2-2

ENTRANCE EXAMINATION - 2021

Integrated Master of Optometry (I M.Optom.)

Hall Ticket Number

Time: 2 hours

Total marks: 100

INSTRUCTIONS

Please read the following instructions carefully:

1. Write the Hall Ticket Number in the above box AND on the OMR Answer Sheet.
2. All answers should be marked in the OMR Answer sheet ONLY following the instructions provided there upon.
3. This question paper has two (2) parts:
    a. PART-A consists of 25 questions (Nos. 1-25) of one mark each for a total 25 marks. There is a NEGATIVE MARKING of 0.33 mark for each wrong answer in PART-A.
    b. PART-B consists of 75 questions (Nos. 26-100) of one mark each for a total 75 marks. There is NO negative marking in PART-B.
4. Hand over the OMR Answer sheet at the end of the examination to the invigilator.
5. Use of non-programmable calculator is allowed.
6. NO additional sheets will be provided. Rough work can be done in the question paper itself/space provided at the end of the booklet.
7. This paper contains 21 pages including this page. Please check thoroughly for all the pages.

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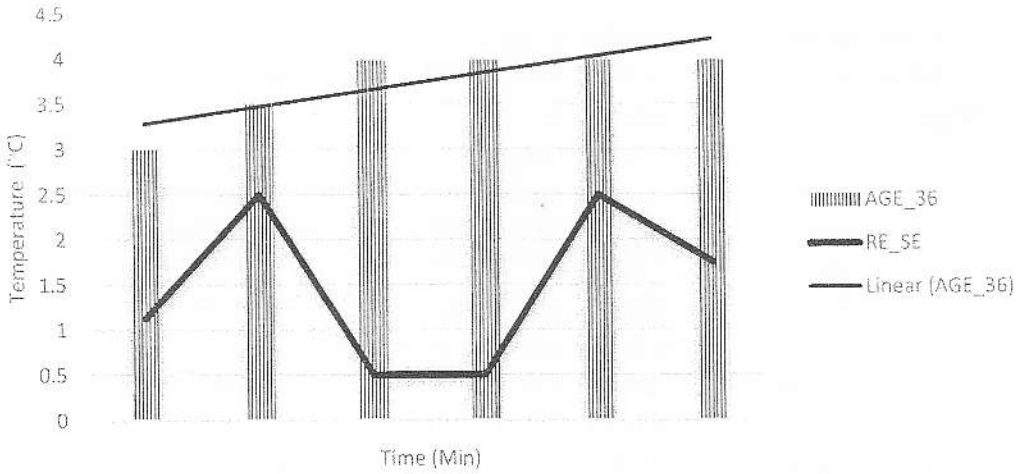
PART-A

1. Data collected from four students on number of children and pets in their respective households were shown in the table below. The calculated correlation coefficient value is 0.982. Which one of the following describes their correlation between variables?

Student	A	B	C	D
Number of children	1	4	2	1
Number of pets	1	6	3	2

A. Neutral correlation
B. Negative correlation
C. Positive correlation
D. No correlation

2. On a hot day, six cars were left in the sun in a car park. The length of time each car was left in the sun and temperature inside the at the end of the period was recorded and plotted as shown below. Which one of the following indicates the predicted value of the temperature of a car which has been left in the sun for 35 min.?



A. 35 °C
B. 40 °C
C. 45 °C
D. 30 °C

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3. When $2x^3 + 2x^2 + ax - b$ is divided by $(x + 3)$, the remainder is -11. When the same polynomial is divided by $(x - 3)$, the remainder is 9. What is $a, and\ b$?

   A. - 8 & 1
   B. - 15 & - 15
   C. 25 & - 15
   D. 9 & 1

4. 400 families were surveyed in a study. It was found that 90% had a TV set, and 60% had a computer. Every family had at least one of these items. How many families had both a TV set and a computer?

   A. 50 %
   B. 40 %
   C. 55 %
   D. 58 %

5. Given n(U) = 30, n(A) = 14, n(B) = 10, and n(A $\cap$ B) = 6. Which one of the following indicates n(B, but not A).

   A. 6
   B. 4
   C. 5
   D. 3

6. Amino acids that are specified by single codons are:

   A. Tryptophan and Methionine
   B. Histidine and Glycine
   C. Alanine and Valine
   D. Tyrosine and Phenylalanine

7. Chemical reactions that do not involve gases, is not affected by

   A. Temperature
   B. Pressure
   C. Concentration
   D. Catalyst

8. Deficiency of Thyroid Hormone can be overcome by external administration of:

   A. Thyroxine
   B. Thymine
   C. Thymidine
   D. Threonine

9. COVID-19 stands or

A. Coronavirus Induced Disease – 2019
B. Coronavirus Infectious Disease – 2019
C. Coronavirus Immunological Disease – 2019
D. Coronavirus Influenza Disease – 2019

10. Immune mediated β-cells destruction of Pancreas leads to

A. Acute Liver failure
B. Type I diabetes
C. Pancreatitis
D. Obstructive jaundice

11. Life cycle in Angiosperms is

A. Haplontic
B. Diplontic
C. Haplodiplontic
D. Diplohaplontic

12. Milk is deficient in which vitamins.

A. Vitamin C
B. Vitamin A
C. Vitamin B2
D. Vitamin K

13. The digestive enzymes of cellular compounds are confined to

A. Lysosomes
B. Ribosomes
C. Peroxisomes
D. Polysomes

14. Which contains more number of molecules?

A. 1g of carbon dioxide
B. 4g of hydrogen
C. 8g of oxygen
D. 6g of Urea

15. Choose the correct statement regarding electrolytic cell

A. It is a device in which chemical energy is converted into electrical energy
B. Anode is shown by negative sign
C. Oxidation reaction takes place at the anode
D. Electrons flow from cathode to anode

16. Two identical billiard balls are in contact on a table. A third identical ball strikes them symmetrically with velocity v and remains at rest after impact. The speed of balls after collision will be

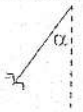
A. $\frac{v}{\sqrt{3}}$

B. $\frac{v}{3}$

C. $\frac{v}{2}$

D. v

17. An insect crawls up a hemispherical surface very slowly (figure). The coefficient of friction between the insect and the surface is 1/3. If the line joining the center of hemispherical surface to the insect makes an angle α with the vertical, the maximum possible value of α is given by



A. $\cot\alpha = 3$

B. $\tan\alpha = 3$

C. $\sec\alpha = 3$

D. $\text{cosec}\alpha = 3$

18. $A = Be^{-kt}$, here t is time and A is pressure. Find dimension of B and k

A. $ML^{-1}T^{-2}$ and T^{-1}

B. MLT^{-2} and T^{-1}

C. $ML^{-1}T^{-2}$ and T

D. $ML^{2}T^{-2}$ and T^{-1}

19. An AC voltage V is applied across a series combination of R, L and C. If V_{RL}, V_{LC}, V_{RC} be the voltage drops across resistor inductor, capacitor inductor and resistor capacitor respectively, then

A. $V_{RL} < V$

B. $V_{RC} < V$

C. $V_{LC} < V$

D. $V_{LC} = V$

20. In hydrogen atom Hα - line arises due to transition $n = 3 \rightarrow n = 2$. In the spectrum of singly ionised helium there is a line having the same wavelength as the Hα line. This is due to the transition –

A. $n = 3 \rightarrow n = 2$
B. $n = 2 \rightarrow n = 1$
C. $n = 5 \rightarrow n = 3$
D. $n = 6 \rightarrow n = 4$

21. Fill in the blank with the correct form of the verb to complete the sentence given below:
If I _____ a bird, I would fly away beyond the horizon.

A. am
B. were
C. will be
D. can be

22. Choose the most appropriate word to fill in the blank in the sentence given below:
Several party members objected to the _____ distribution of portfolios.

A. arbitrary
B. repository
C. analogous
D. sedentary

23. Choose a synonym for the underlined word in the following sentence:
The talkative child made it very difficult for me to concentrate on my work.

A. reticent
B. garrulous
C. gullible
D. pompous

24. Which of the options given below most accurately combines these two sentences? She is proud. She won't admit her mistake.

A. Notwithstanding her pride, she will admit her mistake.
B. She is too proud to admit her mistake.
C. She is not proud enough to admit her mistake.
D. She will never make a mistake because she is proud.

25. Choose the correct option to fill in the blank in the sentence given below:
The earthlings _____ for millions of years when the aliens first arrived.

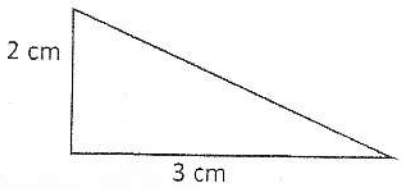
A. had been extinct
B. were extinct
C. may be extinct
D. will be extinct

PART-B

26. Which one of the following indicates expand and simplify of $(x+5)(x-6)$.

A. $x^2 - x - 30$
B. $6x^2 - 5x - 5$
C. $18x - x^2 - 6$
D. $5x - x^2 - 6$

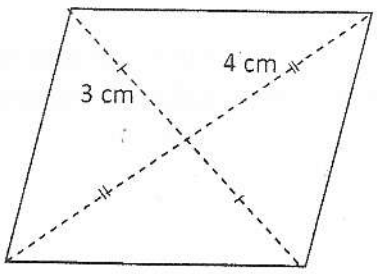
27. Find the length of the hypotenuse in the given picture



A. $\sqrt{13}$ *cm long*
B. $\sqrt{3}$ *cm long*
C. $\sqrt{11}$ *cm long*
D. None of the above

28. A rhombus has diagonals of length 6 cm and 8 cm. What is the length of its sides?

A. 7 cm
B. 6 cm
C. 5 cm
D. 4 cm



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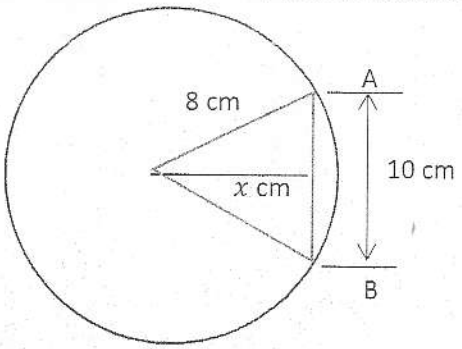
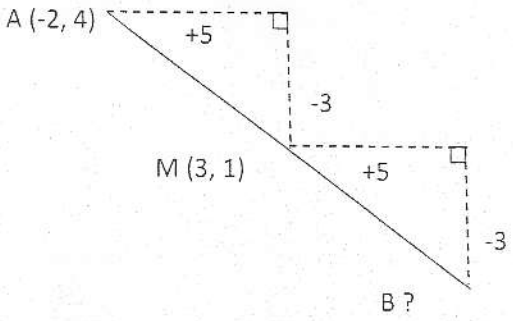
29. A circle with a radius 8 cm has a chord of length 10 cm. What is the shortest distance from the centre of the circle to the chord?

A. 5.24 cm
B. 6.24 cm
C. 7.24 cm
D. 4.24 cm



30. Suppose A is (-2, 4) and M is (3, 1), where M is the midpoint of [AB]. What is B?

A. 5, -2
B. 8, -2
C. 3, 5
D. -2, 5

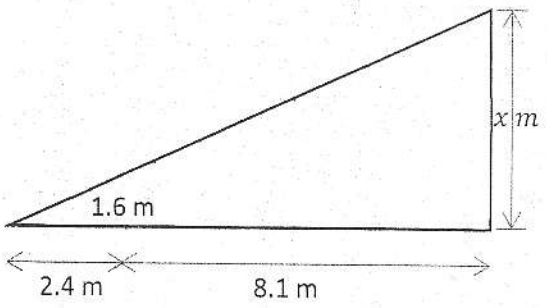


31. Which one of the following is the midpoint of the line segment joining A (-2, 3) to B (-4, 3)?

A. -3, 3
B. -6, 4
C. -6, 3
D. -5, 4

32. A boy who is 1.6 m tall stands 8.1 m from the base an electric light pole. He casts a shadow 2.4 m long. How high above the ground is the light globe?

A. 5 m
B. 6 m
C. 7 m
D. 8 m



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33. The number of aeroplanes flying into a remote airstrip over a 15-day period is given below. For this data, what is the median?

5 7 0 3 4 6 4 0 5 3 6 9 4 2 8

A. 4.4
B. 4.0
C. 8.0
D. 15.0

34. Linda has taken four contact lens tests so far this semester. Each test has been out of 20 marks, and her average mark has been 15. How many mark does Linda need in the 5^{th} test to raise her average to 16.

A. 15
B. 20
C. 10
D. 17

35. The life of a clock battery is found to be normally distributed with mean 35.4 weeks and standard deviation 6.8 weeks. In a batch of 500 batteries, how many are needed to last at least 21.8 weeks?

A. 79
B. 11
C. 239
D. 54

36. $\frac{5}{x+2} = \frac{2}{x-1}$. What is x?

A. 3
B. 6
C. 9
D. 18

37. A fruit bowl contains 3 apples and 5 oranges. Neeraj selects a piece of fruit at random, and eats it. His brother Ajay then selects a piece of fruit for himself. What is the probability that both fruit selected are apples?

A. $\frac{3}{28}$
B. $\frac{3}{8}$
C. $\frac{2}{7}$
D. $\frac{5}{8}$

38. Consider the arithmetic sequence 3, 9, 15, 21, 27, ...Which one of the following indicates the 100^{th} term of sequence.

A. 603
B. 597
C. 429
D. 309

39. Suppose $y = 2x^2 + 4x - 5$. Find the value of y when the $x = 3$.

A. 15
B. 20
C. 25
D. 18

40. In a group of 25 students, 15 like milk, and 17 like coffee. Two students like neither, and 9 students like both. One student is randomly selected from the class. What is the probability of the student liking the milk?

A. $\frac{15}{17}$
B. $\frac{3}{5}$
C. $\frac{1}{25}$
D. $\frac{9}{17}$

41. The strength of which of the chemicals, listed below cannot be described in terms of Molarity:

A. Acetone
B. Glucose
C. NaCl
D. $CaCl_2$

42. Pick the odd one out

A. Alanine
B. Adenine
C. Histidine
D. Glycine

43. Which amongst the following has the highest pH value?

A. Acetic Acid
B. Water
C. Milk
D. Sodium Hydroxide

44. The symbol Au stands for which element:

A. Silver
B. Platinum
C. Gold
D. Magnesium

45. Lead pencil contains

A. Charcoal
B. Lead
C. Carbon
D. Graphite

46. Vitamin B12 contains

A. Magnesium
B. Iron
C. Zinc
D. Cobalt

47. An atom with more electrons than protons is called:

A. An isotope
B. An anion
C. A molecule
D. A cation

48. Select the odd one out

A. Tuberculosis and Typhoid
B. Herpes and Influenza
C. Cholera and Ringworm
D. Malaria and Leishmaniasis

49. The highest concentration of iron in the human body is found in

A. Kidney
B. Lungs
C. Blood
D. Liver

50. Pick the mismatched pair, with respect to the functions of Homeostasis performed in our body:

A. Kidney – Electrolytes
B. Lungs – Gases
C. Brain – Temperature
D. Liver - Fluids

51. Which amongst the following environmental factors is an important requirement for Vitamin D?

A. Sunlight
B. Rainfall
C. Moonlight
D. Wind(s)

52. The group of similar organisms which can capable of producing fertile off springs and inbreeding is called:

A. Tribe
B. Genus
C. Species
D. Family

53. Which of the following components is not a part of Innate Immunity?

A. Neutrophils
B. B- cells
C. Macrophages
D. Natural Killer cells

54. Aspirin belongs to which class of drugs:

A. Analgesics
B. Anaesthetics
C. Anti-biotics
D. Anti-histamines

55. Pick the odd one out

A. Anaemia
B. Diabetes
C. Gigantism
D. Scurvy

56. The fatty acids can be transported into and out of mitochondria through

A. Active transport
B. Facilitated transfer
C. Non-facilitated transfer
D. None of these

57. These are specialized structures detached from the parental plant by fragmentation.

A. Eyes
B. Bulbs
C. Gemmae
D. Buds

58. These are produced only due to mitosis but not by meiosis

A. Zoospores
B. Aplanospores
C. Conidiospores
D. Microspores

59. Oxidation of which substance in the body yields the most calories

A. Glucose
B. Glycogen
C. Protein
D. Lipids

60. A lipid bilayer is permeable to

A. Urea
B. Fructose
C. Glucose
D. Potassium

61. In mammalian cells rRNA is produced mainly in the

A. Endoplasmic reticulum
B. Ribosome
C. Nucleolus
D. Nucleus

62. Proteins contain

A. Only L- □ - amino acids
B. Only D-amino acids
C. DL-Amino acids
D. Both (A) and (B)

63. Which of the following is heaviest?

A. 50g of iron
B. 5 moles of nitrogen
C. 0.1-gram atom of silver
D. 1023 atoms of carbon

64. The value of e/m for an electron is

A. 1.78 × 108 c/g
B. 1.6724 × 10–24 c/g
C. 0.005486 c/g
D. 1.00866 c/g

65. When the speed of electron increases, its specific charge

A. Increases
B. Decreases
C. Remains unchanged
D. Increases and then decreases

66. Molarity of pure water (density=1gm/ml) is

A. 40M
B. 4M
C. 55.6M
D. 25M

67. The volume of 0.2M H_2SO_4 solution containing 10 milli equivalents of solute is

A. 50 ml
B. 40 ml
C. 100 ml
D. 25 ml

68. Rate of evaporation depends up on

A. Nature of liquid
B. Surface area of the liquid
C. Temperature
D. Flow of air current over the surface

69. 3 gms of urea is added to 36 gms of boiling water. The lowering in vapour pressure of solution is

A. 19 mm
B. 38 mm
C. 760 mm
D. 76 mm

70. In a period from left to right, electron affinity

A. Increases with exceptions
B. Decreases
C. Remains constant
D. Increases regularly

71. Fill in the blank with the correct option to complete the following sentence:

Our twelve-year-old dog was suffering from terminal cancer so we decided to have him put _____.

A. out
B. off
C. away
D. down

72. Fill in the blanks with the correct set of words from the options given below:

The President just _____ that a nation-wide lockdown will be _____ for two weeks.

A. announced, imposed
B. annulled, declared
C. designated, curtailed
D. projected, revealed

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73. At least seventy coastal villages were _____ by the cyclone.

A. effected
B. affected
C. demented
D. enraged

74. To decide whether the batsman is out or not is the umpire's _____.

A. pejorative
B. injunction
C. prerogative
D. conjunction

75. Match these antonyms correctly:

i.	Bright	a. Restive
ii.	Harsh	b. Dull
iii.	Calm	c. Devious
iv.	Honest	d. Mild

A. i-d, ii-c, iii-a, iv-b
B. i-b, ii-d, iii-a, iv-c
C. i-d, ii-a, iii-b, iv-c
D. i-b, ii-c, iii-d, iv-a

76. Choose the most appropriate option to combine these two sentences:

Most of the students bunked the class. The teacher was furious.

A. Most of the students were furious with the teacher so they bunked the class.
B. The teacher was mostly furious because the students bunked the class.
C. The teacher was furious because most of the students bunked the class.
D. The students bunked the class mostly because the teacher was furious.

77. Fill in the blanks with the correct options to complete the following sentence:

We think either Harry or one of his friends _____ where the car keys are but they claim none of them _____.

A. know, do
B. known, do
C. know, does
D. knows, do

78. What does the following sentence mean?

It was clear from the way Tom acted around the office that he had an axe to grind.

A. Tom wanted to renovate the office furniture using his axe.
B. Tom had a personal agenda he wanted to push in the office.
C. Tom was known in the office for his determination to work hard.
D. Tom failed to conceal his working-class background in the office.

79. Choose the correct option to complete the sentence given below:

The news of the bomb blast has been _____ by Reuters.

A. confirmed
B. conformed
C. conferred
D. conjured

80. Fill in the blanks with the correct set of words:

The passengers were _____ that the driver _____ the accident.

A. grateful, accosted
B. gratified, accorded
C. grateful, averted
D. gracious, asserted

81. What does the following sentence mean?

The chat show host played the devil's advocate by suggesting that there is a natural justification for genetic profiling.

A. The chat show host was vehemently opposed to the idea of genetic profiling.
B. The chat show host was enacting the role of the devil in a courtroom drama.
C. The chat show host was unwittingly supporting the case for genetic profiling.
D. The chat show host was deliberately provoking a debate on genetic profiling.

82. Match the following words to form standard English phrases:

i.	catch	a. your mind
ii.	throw	b. your step
iii.	watch	c. a tantrum
iv.	know	d. one's eye

A. i-d, ii-a, iii-b, iv-c
B. i-c, ii-d, iii-a, iv-b
C. i-d, ii-c, iii-b, iv-a
D. i-c, ii-d, iii-b, iv-a

83. Choose the correct option to complete the sentence given below:

Rita has been taking swimming lessons _____ two weeks now.

A. since
B. from
C. during
D. for

84. Choose the correct option to rectify the errors in the following sentence:

Despite of the many challenges he had to face, Harry fulfilled every task and emerged victorious at the end of the tournament.

A. Despite of the many challenges he had to face, Harry fulfilled every task and emerged victorious at the end of the tournament.
B. Despite the many challenges he had to face, Harry fulfilled every task and emerged victorious at the end of the tournament.
C. Despite the many challenges he had to face, Harry fulfilled every task and emerged victorious at the end of the tournament.
D. Despite of many challenges he had to face, Harry fulfilled every task and emerged victorious at the end of tournament.

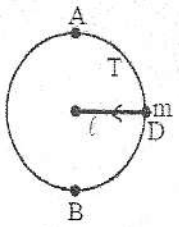
85. Choose the correct pair of prepositions to fill in the blanks in the following sentence:

The poet tried to impress his lady love by comparing her _____ the moon but she did not care _____ such flattery.

A. with, over
B. to, for
C. through, to
D. of, about

86. A particle of mass m, attached with a string of length l is moving in a vertical circle. If the particle is just looping the loop without slacking of the string and V_A, V_B, V_D are speeds at position A, B, D shown in the figure then: -

A. VB > VD > VA
B. Tension in the string at D is 3 mg
C. $(c) VD = \sqrt{3gl}$
D. All of the above



87. A string of length 1.5 m with its two ends clamped is vibrating in fundamental mode. Amplitude at the centre of the string is 4 mm. Distances between the two points having amplitude 2 mm is:

A. 1 m
B. 75 cm
C. 60 cm
D. 50 cm

88. Imagine a light planet revolving around a very massive star in a circular orbit of radius r with a period of revolution t. If the gravitational force of attraction between the planet and the star is proportional to r5/2, then the time period will be proportional to

A. r^3
B. r^2
C. $r^{2.5}$
D. $r^{3.5}$

89. Unpolarized light of intensity I passes through an ideal polarizer A. Another identical polarizer B is placed behind A. The intensity of light beyond B is found to be ½. Now another identical polarizer C is placed between A and B. The intensity beyond B is now found to be $\frac{I}{8}$. The angle between polarizer A and C is:

A. 45°
B. 60°
C. 0°
D. 30°

90. One of two rectangular components of a force is 20 N and it makes an angle of 60° with the force. Then the magnitude of another component will be

A. $\frac{20}{\sqrt{3}}N$
B. $20\sqrt{3}N$
C. 40 N
D. Zero

91. Two identical piano wires, kept under the same tension T have a fundamental frequency of 600Hz. The fractional increase in the tension of one of the wires which will lead to occurrence of 6 beats / s when both the wires oscillate together would be:

A. 0.01
B. 0.02
C. 0.03
D. 0.04

92. The path difference between two interfering waves at a point on the screen is $\frac{\lambda}{8}$ The ratio of intensity at this point and that at the central fringe will be

A. 0.853
B. 8.53
C. 85.3
D. 853

93. STATEMENT-1: When frequency is greater than resonance frequency in a series LCR circuit, it will be an inductive circulate.
STATEMENT-2: Resultant voltage will lead the current

A. Statement – 1 is True, Statement – 2 is True; Statement – 2 is a correct explanation for Statement – 1.
B. Statement – 1 is True, Statement – 2 is True; Statement – 2 is NOT a correct explanation for Statement – 1.
C. Statement – 1 is True, Statement – 2 is False.
D. Statement – 1 is False, Statement – 2 is True.

94. A dam for water reservoir is built thicker at the bottom than at the top because:

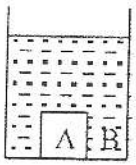
A. Pressure of water is very large at the bottom due to its large depth
B. Water is likely to have more density at the bottom due to its large depth
C. Quantity of water at the bottom is large
D. None of the above

95. After absorbing a slowly moving neutron of Mass mN (momentum $\neq 0$) a nucleus of mass M breaks into two nuclei of masses m1 and 5m1 (6 m1 = M + mN) respectively. If the de Broglic wavelength of the nucleus with mass m1 is $\neq$, the de Broglie wavelength of nucleus will be:

A. 500
B. 1/5
C. 1
D. 2500

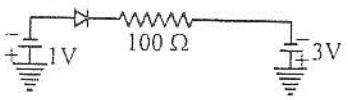
96. A parallel sided block of glass of refractive index 1.5 which is 36 mm thick rests on the floor of a tank which is filled with water (refractive index = 4/3). The difference between B apparent depth of floor at A & B when seen from vertically above is equal to

A. 2 mm
B. 3 mm
C. 4 mm
D. None of the above



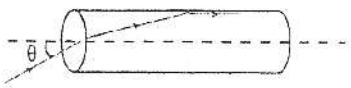
97. What is the current through an ideal PN-Junction diode shown in figure below?

A. Zero
B. 10 mA
C. 20 mA
D. 50 mA



98. A transparent solid cylinder rod has a refractive index of $2/\sqrt{3}$. It is surrounded by air. A light ray is incident at the midpoint of one end of the rod as shown in the figure. The incident angle θ for which the light ray gazes along the wall of the rod is:

A. $sin^{-1}(1/2)$
B. $sin^{-1}(\sqrt{3}/2)$
C. $sin^{-1}(2/\sqrt{3})$
D. $sin^{-1}(1/\sqrt{3})$



99. A point source of power 15 W is placed at a certain point in the space. The amplitude of magnetic field at a distance of 2 meter from source is

A. 5×10^{-8} T
B. 6×10^{-8} T
C. 10×10^{-8} T
D. 1×10^{-8} T

100. In Young's double slit experiment, the distance between two sources is 0:1 mm. The distance of the screen from the source is 20 cm Wavelength of light used is 5460 & the angular position of the first dark fringe is

A. 0.08°
B. 0.16°
C. 0.20°
D. 0.32°

-End of paper-

University of Hyderabad
Entrance Examinations - 2021

School/Department/Centre : School of Medical Sciences
Course/Subject : Master of Optometry

Q.No.	Answer	Q.No.	Answer	Q.No.	Answer	Q.No.	Answer
1	C	26	A	51	A	76	C
2	B	27	A	52	C	77	D
3	A	28	C	53	B	78	B
4	A	29	B	54	A	79	A
5	B	30	B	55	C	80	C
6	A	31	A	56	B	81	D
7	B	32	C	57	C	82	C
8	A	33	B	58	C	83	D
9	B	34	B	59	D	84	B C
10	B	35	B	60	A	85	B
11	D	36	A	61	C	86	D
12	A	37	A	62	A	87	A
13	A	38	B	63	B	88	D
14	B	39	C	64	A	89	A
15	C	40	B	65	B	90	B
16	A	41	A	66	C	91	B
17	A	42	B	67	D	92	A
18	A	43	D	68	A B C D	93	A
19	C	44	C	69	A	94	A
20	D	45	D	70	A	95	C
21	B	46	D	71	D	96	B
22	A	47	B	72	A	97	C
23	B	48	C	73	B	98	D
24	B	49	C	74	C	99	A
25	A	50	D	75	B	100	B

Note/Remarks : Q.No. 68 the correct answer is 'A' or 'B' or 'C' or 'D'.
Q.No.84 the correct answer is 'B' or 'C' and B & C.

Signature of the Head/Dean
School/Department/Centre