

M.Sc. (5-Year Integrated) Optometry and Vision Sciences**Entrance examination- 2012****Hall Ticket Number****Time : 2 hours****Total marks: 75**

Please read the following instructions carefully before answering.

Instructions

1. This booklet has (7) 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. In the life cycle of many animals, only *sperm* and *eggs* have
A. Diploid number of chromosomes B. Triploid number of chromosomes
C. Haploid number of Chromosomes D. Polyploid number of chromosomes
2. The nuclei of somatic cells undergo *mitosis*, a nuclear division in which the number of chromosomes gets
A. Doubled B. Tripled C. Remains same D. Half
3. Photoautotrophic microorganisms are:
A. Cyanobacteria B. Purple nonsulfur bacteria
C. Green sulfur bacteria D. Nitrifying bacteria
4. This hormone is responsible for a raise in blood glucose level:
A. Oxytocin B. Epinephrin
C. Insulin D. Prolactin

5. The overall reaction for photosynthesis is:
 A. $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy} \rightarrow \text{C}_3\text{H}_6\text{O}_3 + 6\text{O}_2$
 B. $3\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
 C. $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
 D. $6\text{CO}_2 + 3\text{H}_2\text{O} + \text{energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
6. What is acetyl-CoA split into in the Krebs cycle?
 A. Hydrogen and Oxygen B. Oxygen and Carbon
 C. Carbon dioxide and hydrogen D. Carbon and hydrogen
7. This hormone support sperm formation:
 A. Thymosin B. Follicle Stimulating Hormone
 C. Luteinizing Hormone D. Androgen
8. Which one of them is a monosaccharide:
 A. Sucrose B. Lactose C. Fructose D. Maltose
9. If 4.2 J of heat is lost by 1 g of water to cool it by 1°C , how much heat will be lost by 3 g of water to cool from 80°C to 10°C :
 A. 294.0 J B. 588.0 J C. 882.0 J D. 210.0 J
10. Velocity of light in vacuum is approximately equal to :
 A. $3 \times 10^{10} \text{ cms}^{-1}$ B. $3 \times 10^8 \text{ cms}^{-1}$ C. $3 \times 10^6 \text{ cms}^{-1}$ D. $3 \times 10^{10} \text{ ms}^{-1}$
11. Three coplanar vectors are expressed with respect to a certain rectangular co-ordinate system of a given reference frame $\mathbf{a} = 4\mathbf{i} - \mathbf{j}$, $\mathbf{b} = -3\mathbf{i} + 2\mathbf{j}$, $\mathbf{c} = -3\mathbf{j}$. The value of vector "r", which is sum of these vectors is:
 A. $\mathbf{i} - 2\mathbf{j}$ B. $2\mathbf{i} - \mathbf{j}$ C. $2\mathbf{i} - 2\mathbf{j}$ D. $\mathbf{i} - \mathbf{j}$
12. The coordinate systems (a) $\mathbf{i} \cdot \mathbf{i} = \mathbf{j} \cdot \mathbf{j} = \mathbf{k} \cdot \mathbf{k} = 1$, (b) $\mathbf{i} \cdot \mathbf{j} = \mathbf{j} \cdot \mathbf{k} = \mathbf{k} \cdot \mathbf{i} = 0$, (c) $\mathbf{i} \times \mathbf{i} = \mathbf{j} \times \mathbf{j} = \mathbf{k} \times \mathbf{k} = 0$ and (d) $\mathbf{i} \times \mathbf{j} = -\mathbf{k}$ $\mathbf{k} \times \mathbf{i} = \mathbf{j}$ $\mathbf{j} \times \mathbf{k} = -\mathbf{i}$. Which one of them is incorrect?
 A. (a) B. (b) C. (c) D. (d)
13. A body is dropped from rest and falls freely (the value of gravitational pull, $g = 980 \text{ cm/s}^2$). The position and speed after 1 second is:
 A. 490 cm, -980 cm/sec B. 490 cm, 980 cm/sec
 C. 980 m, -980 m/sec D. 980 m, 980 m/sec
14. A convex mirror has a radius of curvature of 20 cms. If a point source is placed 14 cms away from the mirror, the image formed will be at:
 A. 8.5 cm B. -8.5 cm C. 5.8 cm D. -5.8 cm
15. Two thin lenses of focal length, f_1 and f_2 are in contact. What is their combined focal length, f:
 A. $f_1 f_2 / f_1 + f_2$ B. $f_1 + f_2 / f_1 f_2$ C. $f_1 - f_2 / f_1 f_2$ D. $-f_1 f_2 / f_1 + f_2$
16. The three fundamental particles of the atom are:
 A. Nucleus, Electrons, Neutrino B. Nucleus, Positrons, Neutrino
 C. Protons, Nucleus, Mesons D. Nucleus, Protons, Electrons

17. Electrolysis of water, (H_2O) to break down a water molecule into Hydrogen and Oxygen is an example of :
 A. Simple displacement reaction B. Double decomposition reaction
 C. Decomposition reaction D. Synthesis or direct combination reaction
18. The number of chromosomes in human is
 A. $42+XX$ or XY B. $44+XX$ or XY C. $40+XX$ or XY D. $41+XX$ or XY
19. Which one of the following does not have net dipole moment?
 A. Carbon tetrachloride B. Carbon trichloride
 C. Carbon Dichloride D. Carbon monochloride
20. The doubling time of the bacteria *E.coli* is 20 mins. How many bacteria are present at the end of 2 hours, if you start with 1,000 bacteria?
 A. 32,000 B. 128,000 C. 16,000 D. 64,000
21. The ultimate source of energy for ecosystems is _____ and this energy is passed from plants to animals.
 A. Chemical Energy B. Solar Energy
 C. Mechanical Energy D. Potential Energy
22. Insulin action
 A. Inhibits glucose uptake in Liver
 B. Stimulates glucose uptake in Muscle
 C. Stimulates lipid break down in Adipose tissue
 D. Stimulates gluconeogenesis in Liver
23. Monomers of Polysaccharides, Proteins, Nucleic Acids and Fats are in the order of:
 A. Nucleotides, Amino Acids, Fatty Acids, Sugars
 B. Amino Acids, Fatty Acids, Sugars, Nucleotides
 C. Sugars, Fatty Acids, Amino Acids, Nucleotides
 D. Sugars, Amino Acids, Nucleotides, Fatty Acids
24. Isotopes are different forms of the same element differing in the number of:
 A. Electrons B. Protons C. Neutrons D. Mesotrons
25. The process of destroying foreign particles entering into the body is known as:
 A. Phagocytosis B. Haemolysis C. Exocytosis D. Catalysis

PART B

26. Before nuclear division occurs, the following event takes place
 A. Transcription B. Translation C. Replication D. Apoptosis
27. Mitosis has four phases in the following order: 1) *telophase*, 2) *metaphase*, 3) *prophase*, 4) *anaphase*
 A. 1,2,3,4 B. 2,1,4,3 C. 3,1,2,4 D. 3, 2,4,1

43. The freezing point of water is:
A. 0°F B. 100°F C. 32°F D. 212°F
44. A 1M solution of NaCl, having a molecular weight of 58.5, in 100ml will contain grams of NaCl:
A. 58.5 B. 40.0 C. 5.85 D. 4.0
45. The horizontal rows in a periodic table are called:
A. Groups B. Classes C. Periods D. Types
46. Two elements electrons to form an ionic bond:
A. Borrow B. Share C. Exchange D. Polarize
47. Heat is absorbed in:
A. Endothermic reaction B. All chemical reaction
C. Exothermic reaction D. Substitution reactions
48. All the four Sp³ hybrid orbital's are:
A. Expected B. Rotate C. Catenation D. Denerate
49. The dimensional equation of acceleration is:
A. ML^2T^{-2} B. MLT^{-2} C. M^0LT^{-2} D. $ML^{-1}T^{-2}$
50. A force is called conservative if the work done by the force on a particle that moves through any trip is:
A. 1 B. 2 C. 0 D. Infinite
51. A body of 2 Kg mass makes an elastic collision with another body at rest and afterwards continues to move in the original direction but with one fourth of its original speed. What is the mass of the struck body:
A. 2 Kg B. 4 Kg. C. 6 Kg D. 8 Kg
52. A 4 Kg block extends a spring 16 cm from its un stretched position. What is the stretching co-efficient of the spring:
A. 25 Nt/m B. 2.5 Nt/m C. 2.5 Nt/cm D. 0.25 Nt/m
53. The lowest and the highest pitch detectable by human ear is 20 vib/sec and 20,000 vib/sec. What is the wavelength of sound in the air (speed of sound in air is 330 m/s):
A. 1650 cm, 1.65 cm B. 1.65cm, 1650 m
C. 165 cm, 16.5 cm D. 165 cm, 165 cm
54. A stone is dropped into the well. The sound of the splash is heard at a time $t=3$ sec. What is the depth of the well:
A. 990 m B. 110 m C. 330 m D. 990 cm
55. The images formed by convex and concave lenses are:
A. real and virtual B. virtual and real
C. virtual and virtual D. real and real

56. Which gas in the atmosphere protects us from the harmful effects of the UV rays from Sun?
 A. Carbon Dioxide B. Oxygen C. Ozone D. Nitrogen
57. A 10% percent Glucose solution in 100 ml will have:
 A. 18 grams of Glucose B. 100 grams of Glucose
 C. 180 grams of Glucose D. 10 grams of Glucose
58. Lengthening of long bones in humans occurs in a particular area of the bone. This area is called the:
 A. medullary canal B. cancellous bone C. periosteum D. epiphysis
59. The sugar present in RNA molecule
 A. Ribose B. Rehanose C. Deoxyribose D. Glucose
60. The human blood genetic disease in which the red blood cells have an abnormal shape is called
 A. Anemia B. Pneumonia C. Insomnia D. Sickle cell Anemia
61. Color blindness is an
 A. Autosomal genetic disorder B. X chromosome linked genetic disorder
 C. Mitochondrial genetic disorder D. Autosomal recessive genetic disorder
62. The blood group of a human with neither antigens is
 A. 'O' B. 'A' C. 'AB' D. 'B'
63. Klienfelter syndrome has the genetic makeup:
 A. 44 autosomes+xxxy B. 44 autosomes+xo
 C. 45 autosomes+xy D. 45 autosomes+xy
64. Non coding sequences present within a gene is called
 A. Exon B. Operon C. Promoter D. Intron
65. The optimum pH value for pancreatic lipase is
 A. 9.00 B. 7.00 C. 8.00 D. 10.00
66. The detachable co-factor of an enzyme is called as
 A. Aquous B. Activator C. Apoenzyme D. Catalytic
67. In urea cycle one molecule of Amonia and one molecule of CO₂ combine with one molecule of ornithine to form:
 A. Arginine B. Citrulline C. Urea D. Arginosuccinate
68. Ammonia is secreted by most
 A. Bony fishes B. Adult amphibians
 C. Organism that produces shelled eggs D. Insect

69. The sum of all the chemical reaction that occur in the body is known as
A. Catabolism B. Metabolism C. Anabolism D. Embolism
70. Which of the following is a protein
A. Cholesterol B. ATP C. Sucrose D. Cellulase
71. The centromeric position divides chromosomes into
A. 2 B. 6 C. 3 D. 4
72. Gene therapy is used to repair a
A. Effective gene B. Expressive gene
C. Faulty gene D. Suppressive gene
73. The nuclear energy is derived by splitting the nucleus of
A. Radioactive element B. Radioactive substance
C. Radioactive cell D. Radioactive atom
74. Fungi can absorb the food from substrate by:
A. Ascospores B. Conidia C. Rhizoids D. Sporangiohores
75. Which one of this vitamin is responsible for proper utilization of calcium and phosphorus?
A. Vitamin D B. Vitamin A C. Vitamin E D. Vitamin C