

Q-2

**Integrated Masters in Optometry – I.M.Optom  
Entrance examination- 2018**

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**Hall Ticket Number**

**Time: 2 hours**

**Total marks: 100**

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Please read the following instructions carefully before answering.

**Instructions**

1. This booklet has twenty two (22) 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 PART A only. 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 – 100). In case of a tie, marks obtained in PART A will be considered for resolving the tie.
5. Scientific Calculators are not permitted

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**PART A**

1. Biologically relevant carbohydrates contain
  - (A) 4-6 Carbon atoms
  - (B) 3-6 Carbon atoms
  - (C) 4-7 Carbon atoms
  - (D) 3-7 Carbon atoms

2. Carbohydrates are
- (A) Polyhydroxy Aldehydes and Phenols
  - (B) Polyhydroxy Aldehydes and Ketones
  - (C) Polyhydroxy Phenols and Alcohols
  - (D) Polyhydroxy Ketones and Phenols
3. Urine is formed in a three-step process: which of the following gives the correct order of the steps that take place in the nephron?
- (A) Glomerular filtration, tubular secretion, tubular reabsorption
  - (B) Tubular secretion, tubular reabsorption, glomerular filtration
  - (C) Glomerular filtration, tubular reabsorption, tubular secretion
  - (D) Tubular reabsorption, tubular secretion, glomerular filtration
4. A drop of colour spreading out in a cup of water is an example of the transport process called:
- (A) Osmosis
  - (B) Effusion
  - (C) Diffusion
  - (D) Evaporation
5. Oxidative phosphorylation is carried out by enzymes located in the
- (A) Outer Endoplasmic reticulum
  - (B) Outer mitochondrial membrane
  - (C) Inner mitochondrial membrane
  - (D) Inner Endoplasmic reticulum
6. The highest point on a transverse wave is known as:
- (A) Wavelength
  - (B) Amplitude
  - (C) Crest
  - (D) Trough

7. Cushing's syndrome is caused due to the over production of hormones of \_\_\_\_\_ gland.
- (A) Thymus
  - (B) Parathyroid
  - (C) Adrenal
  - (D) Thyroid
8. An integer is chosen at random between 1 and 100. Find the probability that it is not divisible by 8?
- (A) 0.88
  - (B) 0.80
  - (C) 0.84
  - (D) 0.92
9. A plane left 30 minutes late than its scheduled time and in order to reach the destination 1000 Km away in time it had to increase its speed by 100 Km/h from the usual speed find its usual speed
- (A) 500 km/hr
  - (B) 400 km/hr
  - (C) 300 km/hr
  - (D) 200 km/hr
10. A heap of rice is in the form of cone of base diameter 30 m and height 3.5m. How much canvas cloth is required to just cover the heap?
- (A) 700 sq.meter
  - (B) 750 sq.meter
  - (C) 726 sq.meter
  - (D) 730sq.meter

11. An observer from the top of a 50m high light house from the sea level the angle of depression of the two ships are  $30^\circ$  and  $45^\circ$ . If one ship is exactly behind the other on the same side the light house find the distance between the two ships. [ use  $\sqrt{3} = 1.732$ ]
- (A) 56.6 m  
(B) 46.6 m  
(C) 26.6 m  
(D) 36.6 m
12. A train travels at a certain average speed for a distance of 63 km and then travels at a distance of 72 km at an average speed of 6 km/hr more than its original speed. It takes 3 hours to complete total journey, what is the original average speed?
- (A) 42 km/hr  
(B) 40 km/hr  
(C) 44km/hr  
(D) 68 km/hr
13. The ratio of the areas of two triangles with common base is 6:4. Height of the larger triangle is 10 cm then find the corresponding height of the smaller triangle
- (A) 7.5 cm  
(B) 6.67 cm  
(C) 8 cm  
(D) 7 cm
14. 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

15. 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 decreases and the acidity decreases.
16. A catalyst is a substance which speeds up
- (A) Reactions involving only liquids
  - (B) Reactions and is used up in the reaction
  - (C) Reactions and is not used up in the reaction
  - (D) Reactions involving only gases
17. Which part of our diet is needed for body growth and repair.
- (A) Fibre
  - (B) Fats and oils
  - (C) Proteins
  - (D) Carbohydrates
18. 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.
19. 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

20. A disease that is continuously present in a certain population would be classified as
- (A) Sporadic
  - (B) Endemic
  - (C) Pandemic
  - (D) Epidemic
21. Vaccines are available for all of the following EXCEPT
- (A) *Streptococcus pneumoniae*
  - (B) Influenza
  - (C) Pertussis
  - (D) Legionnaire's disease
22. The suspension of slaked lime in water is known as
- (A) Milk of lime
  - (B) Quicklime
  - (C) Limewater
  - (D) Slaked lime water
23. X-ray was invented by
- (A) Robert Koch
  - (B) Louis Pasteur
  - (C) Roentgen
  - (D) Alexander Fleming
24. Two cars A and B start from a point at the same time in a straight line and their position are represented by  $X_a(t) = at + bt^2$  and  $X_b(t) = ft - t^2$ . At what time do the cars have the same velocity
- (A)  $(f - a)/2(1 + b)$
  - (B)  $(f + a)/2(1 + b)$
  - (C)  $(f - a)/2(1 - b)$
  - (D)  $(f + a)/2(1 - b)$

25. A satellite of mass  $m$  is orbiting the earth of radius  $R$  at a height  $h$  from its surface. The total energy of the satellite in terms of  $g_0$  the value of acceleration due to gravity at the earth's surface is
- (A)  $(mg_0R^2) / 2(R+h)$
  - (B)  $-(mg_0R^2) / 2(R+h)$
  - (C)  $(mg_0R^2) / 2(R-h)$
  - (D)  $-(mg_0R^2) / 2(R-h)$

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**PART B**

26. Which amongst the following is one of the most abundant organic compounds in the biosphere?
- (A) Cellulose
  - (B) Starch
  - (C) Amylose
  - (D) Glycogen
27. Which amongst them is not a an amino acid:
- (A) Phenylalanine
  - (B) Glutaminel
  - (C) Alanine
  - (D) Histamine
28. Pulmonary physiology explains the working of:
- (A) Nephrons
  - (B) Neurons
  - (C) Muscles
  - (D) Lungs

29. Unsaturated fatty acids contain at least \_\_\_\_\_ double bond

- (A) 1
- (B) 2
- (C) 3
- (D) 4

30. An atom that has more protons than electrons is called:

- (A) Cation
- (B) Anion
- (C) An Isotope
- (D) A molecule

31. The bacteria responsible for causing ulcers in the stomach are:

- (A) Clostridium tetani
- (B) Helicobacter pylori
- (C) Vibrio cholera
- (D) Escherichia coli

32. When water freezes, it

- (A) expands
- (B) contracts
- (C) conducts
- (D) has no effect

33. The volume of a gas at pressure 90.0 kPa is 300 ml. What will be the volume of the gas, if the pressure is increased to 180 kPa, considering that the gas obeys Boyle's law?

- (A) 54 ml
- (B) 60 ml
- (C) 150 ml
- (D) 600 ml



34. Which of the following gas produced when cigarettes are smoked?
- (A) Nitrogen
  - (B) Oxygen
  - (C) Carbon monoxide
  - (D) Carbon dioxide
35. This part of the cell is responsible for making starch
- (A) Cell wall
  - (B) Chloroplast
  - (C) Vacuole
  - (D) Nucleus
36. Acid solutions have a pH value of.....
- (A) Equal to 7.
  - (B) Between 5 and 9.
  - (C) More than 7
  - (D) Less than 7.
37. A balanced diet consists of
- (A) Proteins, carbohydrates and hydrocarbons, vitamins and minerals
  - (B) Fats, proteins and carbohydrates, vitamins and minerals
  - (C) Fats, proteins and hydrocarbons, vitamins and minerals
  - (D) Fats, carbohydrates and hydrocarbons, vitamins and minerals
38. Which type of substance is broken down during digestion into amino acids?
- (A) Fats and oils.
  - (B) Proteins.
  - (C) Carbohydrates.
  - (D) Fibre.

39. The process by which sugars present in fruit and vegetables can be converted into alcohol?
- (A) Fractionation.
  - (B) Distillation.
  - (C) Cracking.
  - (D) Fermentation.
40. What kind of substance, found in yeast, catalyses the conversion of sugar into alcohol?
- (A) A vitamin.
  - (B) A mineral.
  - (C) A carbohydrate.
  - (D) An enzyme.
41. During mitosis, the cell duplicates it's \_\_\_\_\_ :
- (A) Centromeres
  - (B) Chromosomes
  - (C) Nucleotides
  - (D) Chloroplasts
42. Our body maintains body an acceptable temperature by a homeostatic process called:
- (A) Autoregulation
  - (B) Thermoregulation
  - (C) Transpiration
  - (D) Haemoregulation
43. Meningitis is an inflammatory disease of
- (A) Kidney
  - (B) Eye
  - (C) Brain
  - (D) Heart

44. The basis of HIV/AIDS disease is:
- (A) Infection
  - (B) Genetic
  - (C) Injury
  - (D) Deficiency
45. Active transport within the body requires
- (A) Gradient
  - (B) Energy
  - (C) Optimum temperature
  - (D) Calories
46. Carrot is a good source of:
- (A) Vitamin A
  - (B) Calcium
  - (C) Protein
  - (D) Carbohydrates
- 47. Optics is the study of:
- (A) Optical fibers
  - (B) Camera
  - (C) Light
  - (D) Colours
48. 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

49. Dialysis is used for the treatment of

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

50. Sunlight is the major source of

- (A) Vitamin A
- (B) Vitamin B
- (C) Vitamin C
- (D) Vitamin D

51. Milk is deficient in which vitamins?

- (A) Vitamin C
- (B) Vitamin A
- (C) Vitamin B2
- (D) Vitamin K

52. Most mutations are:

- (A) Beneficial
- (B) Neutral
- (C) Detrimental
- (D) Fatal

53. Non-sex chromosomes are called:

- (A) Monosomes
- (B) Archosomes
- (C) Autosomes
- (D) Phenosomes

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

- (A) Nucleus
- (B) Mitochondria
- (C) endoplasmic reticulum
- (D) golgi apparatus

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

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

56. What are the components of DNA?

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

57. The function of tRNA is to

- (A) Transport of amino acids for protein synthesis
- (B) Carry codons to the ribosomes
- (C) Translate RNA
- (D) Transcribe the DNA code

58. The function of the lungs is to take in

- (A) Oxygen into the blood and remove nitrogen
- (B) Nitrogen into the blood and remove carbon dioxide
- (C) Carbon dioxide into the blood and remove oxygen
- (D) Oxygen into the blood and remove carbon dioxide

59. Down syndrome is an example of a chromosomal abnormality called:

- (A) Trisomy
- (B) Monosomy
- (C) Deletion
- (D) Inversion

60. Mercury is:

- (A) A liquid and metal
- (B) A liquid and non-metal
- (C) A solid and non-metal
- (D) Neither liquid nor metal

61. Genetics is the study of :

- (A) Functions of nuclear material
- (B) Sexual and asexual characteristics
- (C) Science of reproduction
- (D) Study of human traits

62. The richest source of Vitamin-C is:

- (A) Amla
- (B) Orange
- (C) Grapes
- (D) Lemon

63. The purest form of water is:

- (A) Rain water
- (B) Aerated water
- (C) river water
- (D) Spring water

64. Who is the father of Geometry?
- (A) Kepler
  - (B) Euclid
  - (C) Pythagoras
  - (D) Newton
65. The temperature of the system decreases in the process of:
- (A) Free expansion
  - (B) adiabatic expansion
  - (C) isothermal expansion
  - (D) isothermal compression
66. The quantity having the units of mass is:
- (A) Impulse
  - (B) Inertia
  - (C) Moment of inertia
  - (D) Density
- 67. Bhopal gas tragedy of 1984 was caused by:
- (A) Carbon monoxide
  - (B) Phosgene
  - (C) Methyl cyanate
  - (D) Methyl isocyanate
68. It is easier to roll a stone up a sloping road than to lift it vertical upwards because
- (A) work done in rolling is more than in lifting
  - (B) work done in lifting the stone is equal to rolling it
  - (C) work done in both is same but the rate of doing work is less in rolling
  - (D) work done in rolling a stone is less than in lifting it

69. Light year is a unit of
- (A) Time
  - (B) Distance
  - (C) Light
  - (D) Intensity of Light
70. It is more difficult to walk on a sandy road than on a concrete road because
- (A) sand is soft and concrete is hard
  - (B) the friction between sand and feet is less than that between concrete and feet
  - (C) the friction between sand and feet is more than that between concrete and feet
  - (D) the sand is grainy but concrete is smooth
71. A site where microbes can survive, multiply, and serve as a continual source of infection is called a(n)
- (A) portal of entry
  - (B) reservoir
  - (C) vector
  - (D) agent
72. Tuberculosis is spread by
- (A) droplet transmission
  - (B) airborne transmission
  - (C) contaminated water
  - (D) a and b only
73. Human body requires the following macronutrients
- (A) Calcium, Phosphorus, Vitamin D
  - (B) Carbohydrates, Proteins, Fats
  - (C) Potassium, Chloride, Sodium
  - (D) Iron, Iodine, Zinc



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74. Single most common cause of Mental handicap worldwide is

- (A) Iron deficiency
- (B) Iodine deficiency
- (C) Combination of a and b
- (D) Neither a nor b

75. Mosquito bites can cause the following disease except

- (A) Malaria
- (B) Filariasis
- (C) West Nile Fever
- (D) Rabies

76. The recent ebola epidemic occurred in

- (A) Asia
- (B) Australia
- (C) Africa
- (D) America

77. Which one of the following is not correct

- (A) Insulin : Pancreas
- (B) Epinephrine : Adrenal gland
- (C) Prolactin : Pituitary gland
- (D) Oxytocin : Thyroid gland

78. A circle divided into sectors proportional to the frequency of items shown is called

- (A) Bar chart
- (B) Pie chart
- (C) Frequency polygon
- (D) Histogram

79. Which of the following is not a water-soluble vitamin?

- (A) Vitamin B
- (B) Vitamin C
- (C) Vitamin E
- (D) None

80. Anaemia is mainly due to deficiency of

- (A) Ca
- (B) Fe
- (C) Na
- (D) Mg

81. Insulin deficiency causes

- (A) Diabetes insipidus
- (B) Goitre
- (C) Diabetes mellitus
- (D) All of the above

82. Which of the following vitamin deficiency causes night blindness

- (A) Vitamin A
- (B) Vitamin B
- (C) Vitamin C
- (D) Vitamin D

83. When the number of educated females is expressed as a percentage of total females present in a village. It is known as:

- (A) Proportion
- (B) Rate
- (C) Ratio
- (D) Frequency

84. Human body has \_\_\_\_\_ number of bones

- (A) 100
- (B) 140
- (C) 206
- (D) 260

85. Slope of a line is 4 and y intercept is  $-4$ . The equation of a line is

- (A)  $y = 4x - 4$
- (B)  $y = 4x + 4$
- (C)  $y = 4(x + 1)$
- (D)  $y = x(4 + 1)$

86. what is the value of  $(\cos^2 70 - \sin^2 20)$

- (A) 0.25
- (B) 0
- (C)  $-0.25$
- (D) 0.5

87. The volume of a cube is  $343 \text{ cm}^3$  find its side

- (A) 6
- (B) 7
- (C) 8
- (D) 5

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88. Planck's constant ( $h$ ), speed of light in vacuum ( $C$ ) and Newton's gravitational constant ( $G$ ) are three fundamental constants. Which of the following combinations of these has the dimension of length?
- (A)  $\sqrt{hG} / C^{1/2}$
  - (B)  $\sqrt{hG / C^{1/2}}$
  - (C)  $\sqrt{hC} / G^{1/2}$
  - (D)  $\sqrt{hG} / C^{3/2}$
89. A line passing through the points A (-4,5) and B (5,6) the equation of the line is
- (A)  $X - 9Y + 49 = 0$
  - (B)  $X + 9Y + 49 = 0$
  - (C)  $X - 11Y + 40 = 0$
  - (D)  $X - 11Y + 40 = 0$
90. Two different dice are tossed together. Find the probability of getting a sum 9 of the numbers on the two dice
- (A)  $1/12$
  - (B)  $1/9$
  - (C)  $1/4$
  - (D)  $1/2$
91. A filament bulb (400 W, 100V) is to be used in a 240 V main supply. When a resistance  $R$  is connected in series, it works perfectly and the bulb consumes 400W. The value of  $R$  is
- (A)  $26 \Omega$
  - (B)  $30 \Omega$
  - (C)  $20 \Omega$
  - (D)  $35 \Omega$

92. A long wire carrying a steady current is bent into a circular loop of one turn. The magnetic field at the centre of the loop is  $B$ . It is then bent into a circular coil of  $n$  turns. The magnetic field at the centre of this coil of  $n$  turns will be
- (A)  $nB$
  - (B)  $nB^2$
  - (C)  $2nB$
  - (D)  $n^2B$
93. The potential differences across the resistance, capacitance and inductance are 80 V, 40 V and 100 V respectively in an L-C-R circuit. The power factor of this circuit is
- (A) 0.8
  - (B) 0.7
  - (C) 0.9
  - (D) 0.4
94. An air bubble in a glass slab with refractive index 1.5 (near normal incidence) is 6 cm deep when viewed from one surface and 4 cm deep when viewed from the opposite face. The thickness (in cm) of the slab is
- (A) 15
  - (B) 12
  - (C) 14
  - (D) 16
95. Which one of the following is **wrong** for fungi?
- (A) They are eukaryotic
  - (B) They are heterotrophic
  - (C) All fungi possess a purely cellulosic cell wall
  - (D) They are both unicellular and multicellular

96. Actinomorphic symmetry is found in the flowers of

- (A) Trifolium
- (B) Pisum
- (C) Cassia
- (D) Brassica

97. Interspecific hybridization is the mating of

- (A) Two different related species
- (B) Animals within the same breed without having common ancestors
- (C) Animals within the same breed having common ancestors
- (D) Superior males and females of different breeds

98. The chronological order of human evolution from early to the recent is

- (A) Ramapithecus, Homo habilis, Australopithecus, Homo erectus
- (B) Ramapithecus, Australopithecus, Homo habilis, Homo erectus
- (C) Homo habilis, Ramapithecus, Australopithecus, Homo erectus
- (D) Australopithecus, Homo habilis, Ramapithecus, Homo erectus

99. The number of electrons delivered at the cathode during electrolysis by a current of 1 ampere in 60 seconds is (charge on electron =  $1.6 \times 10^{-19} \text{c}$ )

- (A)  $6 \times 10^{23}$
- (B)  $6 \times 10^{20}$
- (C)  $3.75 \times 10^{20}$
- (D)  $3.75 \times 10^{23}$

100. Three sound waves of equal amplitudes have frequencies  $(n - 1)$ ,  $n$ ,  $(n + 1)$ . They superimpose to give beats. The number of beats produced per second will be

- (A) 4
- (B) 3
- (C) 2
- (D) 5