

National Board of Examinations

Question Paper Name : DNB Radiation Oncology Paper4
Subject Name : DNB Radiation Oncology Paper4
Duration : 180
Total Marks : 100
Display Marks: No

Maximum Instruction Time : 0

Question Number : 1 Question Id : 32718733614 Consider As Subjective : Yes

Please write your answers in the answer booklet within the allotted pages as follows:-

Question Number	Answer to be attempted within	Question Number	Answer to be attempted within
Q. 1	Page 1-5	Q. 6	Page 26-30
Q. 2	Page 6-10	Q. 7	Page 31-35
Q. 3	Page 11-15	Q. 8	Page 36-40
Q. 4	Page 16-20	Q. 9	Page 41-45
Q. 5	Page 21-25	Q. 10	Page 46-50

1. a) What are unsealed isotopes? [2]
- b) Cite three uses of unsealed isotopes in oncology. [3]
- c) Describe the cobalt 60 teletherapy source and give a schematic diagram of its decay. [5]

Question Number : 2 Question Id : 32718733615 Consider As Subjective : Yes

Describe the structure, pros and cons of MR linac. [10]

Question Number : 3 Question Id : 32718733616 Consider As Subjective : Yes

- a) Plating efficiency and surviving fraction. [4]
- b) Shape of survival curve for mammalian cells exposed to radiation. [6]

Question Number : 4 Question Id : 32718733617 Consider As Subjective : Yes

- a) Discuss the physiology of acute and chronic hypoxia. [4]
- b) What are the mechanisms of reoxygenation and the implications in radiotherapy? [6]

Question Number : 5 Question Id : 32718733618 Consider As Subjective : Yes

- a) “Knudson two-hit” hypothesis. [3]
- b) Apoptosis. [3]
- c) Tumour metastasis: Major pathways and molecular mechanism. [4]

Question Number : 6 Question Id : 32718733619 Consider As Subjective : Yes

- a) MRI-guided RT planning. [4]
- b) Single-photon emission computed tomography (SPECT). [3]
- c) Stereotactic biopsy for CNS tumours. [3]

Question Number : 7 Question Id : 32718733620 Consider As Subjective : Yes

- a) Biological advantages of low dose rate continuous irradiation. [3]
- b) Parameters affecting central axis depth dose distribution. [3]
- c) Performance characteristics of a screening test. [4]

Question Number : 8 Question Id : 32718733621 Consider As Subjective : Yes

- a) Role of IHC in the management of NSCLC. [5]
- b) Describe briefly various immunotherapy and targeted agents with their mechanism of action used in the management of lung cancers. [5]

Question Number : 9 Question Id : 32718733622 Consider As Subjective : Yes

- a) Briefly discuss the duties and responsibilities of Radiological Safety Officer (RSO) in radiation oncology department. [5]
- b) Guidelines for comprehensive quality assurance of proton therapy center. [5]

Question Number : 10 Question Id : 32718733623 Consider As Subjective : Yes

- a) What is the principle and basic mechanism of PET-CT? [4]
- b) Apart from FDG, enumerate other common isotopes, their properties and uses in the field of oncology with special reference to CNS tumours. [6]