FINAL ANSWER KEY

Question Paper Code:	104/2024/OL
Category Code:	531/2023
Exam:	Technical Assistant X Ray
Date of Test	04-09-2024
Department	Govt Ayurveda College

Question1:-Which of the following statements are true regarding x-rays?

i. Invisible
ii. Electrically charged
iii. No mass
iv. Can be optically focused

A:-i, ii and iii are correct

B:-i and iii are correct

C:-i, ii, iii and iv are correct

D:-ii and iv are correct

Correct Answer:- Option-B

Question2:-X ray beam used in diagnostic radiography are

A:-Monoenergetic

B:-Homogeneous

C:-Polyenergetic

D:-Unscattered

Correct Answer:- Option-C

Question3:-Wavelength and frequency are

A:-Inversely related

B:-Directly related

C:-Not related

D:-Partially related

Correct Answer:- Option-A

Question4:-Focusing cup used in X ray tubes has

A:-No charge

B:-Positive charge

C:-Negative charge

D:-Dual charge

Correct Answer:- Option-C

Question5:-Atomic number of tungsten

A:-37

B:-64

C:-58

D:-74

Correct Answer:- Option-D

Question6:-X-rays other than primary beam escaping the tube house are called

A:-Scattered radiation

B:-Leakage radiation

C:-Secondary radiation

D:-Characteristic radiation

Correct Answer:- Option-B

Question7:-When electrons strike the anode target, how many percentage of kinteic energy is converted to X-rays approximately?

A:-1

B:-99

C:-50

D:-25

Correct Answer:- Option-A

Question8:-Anode heel effect can be used while taking radiograph of

A:-Hand

B:-Skull

C:-Chest x ray

D:-Thoracic spine

Correct Answer:- Option-D

Question9:-Which of the following statements are true about increasing the efficiency of X-ray tube?

i. Warm up the tube after a long idle time
ii. Do not move the tube while it is energized
iii. Avoid excessive heat unit generation
iv. Hold the rotor button without making an exposure

A:-Only ii is correct

B:-i, ii, iii are correct

C:-Only iv is correct

D:-i, ii, iii and iv are correct

Correct Answer:- Option-B

Question10:-Which material is primarily used for added filtration in X ray tubes?

A:-Oil surrounding the tube

B:-Glass envelope

C:-Aluminum

D:-Collimator mirror

Correct Answer:- Option-C

Question11:-Cervical rib is associated with

A:-Klippel-trenounay syndrome

B:-Klippel-Feil syndrome

C:-Sturge-weber syndrome

D:-Snapping-Hip syndrome

Correct Answer:- Option-B

Question12:-Vitamin D3 is converted to 25-OH vitamin D3 in which organ?

A:-Skin

B:-Spleen

C:-Kidney

D:-Liver

Correct Answer:- Option-D

Question13:-Boehler Angle is seen at

A:-Foot

B:-Hand

C:-Shoulder

D:-Elbow

Correct Answer:- Option-A

Question14:-Dynamic post contrast imaging is employed in the evaluation of

A:-Glioblastoma

B:-Central neurocytoma

C:-Pituitary microadenoma

D:-Pineal cyst

Correct Answer:- Option-C

Question15:-Optic nerve is seen in which compartment?

A:-Intraconal

B:-Extraconal

C:-Preseptal

D:-Subperiosteal

Correct Answer:- Option-A

Question16:-Most common site of Thyroglossal duct cyst is

A:-Midline thorax

B:-Lateral neck

C:-Midline neck

D:-Lateral thorax

Correct Answer:- Option-C

Question17:-Pneumothorax is most frequently seen in X ray as

A:-Hyperlucency

B:-Opacity

C:-Not visualizable

D:-All the above

Correct Answer:- Option-A

Question18:-Reporting and data system used for classifying breast lesions

A:-TIRADS

B:-BIRADS

C:-LIRADS

D:-PIRADS

Correct Answer:- Option-B

Question19:-Air is seen in which of the following conditions?

A:-Chronic cholecystitis

B:-Calculous cholecystitis

C:-Acalculous cholecystitis

D:-Emphysematous cholecystitis

Correct Answer:- Option-D

Question20:-Most common site of colonic diverticulosis

A:-Ascending colon

B:-Rectum

C:-Transverse colon

D:-Descending colon

Correct Answer:- Option-D

Question21:-Number of films that can be processed per hour is called

A:-Processing cycle

B:-Processor capacity

C:-Replenishing cycle

D:-Replenisher capacity

Correct Answer:- Option-B

Question22:-Which is the fast-reducing agent used in developer?

A:-Phenidone

B:-Hydroquinone

C:-Sodium carbonate

D:-Glutaraldehyde

Correct Answer:- Option-A

Question23:-Which is the hardener used in fixer solution?

A:-Sodium sulfite

B:-Acetic acid

C:-Aluminum salts

D:-Ammonium thiosulfate

Correct Answer:- Option-C

Question24:-The type of roller which moves the film from one tank to another is

A:-Entrance

B:-Transport

C:-Turnaround

D:-Crossover

Correct Answer:- Option-B

Question25:-Plus density artifact on X ray film is seen as

A:-Yellow

B:-Red

C:-White

D:-Black

Correct Answer:- Option-D

Question26:-Median sagittal plane divides the body into

A:-Right and left halves

B:-Anterior and posterior parts

C:-Superior and inferior parts

D:-Front and back parts

Correct Answer:- Option-A

Question27:-Movement unsharpness can be reduced by

A:-Shorter exposure time

B:-Small object to film distance

C:-Immobilization

D:-All of the above

Correct Answer:- Option-D

Question28:-Ball catcher's view is used in the diagnosis of

A:-Rheumatoid arthritis

B:-Fracture base of 5th metacarpal

C:-Both of the above

D:-None of the above

Correct Answer:- Option-C

Question29:-Which one of the following is not used for achieving skyline projection of Patella?

A:-Sitting infero-superior

B:-Prone supero-inferior

C:-Sitting supero-inferior

D:-Prone infero-superior

Correct Answer:- Option-B

Question30:-Stenver's view is used in the radiography of

A:-Petrous temporal bone

B:-Mastoid temporal bone

C:-Styloid preocess of temporal bone

D:-Sella turcica

Correct Answer:- Option-A

Question31:-What is the maximum whole body dose limit of radiation exposure to public per year?

A:-5 mSv

B:-10 mSv

C:-1 mSv

D:-20 mSv

Correct Answer:- Option-C

Question32:-Inverse square law is applied in

A:-Doppler

B:-MRI

C:-Ultrasonography

D:-Radiography

Correct Answer:- Option-D

Question33:-Average of effective dose from background natural radiation in Kerala coast is about _____ mSv/year.

A:-12.5

B:-125

C:-1.25

D:-260

Correct Answer:- Option-A

Question34:-Typical effective dose of a CT head examination is less than

A:-Barium enema

B:-Lumbar spine x ray

C:-Mammography

D:-Chest X ray

Correct Answer:- Option-A

Question35:-As the pitch factor in CT increases, effective radiation dose to the body _____

A:-Increases

B:-Decreases

C:-Remains same

D:-None of the above

Correct Answer:- Option-B

Question36:-Iodine particle ratio of low osmolar non ionic contrast media is

A:-3:2

B:-6:1

C:-3:1

D:-2:1

Correct Answer:- Option-C

Question37:-The safe level of eGFR (mL/min/1.73 m^2) above which iodinated contrast can be administered safely without any contraindication is

A:-20

B:-30

C:-40

D:-60

Correct Answer:- Option-D

Question38:-Which among the following is not a risk factor for iodinated contrast medium induced nephropathy?

A:-Dehydration

B:-High osmolality agents

C:-Diabetic nephropathy

D:-Hypertension

Correct Answer:- Option-D

Question39:-Which among the following are deterministic radiation effects?
i. Cataract

ii. Skin erythema
iii. Oligozoospermia
iv. Cancer

A:-i and ii

B:-i, ii and iii

C:-i, ii and iv

D:-i and iv

Correct Answer:- Option-B

Question40:-Which among the following is not used in CT for patient dosed reduction?

A:-Automatic exposure control

B:-Dynamic collimators

C:-In-plane bismuth shielding

D:-Iterative reconstruction techniques

Correct Answer:- Option-C

Question41:-Which emergency drug is used for counteracting bradycardia?

A:-Adrenaline

B:-Steroid

C:-Diazepam

D:-Atropine

Correct Answer:- Option-D

Question42:-Qualified X-ray technologist with how many years of experience in the field of CT/Interventional radiology can be nominated for RSO (Radiation Safety Officer) approval after registering as Radiation Professional (RP) in e-LORA.

A:-3

B:-4

C:-5

D:-2

Correct Answer:- Option-A

Question43:-What should be the thickness of lead in mm lining the door of CT examination room?

A:-5

B:-0.25

C:-2

D:-0.5

Correct Answer:- Option-C

Question44:-Subnormal kVp radiography is

A:-Lateral neck radiograph

B:-Double contrast Barium enema

C:-Mammography

D:-CT

Correct Answer:- Option-C

Question45:-Skeletal survey is used in

A:-Multiple myeloma

B:-Polytrauma

C:-Non accidental injury in children

D:-All of the above

Correct Answer:- Option-D

Question46:-The technique of radiography in which the part to be visualized remains stationary during exposure while overlying structures produce unsharp images due to its motion is used in

A:-Mandible

B:-Cervical spine

C:-Lumbar spine

D:-Ankle joint

Correct Answer:- Option-B

Question47:-The window used in mammography tube

A:-Molybdenum

B:-Glass

C:-Aluminum

D:-Beryllium

Correct Answer:- Option-D

Question48:-Which of the following anatomic structure in children can mimic pathology in chest radiograph?

A:-Thyroid

B:-Thymus

C:-Heart

D:-Aorta

Correct Answer:- Option-B

Question49:-The radiograph taken for age determination of a person around 11 years

A:-Elbow

B:-Shoulder

C:-Foot

D:-Knee

Correct Answer:- Option-A

Question50:-Maximum pressure used in mammography for breast compression is

A:-300 N

B:-200 N

C:-250 N

D:-400 N

Correct Answer:- Option-B

Question51:-$^{60}_{27}Co$ and $^{60}_{28}Ni$ are examples of

A:-Isotopes

B:-Isomers

C:-Isotones

D:-Isobars

Correct Answer:- Option-D

Question52:-The energy of the characteristic X-ray is

A:-equal to the maximum energy of the incident electron

B:-always less than the maximum energy of the incident electron

C:-equal to the difference in the binding energies of two orbital electrons involved

D:-equal to the sum of the binding energies of two orbital electrons involved

Correct Answer:- Option-C

Question53:-The half life of Iridium-192 is 74 days. The fraction of atoms that will remain after 148 days

A:-75%

B:-50%

C:-25%

D:-12.5%

Correct Answer:- Option-C

Question54:-An incident photon interacts with an outer orbital electron. If the energy is shared between the ejected electron and a scattered photon, it is called as

A:-Photoelectric effect

B:-Compton scattering

C:-Coherent scattering

D:-Photo disintegration

Correct Answer:- Option-B

Question55:-A cobalt-60 teletherapy unit emit

A:-1.66 and 2.34 MeV X rays

B:-1.66 and 2.34 MeV Gamma rays

C:-1.17 and 1.33 MeV X rays

D:-1.17 and 1.33 MeV Gamma rays

Correct Answer:- Option-D

Question56:-The electromagnetic waves used in linear accelerator to generate an electric field

A:-Microwaves

B:-Radiowaves

C:-Ultraviolet rays

D:-Infrared rays

Correct Answer:- Option-A

Question57:-What is the purpose of the flattening filter in linear accelerator?

A:-To collimate the X ray beam

B:-To make the X ray beam intensity uniform across the field

C:-To monitor field symmetry and dose rate

D:-To flatten the electron field

Correct Answer:- Option-B

Question58:-The radiation field size is defined as the distance perpendicular to the beam's direction that corresponds to the

A:-100% isodose at the beam's edge

B:-80% isodose at the beam's edge

C:-50% isodose at the beam's edge

D:-25% isodose at the beam's edge

Correct Answer:- Option-C

Question59:-Which of the following is false regarding bolus?

A:-It is made up of tissue equivalent material

B:-It can be placed directly on skin surface

C:-It can increase the skin sparing of megavoltage photon beams

D:-It can also be used to fill a tissue deficit

Correct Answer:- Option-C

Question60:-According to ICRU report 62, Internal Target Volume (ITV) lies between

A:-GTV and CTV

B:-CTV and PTV

C:-PTV and Treated volume

D:-Treated volume and irradiated volume

Correct Answer:- Option-B

Question61:-Select the serial organ from the following options

A:-Parotid gland

B:-Optic nerve

C:-Mandibular joint

D:-Skin

Correct Answer:- Option-B

Question62:-A 14 year old boy has been diagnosed with nasopharyngeal cancer. Which cranial nerve has got the highest probability to be involved?

A:-Facial nerve

B:-Abducent nerve

C:-Olfactory nerve

D:-Vestibulocochlear nerve

Correct Answer:- Option-B

Question63:-All of the following are subsites of supraglottic larynx except

A:-Epiglottis

B:-Arytenoid

C:-False cords

D:-True vocal cords

Correct Answer:- Option-D

Question64:-A 45 year old lady has been diagnosed with right sided breast cancer. The tumor measures 6 cm and it is fixed to skin with ulceration. There is also a 2 cm right sided axillary node which is fixed. Metastatic work up is negative. Stage the disease

A:-c T3 N1 M0

B:-c T3 N2 M0

C:-c T4b N1 M0

D:-c T4b N2 M0

Correct Answer:- Option-D

Question65:-Which among the following sites is head and neck malignancy has got the highest risk of subclinical neck node involvement?

A:-T1 floor of mouth

B:-T1 Oral tongue

C:-T1 Supraglottic larynx

D:-T1 nasopharynx

Correct Answer:- Option-D

Question66:-In breast cancer staging chest wall includes all except

A:-Ribs

B:-Intercostal muscles

C:-Serratus anterior muscle

D:-Pectoral muscles

Correct Answer:- Option-D

Question67:-A 35 year old gentleman has been diagnosed with HPV positive oropharyngeal cancer. N1 is defined for this patient according to TNM staging as

A:-Metastasis in a single ipsilateral lymph node, not larger than 3 cm

B:-Metastasis in single or multiple ipsilateral lymph node, none larger than 3 cm

C:-Metastasis in single or multiple ipsilateral lymph node, none larger than 6 cm

D:-Metastasis in contralateral or bilateral lymph node, none larger than 6 cm

Correct Answer:- Option-C

Question68:-Gastroesophageal junction is located at

A:-15 cm from incisors

B:-25 cm from incisors

C:-40 cm from incisors

D:-50 cm from incisors

Correct Answer:- Option-C

Question69:-'Esophageal Cancer Belt' does not include

A:-North America

B:-Northern Iran

C:-Central Asian Republics

D:-North China

Correct Answer:- Option-A

Question70:-In breast cancer, the lymph node region that is caudal and lateral to the pectoralis minor is categorised as

A:-Level I

B:-Level II

C:-Level III

D:-Level IV

Correct Answer:- Option-A

Question71:-All are used as modern permanent vLDR implants except

A:-Iodine - 125

B:-Palladium - 103

C:-Cesium - 131

D:-Cobalt - 60

Correct Answer:- Option-D

Question72:-In conventional fractionation radiation treatment dose per fraction delivered is between

A:-1.8-2 Gy

B:-2-2.3 Gy

C:-1-2 Gy

D:-0.5-1 Gy

Correct Answer:- Option-A

Question73:-Inverse treatment planning is used in

A:-3DCRT

B:-Conventional radiation planning

C:-IMRT

D:-All of the above

Correct Answer:- Option-C

Question74:-An electron beam is used for which treatment site

A:-Lung

B:-Total skin irradiation

C:-Prostate

D:-Brain

Correct Answer:- Option-B

Question75:-4DCT is most useful for the treatment planning of tumour located near the

A:-Brain

B:-Neck

C:-Diaphragm

D:-Pelvis

Correct Answer:- Option-C

Question76:-Advantages of Iridium-192 as HDR source are all except

A:-High specific activity

B:-Short half-life and quarterly source replacement

C:-Shielded effectively

D:-Small source size

Correct Answer:- Option-B

Question77:-All are image guided radiotherapy techniques except

A:-Kv Cone beam CT

B:-MV Cone beam CT

C:-Real time tumour tracking system

D:-IMRT

Correct Answer:- Option-D

Question78:-VMAT usually refers to

A:-Arc treatment with static photon fields

B:-Arc treatment with static electron fields

C:-Intensity modulated photon field delivered with gantry in motion

D:-Intensity modulated electron field delivered with gantry in motion

Correct Answer:- Option-C

Question79:-High dose rate brachytherapy as per ICRU report no 38 is

A:->12Gy/Hr

B:->6Gy/Hr

C:->8Gy/Hr

D:->4Gy/Hr

Correct Answer:- Option-A

Question80:-All are brachytherapy techniques except

A:-Interstitial implant

B:-Intraluminal treatment

C:-Intracavitary treatment

D:-Total body irradiation

Correct Answer:- Option-D

Question81:-All are features of modern CT simulator except

A:-Flat Table top

B:-Orthogonal laser system

C:-Digital interface to a planning system (DICOM)

D:-Small bore CT scanner

Correct Answer:- Option-D

Question82:-Xerostomia in head and neck radiation is best avoided by which technique

A:-3D CRT

B:-Conventional radiation planning

C:-IMRT

D:-All of the above

Correct Answer:- Option-C

Question83:-All are organs at risk in Head and Neck radiation planning except

A:-Parotid

B:-Spinal cord

C:-Brain stem

D:-Planning target volume

Correct Answer:- Option-D

Question84:-State the true statement

A:-Breast conservative surgery is followed by whole breast radiation

B:-Normal tissue complications are more with IMRT than conventional radiation planning

C:-Immobilisation is not mandatory in Head and Neck Radiation

D:-Electron beams are used for deep seated tumours

Correct Answer:- Option-A

Question85:-State the wrong statement

A:-DIBH is used for cardiac sparing in left sided breast cancer

B:-SRS is single high dose fraction radiation treatment

C:-Internal target motion from respiration is minimised by DIBH, active breath control, respiratory gating

D:-Inverse treatment planning is done in 3DCRT

Correct Answer:- Option-D

Question86:-Craniospinal radiation is a technique used in

A:-Astrocytoma

B:-Medulloblastoma

C:-Meningioma

D:-Shwannoma

Correct Answer:- Option-B

Question87:-Organ preservation is possible with radiation treatment in which site

A:-Larynx

B:-Pancreas

C:-Stomach

D:-Colon

Correct Answer:- Option-A

Question88:-Accelerated partial breast radiation uses following techniques except

A:-Interstitial implant

B:-IMRT

C:-Radio immunotherapy

D:-Intraoperative radiotherapy

Correct Answer:- Option-C

Question89:-All are immobilisation devices used in radiation treatment except

A:-Breast boards

B:-Water phantom

C:-Head rests

D:-Masks

Correct Answer:- Option-B

Question90:-Image verification in radiotherapy planning is done by all except

A:-Belly board

B:-MV Cone beam CT

C:-EPID

D:-kv Cone beam CT

Correct Answer:- Option-A

Question91:-What is the primary characteristic of stochastic effects in Radiation Oncology?

A:-Directly proportional to radiation dose

B:-Increase linearly with radiation dose, but have a threshold

C:-Occur randomly and are independent of radiation dose

D:-Are deterministic and always occur above a certain dose threshold

Correct Answer:- Option-C

Question92:-What is the recommended dose limit for the lens of the eye for occupational exposure in Radiation oncology?

A:-150 mSv/year

B:-50 mSv/year

C:-20 mSv/year

D:-500 mSv/year

Correct Answer:- Option-A

Question93:-What is the effect of doubling the distance from a radiation source on radiation exposure?

A:-Exposure increases by a factor of 4

B:-Exposure decreases by a factor of 2

C:-Exposure decreases by a factor of 4

D:-Exposure remains the same

Correct Answer:- Option-C

Question94:-What is the primary advantage of Volumetric Arc therapy to traditional IMRT?

A:-Increased dose conformity

B:-Reduced treatment time

C:-Improved dose homogeneity

D:-Enhanced tumor targeting

Correct Answer:- Option-B

Question95:-What is the half life of Iodine 125 (I-125) seeds used in permanent prostate implants?

A:-60 days

B:-30.2 years

C:-17.1 years

D:-13.3 months

Correct Answer:- Option-A

Question96:-What is the typical number of cobalt sources used in Gamma knife unit?

A:-10-20 sources

B:-150 sources

C:-201 sources

D:-50-60 sources

Correct Answer:- Option-C

Question97:-What is the primary goal of Stereotatic Body Radiation Therapy?

A:-To deliver a high dose of radiation to a large tumor volume

B:-To provide palliative care for advanced cancer patients

C:-To replace surgery for all cancer patients

D:-To deliver a high radiation dose to a small well defined tumor volume

Correct Answer:- Option-D

Question98:-A patient with cervical cancer is undergoing External beam radiation therapy. She had a treatment break of 10 days due to side effects. What is the most significant concern regarding the treatment gap?

A:-Reduced tumor control due to accelerated re population

B:-Increased risk of late toxicity

C:-Decreased efficacy of concurrent chemotherapy

D:-Loss of radio-sensitization effect from concurrent chemotherapy

Correct Answer:- Option-A

Question99:-What is the name of the device used to measure individual's cumulative radiation exposure?

A:-Geiger counter

B:-Dosimeter

C:-Radiation spectrometer

D:-Survey meter

Correct Answer:- Option-B

Question100:-What is the name of the technology used in Cyber knife system to track and adjust for tumor movement during treatment?

A:-X sight

B:-Accuray

C:-Robocouch

D:-Synchrony

Correct Answer:- Option-D