

Duration: 2.5 hours

Total marks: 60

N.B. All questions are compulsory

Numbers to the right indicate marks

Draw neat labelled diagram wherever necessary

Q.1 Answer any four of the following

16

- a Elaborate any two fields of biochemistry.
- b Explain the contribution of Dr. Har Gobind Khorana in the field of biochemistry.
- c What is biochemistry ? State its significance.
- d What is the research work of scientist R Rajlakshmi in the field of biochemistry?
- e Write a short note on quantum theory by Homi Jahngir Bhabha.
- f Who was scientist Kamala Sohanie? Explain her contribution in the field of biochemistry.
- g Explain the theory of X-ray diffraction given by G N Ramachandran.
- h Explain the contribution of Dr. Venki Ramchndran in the field of biochemistry.

Q.2 Answer any four of the following

16

- a Calculate the normality of 0.532 gm sodium carbonate when it is mixed in a 500 ml distilled water. (Molecular weight sodium carbonate is 105.98 g/mol)
- b Explain the mechanism of osmosis.
- c Justify: When Nacl is dissolved in water, entropy increases.
- d Write a short note on the buffer solution with one example.
- e A solution is prepared by bubbling 4.56 gm of hydrochloric acid in water. Here, the volume of the solution is 32.8 ml. Calculate the molarity of the solution. (Molecular Weight of HCl 36.458 g/mol)
- f Explain the following terms in detail: a) Specific heat b) Latent heat
- g How do non-polar compounds interact with the structure of water?
- h Justify: Insects can easily run on water.

**Q.3 Answer any four of the following**

- a Write a note on polysaccharides and explain the structural formation of chitin.
- b Define disaccharides and explain the structure of lactose.
- c Explain epimers and enantiomers with examples.
- d What is Mutarotation? explain its reaction with respect to fructose.
- e Give and explain the reaction of glucose and fructose with alkali.
- f Explain the enediol formation with respect to glucose and fructose.
- g Explain the reaction of hemiacetals and hemiketals.
- h What are carbohydrates? Explain their classification and functions.

**Q.4 Answer any six of the following**

- a What are biocatalysts?
- b Enlist the types of disease causes due to biochemical alterations.
- c Explain animal biochemistry in brief.
- d What is food biochemistry?
- e State any two roles of water in the biological system.
- f Define: a) Avogadro number b) Mole
- g How to make 250 ml of 20% sucrose solution?
- h Enlist the applications of Buffers.
- i Define monosaccharides with examples.
- j Explain in brief about orcinol with respect to ribose.
- k Give the structure of the following sugars by using the Fisher projection method:
  - a. L- Glucose.
  - b. L- galactose.
- l Give the structure of the following sugars by using the Haworth projection method:
  - a. D - Fructose.
  - b. D- Ribose