaction will move in reverse direction and there will be effective increase in the yield of methane
(D) The reaction will move in forward direction and there will be effective increase in the yield of methane

85. Which gas is obtained when urea is heated with HNO_2 ?

- (A) O_2 (B) H_2
(C) NH_3 (D) N_2

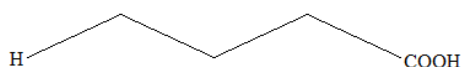
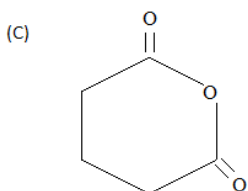
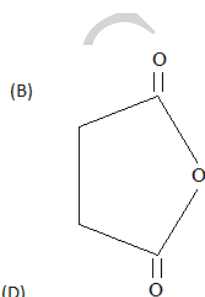
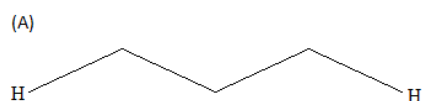
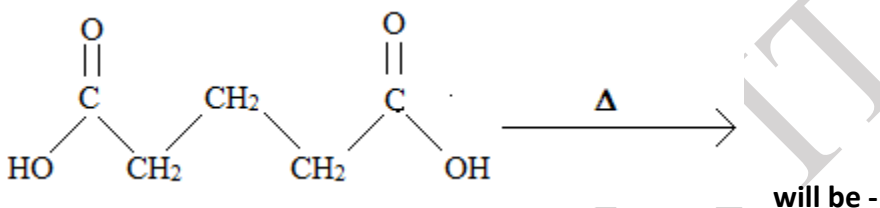
86. Chlorophyll is –

- (A) A dipyrrole pigment (B) A green pigment containing Mg.
(C) A compound that makes CO_2 plants (D) Derived from Haem

87. Which of the following oxides of nitrogen is most thermally stable?

- (A) NO (B) N_2O
(C) N_2O_3 (D) N_2O_5

88. The product of the reaction –



89. Cetyl trimethyl ammonium bromide is a –

- (A) Cationic detergent (B) Soap
(C) ester of glycerol (D) anionic detergent

90. In the reaction $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$, The stoichiometry tells that the hydrogen and oxygen react to produce water in the mass ratio of –

- (A) 4 : 2 (B) 4 : 16
(C) 4 : 32 (D) 2 : 1

91. A DNA formed from RNA by using RNA dependent DNA polymerase (reverse transcriptase) is called –

- (A) cDNA (B) rDNA
(C) z-DNA (D) cloned DNA

92. The recognition sequence of Ecor I is –

- (A) 5' - C - C - T - G - G - 3'
3' - G - G - A C C - 5'
- (B) 5' - C - T - T - A - A - G - 3'
3' - G - A - A - T - T C - 5'
- (C) 5' - GAATTC - 3'
3' - CTTAAC - 5'
- (D) All are wrong

93. Modern biotechnology is initiated due to the knowledge of –

- (A) Reverse transcription (B) Restriction exonucleases
(C) Restriction endonucleases (D) Protease

94. Transfer of any gene into a completely different organism can be done through –

- (A) Genetic engineering (B) Tissue culture
(C) Transformation (D) None of these

95. Which of the following pairs are correctly matched?

- (A) Central dogma – Codon (B) Okazaki fragments – Splicing
(C) RNA polymerase – DNA primer (D) Restriction enzyme – Genetic engineering

96. Which is not a plasmid vector?

- (A) pBR-322 (B) PUC 18
(C) YAC (D) PET

97. Poly acrylamide gel electrophoresis (PAGE) is generally used to isolate –

- (A) RNA (B) Proteins
(C) DNA (D) Both DNA and RNA

98. The technique which is used to detect genetic disorders in human is –

- (A) Autoradiography (B) Electrophoresis
(C) PCR (D) Spectroscop

99. Kaziranga National Park is famous for one – horned *Rhinoceros* this park is located –

- (A) Assam (B) Manipur
(C) Punjab (D) Rewa

100. *Spirulina* used to produce SCP. It belongs to kingdom –

- (A) Protista (B) Monera
(C) Fungi (D) Plantae

101. Malaria is caused due to infection of –

- (A) Plasmodium (B) *Plasmodium*
(C) *Gonyaulax* (D) *Trypanosoma*

102. Yeast is included in fungi and not Protista because –

- (A) It has prokaryotic organisation (B) Chlorophyll is absent
(C) It forms pseudomycelium (D) Cellulose cell wall

103. Protonema stage found in –

- (A) Funaria (B) Marchantia
(C) Fern (D) Porella

104. Which is similar in Blue green algae and red algae –

- (A) Cell type and structure (B) Not motile cells
(C) N_2 – fixation capacity (D) Symbiotic association

105. Apospory is development of –

- (A) Sporophyte without fertilisation
(B) Gametophyte from haploid spores
(C) Gametophyte directly from diploid cells of sporophyte
(D) Sporophyte directly from haploid cells of gametophyte

106. Most developed sporophytic generation is found in –

- (A) Bryophyta (B) Pteridophyta
(C) Gymnosperms (D) Angiosperms

107. Select wrong statement –

- (A) *taq* polymerase is used in PCR (B) *pfu* polymerase is a DNA polymerase
(C) *Vent* polymerase used in PCR (D) RNA primers used in PCR

108. Select wrong statement –

- (A) Gametophytic generation of some pteridophytes is symbiotically associated with fungi
- (B) Coralloid roots of cycas is symbiotically associated with cyanobacteria
- (C) Little leaf of *brinjal* is caused by mycoplasma
- (D) Largest kingdom is fungi

109. Which type of inflorescence is found in our national tree?

- (A) Verticillaster
- (B) Cyathium
- (C) Hypanthodium
- (D) Spikelets

110. A drupe is developed from –

- (A) Monolocular, *mono – ovular, superior, bicarpellary ovary*
- (B) Monocarpellary, *mono – ovular, superior ovary*
- (C) Thalamus and pedicel
- (D) Monocarpellary, *mono – ovular, multilocular*

111. Which works as pioneer species along with lichens in xerarch succession?

- (A) Algae
- (B) Fungi
- (C) Bryophyta
- (D) Gymnosperms

112. How many plants in following are homosporous? *Selaginella, Lycopodium, Salvinia, Equisetum, Cycas, Pinus*

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

113. Which is restriction enzyme produces blunt ends?

- (A) Alu I
- (B) Hae
- (C) Both (A) and (B)
- (D) None of these

114. Nuclue and globule are reproductive structures. They are present in –

- (A) *Chlamydomanas*
- (B) *Ustilago*
- (C) *Chara*
- (D) *Adiantum*

115. Edible part of the fruit of apple is the example of –

- (A) Parthenocarpy
- (B) Parthenogenesis
- (C) Fleshy receptacle
- (D) Apomixis

116. Match the plants in column 1 with their modification types in column 2 and choose the right options given below –

Column 1

(a) Ginger

(b) Pumpkin

(c) *Bougainvillea*

(d) *Opuntia*

Column 2

(1) Flattened stem

(2) Thorns

(3) Stem tendrils

(4) Underground stem

(A) (a) – 4, (b) – 3, (c) – 2, (d) – 1

(B) (a) – 4, (b) – 1, (c) – 2, (d) – 3

(C) (a) – 2, (b) – 3, (c) – 1, (d) – 4

(D) (a) – 3, (b) – 4, (c) – 2, (d) – 1

117. In fungi food is mainly stored in the form of –

(A) Glucose

(B) Glycogen and oil drops

(C) Starch

(D) Chitin

118. Probes that used in DNA fingerprinting technique, are binds with –

(A) All DNA segment

(B) VNTRs

(C) Coding sequence

(D) Cut ends of restriction on enzyme

119. Tricarpellary, Syncarpous gynoecium found in –

(A) *Petunia*

(B) *Colchicum autumnale*

(C) *Gloriosa superba*

(D) Both (B) and (C)

120. Lateral roots originate from –

(A) Endodermis of monocot root

(B) Pericycle

(C) Pricycle of monocot stem

(D) Cortex and epidermis

121. Bulliform (motor cells) are –

(A) Highly vacuolated

(B) Present in mesophyll

(C) Found in adaxial epidermis of dorsiventral leaves

(D) Found in abaxial epidermis of isobilateral leaves

122. Which type of plastids are abundant in aleuron cells of maize grain?

(A) Amyloplast

(B) Elaioplasts

(C) Chloroplast

(D) Aleuroplast

123. Which is unique in semiautonomous cell organelles?

- (A) Membrane
- (B) DNA
- (C) Proteins
- (D) Free from nucleus

124. Most abundant mineral in cellular pool is –

- (A) Na^+
- (B) K^+
- (C) Cl^-
- (D) P

125. A cell contains minimum amount of DNA during –

- (A) G_0 – phase
- (B) S – phase
- (C) Prophase
- (D) G_2 – phase

126. Solute potential of a living cell is usually –

- (A) 0
- (B) < 0
- (C) > 0
- (D) Between 0.1 to 1.0

127. Root pressure can results –

- (A) Absorption of minerals
- (B) Guttation
- (C) Photosynthesis
- (D) Organic (phloem) transport

128. Select correct statement –

- (A) *Rhizobium* can fix N_2 in free living as well as symbiotic condition
- (B) Nitrogenase found in only prokaryotes
- (C) Leghaemoglobin acts as O_2 scavenger in root nodules and heterocyst of Blue green algae
- (D) All blue green algae also able to fix N_2

129. Select wrong statement –

- (A) Chlorophyll is most abundant photosynthetic pigment in green plants
- (B) O_2 is an important limiting factor of photosynthesis
- (C) Chlorophyll a and chl-b are not isolated in water
- (D) Green sulphur photosynthetic bacteria utilise H_2S instead of H_2O in light reaction

130. Main benefit of C_2 – cycle (photorespiration) in C_3 plants is to –

- (A) Use excess light energy
- (B) Provide CO_2 and maintain C_3 – cycle
- (C) Produce NH_3 in mitochondria
- (D) Reduce excess water loss

138. A single amino acid is often coded by more than one triplet codes, in most of the cases the first two bases are the same but the third base is different. This feature of the genetic code is called –

- (A) Universality
- (B) Non – Overlapping and commaless
- (C) Degeneracy
- (D) Non – ambiguity

139. Genetic code in mRNA is complementary of –

- (A) Template stand of DNA
- (B) Anticodonor of t RNA
- (C) Both (A) and (B)
- (D) Coding stand of DNA

140. Speciation of finches in Galapagos island, was-

- (A) Allopatric
- (B) Sympatric
- (C) Only due to stabilizing mode of natural selection
- (D) Only due to inter specific compitian

141. Genetic drift usually operates on –

- (A) Largest population in biosphere
- (B) Small isolated population
- (C) Populations that free from natural selection pressure
- (D) Community with high biodiversity

142. The frequency of allele "a" is 0.4 in a population. What is frequency of genotype 'Aa' in same population?

- (A) 0.16
- (B) 0.36
- (C) 0.48
- (D) 0.24

143. Hisardale is example of –

- (A) Out crossing
- (B) Cross breeding
- (C) In breeding
- (D) Interspecific hybridisation

144. Most appropriate explant is –

- (A) Meristem
- (B) Cortex of root
- (C) Mesophyll
- (D) Stock and scion

145. Which is used for gene transfer without using vector?

- (A) RFLPs (B) PCR
(C) β - galactosidase (D) Polyethylene glycol

146. Which fungus is used in preparation of Roquefort cheese?

- (A) *Saccharomyces* (B) *Penicillium*
(C) *Propionibacterium* (D) *Monascus*

147. Which set of gases is released in biogas plant?

- (A) Only CH_4 and CO_2 (B) CH_4 , CO_2 , H_2
(C) CH_4 , CO_2 , and N_2 (D) All are correct

148. N – value of a crocodile population was 100 in 2016. It is increased to 120 in 2017 by 30 birth. Use the given data and r – value if this choose correct population show exponential growth pattern –

- (A) 30 (B) 20
(C) 0.2 (D) 0.1

149. Urn shaped age pyramid represent –

- (A) Expanding population (B) Stable population
(C) Declining population (D) Both (b) and (c)

150. Select wrong statement –

- (A) NPP is always greater than secondary productivity
(B) GPP is always greater than NPP
(C) Biomass of carnivores is standing crop of Herbivores
(D) $\text{GPP} - \text{R} = \text{NPP}$

151. Select correct match –

- (A) Elton – Ecological pyramid (B) Lindeman – Ten percent law
(C) Tansley – Term 'Ecosystem' (D) All are correct

152. How many biodiversity hot spots are traced in India?

- (A) 3 (B) 4
(C) 5 (D) 2

153. Select correct statement –

- (A) CFC is main responsible component of global warming
- (B) Good and bad ozone are found in stratosphere
- (C) Sound intensity measured in Dobson unit
- (D) Sacred grooves are in – situ mode of biodiversity conservation

154. Animal which have notochord only in their larval tail are belong to –

- (A) Cephalochordate
- (B) Urochorda
- (C) Hemichordata
- (D) Vertebrata

155. Largest taxon of animal in respect of biodiversity is –

- (A) *Crustacea*
- (B) *Insecta*
- (C) *Mammalia*
- (D) *Aves*

156. Which is not a cartilaginous fish?

- (A) *Scolidon (dog fish)*
- (B) Great white shark
- (C) *Trygon*
- (D) *Hippocampus*

157. Epithelial tissues arise from –

- (A) Ectoderm
- (B) Mesoderm
- (C) Endoderm
- (D) All of these

158. Select correct statement about eye of cockroach –

- (A) Mosaic type of vision
- (B) More sensitivity but less resolution
- (C) Hexagonal ommatidia are structural unit of eye
- (D) All are correct

159. Chemosensitive area found in –

- (A) Medulla oblongata
- (B) Pons varolii
- (C) Heart
- (D) Lungs

160. Minimum water loss occurs through urination in –

- (A) Camel
- (B) Rabbit
- (C) Frog
- (D) Cockroach

161. Our heart is –

- (A) Myogenic and autoregulated
- (B) Neurogenic
- (C) Four chambered and connected with single circulation
- (D) All are correct

162. Glenoid cavity in pectoral girdle represent –

- (A) Socket of ball and socket joint
- (B) Space above the clavicle
- (C) Fibrous joint between humerus and clavicle
- (D) A cavity that jointed with femur

163. Oblique muscle layer is present in muscularis of –

- (A) Oesophagus
- (B) Stomach
- (C) Intestine
- (D) Pharynx

164. With increasing p^H of blood the oxygen dissociation curve –

- (A) Shift towards right
- (B) Shift towards left
- (C) Shift left initially and right subsequently
- (D) remain unchanged

165. Which can be used as vector –

- (A) Plasmid
- (B) Retrovirus
- (C) Cosmids
- (D) All of these

166. Unit of hearing is –

- (A) Organ of Corti
- (B) Crista ampullaris
- (C) Maculae
- (D) Tectorial membrane

167. Processing of vision and their recognition is take place in –

- (A) Optic – Chiasma
- (B) Occipital lobe
- (C) Olfactory lobe
- (D) Eye

168. What is happen to restore resting potential at the depolarized site of axon?

- (A) Na^+ efflux only within a fraction of second
- (B) K^+ influx by $Na^+ - K^+$ pump
- (C) K^+ efflux within a fraction of second
- (D) Na^+ influx by $Na^+ - K^+$ pump

169. Which is not a part of embryo?

- (A) Trophoblast
- (B) Inner cell mass
- (C) Mesoderm
- (D) Endoderm

170. Sperm entry in ovum cause –

- (A) Repolarisation of cell membrane of sperm
- (B) Depolarisation of cell membrane of ovum
- (C) Further entry of another sperm
- (D) Influx of K^+ and efflux of Na^+

171. How many spermatids are required to produce 200 sperms?

- (A) 50
- (B) 100
- (C) 400
- (D) 200

172. Antennal glands perform the excretory function in –

- (A) Crustacean like prawn
- (B) Reptiles
- (C) Insects
- (D) Starfish

173. Open circulatory system is found in –

- (A) earthworm
- (B) cockroach
- (C) snail
- (D) both (b) and (c)

174. Which one is not a protein –

- (A) Collagen
- (B) Antibodies (immunoglobulins)
- (C) Heparin
- (D) Haemoglobin

175. Select correct statement about p^{BR322} –

- (A) It is artificial plasmid
- (B) Cloning sites of BamHI and Sal I occur in tetracyclin resistant gene
- (C) amp^R is selectable marker
- (D) All are correct

176. Which is used in RNAi (RNA interference)?

- (A) ss DNA
- (B) ds DNA
- (C) ds RNA
- (D) ss RNA

177. Youngest secondary xylem is located –

- (A) Just outside of the vascular cambium
- (B) Just below the cork cambium
- (C) In outer most layer of secondary xylem
- (D) In central part of the wood

178. In Bam HI, am is stands for –

- (A) *aegyptius*
- (B) *amyloliquefaciens*
- (C) *amphioxus*
- (D) *amylophilus*

179. Sites of crossovers form X – shape structures during diplotene of prophase – I. These structures are known as –

- (A) Cross over
- (B) Chiasmata
- (C) Terminal
- (D) X – Joint

180. A population containing a gene 'X' with two alleles 'Aa' is in Hardy Weinberg equilibrium for gene 'X'. If the frequency of allele A is 0.2, allele frequency of 'a' is –

- (A) 0.2
- (B) 0.42
- (C) 0.8
- (D) 1