



Indian Association for the Cultivation of Science
(Deemed to be University under *de novo* Category)
**Master's/Integrated Master's-PhD Program/Integrated Bachelor's-Master's
Program/PhD Course**
Mid-Semester Examination-Spring 2025

Subject: Biochemistry, Genetics & Evolution
Full Marks: 25

Subject Code(s): BIS 1201
Time Allotted: 2 h

Part - A

- ✓ 1. D Glucose has 4 chiral centers. How many aldohexose isomers are possible for D Glucose. 1
- ✓ 2. [A] is an aldohexose which is an epimer of D Glucose. [A] upon oxidation provides an optically inactive Aldo saccharic acid. [B] and [A] provide same osazone. [B] on reduction provides optically active alditol. Identify [A] and [B]. 2
- ✓ 3. Galactose in solvent [A] shows mutarotation whereas solvent [B] it failed to show mutarotation. Identify the nature of [A] and [B]. 1
- ✓ 4. Among Maltose and Sucrose which one is reducing and why? 2
- ✓ 5. Glucosamine is prescribed as a food supplement for treating ache at knee joint, why? 2
- ✓ 6. Why the cancer tissue environment is acidic in nature? 2
- ✓ 7. Which three carbon intermediate is different in fructose metabolism than Glucose metabolism? 1
- ✓ 8. Cancer cells generally overexpressed GLUT receptors, why? 1
- ✓ 9. A blood group person is married a B blood group woman. Can the blood group of their son be O, justify? 2
- ✓ 10. If A person is under carb free diet for more than 10hr. He has been consumed 10 eggs and after that he felt dizziness and he got faint after sometime. What could be the probable reason explain from biochemistry point of view. 2
- ✓ 11. What is the biological requirement for the conversion of Glucose to Glucose 6 phosphate? 1
- ✓ 12. Why cellulose cannot increase the blood sugar level and generally it is prescribed for removing constipation. 1
13. Why beta D Glucose is more abundant than beta D galactose in nature? 2

Part - B

14. Define the following (any one):

1

- a) Macroevolution
- ✓b) Second filial generation in Mendelian breeding experiment

15. Answer the following (any one):

2

- ✓a) The cross between plants having yellow and wrinkled cotyledons and plants having green and round cotyledons produces the plants with yellow and round seeds. If plants of green and round cotyledons are crossed with plants of green and wrinkled cotyledons, what will be the genotypic and phenotypic ratios of offspring plants?

1+1=2

- b) Describe the experiment showing maternal inheritance of shell coiling in snails.

2

16. Explain the following (any one):

2

- ✓a) Test cross.
- b) During the Industrial Revolution in Manchester the number of dark colored peppered moth is increased drastically compared to pale-colored populations.