

**Total No. of Pages : 02**

**Total No. of Questions : 09**

**Time : 3 Hrs.**

**Max. Marks : 60**

**INSTRUCTIONS TO CANDIDATES :**

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

## SECTION-A

**1. Answer briefly :**

- (a) Radioactive materials
- (b) Mass spectrometry
- (c) Anion exchange
- (d) Radio isotopes
- (e) Sodium absorption ratio
- (f) Cation exchange capacity
- (g) Adsorption of nutrient in soil
- (h) Terms and conditions for storage of radioactive material
- (i) Iso-morphous substitution
- (j) Half life of carbon

### SECTION-B

2. Define isotopes and explain in detail the properties and uses of isotopes.
3. Elaborate uses of X-ray diffraction instrument.
4. Write principle on which X-ray diffraction machine works.
5. Describe principles of spectrometry in visible region.
6. Explain Planning for soil, water and plant testing laboratory.

### SECTION-C

7. Explain in detail the uses of chromatography in agriculture and allied fields.
8. Explain establishment of soil, water and plant testing laboratory.
9. Explain principle, working and uses of inductively coupled plasma (ICP) spectrometer in estimation of elemental content.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**