

## TEST SERIES - 13

### TOPICS COVERED

- PHYSICS** : Heat and Thermodynamics  
**CHEMISTRY** : Thermodynamics  
**BOTANY** : Photosynthesis - II, Respiration in Plants  
**ZOOLOGY** : Neural Control and Coordination, Chemical Coordination and Integration

### INSTRUCTIONS

1. The paper contains 180 objective type questions (45 each in Physics, Chemistry, Botany & Zoology). Four alternatives are given for each question out of which only one is correct. Darken the correct alternative on the given answer-sheet, with a pencil or pen.
2. All the questions carry **four marks** each.
3. For each incorrect answer **1 mark** will be deducted.
4. For unattempted questions the award is neither positive nor negative.
5. No student is permitted to leave examination hall before the time is complete.
6. Use of calculator is not permitted.
7. Use of unfair means shall invite cancellation of the test.

Name of the Student : \_\_\_\_\_

Centre : \_\_\_\_\_

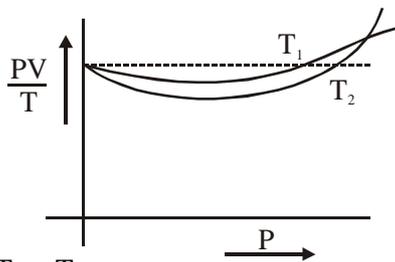
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## PHYSICS & CHEMISTRY

1. A pan filled with hot food cools from  $94^{\circ}\text{C}$  to  $86^{\circ}\text{C}$  in 2 minutes when the room temperature is at  $20^{\circ}\text{C}$ . The time it take to cool from  $71^{\circ}\text{C}$  to  $69^{\circ}\text{C}$  is  
 (1) 30 second                      (2) 42 second  
 (3) 60 second                      (4) None of these
2. A blacksmith fixes iron ring on the rim of the wooden wheel of a bullock cast. The diameter of the rim and the iron ring are 5.243m and 5.231 m respectively at  $27^{\circ}\text{C}$ . The temperature of the ring 50 as to fit the rim of the wheel  
 (1)  $280^{\circ}\text{C}$                       (2)  $218^{\circ}\text{C}$   
 (3)  $258^{\circ}\text{C}$                       (4)  $238^{\circ}\text{C}$
3. The pressure at which the water exist in all three phase is  
 (1)  $6.11 \times 10^{-3}\text{ Pa}$               (2)  $1.01 \times 10^5\text{ Pa}$   
 (3)  $2.02 \times 10^5\text{ Pa}$               (4)  $1.01 \times 10^{-3}\text{ Pa}$
4. The substance which is not subline  
 (1) Dry ice                      (2) Iodine  
 (3) Solid  $\text{CO}_2$                       (4) Phosphorus
5. When 0.15 kg of ice of  $0^{\circ}\text{C}$  mixed with 0.30 kg of water at  $50^{\circ}\text{C}$  in a container. The resulting temperature is  $6.7^{\circ}\text{C}$ . The heat of fusion of ice is [ $S_w = 4186\text{ J kg}^{-1}\text{ K}^{-1}$ ]  
 (1)  $3.34 \times 10^6$                       (2)  $3.34 \times 10^4$   
 (3)  $3.34 \times 10^5$                       (4)  $3.34 \times 10^3$
6. A fully inflated ballon when immersed in cold water  
 (1) It starts shrinking      (2) It expands  
 (3) It remains same      (4) It bursts
7. For the same rise in temperature copper expand how many time than glass nearly  
 (1) 5 times                      (2) 3 times  
 (3) 4 times                      (4) 2 times
8. Coefficient of volume expansion of mercury is more than  
 (1) Water                      (2) Alcohol (ethyl)  
 (3) Iron                      (4) None of these
9. When water cool below  $4^{\circ}\text{C}$   
 (1) Its volume increases  
 (2) Density decreases  
 (3) Both (1) and (2)  
 (4) None of (1) and (2)
10. Some water is taken in a flask and heated to boiling point of water. Then allow water to cool to about  $80^{\circ}\text{C}$ . Close the flask with the airflight cork. Keep the flask turned upside down on the stand. Pour ice-cold water on the flask. Then  
 (1) Water vapour in teh flask condense  
 (2) Pressure on the ater surface inside the flask will reduce  
 (3) Water beings to boil  
 (4) All of above
11. A copper block of mas 2.5 kg is heated in a furnace to a temperature of  $500^{\circ}$  and then placed on a large ice block. The maximum amount of ice that can melt [Specific heat of Cu =  $0.39\text{ J/g/K}$ , heat of fusion of water =  $335\text{ J/g}$ ]  
 (1) 1 kg                      (2) 1.5 kg  
 (3) 2 kg                      (4) 2.5 kg
12. A refrigerator is to maintain eatables kept inside at  $9^{\circ}\text{C}$ . If room temperature is  $36^{\circ}\text{C}$ . Its room temperature is  $36^{\circ}\text{C}$ . Its cofficient of performance is  
 (1) 4                      (2)  $1/4$   
 (3) 10.4                      (4) None of these
13. An elecric heater supplies heat to a system at a rate of 100W. If system performs work at a rate of 75 J/sec. The rate its internal energy increasing is  
 (1) 25 W                      (2) 75 W  
 (3) 100 W                      (4) 125 W
14. The incorrect statement is  
 (1) If  $W < O$ , work is done on the system  
 (2) If  $W > O$ , work is doen by the system  
 (3) If  $Q > O$ , heat is added to the system  
 (4) None of the above

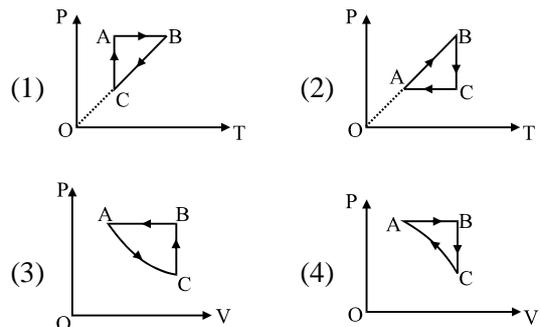
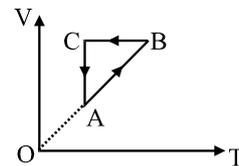
15. 1 g of water go from liquid to vapour phase. At atmospheric pressure, 1 g of water has a volume  $1 \text{ cm}^3$  in liquid phase and  $1671 \text{ cm}^3$  in vapour phase. Its change in internal energy is approximately  
 (1) 2087 J (2) 2256 J  
 (3) 169 J (4) 1671 J
16. Molar heat capacities of solids at atmospheric pressure and ordinary room temperature is approximately  $3R$  except  
 (1) Lead (2) Copper  
 (3) Carbon (4) Silver
17. The molar heat capacity for an ideal gas  
 (1) Cannot be negative  
 (2) Must be equal to either  $C_v$  or  $C_p$   
 (3) Must lie in the range  $C_v \leq C \leq C_p$   
 (4) May have any value between  $-\infty$  and  $+\infty$
18. Uranium has two isotopes of masses 235 and 238 units. If both are present in uranium hexafluoride gas which would have the larger average speed.  
 (1)  $U_{235}$   
 (2)  $U_{238}$   
 (3) Both has same velocity  
 (4) Cannot say
19. At a temperature  $T = 300\text{K}$ , the mean square speed of a molecule in nitrogen gas is  
 (1) 334 m/s (2) 516 m/s  
 (3) 1500 m/s (4) 1024 m/s
20. A cylinder of fixed capacity 44.8 litres contains helium gas at standard temperature and pressure. The amount of heat needed to raise the temperature of the gas in the cylinder by  $15.0^\circ\text{C}$  is ( $R = 2\text{cal/mol}\cdot\text{k}$ )  
 (1) 90 J (2) 45 J  
 (3) 374 J (4) 187 J
21. In a carnot engine if ideal gas is replaced with other gas as working substance the efficiency of car not engine would  
 (1) Decrease  
 (2) Increase  
 (3) Remain same  
 (4) Can be increase or decrease
22. A quasi-static process is  
 (1) On infinitely slow process  
 (2) System in thermal equilibrium with surrounding  
 (3) System is in mechanical equilibrium with surrounding  
 (4) All of the above
23. A cylinder with a movable piston contains 3 moles of hydrogen at standard temperature and pressure. the walls of the cylinder are made of heat insulator and the piston is insulated by having a pile of sand on it. Factor does the pressure of the gas increase if the gas is compressed to half its original value is  
 (1) 2 (2) 2.32  
 (3) 2.64 (4) 2.96
24. Real gases approach ideal gas behaviour at  
 (1) Low pressure and high temperature  
 (2) Low pressure and low temperature  
 (3) High pressure and high temperature  
 (4) High pressure and low temperature
25. A vessel contains two non-reactive gases neon and oxygen. The ratio of their partial pressure is 3 : 2. The ratio of number of molecule is [Atomic mass of Ne = 20.24 and molecular mass of  $\text{O}_2 = 32.04$ ]  
 (1) 15 : 16 (2) 2 : 3  
 (3) 3 : 2 (4) 16 : 15
26. The mean free path  $l$  is the average distance covered by a molecule between two successive collision is given by  
 (1)  $l = \frac{1}{\pi n d^2}$  (2)  $l = \frac{\sqrt{2}}{\pi n d^2}$   
 (3)  $l = \frac{1}{\sqrt{2} \pi n d^2}$  (4)  $l = \frac{\pi}{\sqrt{2} n d^2}$
- where  $n$  is the number density and  $d$  is the diameter of the molecule.

27. Figure shows plot of  $\frac{PV}{T}$  versus  $P$  for  $1 \times 10^{-3}$  kg of oxygen gas at two different temperatures



- (1)  $T_1 > T_2$   
 (2)  $T_2 > T_1$   
 (3)  $T_1 = T_2$   
 (4) Can't be predicted with graph
28. An oxygen cylinder of volume 30 litres has an initial gauge pressure of 15 atm and a temperature of  $27^\circ\text{C}$ . After some oxygen is withdrawn from the cylinder. The gauge pressure drops to 11 atm and its temperature drops to  $17^\circ\text{C}$ . The mass of oxygen taken and of the cylinder is ( $R = 8.31 \text{ J mol}^{-1}\text{K}^{-1}$ , molecular mass of  $\text{O}_2 = 32\text{u}$ )
- (1) 0.14 kg                      (2) 0.16 kg  
 (3) 1.4 kg                        (4) 1.6 kg
29. The total number of air molecules in a room of capacity  $25.0 \text{ m}^3$  at a temperature of  $27^\circ\text{C}$  and 1 atm pressure is
- (1)  $6.10 \times 10^{23}$                       (2)  $6.10 \times 10^{26}$   
 (3)  $6.10 \times 10^{25}$                       (4)  $6.10 \times 10^{24}$
30. The temperature at which the root mean square speed of an atom in an argon gas cylinder equal to the rms. Speed of a helium gas atom at  $-20^\circ\text{C}$ . [atomic mass of Ar = 39.94, of He = 4.04]
- (1) 252 K                              (2) 2.520 K  
 (3) 1260 K                              (4) 5040 K
31. A geyser heats water flowing at the rate of 3.0 litres per minute from  $27^\circ\text{C}$  to  $77^\circ\text{C}$ . If the geyser operates on a gas burner. Its heat of combustion is  $4.0 \times 10^4 \text{ J/g}$ . The rate of consumption of the fuel is
- (1) 16 g per min                      (2) 32 g per min  
 (3) 36 g per min                      (4) 42 g per min

32. Which cannot be the value of co-efficient of performance  $\alpha$  for a refrigerator
- (1) 1                                      (2) 10  
 (3) 100                                      (4)  $\infty$
33. Which is not an extensive variable
- (1) Internal energy                      (2) Volume  
 (3) Total mass                              (4) Temperature
34. Which of the following process is possible according to the first law of thermodynamics –
- (1)  $W > 0, Q < 0$  and  $dU = 0$   
 (2)  $W > 0, Q < 0$  and  $dU > 0$   
 (3)  $W > 0, Q < 0$  and  $dU < 0$   
 (4)  $W < 0, Q > 0$  and  $dU < 0$
35. In a process the pressure of a gas is inversely proportional to the square of the volume. If temperature of the gas is increases, then work done by the gas –
- (1) is positive                              (2) is negative  
 (3) is zero                                      (4) may be positive
36. An ideal gas undergoes a thermodynamic cycle as shown in figure. Which of the following graphs represents the same cycle



37. The emissive power of a black body at  $T = 300 \text{ K}$  is  $100 \text{ Watt/m}^2$ . Consider a body B of area  $A = 10\text{m}^2$  coefficient of reflectivity  $r = 0.3$  and coeffi-

- cient of transmission  $t = 0.5$ . Its temperature is 300 K. Then which of the following is incorrect –
- (1) The emissive power of B is  $20 \text{ W/m}^2$
  - (2) The emissive power of B is  $200 \text{ W/m}^2$
  - (3) The power emitted by is 200 watts
  - (4) The emissivity of B is 0.2
38. A circular hole in an aluminium plate is 2.54 cm in diameter at  $0^\circ\text{C}$ . What is the diameter when the temperature of the plate is raised to  $100^\circ\text{C}$ ? [Given  $\alpha_{\text{Al}} = 2.3 \times 10^{-5} /^\circ\text{C}$ ]
- (1) 2.4558
  - (2) 2.5458
  - (3) 1.4558
  - (4) 1.5458
39. A body cools from  $50^\circ\text{C}$  to  $40^\circ\text{C}$  in 5 minutes. The surrounding temperature is  $20^\circ\text{C}$ . In what further time (in minutes) will it cool to  $30^\circ\text{C}$ ?
- (1) 5
  - (2) 15/2
  - (3) 25/3
  - (4) 10
40. An air bubble of volume  $v_0$  is released by a fish at a depth  $h$  in a lake. The bubble rises to the surface. Assume constant temperature and standard atmospheric pressure above the lake. The volume of the bubble just before touching the surface will be (density of water is  $\rho$ )
- (1)  $v_0$
  - (2)  $v_0(\rho gh/p)$
  - (3)  $\frac{v_0}{\left(1 + \frac{\rho gh}{p}\right)}$
  - (4)  $v_0 \left(1 + \frac{\rho gh}{p}\right)$
41. When an ideal diatomic gas is heated at constant pressure, the fraction of the heat energy supplied which increases the internal energy of the gas is
- (1) 2/5
  - (2) 3/5
  - (3) 3/7
  - (4) 5/7
42. The internal energy of monatomic and diatomic gases are respectively due to
- (1) Linear motion and rolling motion
  - (2) rolling motion and linear motion
  - (3) Linear motion and rotatory motion
  - (4) rotatory motion and linear motion
43. The root-mean-square (rms) speed of oxygen ( $\text{O}_2$ ) molecules at a certain absolute temperature is  $v$ .
- If the temperature is doubled and the oxygen gas dissociates into atomic oxygen, the rms speed would be
- (1)  $v$
  - (2)  $\sqrt{2}v$
  - (3)  $2v$
  - (4)  $2\sqrt{2}v$
44. A gas has volume  $V$  and pressure  $p$ . The total translational kinetic energy of all the molecules of the gas is
- (1)  $(3/2) pV$
  - (2)  $(3/2) pV$  only if the gas is diatomic
  - (3)  $> (3/2) pV$  if the gas is diatomic
  - (4)  $(3/2) pV$  in all cases
45. If  $W_1$  is the work done in compressing an ideal gas from a given initial state through a certain volume isothermally and  $W_2$  is the work done in compressing the same gas from the same initial state through the same volume adiabatically, then
- (1)  $W_1 = W_2$
  - (2)  $W_1 < W_2$
  - (3)  $W_1 > W_2$
  - (4)  $W_1 = 2 W_2$
46. Out of internal energy (A), temperature (B), pressure (C), volume (D), work (E) and enthalpy (F), state functions are
- (1) A, B, C, D
  - (2) A, B, C, E, F
  - (3) A, E, F
  - (4) A, G, E
47. Which is not a state function ?
- (1)  $q$
  - (2)  $H$
  - (3)  $E$
  - (4)  $G$
48. System can be closed if it can
- (1) exchange heat and matter with surroundings
  - (2) exchange heat but not the matter with surroundings
  - (3) neither exchange heat nor matter with surroundings
  - (4) none of the above
49. Out of the following which is not the set of intensive properties ?
- (1) Boiling point, pH, molarity
  - (2) Volume, area, length
  - (3) Freezing point, elevation in b.p., volume
  - (4) Refractive index, molality, density

50. Which of the following is a state function ?  
 (1) The temperature of an ice cube  
 (2) The amount of work in expansion  
 (3) Both (1) and (2)  
 (4) None of the above
51. If bond energy of N–H bond is  $x$  cal mol<sup>-1</sup>, change in internal energy in the following chemical process is  
 $\text{NH}_3(\text{g}) \rightarrow \text{N}(\text{g}) + 3\text{H}(\text{g})$   
 (1)  $x$  cal (2)  $4x$  cal  
 (3)  $3x$  cal (4)  $2x$  cal
52. Temperature of one mole of helium gas is increased by 1°C, hence increase in internal energy is  
 (1) 7 cal (2) 5 cal  
 (3) 3.5 cal (4) 3 cal
53. The value of  $\Delta E$  is positive when energy is transferred from the  
 (1) surroundings to the system  
 (2) system to the surroundings  
 (3) system of system  
 (4) surroundings to surroundings
54.  $\Delta H = \Delta E$  for the case  
 (1)  $\text{C}_2\text{H}_4(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{C}_2\text{H}_6(\text{g})$   
 (2)  $\text{C}(\text{s}) + \text{CO}_2(\text{g}) \rightarrow 2\text{CO}(\text{g})$   
 (3)  $\text{NH}_4\text{HS}(\text{s}) \rightarrow \text{NH}_3(\text{g}) + \text{H}_2\text{S}(\text{g})$   
 (4)  $\text{CH}_4(\text{g}) + 2\text{CO}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g})$
55. When an ideal gas expands in vacuum work done is  
 (1)  $R$  (2)  $\frac{3}{2}R$   
 (3)  $4R$  (4) 0
56. For the reaction  $\text{H}_2(\text{g}) \rightarrow 2\text{H}(\text{g})$   $\Delta H = x$  kJ hence, enthalpy of  $\text{H}_2(\text{g})$  and  $\text{H}(\text{g})$  are respectively  
 (1) 0,  $x$  kJ (2)  $0, \frac{x}{2}$   
 (3)  $x, \frac{x}{2}$  (4)  $\frac{x}{2}, x$
57. The value of  $\Delta E$  when the system absorbs 1000 kJ of heat and does 650 kJ of work on the surroundings is  
 (1) 350 kJ (2) -350 kJ  
 (3) 1650 kJ (4) -1650 kJ
58. An endothermic reaction is spontaneous if  
 (1)  $\Delta H > T\Delta S$  (2)  $\Delta H < T\Delta S$   
 (3)  $\Delta H = T\Delta S$  (4)  $T\Delta S = 0$
59. An exothermic reaction with  $\Delta S = -$  ve, is  
 (1) spontaneous at all temperature  
 (2) spontaneous at high temperature  
 (3) nonspontaneous at low temperature  
 (4) spontaneous at low temperature
60. For the equilibrium at 298 K  
 $2\text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{OH}^-$   $K = 1 \times 10^{-14}$   
 $\Delta G^\circ$  is approximately  
 (1) 100 kJ (2) -80 kJ  
 (3) 80 kJ (4) -100 kJ
61. If a gas absorbs 200 J of heat and expands by 500 cm<sup>3</sup> against a constant pressure of  $2 \times 10^5$  N m<sup>-2</sup>, then change in internal energy is  
 (1) -300 J (2) -100 J  
 (3) +100 J (4) +300 J
62. When one mole of an ideal gas is compressed to half its initial volume and simultaneously heated to twice its initial temperature, the change in entropy ( $\Delta S$ ) is  
 (1)  $C_v \ln 2$  (2)  $C_p \ln 2$   
 (3)  $R \ln 2$  (4)  $(C_v - R) \ln 2$
63. If water kept in an insulated vessel at -10°C suddenly freezes, the entropy change of the system  
 (1) Increases  
 (2) Is equal to that of the surroundings  
 (3) Decreases  
 (4) Is zero
64. Select correct alternate about this reaction  
 (1) It is an endothermic reaction  
 (2) It is an exothermic reaction  
 (3) System gets heated  
 (4) None of the above

65.  $A + B + x_1 \rightarrow C + D + x_2$   
Select correct statement  
(1) If  $x_1 > x_2$ , the reaction is exothermic  
(2) If  $x_2 > x_1$ , the reaction is endothermic  
(3) If  $x_2 > x_1$ , the reaction is exothermic  
(4) If  $x_2 > x_1$ , the reaction is endothermic
66. If liquid is converted into solid state then  
(1) heat is absorbed  
(2) heat is evolved  
(3) no enthalpy change  
(4) heat change depends on nature of solvent
67. Heat of vaporisation  $A(l)$  is  $x_1$  cal and heat of fusion of  $A(s)$  is  $x_2$  cal. Hence, heat of sublimation of  $A(s)$  is  
(1)  $x_1 - x_2$  (2)  $x_2 - x_1$   
(3)  $x_1 + x_2$  (4)  $-(x_1 + x_2)$
68. Which of the following has the highest enthalpy content ?  
(1)  $H_2O(l)$  (2)  $H_2O(s)$   
(3)  $H_2O(g)$  (4) equal
69. Heat of reaction is independent of  
(1) temperature (2) pressure  
(3) physical state (4) path adopted
70. For the following gaseous phase reaction at 298 K  
 $F_2 + 2HCl \rightarrow 2HF + Cl_2$ ,  $\Delta H^\circ = -84.4$  kcal  
If  $\Delta H_f^\circ(HF) = -64.2$  kcal mol<sup>-1</sup> then  $\Delta H_f^\circ(HCl)$  is  
(1) 20.2 kcal mol<sup>-1</sup> (2) -22.0 kcal mol<sup>-1</sup>  
(3) -20.2 kcal mol<sup>-1</sup> (4) +22.0 kcal mol<sup>-1</sup>
71. The heat change for the reaction  
 $C(s) + 2S(s) \rightarrow CS_2(l)$  is known as  
(1) heat of transition of C  
(2) heat of fusion of  $CS_2(l)$   
(3) heat of formation of  $CS_2(l)$   
(4) heat of vaporisation of  $CS_2(l)$
72. Heat of combustion of  $CH_4$ ,  $C_2H_6$  and  $C_3H_8$  are respectively -210, -368.4 and -526.3 kcal mol<sup>-1</sup>  
Hence  
(1)  $C_3H_8$  (2)  $C_2H_6$   
(3)  $CH_4$  (4) equal
73. Heat of combustion of  $H_2(g) = -241.8$  kJ mol<sup>-1</sup>  
 $C(s) = -398.5$  kJ mol<sup>-1</sup>  
 $C_2H_5OH(l) = -1234.7$  kJ mol<sup>-1</sup>  
Hence, heat of formation of  $C_2H_5OH(l)$  is  
(1) -2747.1 kJ mol<sup>-1</sup>  
(2) -277.7 kJ mol<sup>-1</sup>  
(3) 277.7 kJ mol<sup>-1</sup>  
(4) 2747.1 kJ mol<sup>-1</sup>
74. Heat of combustion of  $C(s)$ ,  $H_2(g)$  and  $CH_4(g)$  are  $-x_1$ ,  $-x_2$  and  $-x_3$ . Hence, heat of formation of  $CH_4(g)$  is  
(1)  $-x_1 - x_2 + x_3$  (2)  $-x_1 - 2x_2 - x_3$   
(3)  $-x_1 - x_2 + 2x_3$  (4)  $-x_1 - 2x_2 + x_3$
75. The heat released on neutralisation of  $CaOH$  with all strong acids is 13.4 kcal mol<sup>-1</sup>. The heat released on neutralisation of  $CaOH$  with  $HF$  (weak acid) is 16.4 kcal mol<sup>-1</sup>.  $DH^\circ$  of ionisation of  $HF$  in water is  
(1) 39.8 kcal (2) -39.8 kcal  
(3) -3.0 kcal (4) +3.0 kcal
76. Which of the following process is spontaneous ?  
(1) Diffusion of perfume molecules from one side of the room to the other  
(2) Decomposition of solid  $CaCO_3$   
(3) Heat flow from a cold object to a hot object  
(4) Climbing up a mountain
77.  $H_2O_{ice}(s) \rightleftharpoons H_2O(l)$ ,  $\Delta H^\circ = +6.01$  kJ mol<sup>-1</sup>  
 $\Delta S^\circ = 22.0$  JK<sup>-1</sup> mol<sup>-1</sup>  
Formation of ice is favoured at a temperature  
(1) above 0°C (2) below 0°C  
(3) at 0°C (4) above 10°C
78. A gas is cooled and loses 50 J of heat. The gas contracts as it cools and work done on the system equal to 20 J is exchanged with the surroundings. Hence  $\Delta E$  is  
(1) 70 J (2) -30 J  
(3) 30 J (4) -70 J
79. 1 mol of  $Al_4C_3(s)$  reacts with  $H_2O$  in a closed vessel at 27°C against atmospheric pressure. Work done is  
(1) -1800 cal (2) -600 cal  
(3) +1800 cal (4) Zero

80. For the reaction at 1000°C.  
 $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$   
 $\Delta G^\circ = -27 \text{ kJ}$ ,  $P_{\text{CO}_2} = 0.0023 \text{ atm}$   
 hence, DG at this temperature is  
 (1) -60.5 kJ (2) -87.5 kJ  
 (3) -33.5 kJ (4) +33.5 kJ
81.  $\text{H}_2(\text{g}) + \left(\frac{1}{2}\right)\text{O}_2(\text{g}) = \text{H}_2\text{O}(\text{l})$ ;  
 $\Delta H_{298\text{K}} = -68.32 \text{ kcal}$   
 Heat of vapourisation of water at 1 atm and 25°C is 10.52 k cal. The standard heat of formation (in k cal) of 1 mole of water vapour at 25°C is:  
 (1) -78.84 (2) +78.84  
 (3) +57.80 (4) -57.80
82. For the change,  $\text{C}_{\text{diamond}} \longrightarrow \text{C}_{\text{graphite}}$ ;  $\Delta H = -1.89 \text{ kJ}$ , if 6 g of diamond and 6 g of graphite are separately burnt to yield  $\text{CO}_2$  the heat liberated in first case is  
 (1) Less than in the second case by 1.89 kJ  
 (2) Less than in the second case by 11.34 kJ  
 (3) Less than in the second case by 14.34 kJ  
 (4) More than in the second case by 0.945 kJ
83. Given  $\Delta H_{\text{ioniz}}^0(\text{HCN}) = 45.2 \text{ kJ/mol}$  and  $\Delta H_{\text{ioniz}}^0(\text{CH}_3\text{COOH}) = 2.1 \text{ kJ/mol}$ . Which one of the following facts is true ?  
 (1)  $\text{pK}_a(\text{HCN}) = \text{pK}_a(\text{CH}_3\text{COOH})$   
 (2)  $\text{pK}_a(\text{HCN}) > \text{pK}_a(\text{CH}_3\text{COOH})$   
 (3)  $\text{pK}_a(\text{HCN}) < \text{pK}_a(\text{CH}_3\text{COOH})$   
 (4)  $\text{pK}_a(\text{HCN}) = (45.17/2.07) \text{pK}_a(\text{CH}_3\text{COOH})$
84. The reaction  
 $\text{NH}_2\text{CN}(\text{s}) + \frac{3}{2}\text{O}_2(\text{g}) \rightarrow \text{N}_2(\text{g}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$   
 was carried out in a bomb calorimeter. The heat released was 743 kJ/mol. The value of  $\Delta H_{300\text{K}}$  for this reaction would be  
 (1) -740.5 kJ/mol (2) -741.75 kJ/mol  
 (3) -743.0 kJ/mol (4) -744.25 kJ/mol
85. The  $\Delta H_f^0$  for  $\text{CO}_2(\text{g})$ ,  $\text{CO}(\text{g})$  and  $\text{H}_2\text{O}(\text{g})$  are -393.5, -110.5 and -241.8 kJ/mol respectively. The standard enthalpy change (in kJ/mol) for the reaction  
 $\text{CO}_2(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g})$  is  
 (1) 524.1 (2) 41.2  
 (3) -262.5 (4) -41.2
86. The heat of formation of  $\text{NO}_2(\text{g})$  and  $\text{N}_2\text{O}_4(\text{g})$  are 8.0 and 2.0 kcal/mol respectively. The heat of dimerization of  $\text{NO}_2$  in kcal is  
 (1) 10.0 (2) -6.0  
 (3) -12.0 (4) -14.0
87. The heat of formation of methane  $\text{C}(\text{s}) + 2\text{H}_2(\text{g}) \longrightarrow \text{CH}_4(\text{g})$  at constant pressure is 18500 cal at 25°C. The heat of formation at constant volume would be  
 (1) 19096 cal (2) 18798 cal  
 (3) 18202 cal (4) 17904 cal
88. If,  $\text{S} + \text{O}_2 \longrightarrow \text{SO}_3$ ;  $\Delta H = -298.2 \text{ kJ}$  ... (i)  
 $\text{SO}_2 + \frac{1}{2}\text{O}_2 \longrightarrow \text{SO}_3$ ;  $\Delta H = -98.7 \text{ kJ}$  ... (ii)  
 $\text{SO}_3 + \text{H}_2\text{O} \longrightarrow \text{H}_2\text{SO}_4$ ;  $\Delta H = -130.2 \text{ kJ}$  ... (iii)  
 $\text{H}_2 + \frac{1}{2}\text{O}_2 \longrightarrow \text{H}_2\text{O}$ ;  $\Delta H = -227.3 \text{ kJ}$  ... (iv)  
 The enthalpy of formation of  $\text{H}_2\text{SO}_4$  at 298 K will be  
 (1) -754.4 kJ (2) +320.5 kJ  
 (3) -650.3 kJ (4) -433.7 kJ
89. If 20 kJ work is done by the water fall per unit volume of water and 30 kJ heat was lost per unit volume, the energy change per unit volume of water is:  
 (1) -5 kJ (2) -50 kJ  
 (3) -10 kJ (4) +50 kJ
90. If heat of neutralisation is -13.7 kcal at 25°C and  $H_{f(\text{H}_2\text{O})}^0 = -68 \text{ kcal}$  then standard enthalpy of  $\text{OH}^-$  would be:  
 (1) 54.3 kcal (2) -54.3 kcal  
 (3) 71.3 kcal (4) -71.3 kcal

## BOTANY & ZOOLOGY

91. T.W. Engelmann conducted his experiment using aerobic bacteria. The purpose of using this type of bacteria
- (1) To detect the formation of glucose
  - (2) To detect the utilisation of ATP and NADPH<sub>2</sub>
  - (3) To detect the site of O<sub>2</sub> formation
  - (4) To identify the pathway of non cyclic photophosphorylation
92. CO<sub>2</sub> saturation for C<sub>3</sub> and C<sub>4</sub> plants are
- (1) 450 ppm, 360 ppm
  - (2) 360 ppm, 450 ppm
  - (3) 450 ppm, 650 ppm
  - (4) 650 ppm, 450 ppm
93. In C<sub>4</sub> plants first product of CO<sub>2</sub> fixation is
- (1) 3-PGA
  - (2) OAA
  - (3) Malic acid
  - (4) PEP
94. Agranal chloroplasts are found in
- (1) Mesophyll of pea leaves
  - (2) Mesophyll of maize leaves
  - (3) Bundle sheath of sugarcane leaves
  - (4) Bundle sheath of mango leaves
95. Rubisco in C<sub>4</sub> plants found in
- (1) Mesophyll cell
  - (2) Bundle sheath cells
  - (3) Both (1) and (2)
  - (4) Absent
96. Photorespiration occurs when
- (1) CO<sub>2</sub> Concentration and light intensity is high
  - (2) CO<sub>2</sub> concentration and light intensity is low
  - (3) CO<sub>2</sub> concentration is high but light intensity is low
  - (4) CO<sub>2</sub> concentration is low but light intensity is high
97. Products of non-cyclic photophosphorylation is/are
- (1) ATP only
  - (2) ATP and NADPH<sub>2</sub>
  - (3) ATP, NADPH<sub>2</sub> and O<sub>2</sub>
  - (4) O<sub>2</sub>
98. First stable product of C<sub>3</sub> cycle is
- (1) PGA
  - (2) OAA
  - (3) Malic acid
  - (4) PGAL
99. No. of ATP and NADPH<sub>2</sub> required for fixation of 3CO<sub>2</sub> through C<sub>3</sub> cycle
- (1) 6ATP and 6NADPH<sub>2</sub>
  - (2) 9ATP and 6NADPH<sub>2</sub>
  - (3) 9ATP and 12NADPH<sub>2</sub>
  - (4) 18ATP and 12NADPH<sub>2</sub>
100. No. of ATP and NADPH<sub>2</sub> required to fix 6CO<sub>2</sub> through C<sub>4</sub> pathway.
- (1) 12ATP and 18NADPH<sub>2</sub>
  - (2) 18ATP and 12NADPH<sub>2</sub>
  - (3) 30 ATP and 12NADPH<sub>2</sub>
  - (4) 12ATP and 30NADPH<sub>2</sub>
101. Optimum temperature at which photosynthesis occurs in C<sub>4</sub> plants
- (1) 20-25°C
  - (2) 10-20°C
  - (3) 30-45°C
  - (4) 45°-60°C
102. Common pathway between aerobic and anaerobic respiration is
- (1) TCA cycle
  - (2) Glycolysis
  - (3) ETS
  - (4) PPP
103. Net gain of ATP in anaerobic glycolysis is
- (1) 2ATP
  - (2) 6ATP
  - (3) 8ATP
  - (4) 1ATP
104. Site of EMP in eukaryotes is
- (1) Mitochondrial matrix
  - (2) Cytoplasm
  - (3) Both (1) and (2)
  - (4) Inner mitochondrial membrane
105. Number of NADH<sub>2</sub> molecules produced in EMP of a bacteria per glucose used
- (1) 1
  - (2) 2
  - (3) 3
  - (4) 4
106. Glycolysis was discovered by
- (1) Embden, Mayerhof and Parnas
  - (2) Warburg and Dickens
  - (3) Sir Hans Krebs
  - (4) Calvin

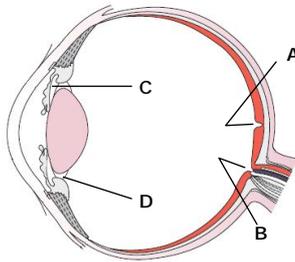
**Rough Work**

107. Oxidative decarboxylation step of eukaryotic aerobic respiration occurs in  
 (1) Cytoplasm  
 (2) Mitochondrial matrix  
 (3) Perimitochondrial space  
 (4) Inner mitochondrial membrane
108. Which is not a product of fermentation carried out by yeast ?  
 (1) Alcohol (2) H<sub>2</sub>O  
 (3) CO<sub>2</sub> (4) ATP
109. Connecting link between glycolysis and TCA cycle is  
 (1) Acetyl CoA (2) OAA  
 (3) Pyruvic acid (4) Citric acid
110. Primary acceptor of TCA cycle is  
 (1) Acetyl CoA (2) Citric acid  
 (3) OAA (4) Pyruvic acid
111. Number of NADH<sub>2</sub>, FADH<sub>2</sub> and ATP molecules produced by one glucose in mitochondria during aerobic respiration is/are  
 (1) 8 NADH<sub>2</sub>, 4FADH<sub>2</sub>, 2ATP  
 (2) 6 NADH<sub>2</sub>, 2FADH<sub>2</sub>, 2ATP  
 (3) 10 NADH<sub>2</sub>, 2FADH<sub>2</sub>, 4ATP  
 (4) 8 NADH<sub>2</sub>, 2FADH<sub>2</sub>, 2ATP
112. 5C acid in TCA cycle is  
 (1) Citric acid (2) α-ketoglutaric acid  
 (3) Fumaric acid (4) Succinic acid
113. Number of total ATP generated in TCA cycle per acetyl CoA used is  
 (1) 14 (2) 10  
 (3) 24 (4) 12
114. Substrate level phosphorylation in TCA occurs when  
 (1) Succinic acid changes to fumaric acid  
 (2) Fumaric acid changes to malic acid  
 (3) Succinyl CoA changes to succinic acid  
 (4) Oxalosuccinic acid changes to α-ketoglutaric acid
115. ETS in bacteria takes place at  
 (1) Cell wall (2) Plasma membrane  
 (3) Nucleus (4) Cytoplasm
116. A single turn of kreb's cycle yields  
 (1) 1 FADH<sub>2</sub>, 2NADH<sub>2</sub>, 1 ATP  
 (2) 2 FADH<sub>2</sub>, 2NADH<sub>2</sub>, 2 ATP  
 (3) 1 FADH<sub>2</sub>, 3NADH<sub>2</sub>, 2 ATP  
 (4) 1 FADH<sub>2</sub>, 3NADH<sub>2</sub>, 1 ATP
117. Number of complexes involved in ETC of respiratory pathway  
 (1) 3 (2) 4  
 (3) 5 (4) 6
118. The complex concerned with oxidative phosphorylation in inner mitochondrial membrane is  
 (1) Complex II (2) Complex III  
 (3) Complex IV (4) Complex V
119. Mobile electron carriers on inner mitochondrial membrane are  
 (1) Cyt b, ubiquinone (2) Cyt c, ubiquinone  
 (3) Cyt a, Cyt a<sub>3</sub> (4) Cyt b, cyt c
120. In eukaryotic cells number of ATP generated from one glucose molecule is  
 (1) 36 (2) 38  
 (3) 34 (4) 32
121. Chemiosmotic theory of ATP synthesis was given by  
 (1) Stephan Hales  
 (2) P.Mitchel  
 (3) Embden, Mayerhoff, Parnas  
 (4) Lindmann
122. According to chemiosmotic mechanisms of ATP synthesis given by P.Mitchel the force/factor responsible for ATP synthesis is  
 (1) Redox potential  
 (2) Electron motive force  
 (3) Membrane potential across membrane  
 (4) Proton motive force
123. Intermediate common to fatty acid and carbohydrate oxidation is  
 (1) Pyruvate (2) Oxaloacetate  
 (3) Acetyl CoA (4) Pyruvic acid
124. RQ value for carbohydrate and proteins are  
 (1) 1, 1.2 (2) 1.33, 1  
 (3) 1, 0.9 (4) 0.9, 1

125. RQ value for tripalmitin is  
 (1) 0.7 (2) 0.9  
 (3) 1 (4) 1.33
126. Intermediate common to protein and carbohydrate oxidation is  
 (1) Amino acids (2) DHAP  
 (3) PGAL (4) Pyruvic acid
127. Terminal electron acceptor in ETS of aerobic respiration is  
 (1)  $H_2O$  (2)  $O_2$   
 (3)  $H_2$  (4)  $CO_2$
128. Element required for activation of pyruvate dehydrogenase is  
 (1)  $Fe^{2+}$  (2)  $Mn^{2+}$   
 (3)  $Cu^{2+}$  (4)  $Mg^{2+}$
129. At which concentration of alcohol, yeasts poison themselves to death during fermentation process ?  
 (1) 8% (2) 13%  
 (3) 18% (4) 40%
130. If 18C in the form fructos-6 -phosphate enters the aerobic respiration in bacteria the find out the total net gain of ATP ?  
 (1) 38 (2) 106  
 (3) 117 (4) 114
131. Select the incorrect statements  
 (1) Respiration is an amphibiolic process  
 (2) Pure fats or proteins are generally used as respiratory substrates  
 (3) RQ is the ratio of  $CO_2$  evolved to the  $O_2$  consumed  
 (4) More the number of oxygen in respiratory substrate, more will be the RQ.
132. Kreb's cycle occurs in  
 (1) Mitochondrial matrix of eukaryotic cell  
 (2) Cytoplasm of eukaryotic cell  
 (3) Chloroplast  
 (4) Nucleoplasm
133. Krebs cycle is also called  
 (1) TCA cycle  
 (2) PCR cycle  
 (3) PCO pathway  
 (4) Co-operative pathway
134. If 12C enters glycolysis in the form of fructose-1,6-diphosphate then find out the no. of ATP synthesised during substrate level phosphorylation in this pathway?  
 (1) 2 (2) 4  
 (3) 8 (4) 16
135. In prokaryotes, Kreb cycle occurs in  
 (1) Mesosome (2) Cytoplasm  
 (3) Nucleus (4) Mitochondial matrix
136. Which part of our central neural system acts as a master clock  
 (1) Pituitary (2) Hypothalamus  
 (3) Medulla (4) Pineal body
137. Complete the statement by choosing appropriate match among the following -  
 Column I Column II  
 (a) Resting potential (i) chemicals involved in the transmission of impulses at synapses  
 (b) Nerve impulse (ii) gap between the pre synaptic and post synaptic neurons  
 (c) Synaptic cleft (iii) electrical potential difference across the resting neural membrane  
 (d) Neuro-transmitters (iv) an electrical wave like response of a neuron to a stimulation  
 (1) (a)-iv, (c)-ii (2) (b)-iv, (d)-iii  
 (3) (a)-iii, (d)-i (4) (b)-iii, (c)-ii
138. Where is the hunger centre located in human brain  
 (1) Pons  
 (2) Hypothalamus  
 (3) Medulla  
 (4) Corpora quadrigemina

139. The difference between electrical transmission and chemical transmission is that in
- (1) Chemical transmission, chemical substances are not used in transmission
  - (2) Electrical transmission, impulses pass from post-synaptic neuron to pre-synaptic neuron
  - (3) Chemical transmission, synaptic cleft is larger than that found in the synapse of electrical transmission
  - (4) Electrical transmission, impulses travel at a slower rate through synapse than that of chemical transmission
140. The hindbrain comprises
- (1) Pons, cerebellum and medulla
  - (2) Pons, cerebrum and medulla
  - (3) Corpora quadrigemina, cerebellum and medulla
  - (4) Cerebrum, cerebellum and medulla
141. How grey matter is different from white matter in the brain, that the grey matter is characterized by
- (1) Presence of perikaryon and unmyelinated nerve fiber
  - (2) Absence of neuroglia and neuroglial cells
  - (3) Presence of dendron and myelinated nerve fiber
  - (4) Absence of cell body and myelinated nerve fiber
142. Select the answer with correct matching of the structure, its location and function.
- | <i>Structure</i>    | <i>Location</i>                                 | <i>Function</i>   |
|---------------------|---|---|
| (1) Eustachian tube | Anterior part of internal ear                   | Equalizes air pressure on either sides of tympanic membrane |
| (2) Cerebellum      | Mid brain                                       | Controls respiration and gastric secretions                 |
| (3) Hypothalamus    | Fore brain                                      | Controls body temperature, urge for eating and drinking     |
| (4) Blind spot      | Near the place where optic nerve leaves the eye | Rods and cones are present but inactive here                |
143. Which part of the human ear plays no role in hearing as such but is otherwise very much required
- (1) Ear ossicles
  - (2) Eustachian tube
  - (3) Organ of Corti
  - (4) Vestibular apparatus
144. The organ of Corti is a structure located on the
- (1) Reissner's membrane
  - (2) Tectorial membrane
  - (3) Tympanic membrane
  - (4) Basilar membrane
145. The daylight (photopic) vision and colour vision are functions of
- (1) Rod cells
  - (2) Cone cells
  - (3) Muller cells
  - (4) Amacrine cells
146. How many of the following statements are correct
- (a) The Eustachian tube helps in equalising the pressures on either sides of the ear drum
  - (b) The middle ear contains three ossicles called malleus, incus and stapes which are attached to one another in a chain-like fashion
  - (c) The coiled portion of the membranous labyrinth is called cochlea
  - (d) At the base of the cochlea, the scala vestibuli ends at the round window, while the scala tympani terminate at the oval window which opens to the middle ear.
- (1) One
  - (2) Two
  - (3) Three
  - (4) Four
147. Arrange the following in the order of reception and transmission of light wave in the eye
- (a)-vitreous humour, (b)-conjunctiva, (c)-lens, (d)-aqueous humour, (e)-cornea, (f)-retina.
- (1) (e) → (b) (a) → (c) → (d) → (f)
  - (2) (b) → (e) → (d) → (c) → (a) → (f)
  - (3) (e) → (b) → (d) → (c) → (a) → (f)
  - (4) (b) → (e) (a) → (c) → (d) → (f)

148. The purplish red pigment rhodopsin contained in the rods type of photoreceptor cells of the human eye, is a derivative of
- (1) Vitamin B<sub>1</sub>                      (2) Vitamin C  
(3) Vitamin D                      (4) Vitamin A
149. The eye ball contains a transparent crystalline lens which is held in place by
- (1) Ligaments attached to the retina  
(2) Tendons attached to the ciliary body  
(3) Ligaments attached to the ciliary body  
(4) Tendons attached to the retina
150. The wall of the human eye ball is composed of how many layers
- (1) Three                              (2) Two  
(3) Four                              (4) Six
151. Blind spot is represented by the labelling



- (1) A                                      (2) B  
(3) C                                      (4) D
152. The point at which optic nerves leave the eye ball is called
- (1) Blind spot                      (2) Macula lutea  
(3) Fovea                              (4) Yellow spot
153. The middle ear contains three ossicles which are
- (1) Cartilages                      (2) Elastic membranes  
(3) Tiny bones                      (4) Smooth muscles
154. Bowman's glands are found in
- (1) Cortical nephrons only  
(2) Juxtamedullary nephrons  
(3) Olfactory epithelium  
(4) External auditory canal

155. Vitreous chamber is present between
- (1) Lens and retina  
(2) Lens and cornea  
(3) Diocoel and metacoel  
(4) V<sub>2</sub> and V<sub>3</sub>
156. Read the following two statements (a-b) carefully and then answer the correct option
- (a) Endocrine system is necessary for the coordination and regulation of the physiological functions in the body  
(b) The nerve fibres do not innervate all cells of the body and the cellular functions need to be continuously regulated
- (1) Both the statement 'a' and 'b' are correct and 'b' is the correct explanation of 'a'  
(2) Both the statement 'a' and 'b' are correct but 'b' is not the correct explanation of 'a'  
(3) Statement 'a' is correct but 'b' is incorrect  
(4) Both the statements 'a' and 'b' are incorrect
157. Blood calcium level is a resultant of how much dietary calcium is absorbed, how much calcium is lost in the urine, how much bone dissolves releasing calcium into the blood and how much calcium from blood enters tissues. A number of factors play an important role in these processes. Mark the one which has no role.
- (1) Vitamin D                      (2) Parathyroid hormone  
(3) Thyrocalcitonin              (4) Thymosin
158. The hormone essential for ovulation is
- (1) FSH                                  (2) LTH  
(3) CG                                  (4) LH
159. Leydig cells produce a group of hormones called
- (1) Androgens                      (2) Estrogens  
(3) Aldosterone                      (4) Gonadotropins
160. The current scientific definition of hormones is
- (1) The chemical produced by endocrine glands and released into the blood and transported to a distantly located target organ  
(2) The chemical produced by endocrine glands and regulate the physiological activities of the body

- (3) The non-nutrient chemicals which are produced by endocrine glands and are stored in the body
- (4) The non-nutrient chemicals which act as intercellular messengers and are produced in trace amounts
161. Which one of the following pairs of hormones are the examples of those that can easily pass through the cell membrane of the target cell and bind to a receptor inside it (mostly in the nucleus)
- (1) Cortisol, testosterone
  - (2) Insulin, glucagon
  - (3) Thyroxin, Insulin
  - (4) Somatostatin, oxytocin
162. Choose the correct answer among the following options
- | Column I                      | Column II                                |
|-------------------------------|--|
| (A) Epinephrine               | (i) Increase in muscle growth            |
| (B) Testosterone              | (ii) Decrease in blood pressure          |
| (C) Glucagon                  | (iii) Decrease in liver glycogen content |
| (D) Atrial natriuretic factor | (iv) Increase heart beat                 |
- Options
- (1) A-ii, B-i, C-iii, D-i
  - (2) A-iv, B-i, C-iii, D-ii
  - (3) A-i, B-ii, C-iii, D-iv
  - (4) A-iv, B-i, C-ii, D-iii
163. One of the following conditions is not linked to deficiency of thyroid hormones
- (1) Cretinism
  - (2) Goitre
  - (3) Myxedema
  - (4) Exophthalmosis
164. Which of the following set of hormones is produced by posterior pituitary
- (1) Growth hormone (GH) and prolactin (PRL)
  - (2) Thyroid stimulating hormone (TSH) and adrenocorticotrophic hormone (ACTH),
  - (3) Luteinizing hormone (LH) and follicle stimulating hormone (FSH)
  - (4) Oxytocin hormone (OT) and Antidiuretic hormone (ADH)
165. In the mechanism of action of a protein hormone, one of the second messengers is
- (1) Cyclic AMP
  - (2) Insulin
  - (3) T3
  - (4) Gastrin
166. What is correct to say about the hormone action in humans
- (1) FSH stimulates the secretion of estrogen and progesterone
  - (2) Glucagon is secreted by  $\beta$ -cells of Islets of Langerhans and stimulates glycogenolysis
  - (3) Secretion of thymosins is stimulated with aging
  - (4) In females, FSH first binds with specific receptors on ovarian cell membrane
167. There are many endocrine glands in human body. The gland which is absent in male is
- (1) Testis
  - (2) Ovary
  - (3) Thymus
  - (4) Pineal
168. The thyroid gland is composed of
- (1) Two lobes
  - (2) Three lobes
  - (3) Four lobes
  - (4) No lobes
169. All the following tissues in mammals except one consists of a central 'medullary' region surrounded by a cortical region. Mark the wrong entry
- (1) Ovary
  - (2) Adrenal
  - (3) Liver
  - (4) Kidney
170. Thymosin is responsible for
- (1) Raising the blood sugar level
  - (2) Raising the blood calcium level
  - (3) Increased production of T lymphocytes
  - (4) Decrease in blood RBC
171. The 24 hour (diurnal) rhythm of our body such as the sleep-wake cycle is regulated by the hormone
- (1) Melatonin
  - (2) Calcitonin
  - (3) Prolactin
  - (4) Adrenaline
172. Parathyroid hormone (PTH) increases the  $\text{Ca}^{2+}$  levels in the blood by
- (a) Bone resorption
  - (b) Reabsorption from renal tubules
  - (c) Absorption from the digested food

- Which of the above statements are correct with respect to the question
- (1) a and b                      (2) b and c  
(3) c and a                      (4) a, b and c
173. Formation of RBC is stimulated by the hormone  
(1) Renin                      (2) Enterocrinin  
(3) Erythropoietin              (4) Secretin
174. The given statement contains some of the blanks. Which one of the given options does not satisfies the blanks  
\_\_\_\_(i)\_\_\_\_ inhibits the synthesis and secretion of \_\_\_\_ (ii) \_\_\_\_ from \_\_\_\_ (iii) \_\_\_\_  
(1) (i)-LH, (ii)-androgens, (iii)-interstitial cells  
(2) (i)-FSH, (ii)-oestrogens, (iii)-theca cells  
(3) (i)-ANF, (ii)-renin, (iii)-juxta-glomerular cells  
(4) (i)-ACTH, (ii)-aldosterone, (iii)- zona glomerulosa
175. Hormones are called chemical signals that stimulate specific target tissues. Their specificity is due to the presence of signal receiving 'receptors' only in the respective target tissues. Where are these receptors present in case of hormones of protein nature?  
(1) Extra cellular matrix  
(2) Blood  
(3) Plasma membrane  
(4) Nucleus
176. Which one is involved in carbohydrate metabolism  
(1) Cortisol                      (2) Paratharmone  
(3) Somatotrophin              (4) Aldosterone
177. Old people have weak immune system. What could be the most probable reason?  
(1) Overstimulation of adrenal cortex resulting in immunosuppression by cortisol  
(2) Degeneration of gonads leading to decreased anabolic hormones such as androgens and oestrogens  
(3) Overstimulation of thyroid resulting in increased metabolism by thyroxine  
(4) Degeneration of thymus resulting in a decreased production of thymosins
178. The steroid responsible for balance of water and electrolytes in our body is  
(1) Insulin                      (2) Melatonin  
(3) Testosterone              (4) Aldosterone
179. Match the source gland with its respective hormone as well as the function
- | <i>Source gland</i>     | <i>Hormone Function</i>  |
|-------------------------|--|
| (1) Anterior pituitary  | Oxytocin Contraction of muscles during birth                                 |
| (2) Posterior pituitary | Vasopressin Stimulates reabsorption of water in distal tubule in the nephron |
| (3) Corpus luteum       | Oestrogen Supports pregnancy   |
| (4) Thyroid             | Thyroxine R e g u l a t e s blood calcium level                              |
180. What is not common between cortisol and glucagon  
(1) Stimulates the process of gluconeogenesis  
(2) Reduces or inhibits the cellular glucose uptake and utilisation  
(3) Promote liver glycogen formation  
(4) Hyperglycemic hormone

**Rough Work**

# ANSWERS

## PHYSICS

1.	(2)	2.	(2)	3.	(1)	4.	(4)	5.	(3)
6.	(1)	7.	(1)	8.	(3)	9.	(3)	10.	(4)
11.	(2)	12.	(3)	13.	(1)	14.	(4)	15.	(1)
16.	(3)	17.	(4)	18.	(1)	19.	(2)	20.	(3)
21.	(3)	22.	(4)	23.	(3)	24.	(1)	25.	(3)
26.	(3)	27.	(1)	28.	(1)	29.	(2)	30.	(2)
31.	(1)	32.	(4)	33.	(4)	34.	(3)	35.	(2)
36.	(4)	37.	(1)	38.	(2)	39.	(3)	40.	(4)
41.	(4)	42.	(1)	43.	(3)	44.	(4)	45.	(2)

## CHEMISTRY

46.	(3)	47.	(1)	48.	(2)	49.	(2)	50.	(1)
51.	(3)	52.	(4)	53.	(1)	54.	(4)	55.	(4)
56.	(2)	57.	(1)	58.	(2)	59.	(4)	60.	(3)
61.	(3)	62.	(4)	63.	(4)	64.	(2)	65.	(3)
66.	(2)	67.	(3)	68.	(2)	69.	(4)	70.	(2)
71.	(3)	72.	(3)	73.	(2)	74.	(4)	75.	(3)
76.	(1)	77.	(2)	78.	(2)	79.	(4)	80.	(2)
81.	(4)	82.	(4)	83.	(2)	84.	(1)	85.	(2)
86.	(4)	87.	(1)	88.	(3)	89.	(3)	90.	(2)

## BOTANY

91.	(3)	92.	(1)	93.	(2)	94.	(3)	95.	(2)
96.	(4)	97.	(3)	98.	(1)	99.	(2)	100.	(3)
101.	(3)	102.	(2)	103.	(3)	104.	(2)	105.	(2)
106.	(1)	107.	(2)	108.	(4)	109.	(1)	110.	(3)
111.	(4)	112.	(2)	113.	(4)	114.	(3)	115.	(2)
116.	(4)	117.	(3)	118.	(4)	119.	(2)	120.	(1)
121.	(2)	122.	(4)	123.	(3)	124.	(3)	125.	(1)
126.	(4)	127.	(2)	128.	(4)	129.	(2)	130.	(3)
131.	(2)	132.	(1)	133.	(1)	134.	(3)	135.	(2)

## ZOOLOGY

136.	(4)	137.	(3)	138.	(2)	139.	(3)	140.	(1)
141.	(1)	142.	(3)	143.	(4)	144.	(4)	145.	(2)
146.	(3)	147.	(2)	148.	(4)	149.	(3)	150.	(1)
151.	(2)	152.	(1)	153.	(3)	154.	(3)	155.	(1)
156.	(1)	157.	(4)	158.	(4)	159.	(1)	160.	(4)
161.	(1)	162.	(2)	163.	(4)	164.	(4)	165.	(1)
166.	(4)	167.	(2)	168.	(3)	169.	(3)	170.	(3)
171.	(1)	172.	(4)	173.	(3)	174.	(3)	175.	(3)
176.	(1)	177.	(4)	178.	(4)	179.	(2)	180.	(3)