

**IM.Sc-Optometry & Vision Science  
Entrance examination- 2011**

**Hall Ticket Number**

**Time : 2 hours**

**Total marks: 75**

**Please read the following instructions carefully before answering.**

**Instructions**

1. This booklet has (8) pages. Please check thoroughly for all the pages.
2. Enter the Hall ticket number on the first page of this booklet as well as on the OMR sheet.
3. There is negative marking. For each wrong answer 0.33 marks will be deducted.
4. There are two PARTS in the question paper – PART A (Question nos. 1-25) and PART B (Question nos. 26-75). In case of a tie, marks obtained in PART A will be considered for resolving the tie.
5. Calculators are not permitted

**PART A**

1. The single strand of a double stranded DNA fragment has 60 guanine bases and 30 adenine bases. The total number of deoxyribose sugar molecules found in the double stranded DNA will be:  
A) 30                                      B) 45                                      C) 90                                      D) 180
2. The series of events during protein synthesis is
  1. Bonds form between amino acids
  2. mRNA attaches to a ribosome
  3. codons and anti-codons link
  4. tRNA bring amino acids to the ribosomeA) 1,2,3,4                                      B) 2,3,4,1                                      C) 2,4,3,1                                      D) 4,2,1,3
3. If the enthalpy change for a reaction is zero,  $\Delta G^0$  is equal  
A)  $\Delta H^0$                                       B)  $-\Delta S^0$                                       C)  $T\Delta H^0$                                       D)  $-T\Delta S^0$

4. Red coloured signal is used in railways because:
- A) It is easily recognised and attracted
  - B) It signifies danger
  - C) It looks good
  - D) It has a longer wavelength and can be seen from a distance
5. Alkanes have a general formula of:
- A)  $C_nH_{2n+2}$
  - B)  $C_nH_{2n}$
  - C)  $C_nH_{2n-2}$
  - D)  $C_nH_{4n}$
6. Milk is deficient in
- A) Vitamin C
  - B) Vitamin A
  - C) Vitamin B2
  - D) Vitamin K
7. What is the energy storage molecule?
- A) ATP
  - B) Adenosine oxidate
  - C) Phospholipids
  - D) AGP
8. What is the density of an object with a volume of 15 mL and a mass of 42 grams?
- A) 0.352g/mL
  - B) 2.80 g/mL
  - C) 630 g/mL
  - D) 1000 g/mL
9. An example of chemical property is:
- A) Density
  - B) Mass
  - C) Acidity
  - D) Solubility
10. Elevated levels of alcohol in the blood leads to
- A) Slower reaction time
  - B) Good learning skills
  - C) Improved glucose absorption in the cells
  - D) Improved memory
11. Water and alcohol can be partly separated from each other by distillation because they have different
- A) melting points
  - B) densities
  - C) boiling points
  - D) viscosities
12. Which of the three elements belong to the Noble Gas?
- A) fluorine, chlorine and bromine
  - B) helium, neon and argon
  - C) lithium, sodium and potassium
  - D) hydrogen, oxygen and nitrogen
13. The difference in atomic size of sodium and chlorine is mainly due to the difference in the
- A) number of neutrons
  - B) number of electrons
  - C) number of protons
  - D) mass of each atom.

14.  $\text{H}_2\text{SO}_4$  has a gram equivalent wt of

- A) 98                                      B) 49                                      C) 147                                      D) 196

15. Which one belongs to the class of Halogens:

- A) Hg                                      B) I                                      C) Al                                      D) Au

16. In nucleus of  $^{20}\text{Ca}^{40}$ , there are:

- A) 40 protons and 20 electrons                                      B) 20 protons and 40 electrons  
C) 20 protons and 20 neutrons                                      D) 20 protons and 40 neutrons

17. Which one is not a crystalline solid?

- A) NaCl                                      B) Ice                                      C) Glass                                      D) KOH

18. Most burning plastics produce

- A) nitrogen dioxide                      B) sulphur dioxide                      C) carbon monoxide                      D) hydrogen

19. Optics is the study of:

- A) Optical fibers                      B) Camera                      C) Light                      D) Colours

20. A balanced diet consists of

- A) Proteins, carbohydrates and hydrocarbons                      B) Fats, proteins and carbohydrates.  
C) Fats, proteins and hydrocarbons                      D) Fats, carbohydrates and hydrocarbons

21. What are the components of DNA?

- A) Sugars, bases, proteins                                      B) Sugars, phosphates, bases  
C) Phosphates, bases, polypeptides                                      D) Phosphates, proteins, polypeptides

22. The function of capillaries are to

- A) Carry blood back to the heart  
B) Carry blood away from the heart  
C) Allow carbon dioxide to pass from the blood to the tissues  
D) Allow nutrients to pass from the blood to the tissues

23. The boiling point of water in Fahrenheit scale is:

- A) 273                                      B) 212                                      C) 180                                      D) 200

24. \_\_\_\_\_ is for rotational motion, as mass is for linear motion:
- A) Gravity                      B) Torque                      C) Weight                      D) Inertia
25. Denaturation of enzymes is not caused by?
- A) excess enzyme                      B) low pH  
C) high pH                      D) loss of optimum temperature
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**PART B**

26. These two substances are required to break down hydrogen peroxide by manganese dioxide?
- A) Oxygen and water                      B) Water and carbon dioxide  
C) Oxygen and carbon dioxide                      D) Oxygen and food
27. A food chain always starts with a.....
- A) carnivore                      B) herbivore                      C) predator                      D) producer
28. What substance is made by photosynthesis?
- A) carbon dioxide                      B) chlorophyll                      C) water                      D) glucose
29. Which of the following is a by-product of respiration for animals?
- A) oxygen                      B) nitrogen                      C) cellulose                      D) carbon dioxide
30. Acid solutions have a pH value of.....
- A) Equal to 7                      B) Between 5 and 9                      C) More than 7                      D) Less than 7
31. Which of the three substances are acidic?
- A) vinegar, baking soda and oven cleaner                      B) bleach, baking soda and limewater  
C) vinegar, Coke and lemonade                      D) baking soda, Coke and lemonade
32. What happens when water is added to an acid solution?
- A) The pH decreases and the acidity increases                      B) The pH rises and the acidity increases  
C) The pH rises and the acidity decreases.                      D) The pH and the acidity decreases

33. These two gases are responsible for causing acid rain
- A) Sulphur dioxide and nitrogen dioxide      B) Nitrogen dioxide and carbon dioxide  
C) Carbon dioxide and oxygen                  D) Sulphur dioxide and carbon dioxide
34. In a precipitation reaction, when two solutions are mixed
- A) There is a color change                      B) A gas is formed  
C) An insoluble solid is formed                D) Heat energy is given out
35. A catalyst is a substance which speeds up reactions
- A) involving only liquids                        B) is used up in the reaction  
C) is not used up in the reaction              D) involving only gases
36. Which of the following yields amino acids upon digestion?
- A) Fats and oils                                  B) Proteins                                  C) Carbohydrates      D) Fibre
37. Dietary component needed for body growth and repair is
- A) Fibre    B) Fat    C) Protein                                      D) Carbohydrate
38. Most plastics are made from chemicals obtained from
- A) natural gas                                      B) biogas                                      C) crude oil                                      D) plant material
39. Plastics are produced by a chemical reaction termed as:
- A) polymerization                                B) condensation                                C) neutralization      D) substitution
40. The process by which sugars present in fruit and vegetables can be converted into alcohol?
- A) Fractionation                                  B) Distillation                                  C) Cracking                                      D) Fermentation
41. Substance present in yeast which causes conversion of sugar into alcohol?
- A) A vitamin                                        B) A mineral                                      C) A carbohydrate      D) An enzyme
42. Which of the metals following is used in radiation protection shields?
- A) Lead    B) Aluminium                                      C) Mercury                                      D) Copper.
43. Which of the elements shown is a non-metal?
- A) Chromium                                        B) Potassium                                      C) Phosphorus                                      D) Cobalt

44. Water has \_\_\_\_\_ bonding
- A) Electrostatic      B) Hydrogen      C) Covalent      D) non-chemical
45. Which of the following is the sweetest sugar?
- A) Fructose      B) Glucose      C) Galactose      D) Lactose
46. A process by which constant body temperature maintained is
- A) Autoregulation      B) Thermoregulation      C) Transpiration      D) Haemoregulation
47. Meningitis is an inflammatory disease of
- A) Kidney      B) Eye      C) Brain      D) Heart
48. The basis of sickle cell disease is:
- A) Infection      B) Genetic      C) Injury      D) Deficiency
49. Active transport within the body requires
- A) Optimum temperature      B) Energy      C) Gradient      D) Heat
50. The sum of all chemical reactions in the body is termed:
- A) Homeostasis      B) Physiology  
C) Dynamic feedback      D) Metabolism
51. To make 100 ml of 2.5 M Glucose solution, ..... grams of Glucose ( $C_6H_{12}O_6$ ) is required
- A) 36      B) 90      C) 45      D) 54
52. Light year is related to:
- A) Speed      B) Distance      C) Energy      D) Intensity
53. Light can travel in vacuum but sound cannot travel in vacuum, because:
- A) Light waves are not electromagnetic in nature  
B) Sound waves are electromagnetic in nature  
C) Light waves are electromagnetic in nature  
D) Speed of sound is slower than light
54. The boiling point of water in Fahrenheit scale is:
- A) 273      B) 212      C) 180      D) 200

55. Membrane surrounding a vacuole is called:

- A) Tonoplast                      B) Nucleoplast                      C) Protoplast                      D) Vacuoplast

56. The reciprocal of wavelength is called:

- A) Frequency                      B) Wave velocity                      C) Amplitude                      D) Wave number

57. Which one of them is not a scalar quantity?

- A) Time                      B) Temperature                      C) Velocity                      D) Volume

58. A point mutation comprising the substitution of purine by a pyrimidine is called

- A) Deletion                      B) Transition                      C) Transversion                      D) Translocation

59. Which region of visible light has shortest wavelength?

- A) Violet                      B) Red                      C) Green                      D) Blue

60. *Solanum tuberosum* is the Latin name for

- A) Potato                      B) Turnip                      C) Swede                      D) Brinjal

61. Exothermic processes:

- A) Absorb energy  
B) Give off energy  
C) Have no energy change  
D) Unpredictable energy change of an exothermic process

62. 'Adaptation' of eyes in dark is due to:

- A) Depletion of vision pigment in rod                      B) Depletion of vision pigment in cones  
C) Repletion of vision pigment in rods                      D) Repletion of vision pigment in cones

63. Which of the following vitamins is water soluble as well as anti-oxidant?

- A) Vitamin-B1                      B) Vitamin-A                      C) Vitamin-D                      D) Vitamin-C

64. During strenuous exercise; glucose is converted into:

- A) Glycogen                      B) Pyruvic Acid                      C) Starch                      D) Lactic Acid

65. Dialysis is used for the treatment of

- A) Kidney failure      B) Heart weakness      C) Brain diseases      D) Liver diseases

66. An example of metalloprotein is

- A) Casein      B) Ceruloplasmin      C) Gelatin      D) Salmine

67. The action of pepsin requires a medium which is

- A) Alkaline      B) Neutral      C) Acidic      D) Salty

68. The final product of anaerobic respiration is

- A) Methanol      B) Pyruvate      C) Ethanol      D) Starch

69. Non-sex chromosomes are called:

- A) monosomes      B) archosomes      C) autosomes      D) phenosomes

70. The site where most of the ATP is generated in a cell is the

- A) endoplasmic reticulum      B) mitochondria      C) nucleus      D) golgi apparatus

71. Most of the CO<sub>2</sub> that is transported in blood

- A) is dissolved in the plasma      B) is bound to hemoglobin  
C) as bicarbonate ion      D) is carbonic acid

72. Which non-metal element is a conductor of electricity?

- A) Phosphorus      B) Sulphur      C) Carbon      D) Iodine

73. This part of the cell is responsible for making starch

- A) Cell wall      B) Chloroplast      C) Vacuole      D) Nucleus

74. Plants use which gas during respiration?

- A) starch      B) carbon dioxide      C) oxygen      D) water

75. Which of the following gas produced when cigarettes are smoked?

- A) Nitrogen      B) Oxygen  
C) Carbon monoxide      D) Carbon dioxide