

# ***Examination for Diploma, Part 1***

## **Clinical Radiobiology**

Time allowed : 3 hours

ALL QUESTIONS ARE TO BE ATTEMPTED.

All questions are of equal value. Clearly labeled diagrams should be drawn wherever relevant.

1. Define and quantify the TD<sub>5/5</sub> for a 10 cm length of human spinal cord. Discuss the clinical and radiobiological limitations of the data used to derive this value.
2. Outline the basic components of the clonogenic cell survival assay. What difficulties exist in extrapolating results from this assay to in-vivo tissue responses?
3. The radioresistance of a tumour is the clinical outcome resulting from a variety of phenomena overlapping at the cellular and tissue level. In RADIOBIOLOGICAL TERMS, give an account of these factors including the modalities that are currently in use for treatment of this problem.
4. Cell loss is an important kinetic factor which contributes to the dynamic state of tumour growth. Describe the various mechanisms by which cell loss occurs, how it is measured in normal and neoplastic tissues and, in particular, the relevance of cell loss in tumour growth pre-irradiation and post-irradiation.
5. In RADIOBIOLOGICAL TERMS write short notes on any three of the following :
  - a) Radiobiological effects of anaemia
  - b) X-ray effects on the embryo and foetus
  - c) Shrinking field technique
  - d) Mechanism and kinetics of alkylating agents
6. This question is of a multiple choice format and is to be answered on the separate QUESTION DOCUMENT provided, according to the instructions of the document itself.