

1. The caudal margin of the target volume in patients with endometrial carcinoma is: 3:161
 - A. Anterior superioriliac spine
 - B. Brim of true pelvis
 - C. Midobturator foramen
 - D. Widest point of the bony pelvis
2. Which of the following tissue will most likely require a homogeneity correction factor of .25 gmcc? 3:203
 - A. Liver
 - B. Lung
 - C. Breast tissue
 - D. Bone tissue
3. The target volume for malignancies of the nasopharynx must include all or part of: 3:242
 1. Base of the skull
 2. Cervical lymph nodes
 3. Supraclavical lymph nodes
 - A. 1 & 2 only
 - B. 1 & 3 only
 - C. 2 & 3 only
 - D. 1, 2, & 3
4. During rotation therapies with an arc angle of 100 degrees, the point of maximum dose is normally located: 8:228
 - A. On the isocenter
 - B. Displaced toward the irradiated sector
 - C. Displaced away from the irradiated sector
 - D. At depth of Dmax
5. During radiotherapy of the rectum custom shield blocks for the lateral wedged field are designed to reduce irradiation of the: 3:190
 1. Sacrum
 2. Urinary bladder
 3. Prostate gland
 - A. 1 & 2 only
 - B. 1 & 3 only
 - C. 2 & 3 only
 - D. 1, 2, & 3
6. Preservation of reproductive function when high pelvic irradiation is unavoidable can be accomplished by: 3:320
 1. External organ shields
 2. Internal organ shields
 3. Surgical relocation of the gonads
 - A. 1 only
 - B. 2 only
 - C. 3 only
 - D. 1, 2, & 3
7. The mass attenuation coefficient for a 10 MeV photon beam will be highest for: 8:72
 - A. Water
 - B. Blood
 - C. Bone
 - D. Soft tissue
8. What is the geometric penumbra for a 2.0cm diameter source at a 80cm source-to-surface distance (SSD) and a 40cm source diaphragm distance (SDD) at a depth of 10 cm? 8:64
 - A. 1.09
 - B. 1.25
 - C. 2.50
 - D. 3.75
9. The amount of geometric penumbra is not effected by the: 8:64
 - A. Source skin distance
 - B. Source diaphragm distance
 - C. Field size
 - D. Source size
10. Tumors that are limited to the upper cervical esophagus are best treated with: 2:185
 - A. A single field treatment
 - B. AP/PA opposed port
 - C. Three field technique with posterior obliques
 - D. 360 degree rotation

22. Which of the following may lead to errors in treatment? 3:3
1. *Illegible handwriting* 2. *Miscalculation of time* 3. *Not noting prescription change*
- A. 1 & 2 only C. 2, & 3 only
 B. 1 & 3 only D. 1, 2, & 3
23. In order to obtain accurate measurements of patient dosimetry, which of the following factors must be considered? 8:239
1. *Target depth* 2. *Body contours* 3. *Tissue density*
- A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
24. The prescription for treatment should include all of the following EXCEPT: 3:3
- A. Energy of the unit C. Monitor units given
 B. Total dose planned D. Depth of tumor
25. To maintain a surface dose of less than 50% with a Cobalt beam, an air gap of at least _____ is required. 9:67
- A. 3cm C. 12cm
 B. 5cm D. 15cm
26. The dose distribution data measured by a water phantom closely approximates the radiation absorption and scattering properties of: 8:157
1. *Bone tissue* 2. *Muscle tissue* 3. *Soft tissue*
- A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
27. The most desirable feature of a wedge pair technique is a _____ beyond the overlap region. 8:231
1. *Rapid dose build-up* 2. *Rapid dose fall off* 3. *Uniform dose distribution*
- A. 1 only C. 3 only
 B. 2 only D. 1, 2, & 3
28. Radiotherapy treatment simulation is used for: 9:27
1. *Determination of patient position*
 2. *Checking accuracy of block placement*
 3. *Delineate of treatment field*
- A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
29. Whenever possible, patient immobilization should be performed in the: 8:268
- A. Prone position C. Lateral position
 B. Supine position D. Oblique position
30. The optimum hinge angle for a 60 degree wedge pair is: 8:231
- A. 30 degrees C. 60 degrees
 B. 45 degrees D. 90 degrees
31. The process that converts ultrasound energy from electrical energy and vice-versa is the: 8:246
- A. Auger effect C. Piezoelectric effect
 B. Modulation transfer effect D. Van de Graf effect

32. The rationale behind using lower than the 100 percent isodose curve for irradiation of the chest wall using an electron beam is: 8:323
1. *Increased skin sparing*
 2. *Lower lung exposure*
 3. *Reduced bolus use*
- A. 1 only
B. 2 only
C. 3 only
D. 1, 2, & 3
33. Irregular fields dose calculations can be done by using the _____ method. 8:180
1. *SSD*
 2. *Clarkson*
 3. *TMR*
- A. 1 only
B. 2 only
C. 3 only
D. 1, 2, & 3
34. One of the weakest links in the treatment planning process is: 8:267
- A. Patient positioning
B. Isocentric technique
C. Simulation
D. Localization
35. For a Cobalt 60 unit, as the prescription depth increases:
1. *The surface dose increases*
 2. *The tumor dose increases*
 3. *The applied dose increases*
- A. 1 & 2 only
B. 1 & 3 only
C. 2 & 3 only
D. 1, 2, & 3
36. Direct calculation of absorbed dose from a given exposure may not be used: 8:129
1. *For photon energies above 3 MeV*
 2. *Where electronic equilibrium does not exist*
 3. *For electron beams*
- A. 1 & 2 only
B. 1 & 3 only
C. 2 & 3 only
D. 1, 2, & 3
37. What is the principal advantage of isocentric technique over SSD technique for a treatment with multiple ports? 8:267
- A. Depth of tumor is known
B. Laser lights are easily used
C. Patient is not moved
D. Field size is defined on the skin
38. The tumor, presumed tumor and normal surrounding tissues enclosed by the minimum target dose isodose surface is called the: 8:235
- A. Maximum target volume
B. Mean target volume
C. Treatment volume
D. Minimum target volume
39. One or more serious problem(s) when a treatment field is inaccurately aligned is(are) 14:81
1. *Underdose to normal tissue*
 2. *Abnormal beam profile*
 3. *Failure to treat entire tumor*
- A. 1 only
B. 2 only
C. 3 only
D. 1, 2, & 3
40. Ultrasound provides useful information for patient contours of the following structures, except: 8:245
- A. Retroperitoneum
B. Lung tissue
C. Chest wall
D. Breast
41. What is the angle between the central axis of two beams called? 8:228
- A. Hinge angle
B. Overlap angle
C. Block angle
D. Wedge angle

52. When treating to a depth of 5 cm using partial arc therapy the isocenter should be: 8:228
 A. 1.5 cm C. 5.0 cm
 B. 2.5 cm D. 7.0 cm
53. A record of treatment is contained within the: 3:3
 A. Flow chart C. Treatment chart
 B. Patient log book D. Simulation chart
54. For a sloping skin surface, isodose curves are not perpendicular to the direction of the beam. The skin sparing effect can be maintained and the situation corrected by using (a): 8:266
 A. Bolus C. Shielding blocks
 B. Multi-field techniques D. Compensating wedge filter
55. During a given treatment, a 10 gram tumor receives a uniform dose of 400 rads. The total energy absorbed by this tissue is: 8:122
 A. 4×10^3 ergs C. 8×10^3 ergs
 B. 6×10^3 ergs D. 4×10^4 ergs
56. The use of lymphangiography is an important part of a diagnostic workup for: 9:272
 A. Vaginal tumors C. Breast tumors
 B. Testicular tumors D. Brain tumors
57. The strongest amount of echo reflection in an ultrasonic imaging system occurs for which tissue interface?
 1. Muscle - fat 2. Soft tissue - fat 3. Soft tissue - bone
 A. 1 only C. 3 only 8:245
 B. 2 only D. 1, 2, & 3
58. Which of the following is a commonly employed method of tumor localization? 8:52
 1. Palpation 2. C.T. scanning 3. Radiography
 A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
59. When using shielding blocks, which of the following is effected? 8 187
 A. Equivalent square C. STD
 B. S.S.D. D. SAD
60. The wedge used during the external beam irradiation of the larynx is employed to 8
 A. Increase skin dose C. Reduce skin dose
 B. Evenly distribute dose D. Reduce backscattering
61. The treatment chart contains information as to 3:3
 1. Type of cancer 2. Record of treatment given 3. Description of treatment position
 A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
62. Determine the equivalent square for a rectangular field with a width of 7cm and a length of 17cm 8:165
 A. 9.1 C. 10.9
 B. 9.9 D. 11.6

73. Hot and cold spots are common problems associated with: 8:287
 1. *Isocentric fields* 2. *Abutting fields* 3. *Four field technique*
 A. 1 only C. 3 only
 B. 2 only D. 1, 2, & 3
74. Which of the following devices can be used to provide for cross-section image localization of internal structures? 8:241
 1. *Conventional tomography* 2. *Transverse tomography* 3. *Computed tomography*
 A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
75. The advantages of treatment simulations include: 8:249
 1. *Unforeseen problems can be solved*
 2. *Increased treatment room "up" time*
 3. *Improved radiographic quality*
 A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
76. Which of the following MUST be noted in the treatment chart: 3:3
 A. Set-up sketch C. Patient position
 B. Dose calculation D. Patient photograph
77. A lesion is being treated using a 100 degree angle of arc rotation. The midpoint of the tumor volume is 5cm. The isocenter should be placed at: 8:228
 A. 0.5cm C. 5cm
 B. 2.5cm D. 7.5cm
78. Two treatment fields on a patient with cancer of maxillary sinus have a hinge angle of 90 degrees. Calculate the wedge angle. 8:231
 A. 0 degrees C. 60 degrees
 B. 45 degrees D. 90 degrees
79. During a 4 mV treatment, a sloping skin surface is corrected by a _____ shift toward the skin surface of the isodose curve. 3:125
 A. 3/4 C. 1/2
 B. 2/3 D. 1/4
80. The major advantages of megavoltage irradiation compared to orthovoltage technique include: 3:11
 1. *Higher depth dose* 2. *Less side scatter* 3. *Skin sparing*
 A. 1 & 2 only C. 2 & 3 only
 B. 1 & 3 only D. 1, 2, & 3
81. The best method for reproducing the large irregular field required in the radiotherapy of a bronchopulmonary lesion is best achieved through the use of: 3:208
 A. Wedged fields C. Customized non-divergent blocks
 B. Customized divergent blocks D. Shaped bolus blocks

82. When preparing a treatment chart, which of the following may lead to treatment errors? Incorrect data concerning: 3:3
1. Energy of unit 2. Patient respiration 3. Microscopic extensions
- A. 1 only C. 3 only
B. 2 only D. 1, 2, & 3
83. A 4 MV photon beam is being used at 100cm SAD to treat a lesion using an arc angle of 110 degrees. If the midpoint of the tumor volume is at 5cm, the isocenter should be placed at: 8:228
- A. 2cm C. 7cm
B. 5cm D. 15cm
84. If the exposure rate of the Colbalt treatment machine is increased by 30%, which of the following will increase? 11:349
- A. Percentage depth dose C. Backscatter factor
B. Tumor dose D. All of the above
85. Tumors that are limited to the upper cervical esophagus are first best treated with _____ then to spare the cord, oblique parallel opposed technique can be used:
1. A single field treatment 2. Parallel opposed ports 3. 360 degree rotation
- A. 1 only C. 3 only
B. 2 only D. 1, 2, & 3
86. Side and ceiling lasers should intersect at a point in the arc corresponding to the: 22:82
1. Rotational axis 2. SAD of the machine 3. Isocenter of the unit
- A. 1 only C. 3 only
B. 2 only D. 1, 2, & 3
87. The target volume for a bronchopulmonary lesion should include. 3:208
1. Primary lesion 2. Mediastinum 3. Hilar nodes
- A. 1 & 2 only C. 2 & 3 only
B. 1 & 3 only D. 1, 2, & 3
88. During localization of the target volume of the prostate, _____ contrast is often used to locate the bladder and the course of the urethra distal to the bladder 3:178
- A. Air C. Iodine contrast media
B. Nitrogen D. Radium
89. The penetrating power of an x-ray beam can be increased by 8:45
- A. Increasing the HVL C. Decreasing tube filtration
B. Decreasing the kVp D. Increasing the tube current
90. The best non-invasive procedure for the evaluation of tumor response or recurrence after surgery and irradiation for a brain tumor is: 18:267
- A. Computed tomography C. Ultrasonography
B. Cerebral angiography D. Radionuclide scanning
91. The demonstrated tumor and other tissue with presumed tumor is considered the: 8:234
- A. Target volume C. Irradiated volume
B. Treatment volume D. Maximum target volume

