FINAL EXAM
JUNE 2018

NATIONAL BOARD OF EXAMINATIONS

RADIOTHERAPY

PAPER-I

RTH/J/18/41/I

Time: 3 hours
Max. Marks:100

Important Instructions:

- *Attempt all questions in order.*
- *Each question carries 10 marks.*
- *Read the question carefully and answer to the point neatly and legibly.*
- *Do not leave any blank pages between two answers.*
- *Indicate the question number correctly for the answer in the margin space*
- *Answer all the parts of a single question together.*
- *Start the answer to a question on a fresh page or leave adequate space between two answers.*
- *Draw table/diagrams/flowcharts wherever appropriate.*

Write short notes on:

1. Draw a schematic diagram of the lymphatic drainage of the: 4+3+3
   a) Breast
   b) Middle third of the esophagus
   c) Left testis

2. Explain the physiologic / mechanistic basis of: 3+4+3
   a) Visual field defects in a patient with a right occipital glioma.
   b) Mechanisms of breathlessness in a patient with bronchogenic carcinoma.
   c) Aspiration in a patient with oropharyngeal cancer, pre and post radiotherapy.

3. a) What are the various phases of a clinical trial? 4+3+3
   b) The need to define a patient population, randomization & stratification.
   c) The need to define 'trial stopping rules', intention to treat analysis & per protocol analysis.

4. What is meant by: 2+2+3+3
   a) True positive and False positive
   b) Positive and Negative predictive value
   c) Confidence interval
   d) Odds ratio and Hazard ratio

5. a) Screening for cancer and its goal using one tumor site as an example. 5+5
   b) Evidence base and rationale for the frequency and investigations during follow-up of a treated patient of early breast cancer.

6. a) The distinction between beam modifying and beam direction. 3+2+3+2
   b) Need for wedge filters in radiotherapy.
   c) Enumerate methods by which a dose distribution identical to that of a physical wedge filter can be created without using a wedge filter.
   d) What is meant by wedge angle and hinge angle and their general guiding relationship?

P.T.O.

7. a) Percentage depth dose. 2+3+3+2
b) Factors influencing Percentage depth dose.
c) Mechanism that explains the location of Dmax and it variation with various photon energies.
d) Field equivalence of rectangular fields for central axis depth dose distribution.

8. a) Properties of an ideal brachytherapy source. 2+2+3+3
b) Why were radium substitutes required?
c) How are dose rates in brachytherapy binned together?
d) Compare HDR with LDR brachytherapy and the rational to use these.

9. What is the rationale of the choice of prescription point / normalization method in: 4+3+3
a) Conventional 2 D radiotherapy planning
b) Intensity modulated radiotherapy
c) Radiosurgery

10. With regard to immobilization & positioning devices: 4+2+2+2
a) Describe those in common use for various sites of the body.
b) What is the basic purpose of their use?
c) How do you calculate the precision of relocation?
d) How do you correct errors in relocation on the treatment table?

****