Roll No.....

Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013

ANATOMY INCLUDING RADIOGRAPHIC ANATOMY

PAPER FIRST

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Write briefly on:

Q. 1. Boundaries, contents and applied anatomy of the femoral triangle

Q. 2. Anterior and posterior relations of the right kidney

Q. 3. Parts and blood supply of a long bone

Q. 4. Movements of eversion and inversion

Q. 5. Intrinsic muscles of the hand

Q. 6. Radial nerve injuries

Q. 7. Supports of the uterus

Q. 8. Interior of the right atrium

Q. 9. Shoulder joint- type of joint, bones forming it, factors stabilizing the joint and applied anatomy.

Roll No.....

Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013

ANATOMY INCLUDING RADIOGRAPHIC ANATOMY

PAPER FIRST (MCQ)

Time allotted for MCQ- 15 minutes

(½ x 14= 7)

B : MCQs (Single response type):

Select the most appropriate answer and encircle the alphabet against it

1. Action of Popliteus is:
   a. Locking of knee joint
   b. Extension of knee joint
   c. None of the other options
   d. Unlocking of knee joint
2. Medial malleolus is formed by:
   a. Fibula
   b. Femur
   c. Tibia
   d. Hip bone
3. Injury to nerve to serratus anterior leads to :
   a. Winging of scapula
   b. Wrist drop
   c. Frozen shoulder
   d. Flexion of elbow
4. Posterior circumflex humeral artery is a branch of:
   a. 1st part of axillary artery
   b. 2nd part of axillary artery
   c. 3rd part of axillary artery
   d. Brachial artery
5. Movements of pronation and supination occur at :
   a. Radioulnar joints
   b. Wrist joint
   c. Shoulder joint
   d. Sternoclavicular joint
6. Portal vein is formed behind the:
   a. Head of pancreas
   b. Body of pancreas
   c. Neck of pancreas
   d. Tail of pancreas
7. Peyer's patches are present in :
   a. Jejunum
   b. Ileum
   c. Duodenum
   d. Colon
8. Left testicular vein drains into :
   a. Inferior vena cava
   b. Left renal vein
   c. Right renal vein
   d. Right internal iliac vein
9. The muscles of mastication are supplied by:-
   a. Mandibular nerve
   b. Trigeminal nerve
   c. Facial nerve
   d. Oculomotor nerve
10. The corpus callosum is made up of:
    a. Projection fibres
    b. Association fibres
    c. Grey matter
    d. Commissural fibres
11. The visual area corresponds to Brodmann's area number:
    a. 3,1,2
    b. 4
    c. 17,18,19
    d. 41,42
12. Upper motor neuron type of facial palsy presents as:
    a. Paralysis of ipsilateral half of face
    b. Paralysis of contralateral half of face
    c. Paralysis of ipsilateral lower half of face
    d. Paralysis of contralateral lower half of face
13. Which type of joint is the first carpometacarpal joint of the hand?
    a. Saddle
    b. Ellipsoid
    c. Ball and socket
    d. Hinge
14. Foot drop is caused due to injury to:
    a. Deep peroneal nerve
    b. Tibial nerve
    c. Superficial peroneal nerve
    d. Medial plantar nerve

Roll No.....

Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013
PHYSIOLOGY INCLUDING BASIS OF DISEASES
PAPER TWO

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Define erythropoesis? How the regulation of erythropoiesis is brought about.

Q. 2. Define hemostasis? How clotting of blood take place inside the body?

Q. 3. Write briefly about the sequence of events at neuromuscular junction?

Q. 4. Write briefly about functions of thyroid hormone.

Q. 5. Describe briefly mechanism of swallowing.

Q. 6. Define cardiac output? How regulation of cardiac output is brought about.

Q. 7. Define synapse and clarify it.

Q. 8. Describe with help of diagram static lung volume and capacities.

Q. 9. Enumerate the differences between myelinated and nonmyelinated nerve fibre.

Roll No.....

Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013

PHYSIOLOGY INCLUDING BASIS OF DISEASES

PAPER TWO (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it

1. For sodium potassium pump the coupling ratio is:
   - **a.** 1:1
   - **b.** 2:3
   - **c.** 3:2
   - **d.** 1:4
2. Approximately 90% osmolality of plasma is contributed by:
   - **a.** Plasma protein
   - **b.** Glucose
   - **c.** Sodium
   - **d.** Urea
3. Exocytosis refuses which ion?
   - **a.** Na^{++}
   - **b.** Ca^{++}
   - **c.** K^{+}
   - **d.** Mg^{++}
4. Eosinophilia occurs in all EXCEPT:
   - **a.** Stress
   - **b.** Urticaria
   - **c.** Allergic rhinitis
   - **d.** Worm infection
5. RBC motivation takes place in -------- days.
   - **a.** 3-5
   - **b.** 6-8
   - **c.** 10-14
   - **d.** 20-25
6. Most potent respiratory stimulant is:
   - **a.** Oxygen
   - **b.** Carbon dioxide
   - **c.** Hydrogen ion
   - **d.** K^{+} ion
7. 100 ml of arterial blood contain -------- of CO_2 :
   - **a.** 16 ml
   - **b.** 32 ml
   - **c.** 48 ml
   - **d.** 52 ml
8. Rate of filtration at any point along a capillary is determined by:
   - **a.** Mean capillary pressure
   - **b.** Colloidal osmotic pressure
   - **c.** Starling process
   - **d.** Filtration pressure
9. Hydrostatic and colloidal pressure in glomerular capillaries is:
   - **a.** 45 and 25 mmhg
   - **b.** 25 and 45 mmhg
   - **c.** 10 and 25 mmhg
   - **d.** 25 and 10 mmhg
10. All are menosynaptic reflexes EXCEPT:
    - **a.** Knee reflex
    - **b.** Biceps reflex
    - **c.** Ankle reflex
    - **d.** Abdominal reflex
11. Kinesthetic receptors are:
    - **a.** Free nerve ending
    - **b.** Pacinian capsule
    - **c.** Ruffini corpuscles
    - **d.** Corticel cells
12. Medical geniculate body is concerned with:
    - **a.** Hearing
    - **b.** Vision
    - **c.** Taste
    - **d.** Smell
13. Harmone secreted by hypothalamus:
    - **a.** GHIH
    - **b.** GH
    - **c.** LH
    - **d.** FSH
14. Substance net excreted via kidney by filtration alone is:
    - **a.** Glucose
    - **b.** Vitamin B_{12}
    - **c.** Mannital
    - **d.** Sucrose

Roll No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013
RADIATION PHYSICS
PAPER THIRD

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. What is nucleus? What are the different atomic models. Explain each in detail.

Q. 2. Explain following: (3+2+2=7)
- **a.** Exposure
- **b.** Dose
- **c.** Graphical respresentation of KERMA and DOSE.

Q. 3. Write short notes on: (3+2+2=7)
- **a.** Radioactivity
- **b.** Specific activity
- **c.** Half value layer

Q. 4. Write short notes on: (4+3=7)
- **a.** Photoelectric effect
- **b.** Importance of photoelectric effect in radiotherapy

Q. 5. **a.** What is Compton effect, explain in detail. (4)
b. Write down the importance of this effect in RT (3)

Q. 6. Explain the production of X-ray with neat & clean diagram of X-ray tube.

Q. 7. What is ionization & exitation process of nucleus. Explain in detail with relevant figures.

Q. 8. Write short notes on: (4+3=7)
- **a.** Particulate radiation
- **b.** Electromagnetic radiation

Q. 9. Write down the process of α – decay, β- decay and γ- decay.

Roll No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013

RADIATION PHYSICS

PAPER THIRD (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it

1. Atomic mass is:
   a. P + N
   b. P + E
   c. Number of protons
   d. Number of electron
2. Atoms with same atomic number & different mass number is called:
   a. Isotope
   b. Isobar
   c. Isotone
   d. None of the above
3. ISD used in linac for daily QA @ 20 cu depth is:
   a. 80 cm
   b. 100 cm
   c. 82.4 cm
   d. 90 cm
4. For radiotherapy the dominant effect is:
   a. Compton effect
   b. Pair production
   c. Photo electric effect
   d. None of the above
5. Highest penetrating power is of :
   a. γ- rays
   b. α- rays
   c. Protons
   d. Neutrons
6. One dps is equal ------- Ci
   a. 3.7×10^{10}
   b. 2.7×10^{11}
   c. 2.7×10^{10}
   d. 3.7×10^{11}
7. X- ray was discovered in:
   a. 1995
   b. 1896
   c. 1895
   d. 1990
8. The unit of dose is:
   a. Gy
   b. Sv
   c. Kg
   d. Newton
9. X-ray photon are used for:
   a. Imaging
   b. Radiotherapy
   c. Both a & b
   d. None of the above
10. The relation between mass and energy is:
    a. $E=mv^2$
    b. $E=mc^2$
    c. v=Em
    d. $E=mk^2$
11. Unit of exposure is:
    a. Ci
    b. Ci/g
    c. Kg
    d. R
12. Unit of specific activity is:
    a. Ci
    b. Ci/g
    c. R
    d. None of the above
13. Energy of photon is:
    a. Hν
    b. Hc/ν
    c. h/ν
    d. None of the above
14. Threshold for pair production is:
    a. 1.02 mev
    b. 1 mev
    c. 1 kev
    d. 10 kev

Roll No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Discuss in brief about differences between conventional simulator and CT simulator.

Q. 2. Draw block diagram of linear accelerator. What is the function of electron gun?

Q. 3. Write short note on treatment couch.

Q. 4. Write short note on electromagnetic radiation.

Q. 5. Write short note on 6 MV photon.

Q. 6. What is the difference between teletherapy and brachytherapy.

Q. 7. What are the 5R's of radiobiology?

Q. 8. Draw cell survival curve. What is the relationship of shoulder and radiosensitivity?

Q. 9. Describe LET. Write down LET of cobalt- 60 gamma rays.

Roll No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2013
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and encircle the alphabet against it

1. Radioactive source is used in all EXCEPT:
   - **a.** Cobalt 60
   - **b.** LINAC
   - **c.** HDR brachytherapy
   - **d.** LDR brachytherapy
2. Orifit is made of --------- equivalent material.
   - **a.** Air
   - **b.** Tissue
   - **c.** Water
   - **d.** Lead
3. Cells are more radiosensitive in:
   - **a.** G_2
   - **b.** S
   - **c.** G_1
   - **d.** All phases
4. Alpha particles are nuclei of:
   - **a.** Helium atom
   - **b.** Hydrogen atom
   - **c.** Carbon atom
   - **d.** Deuteron
5. SI unit of activity is:
   - **a.** Curie
   - **b.** Becquerel
   - **c.** Coulomb
   - **d.** Volt
6. Effect of ionizing radiation in human body is on:
   - **a.** Atom
   - **b.** Blood
   - **c.** DNA
   - **d.** None of the above
7. Reoxygenation is related to:
   - **a.** CO_2
   - **b.** O_2
   - **c.** H_2
   - **d.** N_2
8. The OER approaches unity at LET of about:
   - **a.** 50 Kev/µm
   - **b.** 50 Kev/µm
   - **c.** 50 Kev/µm
   - **d.** 50 Kev/µm
9. Atomic number is number of:
   - **a.** Proton
   - **b.** Electron
   - **c.** Proton + Neutron
   - **d.** Neutron
10. HVL is:
    - **a.** Half value layer
    - **b.** High value layer
    - **c.** Half value lead
    - **d.** High value lead
11. Rad is unit of:
    - **a.** Absorbed dose
    - **b.** Radioactivity
    - **c.** Exposure
    - **d.** None of the above
12. The most radiosensitive organ:
    - **a.** Gonads
    - **b.** Bone
    - **c.** Hair
    - **d.** Lung
13. 6 MV photon is:
    - **a.** Positron
    - **b.** Positive charged
    - **c.** Chargeless
    - **d.** Heavy particle
14. All are beam modifying devices EXCEPT:
    - **a.** Wedge
    - **b.** Bolus
    - **c.** Laser
    - **d.** Shielding blocks

Lib

Regn. No.....

Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Write briefly on:

Q. 1. Describe the Shoulder joint under the following headings: Type, Bones forming, Factors providing stability, movements & applied.

Q. 2. Draw a well labelled diagram of the structure of a Lymph node.

Q. 3. Describe the femoral triangle (Boundaries, contents &applied).

Q. 4. Draw a well labelled diagram of the Circle of Willis.

Q. 5. Write about Systemic Circulation.

Q. 6. Describe the lymphatic drainage of the head and neck region.

Q. 7. Write about the rectus sheath (formation and contents) .

Q. 8. Describe the bronchopulmonary segments of the lung .

Q. 9. Describe the Brachial plexus.

Regn. No.....

Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it

1. Periosteum is absent in:-
   a. Long bones
   b. Short bones
   c. Irregular bones
   d. Sesamoid bones
2. Abduction is defined as:-
   a. Going away from the median plane
   b. Increase of angle
   c. Decrease of angle
   d. Come nearer to the median plane
3. Wrist drop is seen in injuries of:
   a. Median nerve
   b. Ulnar nerve
   c. Radial nerve
   d. Musculocutaneous nerve
4. Pissiform is an example of:-
   a. Long bone
   b. Short bone
   c. Sesamoid bone
   d. Flat bone
5. Right gonadal vein drains into:-
   a. Inferior vena cava
   b. Right renal vein
   c. Right internal iliac vein
   d. Right external iliac vein
6. Spinal cord in an adult ends at the level of:
   a. Lower border of L3
   b. Upper border of L3
   c. Lower border of L1
   d. Upper border of L1
7. Carcinoma prostate occurs in:-
   a. Apex
   b. Base
   c. Central zone
   d. Peripheral zone
8. All are branches of external carotid artery EXCEPT:-
   a. Lingual artery
   b. Facial artery
   c. Posterior auricular artery
   d. Middle meningeal artery
9. Brodmann's number for visual area is:-
   a. 4, 6
   b. 3, 1, 2
   c. 44, 45
   d. 17, 18, 19
10. Pubic Symphysis is an example of:-
    a. Primary cartilaginous joint
    b. Secondary Cartilaginous joint
    c. Synovial joint
    d. Fibrous joint
11. All are hamstring muscles EXCEPT:
    a. Semitendinosus
    b. Semimembranosus
    c. Short head of biceps femoris
    d. Ischial head of adductor magnus
12. The anterior interventricular artery in the heart is a branch of:
    a. Left coronary artery
    b. Right coronary artery
    c. Circumflex artery
    d. Conus artery
13. Movements of pronation and supination occur at:
    a. Radioulnar joints
    b. Wrist joint
    c. Shoulder joint
    d. Elbow joint
14. Motor supply of muscles of facial expression is from:
    a. Trigeminal nerve
    b. Facial nerve
    c. Glossopharyngeal nerve
    d. Hypoglossal nerve

Regn. No..... Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
PHYSIOLOGY INCLUDING BASIS OF DISEASES
PAPER TWO

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: (7 x 9 = 63)

Q. 1. What is erythropoiesis? Describe the stages and factors influencing it.

Q. 2. With help of a diagram describe the structure of neuromuscular junction explain the mechanism of transmission of impulses across it.

Q. 3. List 4 important function of saliva and stomach.

Q. 4. What is synapse? What are the type of synapse? Enumerate the properties of synapse.

Q. 5. Name the anterior pituitary hormone. Describe the functions of growth hormone.

Q. 6. What is cardiac output? Describe the regulation of cardiac output.

Q. 7. What is hypoxia? What are the types of hypoxia?

Q. 8. What is GFR? What is its normal value? What factors affect it?

Q. 9. List the differences between:

a. 1st Heart sound and 2nd heart sound

b. Cortical nephron and juxta medullary nephron.

Regn. No.....

Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
PHYSIOLOGY INCLUDING BASIS OF DISEASES
PAPER TWO (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and encircle the alphabet against it

1. The power house of the cell is :
   a. Centriole
   b. Centrosome
   c. Mitochondria
   d. Lysosomes
2. Erythropoiesis normally occurs in adult in:
   a. Liver
   b. Yolk sac
   c. Spleen
   d. Bone marrow
3. Phagocytic cell is :
   a. Neutrophil
   b. RBC
   c. Platelets
   d. Astrocytes
4. Depolarization in a motor nerve action potential is due to :
   a. Entry of K+ ion
   b. Exit of K+ ion
   c. Entry of Na+ ion
   d. Entry of Ca++ ion
5. The neurotransmitter at neuromuscular function is?
   a. Acetylcholine
   b. Dopamine
   c. Epinephrine
   d. GABA
6. Cause for plateau phase in cardiac muscle action potential is ?
   a. Entry of Na+ ion
   b. Exit of K+ ion
   c. Entry of Ca++ion
   d. Entry of chloride ion
7. First heart sound is best head in :
   a. Mitral area
   b. Pulmonary area
   c. Aortic area
   d. All the above
8. Exposure to high altitude causes :
   a. Hypoxic hypoxia
   b. Stagnant hypoxia
   c. Histotoxic hypoxia
   d. Anemic hypoxia
9. Interruption of respiration during swallowing is called?
   a. Deglutition apnea
   b. Hyperpnea
   c. Sleep apnea
   d. Dyspnea
10. Trypsin helps is the digestion of :
    a. Proteins
    b. Fat
    c. Carbohydrates
    d. Minerals
11. Substances used for estimation of GFR:
    a. Insulin
    b. Inulin
    c. Renin
    d. PAH
12. The vascular layer of eye is:
    a. Sclera
    b. Retina
    c. Choroid
    d. None
13. Dorsal column next carry all sensations except
    a. Pain
    b. Fine touch
    c. Pressure
    d. Vibration
14. A cells of pancreas secrete :
    a. Insulin
    b. Somatostatin
    c. Glucagon
    d. Pancreatic polypeptide

Regn. No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015

RADIATION PHYSICS

PAPER THIRD

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Define atomic mass. What is electron Volt(ev)?

Q. 2. Define half life of radioactive substance. What will be activity of 5000 ci cobalt-60 after 5.26 yrs?

Q. 3. Describe briefly modes of radioactive decay.

Q. 4. How are x-rays produced? Mention briefly Brems Strahlung process.

Q. 5. Name various types of interaction of ionizing radiation with matter & describe Compton Effect.

Q. 6. Draw schematic representative diagram of X-ray tube & label it properly.

Q. 7. Write about TLD – radiation monitoring device.

Q. 8. Write short notes:

a. Ionization

b. Electron capture

Q. 9. Write short notes:

a. Radioactive Equilibrium

b. Bohr Model of atom

Regn. No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015

RADIATION PHYSICS

PAPER THIRD (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it

1. Atomic mass is equal to :
   a. Protons (P)
   b. Neutron (N)
   c. Electrons (E)
   d. P+N
2. Energy equivalent of Electron at rest (E_0):
   a. 1.7 Mev
   b. 0.38 Mev
   c. 0.5 11 Mev
   d. 4 Mev
3. HUL is :
   a. High value layer
   b. High value layer
   c. High value layer
   d. None of these
4. Cobalt-60 decay forms:
   a. Lead
   b. Aluminum
   c. Tin
   d. Nickel
5. The number of electrons is a shell is given by formula:
   a. $2X^2$
   b. X+1
   c. $2X^{2+1}$
   d. X^2
6. S.I Unit of Radioactively?
   a. Curie
   b. Joule
   c. Bacquerel
   d. Roentgen
7. e+ is known as :
   a. Neutron
   b. Electron
   c. Positron
   d. Proton
8. A^0 is unit of length which is equal to :
   a. 1mm
   b. 10^{-6} cm
   c. 10^{-8} cm
   d. 10^{-6} mm
9. Atomic number refer to:
   a. No of electrons
   b. No of protons
   c. No of shells
   d. All of these
10. 1 amu is equal to :
    a. 521 Mev
    b. 0.511 Mev
    c. 931 Mev
    d. 231 Mev
11. Alpha particle comprises of :
    a. 2N+2P
    b. 2N+1P
    c. 1N+1P
    d. 1P
12. Decay of cobalt -60 is by:
    a. α-decay
    b. β-decay
    c. γ-decay
    d. None of these
13. Side effects of Radiation include:
    a. Mucositis
    b. Skin reaction
    c. oesophegits
    d. All of these
14. Neutrons are have:
    a. Negative charge
    b. Positive charge
    c. Neutral
    d. None of these

Regn. No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Write a note on 6mv photon. Draw diagram of electromagnetic spectrum.

Q. 2. What is difference between conventional simulator and CT simulator?

Q. 3. Write a note on immobilization devices used in radiotherapy planning.

Q. 4. Write short note on:

a. Laser

b. Cobalt -60 equipment

Q. 5. What is difference between teletherapy and brachytherapy?

Q. 6. Write a note on hereditary effects of radiotherapy.

Q. 7. Draw cell survival curve. What is significance of shoulder in radiotherapy?

Q. 8. What is cell cycle? Write a note on G2M Phase.

Q. 9. Write a note on production of X-rays.

Regn. No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2015
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR (MCQ)

Time allotted for MCQ- 15 minutes (½ x 14= 7)

B : MCQs (Single response type):

Select the most appropriate answer and encircle the alphabet against it

1. Half life of cobalt – 60 is :
   a. 30 years
   b. 5.26 years
   c. 1662 years
   d. 72 hrs
2. SSD of 6mv unac is:
   a. 100 cm
   b. 80 cm
   c. 0.5 cm
   d. 75 cm
3. Dmax of cobalt-60 is:
   a. 0.5 cm
   b. 1.5 cm
   c. 100 cm
   d. 2 cm
4. Couch is CT simulator is:
   a. Straight & flat
   b. Curved
   c. Fixed
   d. All of the obove
5. Dox required for cataract is:
   a. 6 Gy
   b. 2 Gy
   c. 12Gy
   d. 10 Gy
6. Atomic number of lead is
   a. 32
   b. 27
   c. 52
   d. 82
7. Wide shoulder in cell survival curve signifies:
   a. Radiosensitive timer
   b. Radioresistant
   c. Both A & B
   d. None of the above
8. Gamma rays are:
   a. Negatively charged
   b. Neutral
   c. Positively charged
   d. Chargeless
9. Magnetron is used in
   a. CT Simulator
   b. LINAC.
   c. Cobalt -60
   d. Brachy therapy.
10. 1 Mev equals to:
    a. 10^{-06} ev
    b. 10^{6} ev
    c. 10^{10} ev
    d. 10^{-9} ev
11. Atomic number of cobalt -60 is
    a. 60
    b. 27
    c. 57
    d. 29
12. For superficial therapy voltage required
    a. 50- 150 kv
    b. 40-50 kv
    c. upto 20kv
    d. 6 mv.
13. Teletherapy is called as:
    a. Distant radiation
    b. Near by radiation
    c. Infectable radiation
    d. Braily therapy
14. Cobalt-60 decay into
    a. Ni-60
    b. CV-29
    c. Zn-30
    d. Co-59

Regn. No..... Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Write Briefly about:

Q. 1. Describe the shoulder joint under the following headings: type of joint, bones forming the joint, ligaments, muscles producing the movements & applied anatomy.

Q. 2. Describe the boundaries and contents of popliteal fossa with its applied anatomy.

Q. 3. Write differences between an artery and a vein.

Q. 4. Describe the right atrium of human heart.

Q. 5. Discuss Femoral sheath.

Q. 6. Describe Lymphatic drainage of the stomach.

Q. 7. Describe Flexor retinaculum & Carpal Tunnel Syndrome.

Q. 8. Write a note on Circle of Willis.

Q. 9. Give an outline of Carotid sheath.

Regn. No.....

Paper Code: RT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it

1. All are parts of the brainstem EXCEPT:
   a. Pons
   b. Diencephlon
   c. Midbrain
   d. Medulla Oblongata
2. Brodmann's number for visualarea is:-
   a. Area no.44,45
   b. Area no.6
   c. Area no. 17,18,19
   d. Area no. 4
3. The muscle which depresses the mandible is:-
   a. Masseter
   b. Temporalis
   c. Medial pterygoid
   d. Lateral pterygoid
4. Patella is an example of:-
   a. Long bone
   b. Short bone
   c. Sesamoid bone
   d. Pneumatic bone
5. Supranuclear lesions of facial nerve will lead to paralysis of:-
   a. Ipsilateral half of face
   b. Contralateral half of face
   c. Ipsilateral lower part of face
   d. Contralateral lower part of face
6. The arrangement of structures in the hilum of Kidney from anterior to posterior is:-
   a. Artery, Vein, Pelvis
   b. Pelvis, Artery, Vein
   c. Vein, Artery, Pelvis
   d. Vein, Pelvis, Artery
7. All are features of large intestine EXCEPT:-
   a. Taenia coli
   b. Plicacircularis
   c. Haustrations
   d. Appendices epiploicae
8. Winging of the scapula occurs due to injury to:-
   a. Axillary nerve
   b. Median nerve
   c. Musculocutaneous nerve
   d. Nerve to serratus anterior
9. Which is not a hamstring muscle?
   a. Semimembranosus
   b. Semitendinosus
   c. Short head of biceps femoris
   d. Ischial head of adductor magnus
10. The angle of anteversion in the uterus is:-
    a. 90 degrees
    b. 120 degrees
    c. 60 degrees
    d. 140 degrees
11. The ligament attached to lesser curvature of stomach is:-
    a. Lesser omentum
    b. Greater omentum
    c. Gastrosplenic ligament
    d. None of the above
12. Foot drop is caused due to injury to:-
    a. Femoral nerve
    b. Obturator nerve
    c. Deep peroneal nerve
    d. Superior gluteal nerve
13. Facial artery is a branch of:-
    a. Internal carotid artery
    b. Subclavian artery
    c. Maxillary artery
    d. External carotid artery
14. Corpus callosum is made up of :-
    a. Commissural fibres
    b. Association fibres
    c. Projection fibres
    d. None of the above

Regn. No.....

Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
PHYSIOLOGY INCLUDING BASIS OF DISEASES
PAPER TWO

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Define excitation-contraction coupling. Give the sequence of events involved in excitation-contraction coupling. (2+5=7)

Q. 2. Define cardiac cycle. Enumerate the mechanical events of cardiac cycle giving duration of each and draw labelled diagram showing left ventricular pressure-volume and ECG changes during cardiac cycle. (2+2+3=7)

Q. 3. Draw a spirogram indicating various lung volumes and capacities and define vital capacity. (5+2=7)

Q. 4. Give the composition and functions of pancreatic juice. (3+4=7)

Q. 5. Differentiate between: (3.5 x 2=7)

a. Two types of nephrons in the kidney

b. Graded potential and action potential

Q. 6. Give the origin, course and functions of pyramidal tract and draw a labelled diagram showing the pathway of pyramidal tract. (4+3=7)

Q. 7. Draw labelled diagram to show feedback control of growth hormone secretion. Differentiate between pituitary and hypothyroid dwarf. (3+4=7)

Q. 8. List the various types of leucocytes found in the blood. Describe the major functions of each type. (3+4=7)

Q. 9. Write briefly on functions of hypothalamus. (7)

Regn. No.....

Paper Code: RT- 102...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
PHYSIOLOGY INCLUDING BASIS OF DISEASES
PAPER TWO (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and encircle the alphabet against it

1. The minimal strength of stimulus acting for a given duration that produces action potential is called _____ stimulus.
   a. Chronaxie
   b. Threshold
   c. Sub-threshold
   d. Supra-threshold
2. The value of which of the following is considered as unit of excitability:
   a. Refractory period
   b. Utilization time
   c. Chronaxie
   d. Rheobase
3. The major anion in intracellular fluid is:
   a. Protein
   b. Chloride
   c. Bicarbonate
   d. Phosphate
4. The normal blood pH is:
   a. 7.20
   b. 7.30
   c. 7.40
   d. 7.50
5. The total leucocyte count in an adult person is:
   a. 20000/cu.mm
   b. 15000-18000/cu.mm
   c. 11000-15000/cu.mm
   d. 4000-11000/cu.mm
6. The motor unit is:
   a. Muscle fiber and neurons supplying it
   b. Ventral horn cells along with its motor nerve
   c. Single motor neuron and all the muscle fiber it supplies
   d. Single muscle fiber with its nerve
7. Deglutition refers to:
   a. Chewing the food into smaller particles
   b. Swallowing the food
   c. Degradation of food by digestive enzymes
   d. Transport of nutrients from small intestine into circulation
8. **All** the following are synthesized in the liver **Except:**
   a. Albumin
   b. Immunoglobulins
   c. Urea
   d. Cholesterol
9. In systemic circulation the blood is pumped from:
   a. Right atrium
   b. Right ventricle
   c. Left atrium
   d. Left ventricle
10. The exchange vessels are the:
    a. Arterioles
    b. Veins and venules
    c. Capillaries
    d. Aorta
11. Inspiratory capacity is:
    a. TV+ERV
    b. TV+IRV
    c. ERV+RV
    d. VC+RV
12. Slow pain is carried by:
    a. Aα fiber
    b. B fiber
    c. C fiber
    d. Aδ fiber
13. The tract which carries proprioceptive sensation is:
    a. Spinotectal
    b. Lateral spinothalamic
    c. Dorsal column
    d. Anterior spinothalamic
14. Delta cells of pancreas secrete:
    a. Insulin
    b. Glucagon
    c. Somatostatin
    d. Pancreatic polypeptide

Regn. No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
RADIATION PHYSICS
PAPER THIRD

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Write a note on Compton Effect.

Q. 2. What is radioactive decay law? Define activity and its SI Unit.

Q. 3. How are X rays produced? Draw a diagram of X ray tube.

Q. 4. Write briefly on Alpha Decay and give an example.

Q. 5. Write briefly on Ionization.

Q. 6. What are the different types of Radiation and give examples of each

Q. 7. Draw structure of an atom and describe it briefly.

Q. 8. What is binding energy and mass defect?

Q. 9. Write a short note on Linear Attenuation Coefficient.

Regn. No.....

Paper Code: RT- 103...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
RADIATION PHYSICS
PAPER THIRD (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and encircle the alphabet against it

1. Simulators are primarily used to:
   a. Localize the target
   b. Duplicate the geometry of therapy machine
   c. Duplicate the mechanical movements of therapy machine
   d. All of the above
2. 1 Gy is the same as:
   a. 1 rad
   b. 10cGy
   c. 100cGy
   d. 1 erg
3. Si Unit of Activity is :
   a. Curie
   b. Bequerel
   c. Killogram
   d. Joule
4. Positrons are produced during :
   a. Compton effect
   b. Photoelectric effect
   c. Pair production
   d. Coherent scattering
5. Dose required for permanent sterility:
   a. 6 Gy
   b. 2 Gy
   c. 10Gy
   d. None of the above
6. The maximum dose from a single 6MV photon beam occurs at approximately:
   a. 5 cm
   b. 2 cm
   c. .5 cm
   d. 3 cm
7. CT simulator is different from a diagnostic CT scan:
   a. Small bore
   b. Flat couch
   c. Quality of imaging
   d. None
8. 1 MeV equals to:
   a. 10-6 electron volts (eV)
   b. 106 eV
   c. 1010 eV
   d. 10-9 eV
9. Bolus should be placed:
   a. At skin surface
   b. At some distance of skin surface
   c. Both
   d. None of above
10. What percentage of radiation is transmitted after 5 HVL?
    a. 1%
    b. 3.125%
    c. 5%
    d. 10%
11. D_{max} depends on :
    a. Energy
    b. Buidling
    c. Shielding used
    d. Gantry angle
12. SSD of Cobalt 60 is:
    a. 100cm
    b. 80cm
    c. 5cm
    d. 30cm
13. Atomic Number of Lead:
    a. 32
    b. 27
    c. 52
    d. 82
14. Which of the following elements is not included in the formation of Cerrobend?
    a. Lead
    b. Bismuth
    c. Zinc
    d. Tungsten

Regn. No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Write a short note on Grenz Radiation

Q. 2. Give a brief account of Magnetron

Q. 3. Draw a block diagram of Medical Linear Accelerator. What is the function of klystron in Linear Accelerator ?

Q. 4. What is the difference between cobalt 60 and 6 MV LINAC?

Q. 5. Write a note on virtual simulation workstation

Q. 6. Describe briefly production of X rays from target

Q. 7. Discuss in brief Hereditary effects of radiation

Q. 8. What is the significance of shoulder in management of tumors?

Q. 9. What is indirect effect of radiation at cellular level? Draw cell cycle diagram

Regn. No.....

Paper Code: RT- 104...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2016
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
PAPER FOUR (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and encircle the alphabet against it

1. What is the main source of natural background radiation?
   a. Electrons.
   b. Carbon
   c. Cosmic rays.
   d. Radon gas.
2. Which of the following radiation can be stopped by piece of paper?
   a. Electron
   b. Proton
   c. Alpha
   d. Gamma photon
3. Half Life of Co-60:
   a. 5.26 years
   b. 5.26 days
   c. 30 years
   d. 30 days
4. Electrons are:
   a. Negatively charged
   b. Positively charged
   c. Neutral
   d. None of the above
5. HVL is :
   a. Half value layer
   b. High value layer
   c. High value lead
   d. Half value lead
6. In radiotherapy room how much lasers are need:
   a. 1
   b. 3
   c. 2
   d. 4
7. CT Simulator Couch is made up of:
   a. Wood
   b. Carbon fibre
   c. Lead
   d. Plexiglass
8. Which of the following is most radioresistant?
   a. Bone
   b. Sperm
   c. Lymphocyte
   d. Erythrocyte
9. Radiation acts on ---------- of the biological cell:
   a. Cytoplasm
   b. Cell wall
   c. DNA
   d. Mitochondria
10. Lead Apron is needed during:
    a. CT simulation
    b. X-ray unit
    c. Electron
    d. Photon
11. Atomic number is number of :
    a. Proton + Electron
    b. Electron
    c. Proton + Neutron
    d. Neutron
12. 1 millimeter is equal to:
    a. 10-3 meter
    b. 106 m
    c. 103 m
    d. 1010 m
13. DNA is ……..stranded :
    a. Single
    b. Double
    c. Helical
    d. Both B and C.
14. OER depends upon:
    a. Nitrogen
    b. Oxygen
    c. Carbon
    d. Cobalt

Regn. No..... Paper Code: BRT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2017
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Describe the hip joint under the following headings :- type of joint, bones forming the joint, ligaments, muscles producing the movements & applied.

Q. 2. Describe the formation and branches of the brachial plexus with its applied anatomy.

Q. 3. Write difference between skeletal muscle, smooth muscle & cardiac muscle.

Q. 4. Describe the bronchopulmonary segments with their applied anatomy.

Q. 5. Discuss about muscles of mastication.

Q. 6. Describe lymphatic drainage of uterus & cervix.

Q. 7. Write short notes on cubital fossa.

Q. 8. Describe cerebrospinal fluid circulation & its applied.

Q. 9. Write on Popliteal fossa.

Regn. No..... Paper Code: BRT- 101...

B.R.T. FIRST YEAR EXAMINATION, JUNE/JULY - 2017
ANATOMY INCLUDING RADIOGRAPHIC ANATOMY
PAPER FIRST (MCQ)

Time allotted for MCQ- 15 minutes

B : MCQs (Single response type): **(½ x 14= 7)**

Select the most appropriate answer and encircle the alphabet against it.

1. Spinal cord in adults extends upto:
   a. Lower border of L1
   b. Upper border of L1
   c. Lower border of L3
   d. Upper border of L3
2. Brodmann's number for Broca's motor speech area is:
   a. Area no. – 44,45
   b. Area no. – 6
   c. Area no. – 17
   d. Area no. – 4
3. Middle ear communicates with the pharynx via:
   a. Oval window
   b. Auditory tube
   c. Internal ear
   d. Round window
4. Maxilla is an example of:
   a. Long bone
   b. Short bone
   c. Sesamoid bone
   d. Pneumatic bone
5. All intrinsic muscles of tongue are supplied by:
   a. 7th cranial nerve
   b. 8th cranial nerve
   c. 9th cranial nerve
   d. 12th cranial nerve
6. Portal vein is formed behind the:
   a. Head of pancreas
   b. Neck of pancreas
   c. Body of pancreas
   d. Tail of pancreas
7. Stomach bed is formed by all **except**:
   a. Pancreas
   b. Right kidney
   c. Left suprarenal gland
   d. Splenic artery
8. Corpus callosum connects the:
   a. Two hemispheres of cerebellum
   b. Two hemispheres of cerebral cortex
   c. Cerebral cortex to brain stem
   d. Brain stem to spinal cord
9. Cerebellum controls the:
   a. Proprioception
   b. Co-ordination of motor movements of opposite side
   c. Body sensations
   d. Co-ordination of motor movements of same side
10. Brodmann's number for primary motor area is:
   a. Area no. - 44
   b. Area no - 6
   c. Area no. - 4
   d. Area no. - 17
11. Perineal body is formed by:
   a. 4 paired & 2 unpaired muscles
   b. 4 paired & 4 unpaired muscles
   c. 2 paired & 2 unpaired muscles
   d. 2 paired & 4 unpaired muscles
12. Nerve supply of anterior abdominal wall is:
   a. Upper 6 intercostal nerves
   b. Lower 6 intercostal nerves
   c. Lumbosacral trunk
   d. Sacral plexus
13. 'No' movements occur at:
   a. Atlanto-occipital joint
   b. Atlanto-axial joint
   c. Joint between 6^{th} & 7^{th} cervical vertebra
   d. Joint between 3^{rd} & 4^{th} cervical vertebra
14. In female, pelvic floor is pierced by:
   a. Urinary bladder, vagina, rectum
   b. Urinary bladder, rectum
   c. Urinary bladder, vagina
   d. Vagina, rectum

Regn. No..... Paper Code: BRT- 102...

B.Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
FIRST YEAR EXAMINATION JUNE/JULY - 2017
PHYSIOLOGY INCLUDING BASIS OF DISEASES

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagram wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. Describe the structure of neuromuscular junction with the help of labelled diagram and explain formation of end plate potential. (3.5 +3.5=7)

Q. 2. Enumerate the non-respiratory functions of lung. Define surfactant and give its composition & functions. (3+4=7)

Q. 3. Trace the ascending tracts in TS of spinal cord also illustrating the sensation they carry. What is the sensory loss in complete transection of spinal cord at the level of T 10 vertebra? (5+2=7)

Q. 4. Name the receptors of vision. Trace the visual pathway and write briefly on errors of refraction. (2+3+2=7)

Q. 5. Draw a labelled diagram of juxtaglomerular apparatus? Discuss the role of it in urine formation. (3+4=7)

Q. 6. Define Blood pressure and its components. Discuss the methods of measurement of blood pressure. (3+4=7)

Q. 7. Discuss the hormones regulating the calcium & phosphate metabolism. (7)

Q. 8. Define hemostasis. Discuss the formation of permanent hemostatic plug. (2+5=7)

Q. 9. Draw the microscopic structure of the skeletal muscle and discuss the various proteins involved in its contraction. (3+4=7)

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Regn. No..... Paper Code: BRT- 102...

B.Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
FIRST YEAR EXAMINATION JUNE/JULY - 2017
PHYSIOLOGY INCLUDING BASIS OF DISEASES

Time allotted for MCQ - 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and **encircle** the alphabet against it

1. HCl is produced from:
   a. G cells
   b. Parietal cells
   c. Peptic cells
   d. Mucus cells
2. Muscles of inspiration are all **except**:
   a. Diaphragm
   b. Internal intercostal
   c. Sternocleidomastoid
   d. External intercostal
3. Most important plasma protein for viscosity of blood is:
   a. Albumin
   b. Globulin
   c. Prothrombin
   d. Fibrinogen
4. Amount of air remaining in conducting zone after normal inspiration is:
   a. Residual capacity
   b. Dead space
   c. Residual volume
   d. Functional residual capacity
5. ICF comprises of:
   a. Blood
   b. Fluid in the cell
   c. Lymph
   d. Fluid in the cavity
6. Second heart sound is produced due to closure of:
   a. Semilunar valves
   b. Mitral valves
   c. Tricuspid valves
   d. A-V valves
7. Which of these is called as resistance vessels?
   a. Arterioles
   b. Vein
   c. Capillaries
   d. Venules
8. Maintainance of constant internal environment is called:
   a. Hemostasis
   b. Hematemesis
   c. Homeostasis
   d. Hypotension
9. All are the hormones for calcium homeostasis **except**:
   a. Calcitonin
   b. PTH
   c. Glucagon
   d. Vit D3
10. Windkessel effect is shown by:
    a. Venules
    b. Capillaries
    c. Arteries & aorta
    d. Vena-cava
11. All are responses to parasympathetic system stimulation **except**:
    a. Vasodilation
    b. Bradycardia
    c. Increased gut motility
    d. Pupil dilation
12. Receptors for hearing is present in:
    a. Cochlea
    b. Semicircular canal
    c. Utricle
    d. Saccule
13. Effective filtration pressure depends on all **except**:
    a. Hydrostatic pressure
    b. Oncotic pressure
    c. Interstitial pressure
    d. Bowman capsular pressure
14. Fast pain is carried by:
    a. Aα fiber
    b. B fiber
    c. C fiber
    d. Aδ fiber

Regn. No.....

Paper Code: BRT- 103...

B.Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
FIRST YEAR EXAMINATION, JUNE/JULY - 2017
RADIATION PHYSICS

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagrams wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. What is radioactive disintegration? Write down the law of radioactive decay?

Q. 2. Define:
- **a.** Activity and its unit
- **b.** Half-life and its relation with decay constant

Q. 3. Write about :
- **a.** Calculate radioactive constant (λ) for element whose half-life is 20 years.
- **b.** Find T ½ and T (average life) of radioactive substance of whose decay constant is 4.28X10-4/year.

Q. 4. How does radiation interact with matter? What are different types of interactions that take place when a photon interacts with matter?

Q. 5. Write a note on β-decay and draw energy level diagram for decay of $_{27}Co^{60}$ nucleus.

Q. 6. Explain the working of X-ray tube with diagram. Also explain the physics of X-ray production.

Q. 7. Answer the following:
- **a.** What is atom and explain briefly the structure of atom?
- **b.** What is binding energy and mass defect?

Q. 8. Write notes on:
- **a.** Ionization
- **b.** Percentage depth dose

Q. 9. Explain the following:
- **a.** Electron capture
- **b.** Pair production

****

Regn. No.....

Paper Code: BRT- 103...

B. Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
FIRST YEAR EXAMINATION, JUNE/JULY - 2017
RADIATION PHYSICS
(MCQ)

Time allotted for MCQ - 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and **encircle** the alphabet against it

1. 1 ev is equal to:
   a. $1.602x10^{-19}J$
   b. $2x10^{-27}J$
   c. $1.9x10^{-21}J$
   d. $9.1x10^{-31}J$
2. 1 amu =_____mev:
   a. 521 mev
   b. 0.511 mev
   c. 931 mev
   d. 231 mev
3. One curie is equal to :
   a. $3.7x10^{4}$ dps
   b. $3.7x10^{2}$ dps
   c. $3.7x10^{10}$ dps
   d. $3.7x10^{12}$ dps
4. Electrons are:
   a. Negatively charged
   b. Positively charged
   c. Neutral
   d. None of these
5. HVL is:
   a. Half Value Layer
   b. High Value Layer
   c. High Value Lead
   d. Half Value Lead
6. Decay of $_{27}Co^{60}$ is example of :
   a. B-decay
   b. Γ-decay
   c. A-decay
   d. None of these
7. Energy equivalent of electrons at rest (E_o) =:
   a. 1.7 mev
   b. 0.511mev
   c. 4 mev
   d. 0.38 mev
8. 1 amu = :
   a. 1/12 of mass of $_{6}c^{12}$
   b. 1/12 of mass of $_{8}O^{16}$
   c. 1/12 of mass of $_{16}S^{32}$
   d. None of these
9. Alpha particle has :
   a. 2N+2P
   b. 2N+1P
   c. 1N+1P
   d. 1P
10. SI unit of activity is:
    a. Curie
    b. Becquerel
    c. Roentgen
    d. Joule
11. Atomic mass is equal to :
    a. Protons
    b. Electrons
    c. Protons + Neutrons
    d. Neutrons
12. 1 millimeter is equal to:
    a. 10^{-3} m
    b. 10^{6} m
    c. 10^{3} m
    d. 10^{10} m
13. A^0 is unit of length equal to:
    a. 10^{-8} cm
    b. 10^{10} cm
    c. 10^{-6} cm
    d. 10 mm
14. Auger electrons are produced during:
    a. Compton effect
    b. Photo electric effect
    c. Pair production
    d. Coherent scattering

Regn. No.....

Paper Code: BRT- 104...

B.Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
FIRST YEAR EXAMINATION, JUNE/JULY - 2017
RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY

[Time allotted: Three hours] **[Max Marks: 70]**

Note: Attempt all questions
Draw suitable diagrams wherever necessary

A : Short answer questions: **(7 x 9 = 63)**

Q. 1. What are properties of electromagnetic radiation?

Q. 2. Write a note on CT simulator.

Q. 3. Write note on console in radiotherapy.

Q. 4. What is the difference between cobalt 60 and linear accelerator teletherapy equipment?

Q. 5. Write a note on X-Ray tube. Draw diagram of production of X-rays.

Q. 6. Write a short note on Laser in radiotherapy department.

Q. 7. Write note on indirect effect of radiation.

Q. 8. Write note on 5 Rs in radiotherapy.

Q. 9. What is cancer? Write down various signs and symptoms of cancer.

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Regn. No.....

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B.Sc. MEDICAL TECHNOLOGY (RADIOTHERAPY)
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RADIOTHERAPY EQUIPMENTS & BASIC RADIOBIOLOGY
(MCQ)

Time allotted for MCQ - 15 minutes

B : MCQs (Single response type): (½ x 14= 7)

Select the most appropriate answer and **encircle** the alphabet against it:

1. What is the main source of background radiation?
   a. Electrons.
   b. Carbon
   c. Cosmic rays.
   d. Medical X-rays
2. Which of the following radiation is chargeless?
   a. Electron
   b. Proton
   c. Alpha
   d. Gamma photon
3. Half -life of radium is:
   a. 5.26 years
   b. 5.26 days
   c. 30 years
   d. 1600 years
4. Neutrons are:
   a. Negatively charged
   b. Positively charged
   c. Neutral
   d. None of the above
5. TVL is:
   a. Half value layer
   b. Tenth value layer
   c. Tenth value lead
   d. Half value lead
6. In Cobalt 60 equipment, how many sources are there?
   a. 1
   b. 3
   c. 2
   d. 4
7. Wedge is made up of:
   a. Wax
   b. Carbon fibre
   c. Lead
   d. Plexiglass
8. Which of the following is most radiosensitive?
   a. Bone
   b. Connective tissue
   c. Lymphocyte
   d. Muscle
9. Direct effect of radiation is on ---------- of the biological cell:
   a. Cytoplasm
   b. Cell wall
   c. DNA
   d. Mitochondria
10. Concrete is used in walls in.....equipment:
    a. CT simulation
    b. X-ray unit
    c. Mammography
    d. 6 MV Linac
11. Nucleus in an atom contains:
    a. Proton
    b. Electron
    c. Proton + Neutron
    d. Neutron
12. 1 Gray is equal to:
    a. 100 cGY
    b. 1 cGY
    c. 10 cGY
    d. 1000 cGY
13. RNA is .....stranded:
    a. Single.
    b. Double
    c. Helical
    d. Both b and c
14. Effect of radiation is more in presence of:
    a. Nitrogen
    b. Oxygen
    c. Carbon
    d. Potassium