

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

Medical Physicist

(under Baba Farid University of Health Sciences, Faridkot)

QUESTION BOOKLET NC

IMPRESSION OF THE CANDIDATE

OMR ANSWER SHEET NC

ROLL NO:

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FULL SIGNATURE OF THE CANDIDATE

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FULL SIGNATURE OF INVIGILATOR

Time Allowed: 1:00 Hour (11:00 AM to 12:00 Noon)

Maximum Marks: 50

1. Use BLACK FINE TIP BALL PEN only. Use of pencil is not allowed.
2. Write your Roll number on the OMR answer-sheet and also on the question-booklet only in the space provided for the purpose and at no other place in the question booklets and Answer-sheet
3. Enter the Question Booklet Set and Number on the OMR Answer-sheet and also darken the corresponding bubbles with BLACK FINE TIP BALL PEN.
4. Do not put any marks anywhere in the Question booklet /on the OMR Answer-sheet.
5. **There are 50 objective type questions in all of 1 Mark each.** Before attempting the questions, check that the Question-booklet is complete. In case any question/part of question or page is missing, inform the Centre Superintendent within 5 minutes of the start of the examination. After that no claim will be entertained.
6. **Each question is followed by four alternative responses listed as A), B), C) and D) out of which only one is correct / most correct. In case, all the ovals are left blank, there will be deduction of marks @ 0.25 mark for each such unattempted question. Fifth oval 'E' (introduced for security purpose) is to be darkened in case you do not want to attempt the question to avoid negative marking.**
7. To open the question booklet, remove the seal gently when asked to do so. Handover the OMR Answer-sheet to the officer on duty on the completion of the time before you leave the examination hall.
8. **The candidates are permitted to carry his/her question booklet after completion of the examination but OMR Sheets are compulsory required to be deposited with the invigilator.**
9. A candidate who create disturbance of any kind or changes his/her seat or is found in possession of any paper possibility of any assistance to him/her or unfair means will be expelled from the examination by the Centre superintendent/Observer, whose decision shall be final. ("Expulsion" for this purpose would mean cancellation of the entire examination of the candidate).
10. THE CANDIDATES ARE NOT PERMITTED TO CARRY ANY TELECOMMUNICATION EQUIPMENT SUCH AS WATCH, CELLULAR PHONE, WIRELESS SET, SCANNER ETC. INSIDE THE EXAMINATION HALL.
11. For rough work, use only the blank space of the Question booklet.
12. The candidates will not be allowed to leave the examination hall during the examination.
13. Borrowing any material is not allowed.
14. The answer-sheet is designed for Computer evaluation. If the instructions are not followed properly, the candidate alone shall be responsible for the resultant loss.
15. Smoking/Refreshment shall not be allowed in the Entrance Test Centre/Hall.
16. Male candidates shall affix their Left Thumb Impression (LTI) while Female candidates shall affix Right Thumb Impression (RTI) at the prescribed place on the OMR answer sheet, Question Booklet and attendance sheet. The Centre superintendent shall also obtain and retain it for record.
17. The candidate must fill both the question booklet number and OMR answer sheet number on the attendance sheet.
18. No candidate shall be allowed to leave the centre before **12:00 Noon**.

1. What is the primary purpose of quality assurance (QA) in radiation therapy?
 - A. Increase patient dose
 - B. Improve imaging quality only
 - C. Ensure accurate and safe treatment delivery
 - D. Reduce machine maintenance frequency
2. Which parameter is commonly checked in the daily QA of a linear accelerator?
 - A. Beam energy spectrum
 - B. Output constancy
 - C. Gantry tilt calibration
 - D. Wedge filter profile
3. Which QA test ensures the radiation and light field alignment on a LINAC?
 - A. Beam symmetry test
 - B. Light-radiation field coincidence test
 - C. Isocenter test
 - D. Flatness test
4. How often is a mechanical isocenter check typically performed?
 - A. Daily
 - B. Weekly
 - C. Monthly
 - D. Annually
5. Which test checks the precision of beam delivery angles in radiation therapy machines?
 - A. Couch motion test
 - B. Gantry rotation test
 - C. Star shot test
 - D. PDD measurement
6. What device is commonly used for output constancy checks in daily QA?
 - A. Ionization chamber
 - B. EPID
 - C. Thermoluminescent dosimeter
 - D. Solid-state detector
7. Tolerance for daily output constancy in photon beams is typically:
 - A. $\pm 1\%$
 - B. $\pm 2\%$
 - C. $\pm 3\%$
 - D. $\pm 5\%$
8. What is the main purpose of the 'spoke shot' or 'star shot' test?
 - A. Measure output dose
 - B. Check for beam symmetry
 - C. Assess isocenter accuracy
 - D. Verify treatment plan
9. What aspect does the MLC QA test evaluate?
 - A. Collimator leakage
 - B. Leaf positioning and interleaf leakage
 - C. Couch speed
 - D. Room shielding
10. Which organization provides guidelines for QA in radiation therapy?
 - A. IAEA
 - B. WHO
 - C. AAPM
 - D. FDA
11. What is the basic unit of radiation dose absorbed by matter?
 - A. Sievert (Sv)
 - B. Gray (Gy)
 - C. Becquerel (Bq)
 - D. Roentgen (R)

12. Which of the following is a form of ionizing radiation?
 - A. Microwaves
 - B. Infrared
 - C. X-rays
 - D. Radio waves
13. Which subatomic particle is positively charged?
 - A. Electron
 - B. Neutron
 - C. Proton
 - D. Photon
14. What is the speed of electromagnetic radiation in a vacuum?
 - A. 3×10^6 m/s
 - B. 3×10^8 m/s
 - C. 3×10^3 m/s
 - D. 3×10^5 m/s
15. What is the unit of radioactivity?
 - A. Sievert
 - B. Gray
 - C. Coulomb
 - D. Becquerel
16. What type of radiation consists of two protons and two neutrons?
 - A. Alpha radiation
 - B. Beta radiation
 - C. Gamma radiation
 - D. Neutron radiation
17. Which radiation has no mass and no charge?
 - A. Alpha
 - B. Beta
 - C. Gamma
 - D. Neutron
18. What is the charge of a beta-minus particle?
 - A. +1
 - B. 0
 - C. -1
 - D. -2
19. Which of the following particles is most penetrating?
 - A. Alpha
 - B. Beta
 - C. Gamma
 - D. Proton
20. What is the relationship between energy (E) and frequency (f) of electromagnetic waves?
 - A. $E = hf$
 - B. $E = mc^2$
 - C. $E = \frac{1}{2}mv^2$
 - D. $E = VIt$
21. Which law explains the inverse relationship between intensity and distance?
 - A. Ohm's Law
 - B. Inverse Square Law
 - C. Coulomb's Law
 - D. Newton's Law
22. X-rays are produced when electrons strike:
 - A. Anode
 - B. Cathode
 - C. Grid
 - D. Collimator
23. Which of the following has the highest linear energy transfer (LET)?
 - A. Gamma rays
 - B. Beta particles
 - C. Alpha particles
 - D. X-rays

24. What is the function of the collimator in an X-ray machine?
 - A. Absorb scatter radiation
 - B. Increase patient dose
 - C. Restrict the X-ray beam
 - D. Detect radiation
25. Which part of the atom is involved in X-ray production?
 - A. Nucleus
 - B. Neutrons
 - C. Electrons
 - D. Protons
26. Which of the following is the primary goal of radiation protection?
 - A. Maximize radiation exposure to improve imaging
 - B. Eliminate all radiation use in medicine
 - C. Minimize unnecessary exposure to ionizing radiation
 - D. Increase patient throughput
27. Which unit is used to measure the effective dose of radiation?
 - A. Gray (Gy)
 - B. Becquerel (Bq)
 - C. Sievert (Sv)
 - D. Coulomb/kg
28. What principle is most commonly used in radiation protection?
 - A. ALARA (As Low As Reasonably Achievable)
 - B. NORM (Naturally Occurring Radioactive Material)
 - C. ISO (International Standards Organization)
 - D. PACS (Picture Archiving and Communication System)
29. Which type of radiation shielding is commonly used in diagnostic radiology rooms?
 - A. Plastic shields
 - B. Paper barriers
 - C. Lead barriers
 - D. Water shields
30. Which of the following is a deterministic effect of radiation exposure?
 - A. Genetic mutation
 - B. Skin erythema
 - C. Cancer
 - D. Leukemia
31. Who is responsible for ensuring radiation safety in a healthcare setting?
 - A. Only the patient
 - B. Only the radiologist
 - C. Radiation Safety Officer (RSO)
 - D. Nurse in charge
32. Which personnel monitoring device is used to measure occupational radiation dose?
 - A. Stethoscope
 - B. Thermometer
 - C. Dosimeter (e.g., TLD or OSL)
 - D. Defibrillator
33. What is the most effective way to reduce radiation dose to a healthcare worker?
 - A. Increase exposure time
 - B. Decrease shielding
 - C. Increase distance from the source
 - D. Stand closer to the patient

34. What does time, distance, and shielding refer to in radiation protection?
- Patient positioning techniques
 - Principles of radiographic contrast
 - Basic principles of radiation protection
 - Settings for CT scan parameters
35. 10. Which type of radiation is most penetrating and requires the most shielding?
- Alpha particles
 - Beta particles
 - Gamma rays
 - Ultraviolet rays
36. Which of the following is a key advantage of Intensity-Modulated Radiation Therapy (IMRT)?
- Simplified treatment delivery
 - Uniform dose distribution
 - Ability to conform dose around complex tumor shapes
 - Reduced treatment time
37. Which technique allows for real-time tumor tracking during radiation delivery?
- Stereotactic Radiosurgery (SRS)
 - Gating
 - Brachytherapy
 - IMRT
38. Which imaging modality is often used for adaptive radiation therapy (ART)?
- X-ray
 - CT
 - MRI
 - Ultrasound
39. What does VMAT stand for in radiation therapy?
- Volumetric Modular Arc Therapy
 - Variable Map Arc Therapy
 - Volumetric Modulated Arc Therapy
 - Virtual Machine Assisted Therapy
40. Which technique uses multiple small beams from different angles to deliver high doses to a small target?
- IMRT
 - 3D-CRT
 - SRS
 - Brachytherapy
41. What is the primary benefit of proton therapy over conventional photon therapy?
- Cheaper cost
 - Better imaging
 - Precise dose deposition with minimal exit dose
 - Faster treatment time
42. Which radiation planning approach adapts to patient anatomy and motion over time?
- SRS
 - ART (Adaptive Radiation Therapy)
 - VMAT
 - SBRT
43. Which advanced technique uses fiducial markers for tumor localization?
- Proton therapy
 - Brachytherapy
 - Image-Guided Radiation Therapy (IGRT)
 - SRS

44. What does SBRT stand for in radiation therapy?
- A. Single Beam Radiotherapy
 - B. Stereotactic Body Radiation Therapy
 - C. Simple Body Radiation Therapy
 - D. Scanned Beam Radiation Technique
45. Which treatment modality combines MRI with radiation delivery for real-time soft tissue visualization?
- A. PET-guided therapy
 - B. CT-based therapy
 - C. MR-Linac
 - D. SRS
46. What does the term “dose painting” refer to in radiation therapy planning?
- A. Using contrast dye to visualize tumors
 - B. Painting beams on skin before treatment
 - C. Delivering varying radiation doses within the tumor volume based on imaging data
 - D. Color coding the isodose curves on the treatment plan
47. Which technique uses an arc-based delivery and modulates dose rate, gantry speed, and MLC positions simultaneously?
- A. IMRT
 - B. SBRT
 - C. VMAT
 - D. 3D-CRT
48. In MR-guided radiotherapy systems (MR-Linac), what is a key benefit over traditional CT-guided systems?
- A. Less expensive technology
 - B. Better bone imaging
 - C. Superior soft tissue contrast for adaptive planning
 - D. Higher dose rates
49. Which of the following is true about 4D-CT in treatment planning?
- A. It provides four-dimensional tumor motion analysis over time
 - B. It only uses PET data
 - C. It is only used for brain tumors
 - D. It is a static imaging technique
50. What is the purpose of biologically guided radiation therapy (BgRT)?
- A. To base treatment solely on anatomical images
 - B. To track tumor shape without imaging
 - C. To use functional imaging data (like PET) to guide dose delivery
 - D. To deliver chemotherapy with radiation

ANSWER KEY			
Recruitment test conducted on 29/05/2025 for post of Medical Physicist under BFUHS, Faridkot			
1	C	26	C
2	B	27	C
3	B	28	A
4	C	29	C
5	C	30	B
6	D	31	C
7	C	32	C
8	C	33	C
9	B	34	C
10	C	35	C
11	B	36	C
12	B	37	B
13	C	38	C
14	B	39	C
15	D	40	C
16	A	41	C
17	C	42	B
18	C	43	C
19	C	44	B
20	A	45	C
21	B	46	C
22	A	47	C
23	C	48	C
24	C	49	A
25	C	50	C