चित्तरंजन राष्ट्रीय कैंसर संस्थान
CHITTARANJAN NATIONAL CANCER INSTITUTE
(स्वास्थ्य और परिवार कल्याण मंत्रालय के तहत एक स्वायत्त संस्थान, भारत सरकार)
(An Autonomous Institute under Ministry of Health and Family Welfare, Govt. of India)
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NOTICE

Date: 18th July 2025

Result of MCQ-Based Screening Test for the Post of Medical Physicist (Radiotherapy)

Ref: Advt No. R-002/2025 dated 10th May 2025

The Marks of the candidates who have attended **MCQ-Based Screening Test** for the post of **Medical Physicist (Radiotherapy)** on **17th July 2025 (Thursday), 10:30 AM at CNCI Newtown Campus are as follows:**

Sl No	Name	Marks Obtained out of 200
1.	Sumanta Manna	163
2.	Farhana Khatoon	156
3.	Jubipriya Jena	151
4.	Santanu Bag	150
5.	Md. Parvez Musarrof	148
6.	Swapna Gayen	144
7.	Samapti Acharyya	139
8.	Hena Roy	137
9.	Tuhin Subhra Jana	136
10.	Subhabrata Ghosal	133
11.	Abhinandan Pal	132
12.	Supratip Kapat	125
13.	Priyanka Halsana	123
14.	Prasun Kumar Panda	122
15.	Pijus Kanti Ghosh	112
16.	Sourav Sarkar	110
17.	Suvankar Das	110
18.	Sanchita Chakrabarty	99
19.	Pronoy Majhi	93
20.	Soutrick Maitra	91
21.	Swarnendu Banerjee	89
22.	Sunita Patra	89
23.	Md. Basit Ali	88
24.	Sayantan Mondal	84
25.	Santanu Maity	84
26.	Mehedi Hasan	78
27.	Arpan Datta	80
28.	Arya Ray	73

Objections and Clarifications:
The **Multiple Choice Questionnaire** along with the **correct answers** is provided as an attachment.
Any objections regarding the answer key may be submitted via email to **recruitment.cncik@gmail.com** within **7 days** from the date of this notice.
A fee of **Rs. 50/- per question** to be paid through online transfer to the following bank account:

- **Account Number:** 40382089655
- **Bank Name:** State Bank of India
- **Branch:** Sanjeeva Town (Branch Code: 16913)
- **IFSC Code:** SBIN0016913
- **MICR Code:** 700002475

Please attach **proof of online payment** along with your objection submission.

DIRECTOR
CHITTARANJAN NATIONAL CANCER INSTITUTE, KOLKATA

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ANSWER SHEET OF MCQ based Screening Test on 17th July 2025 at CNCI Newtown Campus

Name of Post: Medical Physicist (Radiotherapy) - Advt No. R-002/2025 dated 10th May 2025

1. 12000 Ci of Co-60 source of Telecobalt machine can be transported in –

a) Type A package
b) Type B (U) package
c) Type C package
d) Industrial package

2. The alpha-beta ratio for Late effect tissue is :

a) 3 Gy
b) 6 Gy
c) 10 Gy
d) 14 Gy

3. **The loss of contrast in a therapy verification image compared with a simulator radiographic image is mostly a result of –**

a) an increased number of pair productions
b) an increased number of Compton interactions
c) an increased number of photoelectric interactions
d) a decreased number of photoelectric interactions

4. **After 10 half-lives the activity A of a radionuclide is reduced approximately to**

a) A/10
b) $Ae^{1/10}$
c) A/1000
d) Zero

5. **If collimator setting differ from reference one which factor will be relevant to use in dose calculation**

a) S_c
b) S_p
c) S_{cp}
d) None of above

6. **Activity can be expressed as**

a) $\Delta N/\Delta t$
b) $0.693/T_{1/2}$
c) 0.693/HVL
d) $1.44/T_{1/2}$

7. **According to NCRP Report 93. the average annual dose from man-made and natural radiation in the United States is 360 mrem. The largest contributor to this value is:**

a) Radon and its daughters.
b) Nuclear weapons testing.
c) Medical X-rays.
d) Natural radiation sources excluding radon.

8. **The oxygen effect in radiotherapy is:**

a) Detrimental radiation effect in presence of oxygen
b) A positive radiation effect in absence of oxygen of therapeutic s
c) Enhancement of radiation effect in presence of oxygen
d) Presence of oxygen during radiation treatment

9. **The rise in temperature due to radiation in calorimetry can be measured appropriately by using a**:

a) Galvanometer
b) Thermometer
c) Capacitor
d) Thermistor

10. **The response of diode detectors shows**:

a) Energy dependence
b) Angular dependence
c) Both
d) None

11. **The energy of an electron beam is specified by its energy:**

a) At exit window
b) At phantom surface
c) At Z_{max}
d) at reference depth zref

12. **The test required for verification of radiation isocentre is:**

a) Garden fence test
b) Picket fence test
c) Winston Lutz test
d) None

13. **PDD for 10x10 cm^2 at 10 cm depth for 10 MV photon beam as recommended by AERB is**

a) 77.0 % ± 2.0 %
b) 73.0 % ± 2.0 %
c) 79.0 % ± 2.0 %
d) 67.5 % ± 2.0 %

14. **The pulse forming network switching device in the modulator of a linear accelerator is**

a) An Oscillator
b) A MOSFET
c) A magnetron
d) A hydrogen thyratron

15. **Stanford technique is used for**

a) Hemi body irradiation
b) Total body irradiation
c) Cranio Spinal irradiation
d) Total skin electron therapy

16. **Workload of radiotherapy simulator is expressed in terms of**

a. mR/wk at 1m
b. mA-min/wk
c. mA/wk
d. cGy/wk

17. **ICRP103 introduced tissue weighting factor for one of these organs which was not in ICRP60**

a) Salivary gland
b) Oesophagus
c) Thyroid
d) Stomach

18. **When TPR20,10 increases, mass stopping power:**

a) Increases
b) Decreases
c) First increase then decrease
d) Remain constant

19. **Which factor is particularly important to consider when using an ion chamber for Flattening Filter Free photon beam measurement verses flattened bean measurement**:

a) Polarity correction
b) Stem Leakage
c) Leakage Current
d) Ion recombination

20. **Field of view refers to**:

a) The size of a pixel
b) A matrix
c) The diameter of the image reconstructed
d) The volume of the voxel

21. **Which of the following organs has the lowest Hounsfield unit:**

a) Fat
b) Lungs
c) Water
d) Muscles

22. **Between a lung (air cavity) and tissue interface, the dose is affected primarily by:**

a) Attenuation of the Primary beam
b) Scatter
c) Mass attenuation coefficient
d) Heterogeneity correction factor

23. **For a polyenergetic beam:**

a) HVL 1 > HVL 2
b) HVL 1 < HVL 2
c) HVL 1 = HVL 2
d) HVL 1 ≤ HVL 2

24. **You are treating a patient to a depth of 5cm with SSD=80cm in Telecobalt mechine. Collimators are 35 cm from the source. If the source diameter is 2.1 cm, what is the geometric penumbra width :**

a) 1.1 cm
b) 2.3 cm
c) 2.7 cm
d) 3.0 cm

25. **In SAD setup dose usually normalised at :**

a) The surface of the patient
b) The isocentre
c) At d_{max}
d) The tissue surrounding the target

26**. A tongue and groove is used in MLC design to :**

a) Reduce interleaf leakage
b) Correct for lack of divergence
c) Change the beam into a broad, clinically useful beam
d) Tilt the isodose lines through a specific angle

27. **The 90% depth dose of a 16MeV beam occurs at** :

a) 2 cm
b) 4 cm
c) 5 cm
d) 8 cm

28. **A plot of the volume of a given structure receiving a certain dose or higher as a function of dose is the definition of** :

a) Differential DVH
b) Commulative integral DVH
c) Dose Volume Histogram (DVH)
d) Beam's Eye View

29. **For an isocentric technique, the source- to- skin distance is**:

a) SSD = SAD – d
b) SSD = SAD + d
c) SSD = SAD/d
d) SSD = SAD X d

30. **The required thickness of Cerroband is approximately**:

a) 50% greater than that of pure lead
b) 30% greater than that of pure lead
c) 20% greater than that of pure lead
d) Equal to that of pure lead

31. **The reference isodose in the Paris system is fixed at:**

a) 85% of the basal dose
b) 50% of the basal dose
c) 95% of the prescribed dose
d) 95% of the volume to receive 100% of the dose

32. **The position of dummy sources and radioactive sources should correspond**:

a) within ± 1mm
b) within ± 3mm
c) within ± 5mm
d) within ± 1cm

33. **The output of Co-60 Telecobalt source decreased by about :**

a) 0.1 monthly
b) 1.0% monthly
c) 1.0% each year
d) 10% each month

34. **The major advantage of proton therapy is:**

a) Distal dose falloff (bragg peak)
b) Very sharp penumbra region
c) Range modulation
d) High energy radiation therapy

35. **Ionization in air is measured in**:

a) Absorbed Dose
b) Roentgen
c) Specific activity
d) RBE

36.**The optical density (OD) is defined as**:

a) log (I_O X I_t)
b) log (I_O / I_t)
c) log (I_O - I_t)
d) log (I_O + I_t)

37. **The most radiosensitive phase of the cell cycle is:**

a) G1
b) S
c) G2
d) M

38. **High dose or horns near the surface created by:**

a) Bolus
b) Compensator
c) Wedge
d) Flattening filter

39**. Full width at half maximum (FWHM) is often used as a measure of:**

A) Uniformity
b) Sensitivity
c) Intensity
d) Resolution
e) Dead time

40. **At what distance is the exposure rate (in mR/hr) indicated by a package's transport index measured:**

a) At the surface
b) At 1 meter from the surface
c) At 3 meters from the surface
d) At 6 meters from the surface
e) Transport index has nothing to do with exposure, all packages, radioactive or not have a T.I.

41. **For pair producton to take place, the threshold energy of the incident photon must be :**

a) Equal to 0.51 MeV
b) Greater than 1.02 MeV
c) Greater than 2.04 MeV
d) Less than 1.02 MeV

42. **The main interaction responsible for diagnostic imaging is:**

a) Coherent scattering
b) Compton Scattering
c) Photoelectric effect
d) Pair Production

43. **The variation due to organ motion was first introduced in**

a) ICRU 50
b) ICRU 62
c) ICRU 71
d) ICRU 83

44. **Radiation isocentre accuracy for SRS facility according to AERB is**:

a) 2 mm dia sphere
b) 0.5 mm dia sphere
c) 1 mm dia sphere
d) 1 cm dia sphere

45. **The frequency of microwaves employed for medical linear accelerators is in the range of**:

a) $3 \text{ X } 10^3$ to $9.3 \text{ X } 10^3$ Hz
b) $3 \text{ X } 10^9$ to $9.3 \text{ X } 10^9$ Hz
c) $3 \text{ X } 10^{12}$ to $9.3 \text{ X } 10^{12}$ Hz
d) $3 \text{ X } 10^3$ to $9.3 \text{ X } 10^3$ Hz

46. **The dose calculation for beam therapy involving asymmetric field in which the dose prescription point is not along central axis is done by using:**

a) BSF
b) Past pointing
c) Off Axis Ratio
d) None

47. **The definition of segmentation in medical image processing is:**

a) Reduction of pixel intensity variations by averaging adjacent pixels
b) Identification of pixels that compose a structure of interest in an image
c) Eliminating low spatial frequencies from the image
d) Altering the relative intensities of the image pixels

48. **Method used for tissue inhomogeinities correcting and make SSD independence is:**

a) SAR
b) Clarkson's method
c) TAR
d) TMR

49. **Effective primary dose is**:

a) Dose scatters produced by the collimating system
b) Dose due to primary photons as well as dose scattered from the collimating system
c) Dose due to the primary photons only
d) Dose scatters produced by the patient

50. **Calculate the wedge angle used in order to get the most homogeneous dose distribution in wedged pair technique if the hinge angle is 120^0**:

a) 60^0
b) 45^0
c) 30^0
d) 15^0