

072/2017

Question Booklet  
Alpha Code

A

Question Booklet  
Serial Number

Total Number of Questions : 100

Time : 75 Minutes

Maximum Marks : 100

### INSTRUCTIONS TO CANDIDATES

1. The question paper will be given in the form of a Question Booklet. There will be four versions of question booklets with question booklet alpha code viz. A, B, C & D.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the question booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a question booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your question booklet is un-numbered, please get it replaced by new question booklet with same alpha code.
6. The question booklet will be sealed at the middle of the right margin. Candidate should not open the question booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the question booklet supplied to him contains all the 100 questions in serial order. The question booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
8. A blank sheet of paper is attached to the question booklet. This may be used for rough work.
9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**
10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.
11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

## 072/2017

1. The 2020 Olympics will be held in :  
(A) Tokyo (B) London (C) Peru (D) Mexico
2. The U.S. President Donald Trump was the Presidential nominee of which party ?  
(A) Socialist Party (B) Republican Party  
(C) Democratic Party (D) Libertarian Party
3. International Literacy Day is on :  
(A) 4<sup>th</sup> September (B) 5<sup>th</sup> June (C) 8<sup>th</sup> June (D) 8<sup>th</sup> September
4. Founder of Samathwa Samajam in Kerala :  
(A) Ayya Vaikunda Swamikal (B) Dr. Palpu  
(C) Sahodaran Ayyappan (D) Ayyankali
5. Karat Govindan Kutty Menon was the real name of \_\_\_\_\_.  
(A) Chattampi Swami (B) Ayya Vaikundar  
(C) Brahmananda Sivayogi (D) Thycaud Ayya
6. 'Ente Jeevitha Samarankal' was the autobiography of :  
(A) Sree Narayana Guru (B) Mannathu Padmanabhan  
(C) Pandit Karuppan (D) V.T. Bhattathirippadu
7. Who has been known as the Father of Kerala Renaissance ?  
(A) K. Kelappan (B) Kumaranasan  
(C) Sree Narayana Guru (D) Vagbhadananda
8. Which River is also known as Indus ?  
(A) Ganga (B) Brahmaputhra (C) Kaveri (D) Sindhu
9. The first ecotourism in India :  
(A) Goa (B) Thenmala (C) Wayanadu (D) Mysore
10. The father of the Modern Travancore :  
(A) Marthanda Varma (B) Dharmaraja  
(C) Pazhassi Raja (D) Visakham Tirunal

11. Who wrote the book "Indian War of Independence" ?  
(A) M.N. Roy (B) V.D. Savarkar (C) Thara Chand (D) B.R. Nanda
12. The progress in increase of Fish production was called :  
(A) White Revolution (B) Yellow Revolution  
(C) Green Revolution (D) Blue Revolution
13. The first Five Year Plan in India was from :  
(A) 1947 - 1952 (B) 1949 - 1954 (C) 1951 - 1956 (D) 1952 - 1957
14. India earns maximum foreign exchange by the export of :  
(A) Iron (B) Tea (C) Textiles (D) Handloom
15. Which Maharaja of Travancore issued the Temple entry proclamation ?  
(A) Sree Chithira Thirunal Balarama Varma  
(B) Setu Lakshmi Bai  
(C) Ayilyam Tirunal  
(D) Swathi Tirunal
16. Andy Murray is a famous \_\_\_\_\_ player.  
(A) Hockey (B) Football (C) Chess (D) Tennis
17. Who was the Viceroy of India at the time of Partition of Bengal (1905) ?  
(A) Lord Curzon (B) Lord Mayo (C) Lord Wellesly (D) Lord Lytton
18. Who was the First Secretary of SNDP ?  
(A) Sree Narayana Guru (B) Chattampi Swamikal  
(C) Ayyankali (D) Kumaranasan
19. Quit India Movement was started on :  
(A) 1930 (B) 1938 (C) 1942 (D) 1946
20. Who was the founder of Ramakrishna Mission ?  
(A) Sri Ramakrishna Paramahamsar  
(B) Dayananda Saraswathi  
(C) Swami Vivekananda  
(D) Raja Rammohan Roy

21. DNA model was proposed by Watson and Crick in the year :  
(A) 1970 (B) 1953 (C) 1983 (D) 1965
22. Which statement of cell cycle is **not** true ?  
(A) It consists of mitosis and interphase  
(B) The cell's DNA replicates during G1  
(C) A cell can remain in G1 for weeks or even longer  
(D) Most proteins are formed throughout all subphase of interphase
23. The element with atomic number  $Z = 115$  will be placed in :  
(A) 7<sup>th</sup> period, I A group (B) 8<sup>th</sup> period, IV A group  
(C) 7<sup>th</sup> period, V A group (D) 6<sup>th</sup> period, V B group
24. Half-life period of a radioactive element X is same as the mean life time of another element Y. Initially, they have same number of atoms. Then :  
(A) X will decay faster than Y  
(B) Y will decay faster than X  
(C) Y and X decay at the same rate after one half-life period  
(D) Y and X have same decay rate initially
25. The difference between soft and hard X-rays is of :  
(A) Velocity (B) Intensity (C) Frequency (D) Polarization
26. Which rays are not the portion of electro-magnetic spectrum ?  
(A) Alpha-rays (B) X-rays (C) Microwaves (D) Radiowaves
27. Whose experiments mark the beginning of the field of communication using electromagnetic waves ?  
(A) J.C. Bose (B) Maxwell (C) Marconi (D) Hertz
28. The correct sequence of the increasing wavelength of the given radiation sources is :  
(A) Radioactive sources, X-ray tube, crystal oscillator, sodium vapour lamp  
(B) Radioactive sources, X-ray tube, sodium vapour lamp, crystal oscillator  
(C) X-ray tube, radioactive sources, crystal oscillator, sodium vapour lamp  
(D) X-ray tube, crystal oscillator, radioactive sources, sodium vapour lamp
29. What is the range of frequency for ultrasonic wave ?  
(A) 1 kHz (B) 5 kHz (C) 50 kHz (D) 100 kHz

30. Which is the commonest cancer among females ?  
(A) Uterus                      (B) Tongue                      (C) Lung                      (D) Breast
31. Cathode rays are made to pass between the poles of a magnet perpendicular to axis, the effect of the magnet is :  
(A) to increase the velocity of rays  
(B) to deflect them towards the north pole  
(C) to deflect them towards the south pole  
(D) to deflect them upwards above the plain of paper
32. Photocell is a device to :  
(A) store photons  
(B) measure light intensity  
(C) convert photon energy into mechanical energy  
(D) store electrical energy for replacing storage batteries
33. If the X-ray tube is working at 20 kV then the minimum wavelength of X-rays will be :  
(A) 0.62 Å                      (B) 0.93 Å                      (C) 0.47 Å                      (D) 0.31 Å
34. Isotopes are atoms having :  
(A) same number of protons, but different number of neutrons  
(B) same number of neutrons, but different number of protons  
(C) same number of neutrons and protons  
(D) none of the above
35. If an electron jumps from 1<sup>st</sup> orbit to 3<sup>rd</sup> orbit, then it will :  
(A) Absorb energy                      (B) Release energy  
(C) Have no difference in energy                      (D) It cannot jump from 1<sup>st</sup> orbit to 3<sup>rd</sup> orbit
36. Gamma rays are deflected :  
(A) In an electric field but not by a magnetic field  
(B) A magnetic field but not by an electric field  
(C) Both electric and magnetic field  
(D) Neither electric nor magnetic field
37. Radioactivity is :  
(A) Irreversible process                      (B) Self disintegration process  
(C) Spontaneous                      (D) All of the above

38. Half life of radioactive element depends upon :
- (A) Temperature (B) Pressure  
(C) Both of the above (D) None of the above
39. Curie is a unit of :
- (A) Energy of gamma rays (B) Half life  
(C) Radioactivity (D) Intensity of gamma rays
40. Boron rods in a nuclear reactor is used to :
- (A) Absorb excess neutrons (B) Absorb alpha particles  
(C) Slow down the reaction (D) Speed up the reaction
41. IMRT stands for :
- (A) Intra Medullary Radiotherapy  
(B) Intensity Modulated Radiotherapy  
(C) Interstitial Modulated Radiotherapy  
(D) Intensity Maximized Radiotherapy
42. Which is the commonest primary Brain tumour ?
- (A) Medulloblastoma (B) Glioma  
(C) Neuroblastoma (D) Pituitary adenoma
43. The length of one turn of DNA is :
- (A) 3.4 A (B) 34 A (C) 20 A (D) 3.04 A
44. Stereotactic Radio-surgery is a form of :
- (A) Radiotherapy (B) Radioiodine therapy  
(C) Robotic Surgery (D) Cryo Surgery
45. Which one of the following therapeutic modes is commonly employed in intra-operative radiotherapy ?
- (A) Electron (B) Photons (C) X-rays (D) Gamma rays
46. WHO Ladder is for the rational titration of :
- (A) Radiotherapy (B) Chemotherapy  
(C) Anti depressants (D) Oral analgesics

47. The following are indications for post operative radiotherapy in a case of carcinoma endometrium except :
- (A) Myometrial invasion of more than half thickness
  - (B) Positive lymph nodes
  - (C) Endocervical involvement
  - (D) Tumor positive for estrogen receptors
48. The technique employed in radiotherapy to counteract the effect of tumor motion due to breathing is known as :
- (A) Arc technique
  - (B) Modulation
  - (C) Gating
  - (D) Shunting
49. Which one of the following radioisotope is not used as permanent implant ?
- (A) Iodine - 125
  - (B) Palladium - 103
  - (C) Gold - 198
  - (D) Caesium - 137
50. The most definitive method of diagnosing pulmonary embolism is :
- (A) EKG
  - (B) Radioisotope perfusion pulmonary scintigraphy
  - (C) Pulmonary arteriography
  - (D) Venography
51. Which of the following causes rib-notching on the chest radiograph ?
- (A) Bidirectional Glem shunt
  - (B) Modified Blalock - Taussing shunt
  - (C) IVC occlusion
  - (D) Coarctation of Aorta
52. 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) 125 kV
53. Which one of the following tumors shows calcification of CT Scan more commonly ?
- (A) Ependymoma
  - (B) Medulloblastoma
  - (C) Meningioma
  - (D) CNS lymphoma
54. Which of the following ultrasound marker is associated with greatest increased risk for Trisomy 21 in fetus ?
- (A) Echogenic foci in heart
  - (B) Hyperechogenic bowel
  - (C) Choroid plexus cysts
  - (D) Nuchal edema

55. The gold standard for the diagnosis of osteoporosis is :  
(A) Dual energy X-ray absorptiometry  
(B) Single energy X-ray absorptiometry  
(C) Ultrasound  
(D) Quantitative computed tomography
56. In order to check for possible leakage of radioactive material from a cobalt camera the \_\_\_\_\_ is used.  
(A) TLD (B) Wipe test (C) G-M counter (D) DRD
57. The optimal film speed for intra-oral radiography is :  
(A) C speed (B) D speed (C) E speed (D) F speed
58. What does a "cell survival curve" describe ?  
(A) The relationship between the radiation dose and the number of cells that have gone through one mitosis after irradiation.  
(B) The relationship between the radiation dose and the proportion of cells that remain clonogenic.  
(C) The relationship between the radiation dose and the number of cells that have not suffered the loss of a specific function.  
(D) The relationship between the radiation dose and the proportion of cells that can produce DNA.
59. Which of the following statements is **false** ?  
(A) Cells are more sensitive to X-rays in the presence of oxygen than in its absence (i.e. under hypoxia).  
(B) By "oxygen enhancement ratio" (OER) is meant the ratio of hypoxic to aerated doses needed to achieve the same biological effect.  
(C) For sparsely ionizing radiation, the OER is about 3 at high doses and about 2 at low doses (i.e. at doses of the order of the daily dose per fraction in radiotherapy).  
(D) The OER does not vary with the phase of the cell cycle.
60. The effective dose for a multiple-slice chest CT-scan is :  
(A) 1 mSv. (B) 2 mSv. (C) 4 mSv. (D) 8 mSv.
61. Which radiologic test is used to diagnose gallstones ?  
(A) Barium enema (B) Intravenous pyelogram  
(C) Cholangiography (D) Stereoscopy



62. Spalding's sign occurs after :
- (A) Birth of live foetus (B) Death of foetus in uterus  
(C) Rigormortis of infant (D) Cadaveric spasm
63. Which one of the following congenital malformations of the fetus can be diagnosed in first trimester by ultrasound ?
- (A) Anencephaly (B) Inencephaly  
(C) Microcephaly (D) Holoprosencephaly
64. Brown tumours are seen in :
- (A) Hyperparathyroidism (B) Pigmented villonodular synovitis  
(C) Osteomalacia (D) Neurofibromatosis
65. Which of the following malignant tumours is radioresistant ?
- (A) Ewing's sarcoma (B) Retinoblastoma  
(C) Osteosarcoma (D) Neuroblastoma
66. The bulge at the upper end of the stomach is called the :
- (A) Fundus (B) Greater curvature  
(C) Pylorus (D) Rugae
67. High-velocity electrons ( $e^-$ ) that completely avoid the orbital electrons as they pass through a tungsten atom, yet come close enough to the nucleus of the atom to come under the influence of its positively charged electric field ( $P^+$ ), will produce what type of X-rays ?
- (A) Characteristic X-rays (B) Compton X-rays  
(C) Bremsstrahlung X-rays (D) Thompson X-rays
68. What is the relationship of LET and biologic damage ?
- (A) They increase in direct proportion.  
(B) They are inversely proportional.  
(C) There is no relationship.  
(D) There is a nonlinear nonthreshold relationship.
69. A young male is brought unconscious to the hospital with external injuries. CT brain showed no midline shift. Basal cistern was compressed with multiple small haemorrhages. What is the likely diagnosis ?
- (A) Cerebral contusion (B) Cerebral laceration  
(C) Multiple infarcts (D) Diffuse axonal injuries

70. The ideal timing of radiotherapy for Wilms Tumour after surgery is :  
(A) Within 10 days (B) Within 2 weeks  
(C) Within 3 weeks (D) Anytime after surgery
71. Half-life of Technetium 99 is :  
(A) 2 hours (B) 6 hours (C) 12 hours (D) 24 hours
72. Radiation damage is divided into (a) lethal damage, (b) sublethal damage and (c) potentially lethal damage (PLD). Which of the following statements is **true** ?  
(A) PLD will cause cell death under ordinary circumstances.  
(B) PLD cannot be repaired under ordinary circumstances.  
(C) The variation of postirradiation conditions cannot enhance PLD repair.  
(D) PLD repair is less likely to occur when mitosis is delayed.
73. Which of the following statements is **false** ?  
(A) Radiation damage can cause a cell to either die or continue being viable but mutated.  
(B) The two events above are very different when it comes to the dose dependence of their probability to occur and also when it comes to their impact on the organism to which the cell belongs.  
(C) Cell killing by radiation is said to be a "deterministic effect".  
(D) Cell mutating by radiation is said to be a "nonstochastic effect".
74. The average effective dose from medical radiation is about :  
(A) The same as the dose from natural background radiation.  
(B) The same as the dose from natural background radiation excluding radon.  
(C) Half of the total effective dose.  
(D) One third of the total effective dose.
75. In the percent-labeled mitoses technique, the time interval before any mitotic cells appear gives the duration of :  
(A) The S phase (B) The G<sub>1</sub> phase (C) The G<sub>2</sub> phase (D) The M phase
76. Which of the following statements is **false** ?  
(A) By "cataract" is denoted any detectable change in the normally transparent lens of the eye.  
(B) Cataracts can be caused by irradiation of the lens.  
(C) Cell division in the lens continues throughout life.  
(D) The lens has the same mechanisms for cell removal as other normal tissues.

77. Typical industrial radiography pocket dosimeters have a full scale reading of :  
 (A) 50 milliroentgens (B) 100 milliroentgens  
 (C) 200 milliroentgens (D) 400 milliroentgens
78. Consider the following statements about electromagnetic radiations; All of them  
 (i) have energy  
 (ii) exert pressure on an object  
 (iii) have the same momentum. Of these statements :  
 (A) (i), (ii) and (iii) are correct (B) (i) and (ii) are correct  
 (C) (ii) and (iii) are correct (D) (i) and (iii) are correct
79. From which embryonic structure does vertebral column develop ?  
 (A) Notocord (B) Nerve cord (C) Coelom (D) Atrium
80. The energy of X-ray photon is 2200 eV. It's frequency would be :  
 (A)  $5.3 \times 10^{16}$  Hz (B)  $5.3 \times 10^{17}$  Hz (C)  $5.3 \times 10^{18}$  Hz (D)  $5.3 \times 10^{15}$  Hz
81. The term "metaplasia" refers to :  
 (A) Differentiated cell is able to become transformed into a differentiated cell of another type  
 (B) Cell becomes dedifferentiated  
 (C) Cell grows abnormally fast  
 (D) A precancerous condition
82. Clouds are contained in a layer from the earth's surface, which is called :  
 (A) Troposphere (B) Stratosphere (C) Mesosphere (D) Ionosphere
83. Sodium lamps are used in foggy conditions because :  
 (A) Yellow light is scattered less by the fog particles  
 (B) Yellow light is scattered more by the fog particles  
 (C) Yellow light is unaffected during passage through the fog  
 (D) Wavelength of yellow light is the mean of the visible part of the spectrum
84. The term 'genetics' was coined by :  
 (A) Mendel (B) Bateson (C) Punnett (D) Morgan
85. A gene, which affects the character of another gene, not located on similar locus of the homologous chromosome is called :  
 (A) Duplicate gene (B) Epistatic gene  
 (C) Complimentary gene (D) Supplementary gene

86. In fluorescence, there is :  
(A) Increase in wavelength of emitted radiation  
(B) Decrease in wavelength of emitted radiation  
(C) No change in wavelength of emitted radiation  
(D) Both increase and decrease in wavelength of emitted radiation
87. What is the treatment of choice for stage III Ca Cervix ?  
(A) Chemotherapy (B) Radiotherapy  
(C) Chemoradiotherapy (D) Surgery
88. What is the surgery of choice for a patient with Ca Breast T2 N0 M0 ?  
(A) Modified Radical Mastectomy (B) MRM + Axillary dissection  
(C) Wide local excision (D) WLE + Axillary dissection
89. Which of the following cannot be emitted by radioactive substances during their decay ?  
(A) Electron (B) Helium nucleus  
(C) Proton (D) Neutrino
90. The functional unit of a gene which specifies synthesis of one polypeptide is a :  
(A) Recon (B) Codon (C) Cloe (D) Cistron
91. Only maternal immunoglobulin normally transported through placenta is :  
(A) IgA (B) IgD (C) IgM (D) IgG
92. What is the screening method for medullary carcinoma of thyroid ?  
(A) Serum calcitonin (B) Serum calcium  
(C) Serum ALP (D) Serum acid phosphatase
93. Stability of the ankle joints is maintained by all except :  
(A) Collateral ligaments (B) Cruciate ligaments  
(C) Tendons of muscles attached (D) Close apposition of articular surfaces of bones
94. Process of heat transfer that involves continual emission of infrared waves from surface of bodies and transmission of these waves without aid of medium is known as :  
(A) Conduction (B) Convection (C) Radiation (D) None of above

95. Attenuation coefficient of bone is  $600 \text{ m}^{-1}$  for X-rays of energy 20 keV and intensity of beam of X-rays is  $20 \text{ Wm}^{-2}$ , then intensity of beam after passing through a bone of 4 mm is :  
 (A)  $3 \text{ Wm}^{-2}$  (B)  $2.5 \text{ Wm}^{-2}$  (C)  $2.0 \text{ Wm}^{-2}$  (D)  $1.8 \text{ Wm}^{-2}$
96. Post cricoid carcinoma of the oesophagus are best treated by :  
 (A) Radiotherapy  
 (B) Total oesophagectomy  
 (C) Pharyngolaryngectomy with gastric transposition  
 (D) Intubation through growth
97. Which of the following tests will provide the best evaluation of the patient with colorectal cancer ?  
 (A) CA 19 - 9 (B) CA 125  
 (C) CEA (carcinoembryonic antigen) (D) AFP (alpha-foetoprotein)
98. Post-operative radiotherapy in a patient operated for Ca-endometrium is indicated in all of the following except :  
 (A) Deep myometrial invasion (B) Pelvic lymph node involvement  
 (C) Enlarged uterine cavity (D) Poor tumour differentiation
99. 'Egg-on-side' appearance on X-ray chest is seen in :  
 (A) Tetralogy of Fallot (B) Uncorrected TGA  
 (C) Tricuspid atresia (D) Ebstein's anomaly
100. Which of the following is **false** regarding intraocular retinoblastoma ?  
 (A) 94% cases are sporadic  
 (B) Individuals with sporadic retinoblastoma do not pass their genes to their children  
 (C) Reese Ellsworth classification is used for predicting visual prognosis following radiotherapy  
 (D) Tumour calcification can be detected by an ultrasound scan

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