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SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
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ENTRANCE EXAMINATION - ACADEMIC SESSION JANUARY 2019

PROGRAM: PG DIPLOMA IN CARDIAC LABORATORY TECHNOLOGY

Time:90 Minutes

Max.Marks: 100

(Select the most appropriate answer)
(There are no negative marks for wrong answers)

Q1. Which charge has higher value?

- a) +2C b) +5C c) -5C d) both b and c

Q2.A positively charged body X attracts a body Y then the charge on body Y may be:

- a) Positive b) Negative c) Zero d) both b and c

Q3.A body can be negatively charged by:

- a) Giving excess electrons to it b) Removing some electrons from it
c) Giving some protons to it d) Removing some neutrons from it

Q4. SI unit of electric flux is

- a)Tesla b) Weber c) Newton d) Joule

Q5.When the distance between the charged particles is halved, the force between them becomes

- a) One – fourth b) Half c) Double d) Four times

Q6. In a capacitor the increase in potential increases

- a) Charge b) Inductance c) Magnetic field d) none of these

Q7. The geometrical centre of a spherical reflecting surface is called

- a) Centre of Curvature b) Focus c) Pole d) None of these

Q8. The ratio of sine of the angle of incidence to sine of angle of refraction is

- a) Zero b) Constant c) One d) Infinity

Q9. Total Internal Reflection Occurs when

- a) Angle of incidence is greater than critical angle
b) Angle of incidence is smaller than critical angle
c) Angle of incidence is equal to critical angle
d) None of these

Q10. The corrective lens used by a person with myopia

- a) Convex lens b) Concave lens c) Cylindrical lens d) none of these

Q11. Which of the following cannot be explained by wave nature of light?

- a) Photoelectric effect b) Diffraction c) Interference d) Both b and c

Q12. Dual nature of radiation is shown by

- a) Diffraction and reflection b) Refraction and diffraction
c) Photoelectric effect and interference d) Diffraction alone

Q13. Which one of the series of hydrogen spectrum is in visible region?

- a) Lyman series b) Balmer series c) Paschen series d) Bracket series

Q14. If the frequency of light in photoelectric experiment is doubled then maximum kinetic energy of photoelectron

- a) is doubled b) is halved c) become more than doubles d) become less than double

Q15. Velocity is a

- a) Scalar quantity b) Vector quantity c) Both a and b d) None of these

Q16. From some height if we drop a particle and simultaneously project another particle horizontally then

- a) Both will reach surface together
b) Dropped particle will reach earlier than projected particle
c) Dropped particle will reach later than projected particle
d) None of these

Q17. A ball is thrown upwards. It returns to ground describing a parabolic path. Which of the following remains constant?

- a) Speed of the ball b) Kinetic energy of the ball
c) Vertical component of velocity d) Horizontal component of velocity

Q18. The force that follow inverse square law:

- a) Electrostatic force b) Gravitational force c) Both a and b d) None of these

Q19. A man getting down a running bus falls forward

- a) Due to inertia of rest b) Due to inertia of motion c) Due to habit d) All the above

Q20. When the speed of a moving body is doubled

- a) Its acceleration is doubled b) Its momentum is doubled
c) Its kinetic energy is doubled d) Its potential energy is doubled

Q21. Swimming is possible of the account of

- a) First law of motion b) Second law of motion c) Third law of motion d) All the above

Q22. In which of the following cases the force may not be required to keep the

- a) Particle going in circle b) Particle going along a straight line
c) The momentum of particle constant d) Acceleration of particle constant

Q23. An aircraft is moving with a velocity 500m/s. If all forces acting on it are balanced, then

- a) It still moves with same velocity b) It will fall down instantly
c) It will decrease its velocity gradually d) All the above

Q24. Two forces of magnitude F have resultant of same magnitude F. The angle between the two forces is

- a) 45° b) 120° c) 60° d) 240°

Q25. A plumb line is suspended from the ceiling of a vehicle with horizontal acceleration of x. What will be the angle of inclination with vertical?

- a) $\tan^{-1}(x/g)$ b) $\tan^{-1}(g/x)$ c) $\cos^{-1}(x/g)$ d) $\cos^{-1}(g/x)$

Q26. The maximum static frictional force is

- a) Equal to area of surface in contact b) Independent of area of surface in contact
c) Both a and b d) None of the above

Q27. Maximum value of static friction is called

- a) Limiting friction b) Rolling friction c) Normal reaction d) None of the above

Q28. As an inclined plane is made slowly horizontal by reducing the value of angle θ with horizontal, the component of weight parallel to the plane of a block resting on the inclined plane

- a) Decreases b) Remains same c) Increases d) None of the above

Q29. For equilibrium of a body on an inclined plane of inclination 45° . The coefficient of static friction will be

- a) Greater than one b) Less than one c) Zero d) Less than zero

Q30. A body of mass 0.1 Kg attains a velocity of 10m/s in 0.1s. The force acting on the body is:

- a) 10N b) 100N c) 0.1 N d) 0.01N

Q31. Which of the following statement about the electron is incorrect?

- a) It is negatively charged particle b) The mass of electron is equal to mass of neutron
c) It is the basic constituent of atoms d) It is a constituent of cathode rays

Q32. Two atoms are said to be isobars if

- a) They have same atomic same atomic number but different mass number.
b) They have same number of electrons but different number of neutrons.
c) They have same number of neutrons but different number of electrons.
d) Sum of the number of protons and neutrons is same but the number of protons is different.

Q33. Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons?

- a) Pauli's exclusion principle b) Heisenberg's uncertainty principle
c) Hund's rule of maximum multiplicity d) Aufbau principle

Q34. If travelling at same speeds, which of the following matter waves have the shortest wavelength?

- a) Electron b) Alpha particle (He^{2+}) c) Neutron d) Proton

Q35. Identify the pairs which are not isotopes?

- a) $^{12}\text{X}_6$, $^{13}\text{Y}_6$ b) $^{35}\text{X}_{17}$, $^{37}\text{Y}_{17}$ c) $^{14}\text{X}_6$, $^{14}\text{Y}_6$ d) $^8\text{X}_4$, $^8\text{Y}_5$

Q36. Which of the following has maximum spin?

- a) Electron b) Proton c) Neutron d) All have equal spin

Q37. Atoms belonging to the same group of periodic table will have

- a) Same number of protons b) Same number of electrons
c) Same number of neutrons d) Same number of electrons in valence shell.

Q38. Of the following pairs which are metalloids

- a) Na and K b) F and Cl c) Cu and Hg d) Si and Ge

Q39. The period number in the long form of the periodic table is equal to

- a) Magnetic quantum number of any element of the period
b) Atomic number of any element of the period
c) Maximum principal quantum number of any element of the period
d) Maximum azimuthal quantum number of any element of the period

Q40. According to the Periodic Law of elements, the variation in properties of elements is related to their

- a) Atomic masses b) Atomic numbers c) Nuclear masses d) Valency

Q41. A group of atoms existing together as one species and having characteristics properties is called

- a) Molecule b) Element c) Metal d) Metalloid

Q42. Which among the following is not an isotope of hydrogen?

- a) Protium b) Ozone c) Deuterium d) Tritium

Q43. The oxidation states exhibited by hydrogen in its various compounds are:

- a) -1 only b) Zero only c) +1, -1 and zero d) +1 only

Q44. Which one of the following processes will produce permanent hard water?

- a) Addition of Na_2SO_4 to water b) Saturation of water with CaCO_3
c) Saturation of water with MgCO_3 d) Saturation of water with CaSO_4

Q45. Platinum is

- a) Ferromagnetic b) Diamagnetic c) Paramagnetic d) None of these

Q46. Which among the following is not a semiconductor?

- a) GaAs b) Si c) CdS d) Ca

Q47. The accumulation of molecular species at surface rather than in the bulk is called

- a) Absorption b) Adsorption c) Desorption d) Sorption

Q48. Which among the following operates in reverse bias?

- a) Zener diode b) Photodiode c) Both a and b d) None of these

Q49. The Ripple factor of Half wave rectifier is

- a) 1.21 b) 0.482 c) 0.707 d) 0.636

Q50. Which among the following is a current controlled device?

- a) MOSFET b) BJT c) JFET d) None of these

Q51. A group of similar cells along with intercellular substances that perform a specific function is called

- a) Organ b) Organ system c) Tissue d) None of these

Q52. The cell theory was formulated by:

- a) Matthias Schleiden b) Theodore Schwann c) Both a and b d) None of these

Q53. The power house of the cell is

- a) Mitochondria b) Golgi apparatus c) Lysosomes d) Vacuoles

Q54. Asthma is a disorder that affects

- a) Heart b) Lungs c) Kidney d) Brain

Q55. Which blood group is called 'universal recipients'?

- a) A b) B c) AB d) O

Q56. Which vitamin helps in blood coagulation?

- a) Vitamin A b) Vitamin B c) Vitamin C d) Vitamin K

Q57. Functional unit of kidneys are:

- a) Cortex b) Nephrons c) Ureter d) Calyx

Q58. Arthritis is

- a) Degeneration of skeletal muscles b) Decrease in blood calcium level
c) Inflammation of joints d) Rapid contraction of muscles

Q59. The shape of Deccan plateau is:

- a) Triangular b) Rectangular c) Square d) Hexagonal

Q60. The winner of 2017 Nobel Prize for physics is:

- a) Kip Thorne b) Rainer Weiss c) Barry Barish d) All the above

Q61. Which acid is called aqua fortis?

- a) Nitric acid b) Sulphuric acid c) Carbonic acid d) Carboxylic acid

Q62. Which among the following is used in rocket fuel?

- a) Liquid hydrogen b) Liquid oxygen c) Both a and b d) None of these

Q63. Which ion causes blue baby syndrome?

- a) SO_4^{2-} b) OH^- c) NO_3^- d) NH_4^+

Q64. Which is used as moderator in nuclear reactors?

- a) Hard water b) Heavy water c) Deionized water d) Mineral water

Q65. Brass is an alloy of

- a) Copper and zinc b) Copper and nickel c) Nickel and tin d) Zinc and nickel

Q66. Water has maximum density at

- a) 0°C b) 4°C c) 100°C d) 273.15°C

Q67. Human circulation was discovered by

- a) William Harvey b) Jonas Salk c) Louis Pasteur d) Edward Jenner

Q68. Which is not a property of LASER beam?

- a) Coherence b) Monochromaticity c) Directionality d) Dispersion

Q69. The refractive index of core is

- a) Less than cladding b) Equal to cladding c) Greater than cladding d) None of these

Q70. The principle of passage of light through optic fibre cable is

- a) Dispersion b) Photo electric effect c) Diffraction d) Total Internal Reflection

Q71. The measure of light gathering capacity of the optical fibre is called

- a) Acceptance angle b) Numerical aperture c) Acceptance cone d) Refractive index

Q72. $2d\sin\theta = n\lambda$ is called

- a) Bragg's law b) Stefan's law c) Wien's law d) Snell's law

Q73. LCD stands for

- a) Light Crystal Display b) Liquid Crystal Diode
c) Liquid Crystal Display d) None of these

Q74. Metallic glasses are

- a) Pure metal b) Alloy c) Element d) Gas

Q75. Which among the following is not a shape memory alloy?

- a) Nitinol b) Cu-Zn alloy c) Au- Cd alloy d) Cu-Al-Ni alloy

Q76. Which among the following is not an allotrope of carbon?

- a) Graphite b) Diamond c) Buckminster fullerene d) None of these

Q77. For a superconductor, at transition temperature the resistivity changes to

- a) Infinity b) One c) Zero d) None of these

Q78. Superconductors are

- a) Paramagnetic b) Diamagnetic c) Ferromagnetic d) None of these

Q79. A thin insulator sandwiched between two superconductors is called

- a) pn junction b) Josephson junction c) Seebeck junction d) Peltier junction

Q80. Super conducting magnets are used in

- a) EEG b) ECG c) MRI d) None of these

Q81. Which is not a part of conduction system of heart?

- a) SA node b) AV node c) Bundle of His d) Schwann cells

Q82. Circulation System present in Human beings is

- a) Double Circulation b) Single Circulation c) Triple Circulation d) None of these

Q83. Pulmonary artery is a part of

- a) Systemic Circulation b) Pulmonary Circulation c) Coronary Circulation d) None of these

Q84. Normal Human Blood Pressure is _____ mmHg

- a) 120/80 b) 150/70 c) 100/50 d) 200/100

Q85. Mitral valve is present

- a) Between right atrium and right ventricle b) Between left atrium and left ventricle
c) Inside aorta d) Inside pulmonary artery

Q86. Tricuspid valve is present

- a) Between right atrium and right ventricle b) Between left atrium and left ventricle
c) Inside aorta d) Inside pulmonary artery

Q87. Mitral valve is a

- a) Tricuspid valve b) Bicuspid valve c) Semilunar valve d) None of these

Q88. Superior venacava

- a) Return oxygenated blood to left atrium b) Return oxygenated blood to right atrium
c) Return deoxygenated blood to left atrium d) Return deoxygenated blood to right atrium

Q89. The artery which supplies blood to heart muscles is

- a) Pulmonary artery b) Renal artery c) Coronary artery d) None of these

Q90. Heart muscles are:

- a) Striated b) Have intercalated disc c) Both a and b d) None of these

Q91. Primary pacemaker of heart is

- a) SA node b) Purkinje fibres c) Bundle of His d) AV node

Q92. Instrument used to measure blood pressure

- a) Pulse oximeter b) Sphygmomanometer c) Thermometer d) None of these

Q93. Which of the following is not a type of arrhythmia?

- a) Bradycardia b) Tachycardia c) Stroke d) Fibrillation

Q94. What is hypertension?

- a) Anxiety disorder b) High blood pressure c) Cardiac arrest d) Angina

Q95. Systolic pressure in _____ mmHg

- a) 80 b) 70 c) 150 d) 120

Q96. Diastolic pressure is due to

- a) Contraction of atria b) Contraction of ventricle
c) Relaxation of atria d) Relaxation of ventricle

Q97. The membrane enclosing the heart is called

- a) Meninges b) Pleura c) Pericardium d) None of these

Q98. Largest artery in the body is

- a) Pulmonary artery b) Aorta c) Renal artery d) Carotid artery

Q99. The blood vessel which carries blood from lungs to heart is

- a) Superior venacava b) Pulmonary vein c) Inferior venacava d) Pulmonary artery

Q.100. Left ventricle pump blood to which of the following artery

- a) Superior venacava b) Pulmonary artery c) Inferior venacava d) Aorta