

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

# **UNIVERSITY EXAMINATIONS 2014/2015**

**END OF SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF RADIOGRAPHY**

**RAD 2202 : EQUIPMENT AND IMAGING**

**DATE: DECEMBER 2014 TIME: 2 HOURS**

**INSTRUCTIONS:**

**ANSWER ALL QUESTIONS IN SECTION A AND B**

**ANSWER ONLY ONE QUESTION IN SECTION C**

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**SECTION A: MULTIPLE CHOICE QUESTIONS [20 MARKS]**

**QUESTION ONE**

1. The following are electromagnetic radiations EXCEPT:
2. White light
3. X-rays
4. Gamma rays
5. Electron beam
6. Bremsstrahlung :
7. Is used to detect the amount of radiation leaving the x-rays tube
8. Is characteristics of the material used in the x-ray tube target
9. Is energy possessed by an x-ray beam
10. Is “breaking radiation” from the x-ray tube
11. Tube current :
12. Is current used to heat the filament of an x-ray tube
13. Is current passing through the high tension circuit of an x-ray tube
14. Is the current that determines the amount of filtration for the x-ray beam
15. Is that current passing through the primary circuit for the x-ray tube
16. The following are true for secondary radiation grids EXCEPT :
17. The are used to minimize scattered radiation reaching the recording media
18. They improve the quality of the radio graphic image
19. They assist in the immobilization of the patient during radiography examinations
20. They are made of lead strips
21. Geometrical unsharpness is due to :
22. Movement of patient during a radiographic exposure
23. The dimension of the focal spot for the x-rays tube
24. Grid movement during a radiographic exposure
25. Geometry of the x-ray beam
26. X-ray tube rating:
27. Is determined by the type of target material used for the X-ray tube
28. Is highest when the anode is stationary during exposure
29. Determines the quality of the radiographic image
30. Determines the turn around time of patients for radiological examinations
31. The penetrating ability of the X-ray beam:
32. Determining the self life of the x-ray tube
33. Is determined by the potential differences between the cathode and anode of the x-ray tube
34. Is not important in digital radiography
35. Is influenced by the tube current
36. One of the following is not true regarding the film-screen combination:
37. The film is exposed by light during exposure
38. The image is revealed using a laser bean
39. The film is placed between intensifying screens in a light tight box
40. Controlled illumination is required for processing the film after exposure
41. Mammography:
42. Is a soft tissue radiographic examination of the whole body
43. Utilizes very low beam energy
44. Require added filtration on the x-ray beam
45. Delivers a very high dose to the radiographer during the procedure
46. Beam collimation helps in:
47. Lengthening the life of the x-ray equipment
48. Reducing the amount of scattered radiation during exposure
49. Receding the exposure time during a radiographic exposure
50. None of the above
51. The probability of anger electron production :.
52. Increases with atomic number
53. Decreases with the photon energy of the e-ray beam
54. Decreases with the increase in atomic mass
55. Decreases with atomic number
56. In a rotating anode x-ray tube
57. The anode disc rotates during a radiographic exposure
58. The tube must be water coated
59. The anode is made of molybdenum
60. The anode is stationary during a radiographic exposure
61. The following statements are true concerning the space charge cloud around the cathode of an x-ray tube. Which one id false?
62. It inhibits the production of electrons
63. It is useful in improving the image contrast for radiographic images
64. The tube current is elevated with the use of high potential differences for the x-ray tube
65. It is undesirable in radiography
66. Anode heat effect:
67. Is due to pitting on the anode of the x-ray tube
68. Is not available in new x-ray tubes
69. Is a disadvantage in radiography and has no application
70. Is not noticeable on the radiographic image
71. Which of the following is not a function of the tube shield /housing?
72. Protects the x-ray tube from mechanical damage
73. Holds the oil for the x-ray tube
74. Holds the connections to the x-ray tube
75. Help in the generation of x-radiation
76. Which of the following is not a component of the stationary anode x-ray tube?
77. Glass envelop
78. Rotor and its winding
79. Tungsten Target
80. Copper block
81. The following statements are true for fluoroscopy EXCEPT :
82. It uses a crossed TV circuit
83. It uses very low tube current
84. Delivers high radiation dose to the operator and the surroundings
85. The tube is run at the highest speed possible
86. Ultrasound wave:
87. Is electromagnetic in nature
88. Propagates through longitudinal waves
89. Is generated by fast moving particles
90. Produces ionizing effect on the body tissues
91. Digital imaging:
92. Uses a special cassette with an x-ray film
93. Requires a processing laboratory
94. Has low patient through-put
95. Used a photostimulable plate in its operation
96. The following statements are true in reference to computerized tomographic image. Which one is false?
97. Acquisition involves measurement of x-ray transmission profiles through a patient
98. Image is acquired through a detector arc
99. Transmission profiles are used to view the image
100. The image is composed of a matrix of picture elements

**SECTION B: SAQ’S [30 MARKS]**

1. Explain briefly the purpose of the following in medical imaging :-
2. Secondary limiting devices
3. Beam centering devices
4. Ultrasound transducers
5. Image receptors
6. Image intensifier tube 5x6=30 marks

**SECTION C: ESSAY QUESTIONS:**

**Answer only ONE Question from this section – 20 marks**

1. Using a well labeled diagram describe the construction features of a rotating anode x-ray tube [20 marks]
2. Describe the construction features of an ultrasound transducer [20 marks]
3. Digital imaging includes direct and computed radiography. Discuss. [20 marks]