

**GMCH COMBINED ENTRANCE TEST (GCET-2023)**  
**B.Sc. Medical Technology (X-Ray): Vocational Course (X-Ray techniques);**  
**diploma Radiography / X-Ray**  
**QUESTION BOOKLET**

**Time: 120 Minutes**

**Number of Question: 100**

**Maximum Marks: 100**

**Roll Number: In figure**

**In Words**

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**Signature of the Candidate:** \_\_\_\_\_

**DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO**

**INSTRUCTIONS-**

1. Write your Roll Number and other details on the Question Booklet and also on the OMR Sheet in the spaces provided.
2. Do not make any identification marks on the OMR Answer Sheet or Question Booklet.
3. Please check that the Question Booklet contains 100 questions. In case of any discrepancy, inform the Assistant Superintendent/Invigilator within 10 minutes of the start of the test.
4. Each question has four alternative answer (A, B, C, D) out of which **only one is correct**. For each question, **darken only one bubble** (A, B, C, or D), whichever you think is the correct answer, on the OMR Answer sheet with **Blue / Black Ball Pen only**. Do not use Gel Pen/ ink pen /Pencil etc. Do not Tick  $\checkmark$  or  $\times$  on the OMR Sheet.
5. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the Questions given the Question Booklet.
6. In case more than one bubble is darkened no marks will be given and the question will be treated as wrong.
7. There will be no negative marking. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the OMR Answer sheet.
8. For rough work, use the blank sheet at the end of the Question Booklet.
9. The question paper includes 30 MCQ Anatomy/ Physiology (1-30); 35 MCQ Radiation Physics and Biology (31-65); 35 MCQ Radiographic techniques (66-100).
10. The OMR Answer sheet is designed for computer evaluation. Therefore, if you do not follow the instructions given on the OMR Answer sheet, it may make evaluation by the computer difficult. Any resultant loss to the candidates on the above account, i.e. not following instructions completely and properly, shall be the responsibility of the candidates only.
11. After the test, handover the Question Booklet and OMR sheet to the Invigilator on duty.
12. Candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper or the any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre superintendent/Observer whose decision shall be final.
13. Telecommunication equipment such as pager, cellular phone, wireless, scanner, smart watch/watch etc. is not permitted inside the examination hall. Use of calculators is not allowed.
14. Candidate should ensure accuracy of their personal details on the OMR Sheet i.e. Name and Roll No., signature and Left thumb impression. The personal details are to be filled in by the candidates with his/her own hand writing.

1. The animal cells are interconnected by:
  - A. Cell wall
  - B. Desmosomes
  - C. Plasma membrane
  - D. Plasmodesmata
2. Myelin sheath to the axons of the CNS is provided by:
  - A. Astrocytes
  - B. Oligodendrocytes
  - C. Microglia
  - D. Ependymal cells
3. The aortic valve prevents blood from flowing backwards into:
  - A. Right ventricle
  - B. Left ventricle
  - C. Aorta
  - D. Left atrium
4. Pacemaker of heart is
  - A. AV Node
  - B. SA Node
  - C. Purkinje fibres
  - D. Bundle of His
5. The endocrine component in kidney that secretes renin and erythropoietin is the:
  - A. Bowman's capsule
  - B. Adrenal gland
  - C. Juxta glomerular apparatus
  - D. Vasa recta
6. Intercalated discs are characteristic of:
  - A. Smooth muscle
  - B. Cardiac muscle
  - C. Skeletal muscle
  - D. Muscularis mucosa
7. The peritoneal fold that stabilizes and supports the small intestine is the:
  - A. Serosa
  - B. Lesser omentum
  - C. Mesentery
  - D. Parietal peritoneum
8. Intrinsic factor is secreted by cells in the stomach wall called:
  - A. Parietal cells
  - B. Chief cells
  - C. Acinar cells
  - D. G cells
9. Largest lymphoid organ of the body is
  - A. Lymph node
  - B. Spleen
  - C. Palatine tonsil
  - D. Appendix
10. Parathyroid hormone secretions regulate:
  - A. Blood calcium
  - B. Blood glucose
  - C. Protein synthesis
  - D. Fat metabolism
11. The primary function of the lens of the eyes is to:
  - A. Absorb light passing through the retina
  - B. Interact with the photoreceptors of the retina
  - C. Focus the visual image on the retina
  - D. Secrete aqueous humour
12. The auditory ossicles of the middle ear include the:
  - A. Sacculus, utriculus, ampulla
  - B. Vestibule, cochlea, organ of Corti
  - C. Malleus, stapes, incus
  - D. Otoliths, maculae, otoconia
13. The bones of the pectoral girdle include:
  - A. Clavicle and scapula
  - B. Ilium and ischium
  - C. Humerus and femur
  - D. Ulna and radius
14. The structure piercing the central tendon of the diaphragm is:
  - A. Inferior vena cava
  - B. Thoracic duct
  - C. Aorta
  - D. Oesophagus
15. Failure of descent of testis to its normal position is called:
  - A. Cholecystitis
  - B. Cryptorchidism
  - C. Hypogonadism
  - D. Sterility

16. Structure of RBC membrane is maintained by  
 A. Elastin  
 B. Collagen  
 C. Spectrin  
 D. Laminin
17. The normal sequence of cell cycle is  
 A. G<sub>0</sub>-G<sub>1</sub>-S-G<sub>2</sub>-M  
 B. G<sub>0</sub>-G<sub>1</sub>- G<sub>2</sub>-M-S  
 C. G<sub>0</sub>-G<sub>1</sub>-S- M -G<sub>2</sub>  
 D. G<sub>0</sub>- M -G<sub>1</sub>-S-G<sub>2</sub>
18. End plate potential is characterized by  
 A. All or none law  
 B. Propagation  
 C. Depolarization  
 D. Hyperpolarization
19. Rheobase is an indicator of  
 A. Specificity of impulse transmission  
 B. Magnitude of current  
 C. Rate of discharge  
 D. Velocity of nerve conduction
20. All are required in heme synthesis except  
 A. Ferrous iron  
 B. Glycine  
 C. Succinyl CoA  
 D. Lead
21. Helper and Cytotoxic cells are  
 A. B cells  
 B. T cells  
 C. Monocytes  
 D. Macrophages
22. Erythropoiesis is promoted by  
 A. Erythropoietin  
 B. Interleukin -5  
 C. Colony stimulating factor  
 D. Interleukin-4
23. The normal Arterial Carbon dioxide level in human blood is:  
 A. 25 mmHg  
 B. 40 mmHg  
 C. 50 mmHg  
 D. 60 mmHg
24. Diffusion capacity for carbon dioxide compared to oxygen is  
 A. 20 time more  
 B. 10 times more  
 C. 5 times more  
 D. 2 times more
25. Blood pressure is defined as the product of  
 A. Systolic pressure and pulse  
 B. Cardiac output and peripheral resistance  
 C. Pulse pressure and pulse rate  
 D. Diastolic pressure and pulse rate
26. Nitric oxide is released by  
 A. Smooth muscle cells  
 B. Mesenchymal cells  
 C. Pericytes  
 D. Endothelial cells
27. Digestion of dietary fiber by colonic bacteria produces  
 A. Free radicals  
 B. Sucrose  
 C. Butyrate  
 D. Glycerol
28. Excessive ingestion of carbohydrate free diet (diet not containing carbohydrates) causes  
 A. Diabetes insipidus  
 B. Ketosis  
 C. Obesity  
 D. Bleeding
29. Most powerful vasopressor is  
 A. Renin  
 B. Angiotensin II  
 C. Aldosterone  
 D. Cortisol
30. Inhibitory neurotransmitter in CNS neurons is  
 A. Glutamate  
 B. Aspartate  
 C. GABA  
 D. Taurine
31. The minimum energy required to emit electrons from a metal surface is:  
 A. Ionization energy  
 B. Dissociation energy  
 C. Cohesive energy  
 D. Work energy



32. An element has mass number =23, number of protons = 11, number of electrons = 11. The number of neutrons will be:
- 11
  - 12
  - 22
  - 23
33. The emission of electrons resulting from absorption of heat energy is called
- Filament evaporation
  - Photoemission
  - Thermionic emission
  - Light emission
34. The nucleus of Sodium contains 11 protons and 12 neutrons while that of Magnesium contains 12 protons and 11 neutrons. This is an example of:
- Isobars
  - Isotopes
  - Isomers
  - Isotones
35. Radiation is being emitted from a radioactive source and is subjected to electrical field perpendicular to the path. The following is true:
- Alpha particles deviate towards positive plate
  - Gamma particles deviate towards positive plate
  - Beta particles deviate towards positive plate
  - Gamma particles deviate towards negative plate
36. The following has the highest ionizing power:
- Beta particle
  - Alpha Particle
  - Gamma ray
  - Photons
37. The radioactive substance having Mass number 238 and Atomic number 92 emits an Alpha particle. The resulting new element has a
- Mass number 238, Atomic number 90
  - Mass number 232, Atomic number 92
  - Mass number 234, Atomic Number 90
  - Mass number 234, Atomic Number 92
38. The Carbon 14 used for carbon dating has a half-life of approximately (rounded off to nearest figure)
- 1425 days
  - 2850 years
  - 5700 years
  - 11400 years
39. In beta emission, an electron is ejected from the substance. This electron comes from:
- Outermost orbit of electrons
  - Innermost orbit of electrons
  - Another atom in the vicinity
  - The Nucleus of the atom
40. Radioactive phosphorus has an Atomic Number 15 and Mass Number 32. When it emits a beta particle then the following is true regarding the new nucleus:
- Atomic number becomes 16
  - Atomic Number becomes 14
  - Mass number becomes 31
  - Mass number becomes 33
41. The difference between Reciprocating Grid and Oscillating grid in Radiology is that:
- With Reciprocating grid, vibration may cause unsharp image
  - With Oscillating grid, motion may cause unsharp images
  - Oscillating grid is affected by change in oil viscosity of the oil-dash pot
  - Oscillating grid has larger subject-film distances

42. While preparing an X-Ray film, the Fixer contains:
- Hydroquinone
  - Sodium sulphite
  - Sodium thiosulphate
  - Sodium carbonate
43. When an X-Ray photon ejects the inner shell K electron, and the space is filled by an outer shell electron, the radiation released is:
- Compton effect
  - Ion Pair production
  - Characteristic radiation
  - Nuclear absorption
44. The following statement is true regarding Coherent Scatter:
- It results in marked ionization
  - There is a change in wavelength of the incident photon
  - There is change in direction of the incident photon
  - It occurs with high energy radiation
45. In modern X ray tubes, the focal spot or target is made of
- Copper plus Steel
  - Lead plus Silver
  - Tungsten plus Rhenium
  - Aluminium plus Brass
46. The dose limitation of radiation to the whole body for X-Ray technicians in any single year is
- 30 mSv
  - 100 mSv
  - 100 mRem
  - 5 mRem
47. When x ray film is exposed to x rays, the image produced is known as
- Visible image
  - Positive image
  - Latent image
  - Negative image
48. In Nuclear physics, Isomers are atoms containing:
- Same number of neutrons but different number of protons
  - Same number of protons and neutrons but different number of electrons
  - Same number of electrons but different number of protons
  - Same atomic and mass number but different radioactive properties
49. In Mass Defect, the mass of the nucleus is:
- More than mass of protons and neutrons
  - Less than the mass of protons and neutrons
  - Equal to the mass of protons and electrons
  - Equal to the mass of neutrons and electrons
50. The correct statement regarding the most stable nuclei is that it should have:
- Odd numbers of neutrons and odd numbers of protons
  - Even numbers of neutrons and even numbers of protons
  - Even number of neutrons and odd number of protons
  - Odd Numbers of neutrons and Even number of protons
51. The Source of sun's energy is the conversion of hydrogen nuclei to helium nuclei by:
- Nuclear fission
  - Thermionic emission
  - Nuclear Fusion
  - Photoelectric emission
52. Characteristic X-Rays are produced when:
- Atoms are bombarded by neutrons
  - Orbital vacancy is filled by an electron from an outer shell
  - Electrons are added to the outer shells without displacement
  - Neutrons are displaced from the nucleus by photons

53. The X-Ray tube is highly evacuated so as to:
- Increase the speed of electrons
  - Prevent electron interactions with air
  - Prevent heating of cathode
  - Prevent heating of anode
54. The Range of Superficial radiotherapy is:
- Below 20 kV
  - Between 40-50 kV
  - Between 50 to 150 kV
  - Between 150 to 500 kV
55. In diagnostic X-Rays, the filter used is made of:
- Graphite
  - Bakelite
  - Aluminium
  - Combination of all the above
56. Advantages of MRI over CT Scan are all EXCEPT:
- Diagnostic Interpretation is better
  - No use of ionizing radiation
  - Higher contrast and better imaging of soft tissue tumor
  - Lower spatial resolution
57. The Latent Image in X-Ray is a/an:
- Image seen on the view-box in the ward
  - Image after chemical fixation in developer
  - Invisible image after exposure
  - Visible image in the dark room
58. By using the inverse square law in radiation, what would be the intensity of radiation at 4 cm from the source if it is X units at the source:
- $X / 4$
  - $X / 8$
  - $X / 16$
  - $X / 32$
59. Helium atom contains the following
- One K electron and One L electron
  - Two K electrons
  - Two K and One L electron
  - Two L electrons
60. In a Cathode ray tube, the following is a component of the Electron Gun:
- Deflecting system
  - Fluorescent screen
  - Grid
  - Graphite coating
61. The process of the production of non-parental phenotypes is called:
- Linkage
  - Recombination
  - Mutation
  - Replication
62. Mutational theory of evolution was given by
- Charles Darwin
  - Robert Brown
  - Oparin
  - Hugo de Vries
63. Negatively regulatory proteins are called
- Repressor
  - Catalytic proteins
  - Accessory proteins
  - All of the above
64. Male gametes whether 2-celled or 3-celled are identical in genetic make-up because of
- Mitosis
  - Meiosis
  - Amitosis
  - Binary fission
65. Genes which are located only in the Y-chromosome are known as:
- Epistatic genes
  - Holandric genes
  - Operator genes
  - Anti-epistasis genes
66. The difference in densities between the adjacent areas on the film is known as
- Detail
  - Contrast
  - Distortion
  - Magnification

67. The area of anode disc on which the bombardment of electrons take place is called
- Focus
  - Stem
  - Rotor
  - Bellows
68. A device used to reduce the size of X-ray beam is the
- Potter Bucky diaphragm
  - Collimator
  - Filter
  - Kenotron tube
69. The lateral decubitus view for chest is obtained to demonstrate
- Minimal Pleural effusion
  - Tuberculosis
  - Carcinoma
  - Interstitial lung disease
70. The contrast medium preparation used in gastrointestinal examination includes
- Barium carbonate
  - Barium sulphate
  - Barium chloride
  - Barium phosphate
71. The device in x ray cassette that converts the energy of x ray beam into visible light is
- Fluorescent screen
  - Intensifying screen
  - X-ray film
  - Aluminium front of cassette
72. The abnormalities in the large intestine can be demonstrated radiologically by
- Barium meal
  - Small bowel Enteroclysis
  - Barium enema
  - Colonoscopy
73. The filters commonly used in diagnostic x ray tubes are made of
- Aluminium
  - Steel
  - Carbon
  - Lead
74. An Orthopantogram is taken to identify a lesion in
- Mandible
  - Zygomatic bone
  - Fascial Bone
  - Skull
75. FLAIR sequence in MRI stands for-
- Fat labelled attenuated inversion recovery
  - Fluid attenuated inversion recovery
  - Fat attenuated inversion recovery
  - Fluid labelled attenuation inversion recovery
76. Mortise view is done for
- Cervical spine
  - Hip Joint
  - Ankle joint
  - Lumbar spine
77. Air under the diaphragm due to perforation of duodenal ulcer is best visualised in
- Chest X ray supine
  - Chest x ray erect
  - Abdominal x-ray supine
  - Barium meal study
78. A Lordotic view is used to demonstrate
- Exaggerated lumbar lordosis
  - Paranasal sinuses
  - Lung apices
  - Middle lobe collapse
79. Barium swallow is the radiographic contrast study for the evaluation of-
- Esophagus
  - Stomach
  - Small bowel
  - Large Bowel
80. The Enteroclysis is an investigation for
- Oesophagus
  - Small intestine
  - Stomach
  - Pancreas



81. In order to visualize the blood flow in the renal arteries, the preferred radiological investigation is:
- Plain CT KUB
  - 2D ultrasound
  - Doppler Ultrasound
  - Intravenous pyelography
82. "Velpeau view" x-ray is taken for which joint
- Wrist Joint
  - Ankle Joint
  - Shoulder Joint
  - Knee joint
83. Gibbs artefact is also known as
- Truncation artefact
  - Ghosting artefact
  - Chemical shift artefact
  - Zipper artefact
84. Patients are told to hold their breath during X-ray exposure to decrease unsharpness due to
- Motion
  - Parallax unsharpness
  - Geometry
  - Screen
85. Stenvers view is used for assessment of
- Sella
  - Maxilla
  - Petrous temporal bone
  - Squamous temporal bone
86. The maxillary sinuses are best visualised in:
- Caldwell's projection
  - Water's projection
  - Law's projection
  - Pirie's projection
87. The INCORRECT statement for lateral view X-rays of sacrum and coccyx is:
- Large focal spot is desirable
  - Breath holding is required after expiration
  - Gonads shielding placed for males
  - Bucky is not required
88. The radiographic contrast study of the uterus and fallopian tubes is called:
- Pyelography
  - Hysterosalpinography
  - Sialography
  - Ductography
89. Hounsfield Units (HU) are used in which of the following modalities
- MRI
  - Mammography
  - PET scan
  - CT scan
90. The primary x-ray beam penetration (percent) through a patient can be increased by increasing the:
- KV.
  - mAs
  - Film-focus distance
  - Beam area
91. Dacryo-cystography is the contrast study of the:
- Mammary ducts
  - Nasolacrimal ducts
  - Salivary ducts
  - Intrahepatic biliary ducts
92. The Investigation of choice for head trauma in the emergency setting is
- MRI
  - X-Ray skull
  - CT scan
  - Angiography
93. When collimating a Cervical Spine X-Ray image, the collimation should be set to
- Larger than film size
  - 1 inch on all sides
  - 2 inch on all sides
  - Film size or slightly smaller
94. The maximum field of view which can be obtained with a specific radiographic system is generally limited by the:
- Focal spot size
  - Anode size
  - Anode angle
  - Focal Length



95. For routine chest radiography you would expect to get the best contrast characteristics by using:
- A. 35 kV.
  - B. 65 kV
  - C. 95 kV
  - D. 120 kV
96. The landmark for centring of chest X-Ray PA view is:
- A. Xiphisternum
  - B. Manubrium sternum
  - C. Inferior angles of scapula
  - D. Midway between manubrium sternum and pubic symphysis
97. Wrong statement for Skyline view of patella is:
- A. Patient is in sitting position with knees flexed at  $170^\circ$
  - B. Patient's feet are resting on sand bag.
  - C. Cassette is supported vertically about 6 inches proximal to femoral condyle
  - D. Centering of X-ray beam at inferior surface of patella with X-ray tube angled  $10^\circ$  towards head
98. Retrograde cystourethrography is done to see
- A. Urinary bladder
  - B. Anterior urethra
  - C. Renal function
  - D. Vesicouretric reflex
99. Potential advantages of using a higher KV (90 rather than 70) in radiography include all of the following EXCEPT:
- A. Increased patient exposure
  - B. Reduced x-ray tube heating.
  - C. Shorter exposure times.
  - D. Decreased area contrast
100. Bowel preparation is usually NOT required for:
- A. X-ray KUB AP view
  - B. X-ray KUB lateral view
  - C. Intravenous pyelography
  - D. Barium meal follow through

*x Ray Vocetumel*

Q No	Key	Q No	Key	Q No	Key	Q No	Key	Q No	Key
1	B	21	B	41	A	61	B	81	C
2	B	22	A	42	C	62	D	82	C
3	B	23	B	43	C	63	A	83	A
4	B	24	A	44	C	64	A	84	A
5	C	25	B	45	C	65	B	85	C
6	B	26	D	46	A	66	B	86	B
7	C	27	C	47	C	67	A	87	D
8	A	28	B	48	D	68	B	88	B
9	B	29	B	49	B	69	A	89	D
10	A	30	C	50	B	70	B	90	A
11	C	31	D	51	C	71	B	91	B
12	C	32	B	52	B	72	C	92	C
13	A	33	C	53	B	73	A	93	D
14	A	34	A	54	C	74	A	94	C
15	B	35	C	55	C	75	B	95	D
16	C	36	B	56	D	76	C	96	C
17	A	37	C	57	C	77	B	97	A
18	A	38	C	58	C	78	C	98	B
19	B	39	D	59	B	79	A	99	A
20	D	40	A	60	C	80	B	100	D