

**Questions and Answer key of the written examination held on 28.02.2016 for the post of Radiation Technologist in Regional Cancer Centre, Thiruvananthapuram**

**Directions (Qn. 1 to 60) : Choose the best alternatives.**

1. The volume of pleural effusion could be assessed by which x ray view of chest
  - a. The PA view
  - b. The lateral view
  - c. Lateral decubitus view**
  - d. Apical lordotic view
2. Patient should breathe in and hold while taking which of the following examinations?
  - a. AP and lateral projection of thoracic spine
  - b. AP Full spine projection
  - c. All Chest examinations
  - d. All of the above**
3. The projection not required for primary Scaphoid examination are
  - a. PA
  - b. AP**
  - c. Lateral
  - d. Oblique
4. Patient expiration does not have any effect on the view of on chest radiograph
  - a. Heart size
  - b. Mediastinal contours and width
  - c. Ribs**
  - d. Diaphragm contours
5. Waters view is used for the examination of
  - a. maxillary sinuses**
  - b. skull
  - c. Ankle
  - d. Foot
6. Identify the correct statement
  - a. X-rays are produced extra nuclearly whereas gamma rays are produced inside the nucleus**
  - b. X-rays always have higher energies than gamma rays.
  - c. C Gamma radiations are particles radiations
  - d. X-rays and gamma rays interact with matter differently.
7. Which photon interaction are dominant in the context of diagnostic radiology?
  - a. Photoelectric effect**
  - b. Pair production.
  - c. Compton scattering
  - d. Rayleigh scattering.
8. The Lethal Dose ( $LD_{50/60}$ ) dose for humans is approximately equal to:
  - a. 1 Gy.
  - b. 6 Gy.**
  - c. 20 Gy.
  - d. 60 Gy.

9. Main advantage of Fluorine-18 ( $^{18}\text{F}$ ) over other PET isotopes is
- a. Non toxic
  - b. Easy availability
  - c. **Half life**
  - d. Less production cost
10. The radioactive process exhibited by technetium-99m ( $^{99\text{m}}\text{Tc}$ ) isotope is
- a. Alpha emission
  - b. **Isomeric transition**
  - c. Electron Capture
  - d. Beta emission
11. The average latent period for cataract in the lens for patients that have received 2.5 to 6.5 Gy is:
- a. 1 year
  - b. **5 years**
  - c. 8 years
  - d. 20 years
12. The effective dose for a single chest radiograph is:
- a. **0.02 mSv**
  - b. 0.5 mSv
  - c. 1 mSv
  - d. 1.5 mSv
13. What is unit of absorbed dose in SI system?
- a. Roentgen
  - b. rad
  - c. **Gray**
  - d. rem
14. Which automatic adjustable device is needed in a dedicated mammography unit.
- a. grid
  - b. **compression**
  - c. focal spot
  - d. filter
15. A dedicated mammography unit is having a
- a. **low ratio grid**
  - b. high ratio grid
  - c. three-phase voltage generator
  - d. tungsten filter
16. Mammograms are taken with \_\_\_\_\_ cassettes.
- a. double screen
  - b. **single screen**
  - c. non-screen
  - d. both a and b
17. Lead is used as a radiation shielding material because of
- a. **High atomic number**
  - b. Low cost
  - c. Low melting point
  - d. Easy availability
18. The x-ray tube used for interventional radiologic procedures has a
- a. small diameter anode
  - b. **small target angle**
  - c. large focal spot
  - d. low power rating
19. Serial radiography requires x-ray equipment with a
- a. large target angle
  - b. small anode disk
  - c. low heat capacity
  - d. **high power rating**

20. The size and construction of the \_\_\_\_\_ determines the anode heat capacity.  
a. tube housing      b. cathode wire      c. bearing assembly      **d. anode disk**
21. A principal advantage of digital fluoroscopy is the  
a. dynamic range      b. image acquisition rate  
**c. image subtraction**      d. progressive mode
22. Image integration results in  
**a. increased patient dose**      b. decreased patient dose.  
c. decreased contrast resolution      d. Increased noise artifact
23. The display for PACS must have a minimum of \_\_\_\_\_ screen resolution.  
**a. 2048 x 2048**      b. 925 x 925      c. 1024 x 1024      d. 256 x 256
24. When using the PACS system, \_\_\_\_\_ is useful for viewing fractures and small, high contrast objects.  
a. windowing      **b. edge enhancement**      c. subtraction      d. highlighting
25. The flow of released electrons from the filament to the anode across the x-ray tube is referred as  
a. Filament current      **b. tube current**  
c. eddy currents      d. inverse current
26. The total number of electrons bombarding the target can be described by  
a. mA      **b. mAS**      c. KVp      d. eV
27. Grid Controlled X ray tubes are used in  
a. Mammography      b. Conventional x ray machine  
**c. Angiography**      d. Dental x ray tubes
28. The anode angle in a diagnostic x-ray tubes is about  
**a. 6 and 17 degrees**      b. 90 degree  
c. c 180 degree      d. 30 -35 degree
29. Molybdenum and rhodium targets are used in  
a. CT machines      b. Angiography machines  
**c. Mammography**      d. Dental X rays

30. Heat unit of an X ray tube is the product of
- a. **Tube voltage , Tube current and Time**
  - b. Energy ,attenuation coefficient and time
  - c. Mass of electron, Kinetic Energy and time
  - d. Atomic number and specific heat capacity
31. Images in digital form are not directly produced in
- a. Computed tomography (CT)
  - b. Magnetic resonance( MRI)
  - c. Computed Radiography C R
  - d. **Digital**
32. Single emulsion film is used in
- a. Chest x rays
  - b. **Mammography**
  - c. Interventional radiography
  - d. HSG
33. Which of the following is not a constituent of fixing solution?
- a. sodium thio sulphate
  - b. potassium alum
  - c. acetic acid
  - d. **silver bromide**
34. The degree of blackening of a region of film is described
- a. **optical density (OD)**
  - b. film sensitivity
  - c. film speed
  - d. transmittance
35. What is the speed of the x-ray film in if 20 mR is required to produce an optical density of 1.0 above base density?
- a. **50**
  - b. 20
  - c. 100
  - d. 1
36. The deposition of metallic silver without exposure to radiation causes in a film
- a. Artefacts
  - b. **Fog**
  - c. Latitude
  - d. Gamma
37. Desirable properties of an x-ray intensifying screen includes following except
- a. A high attenuation coefficient for x rays of diagnostic quality
  - b. A high efficiency for the conversion of energy in the x-ray beam to light
  - c. High transparency to light released by the fluorescent granules
  - d. **A high refractive index**
38. Which of the following materials is not used in intensifying screens?
- a. calcium tungstate
  - b. **cellulose acetate**
  - c. gadolinium oxysulfide
  - d. barium lead sulfate

39. Physiological functional images of human body can be obtained from which of the following imaging modalities?
- Computed Tomography ( CT)
  - Ultrasound imaging
  - Nuclear Medicine**
  - All of the above
40. Full Width Half Maximum (FWHM) of a scintillation gamma Camera is a quantification of
- Sensitivity
  - Spatial resolution**
  - Flood field uniformity
  - None of the above.
41. The first radiographic grid was designed by
- Bucky**
  - Roentegen
  - Coolidge
  - Farady
42. The reduction in brightness and image quality along the border of the fluoroscopic image is referred
- pincushion distortion
  - edge enhancement
  - vignetting**
  - none of the above
43. The incorrect statement regarding CT generations are
- First-generation scanner using a pencil x-ray beam and a combination of translational and rotational motion
  - Second-generation scanner with a fan x-ray beam, multiple detectors, and a combination of translational and rotational motion
  - Third-generation scanner using a fan x-ray beam and smooth rotational motion of x-ray tube and detector array
  - Fourth-generation scanner with rotational motion of the x-ray tube and smooth rotation of a single detector**
44. CT number for air is
- 0
  - 1000**
  - 1000
  - 1
45. CT number for water is
- 0**
  - 1
  - 1000
  - 1
46. Tungsten is used for the construction of filament of an Xray tube because of
- High Atomic number
  - High melting point**
  - High x-ray yield
  - High thermal conductivity
47. The Physical Property that Influence Intrinsic Contrast of MR images is
- Atomic number
  - Physical density
  - Proton density**
  - Electron density

48. Gadolinium is used as a contrast agent in  
a. CT                    **b. MRI**                    c. Ultrasound                    d. PET
49. Which of the following type of Image noise is caused by anode heel effect of an x-ray tube  
a. structure noise                    **b. radiation noise**  
c. receptor noise                    d. quantum mottle
50. Identify a pulse sequence in MRI  
a. Free induction decay                    b. Spin echo  
c. Inversion Recovery                    **d. All of the above**
51. Which is not a contraindication for MRI  
a. Metal objects                    b. Pacemaker                    c. cochlear implants                    **d. Pregnancy**
52. Thallium- 201 is an isotope of choice for the  
a. imaging of Kidney                    b. Imaging of Liver  
**c. imaging of heart**                    d. imaging of bones
53. FLAIR sequence in MRI are commonly used for studies of  
a. Abdomen                    b. Lung                    **c. Brain**                    d. bones
54. Identify the correct statement  
**a. Personal monitoring badges must wear Under Lead apron**  
b. Personal monitoring badges must wear above Lead apron  
c. Personal monitoring badges shield the x ray beams  
d. All of the above
55. Lateral view is not required for the routine examination of  
a. Cervical spine                    b. Thoracic spine                    c. Lumbar spine                    **d. Pelvis**
56. Female infertility can be detected by  
a. Plain AP abdomen xray                    **b. HSG**                    c. KUB                    d. None of the above
57. Contrast mainly used for patients with renal failure is  
a. Fenoldapam                    **b. Low osmolar contrast**  
c. Barium                    d. none of the above
58. Aneurism can be best evaluated using  
a. Ultrasonography                    b. CT                    c. MRI                    **d. Arteriography**

59. In adults spinal cord ends at
- a. **Lower border L1**
- b. Lower border of L3
- c. Lower border of S1
- d. Lower border of L5
60. Which of the following bone does no contribute to the nasal septum?
- a. Sphenoid
- b. **Lacrimal**
- c. Palatine
- d.

**Directions (Qn. 61 to 64) : Pickout the nearest correct meaning or synonym of the words given below.**

- |     |         |               |                   |                    |                   |
|-----|---------|---------------|-------------------|--------------------|-------------------|
| 61. | HARMONY | a. cemetery   | b. ceremony       | c. <b>symmetry</b> | d. hierarchy      |
| 62. | ADVICE  | a. council    | b. <b>counsel</b> | c. practice        | d. proposal       |
| 63. | FACULTY | a. privilege  | b. desire         | c. branch          | d. <b>ability</b> |
| 64. | ANNEX   | a. <b>add</b> | b. low            | c. copy            | d. initial        |

**Directions (Qn. 65 to 67) :** Choose the option which contains a pair of words related to each other in the same way as the pair given in capital letters.

65. TORCH : LIBERTY
- a. Laws : Courts  
c. Balance : Equity
- b. Scales : Justice  
d. Weights : Measure
66. MONEY: BANK
- a. Fear : Tremble  
c. Sound : Music
- b. Arrows : Quiver  
d. Coin : Mint
67. KING: CROWN
- a. Priest : Mitre  
c. Teacher : Chalk
- b. Soldier : Gun  
d. Sculptor : Chisel

**Directions (Qn. 68 to 70) : In the given sentences, a part of the sentences is underlined. Beneath each sentences, four different ways of phrasing the underlined part are indicated. Choose the best alternative.**

68. We want the teacher to be him who has the best rapport with the students.
- a. **We want the teacher to be he**                      b. We want him to be the teacher  
c. We desire the teacher to be him                      d. We anticipate the teacher to be him
69. Anyone interested in the use of computer can learn much if you have access to a state-of-the-art microcomputer.
- a. **if he has access to**                                      b. if access is available to  
c. by access to    d. from access to
70. Today this is a totally different world than we have seen in the last decade.
- a. than what we seen                                      b. then we have seen  
c. from what we seen                                      d. **from what we have seen**

**Directions (Qn. 71 and 72) : In each of the following questions, there is a certain relationship between two given words on one side of :: and one word is given on another side of :: while another word is to be found from the given alternatives, having the same relation with this word as the words of the given pair bear. Choose the correct alternative.**

71. Genuine : Authentic :: Mirage : ?
- a. Image                      b. Transpiration                      c. Reflection                      d. **Illusion**
72. Bread : Yeast :: Curd : ?
- a. Fungi                      b. **Bacteria**                      c. Germs                      d. Virus

**Directions (Qn. 73 and 74) : In each of the following questions, one term in the number series is wrong. Find out the wrong term.**

73. 380, 188, 92, 48, 20, 8, 2
- a. 188                      b. 92                      c. **48**                      d. 20
74. 56, 72, 90, 110, 132, 150
- a. 72                      b. 90                      c. 110                      d. **150**

**Directions (Qn. 75 to 80) : Choose the best alternatives.**

75. In a certain code, '256' means 'you are good'; '637' means 'we are bad' and '358' means 'good and bad'. Which of the following represents 'and' in that code ?
- a. 2                      b. 5                      c. **8**                      d. 3



76. E is the son of A. D is the son of B. E is married to C. C is B's daughter. How is D related to E?  
 a. Brother                      b. Uncle                      c. Father-in-law                      **d. Brother-in-law**
77. Five girls are sitting in a row. Rashi is not adjacent to Sulekha or Abha. Anuradha is not adjacent to Sulekha. Rashi is adjacent to Monika. Monika is at the middle in the row. Then, Anuradha is adjacent to whom out of the following ?  
**a. Rashi**                      b. Sulekha                      c. Abha                      d. Monika
78. In a class, ratio of passed to failed students in an exam is 5:1. Amit is 16<sup>th</sup> from the top and Sujit, who is three ranks below Amit, is 22<sup>nd</sup> from the bottom among the passed students. If all students in the class had appeared for the exam, what is the strength of the class?  
 a. 40                      b. 32                      **c. 48**                      d. Data Inadequate
79. The sum of the ages of a son and father is 48 years. After 4 years, the age of the father will be 3 times that of the son. What is the age of the son?  
 a. 6                      b. 18                      **c. 10**                      d. None of these
80. Shyam starts walking towards East and after walking 20m, turns southward and walks 10 m and then he turns to his right and walks 30m. In which direction is he now with respect to the starting point?  
 a. South                      b. West                      c. South-East                      **d. South-West**

**Directions (Qn. 81 and 82): In each of the following questions, four groups of letters are given, Three of them are alike in a certain way while one is different. Select the one which is different.**

81. **a. STUA**                      b. RQPA                      c. MLKA                      d. HGFA
82. a. RSXY                      **b. NOUV**                      c. MNST                      d. DEJK

**Directions (Qn. 86 to 100) : Choose the best alternatives.**

83. A thief steals a car at 1p.m. and drives at 20 km/hr. The theft is discovered at 2 p.m. If the owner sets of another car at 30 km/hr, then he will overtake the thief at:  
 a. 2.40 pm                      b. 3.20 pm                      **c. 4.00 pm**                      d. 4.20 pm
84. If 15 men and 10 boys can do in one day as much work as 12 men and 20 boys. How much should a man be paid a day if a boy is to get Rs. 10/- a day ?  
 a. Rs. 26.77                      **b. Rs. 33.33**                      c. Rs. 45                      d. None of these

85. A farmer notices that the area of his farm in sq.mts is equal to 2 times the square of the number of tractors he owns. If one tractor is stolen he has to sell 62 sq.mts of the farm so as to maintain the relationship. Find the total number of tractors he has.
- a. 14                      b. 15                      c. **16**                      d. 17
86. Performing 'Sati' by women was declared illegal during the Governor Generalship of :
- a. **William Bentinck**                      b. Dalhousie  
c. Canning                      d. Cornwallis
87. Who was the first Indian to win an individual medal in Olympics?
- a. Milkha Singh                      b. P. T. Usha  
c. Karnam Malleshwari                      d. **K. D. Jadhav**
88. How many countries share land boundaries with India?
- a. Five                      b. Six                      c. **Seven**                      d. Nine
89. An ordinance promulgated by the President of India
- a. Has an indefinite life  
b. Effective only if the Lok Sabha is dissolved  
c. **Must be laid before the Parliament when it meets**  
d. is a parallel power of legislation available to the president even when the Parliament is in session
90. Council of ministers has to resign if it loses the confidence of :
- a. Parliament                      b. Either House of Parliament  
c. Rajya sabha                      d. **Lok Sabha**
91. Which of the following was awarded Noble Peace for three times?
- a. Human Rights Council                      b. World Bank  
c. **International Committee of the Red Cross**                      d. UN peacekeeping forces
92. Which of the countries represent letter 'C' in the category known as BRIC Countries?
- a. Canada                      b. Chile                      c. Cuba                      d. **China**
93. A solar eclipse is caused when the
- a. Sun comes between the earth and the moon  
b. moon comes between the sun and the earth  
c. **earth comes between the sun and the moon**  
d. none of these

94. Chinese currency Yuan was in news during the last week of December 2015. Yuan is also known as:
- a. **Renminbi**                      b. Abbasi                      c. Toman                      d. Pataca
95. The rate at which banks borrow rupees from RBI is
- a. **Repo rate**                      b. Reverse Repo rate  
c. Bank rate                      d. Simple interest rate
96. Who started the first newspaper in India?
- a. Dadabhai Naorji                      b. Sir Syed Ahemed Khan  
c. **James Hickey**                      d. Raveendra Nath Tagore
97. The Olympic games are normally held at an interval of
- a. 2 years                      b. 3years                      c. **4 years**                      d. 5 years
98. Which metal is used for generation of Nuclear Energy by Nuclear power plants?
- a. Zinc                      b. Platinum                      c. **Uranium**                      d. Nickel
99. The country which has no income tax
- a. Nepal                      b. Afganisthan                      c. China                      d. **United Arab Emirates**
100. Where is Harappa situated, according to the present map?
- a. India                      b. Afganisthan                      c. **Pakistan**                      d. China