



MODULUS
ACADEMY
IIT | NEET | PRE-FOUNDATION

Dream Believe Achieve

Intelli-Mind Sample Paper

MAXIMUM TIME : 2 Hrs.

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MAXIMUM MARKS : 240

GENERAL INSTRUCTIONS for This Test

- The question paper consists of 3 sections (Section-A contains Science, Section-B contains Mathematics, Section-C contains Reasoning).
- This Question Paper contains a total of 60 questions.
- All questions are **single correct type questions**. Each of these questions has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct.
- Indicate the correct answer for each question by filling appropriate bubble in your answer sheet.
- For each question, you will be awarded **4 marks** if you have darkened only the bubble corresponding to the correct answer and **zero mark** if no bubble are darkened. In all other cases, **minus one (-1) mark** will be awarded
- Also read **instructions** written on the **OMR sheet**.
- Please fill the OMR answer sheet accordingly and carefully.
- Blank spaces and blank pages are provided in this booklet for your rough work. No additional sheets will be provided for rough work.
- Use of Calculator, Log Table, Slide Rule and Mobile is not allowed.

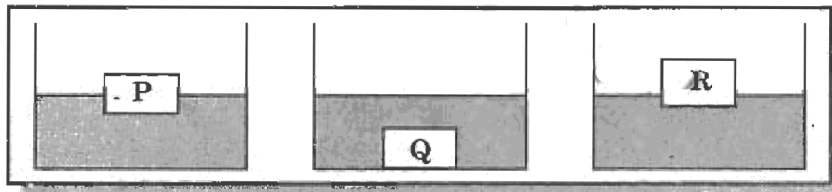
प्रश्न-पत्र के लिए सामान्य निर्देश:

- प्रश्न पत्र के **तीन भाग (भाग-A : Science, भाग-B : Mathematics तथा भाग-C : Reasoning)** है। कृपया अपने उत्तर को उत्तर पुस्तिका (OMR) में क्रमानुसार व ध्यानपूर्वक भरें।
- सुनिश्चित करें कि प्रश्न पत्र में प्रत्येक खण्ड व पेज में सभी प्रश्न है। यदि आपको प्रश्न पत्र में कोई त्रुटि जैसे कोई प्रश्न या पेज नहीं मिलता है, तो निरीक्षक से सम्पर्क करें।
- प्रत्येक भाग में 20 प्रश्न है, अतः इस प्रश्न पत्र में कुल 60 प्रश्न है।
- सभी प्रश्न **एकल सही विकल्प प्रकार** के प्रश्न है। प्रत्येक प्रश्न के चार विकल्प (A), (B), (C) तथा (D) दिये गये है जिनमें से केवल एक सही है।
- प्रत्येक सही उत्तर के लिए आपको **4 अंक** मिलेगे अगर आपने सही उत्तर से संबंधित बुलबुले को काला किया है और **शून्य अंक** मिलेगा यदि कोई बुलबुला काला नहीं किया है। अन्यथा **ऋणात्मक एक (-1) अंक** मिलेगा।
- रफ कार्य के लिए इस पुस्तिका में रिक्त स्थान तथा रिक्त पेज उपलब्ध कराये गये हैं। अतः रफ कार्य के लिए अतिरिक्त पुस्तिका नहीं दी जायेगी।
- आपको प्रत्येक सही उत्तर के लिए उत्तर पुस्तिका में उसी प्रश्न संख्या के सामने उपयुक्त बुलबुले को काला करना है।
- कैलकुलेटर, लॉग तालिका, स्लाइड रूल, तथा मोबाईल के उपयोग की अनुमति नहीं है।

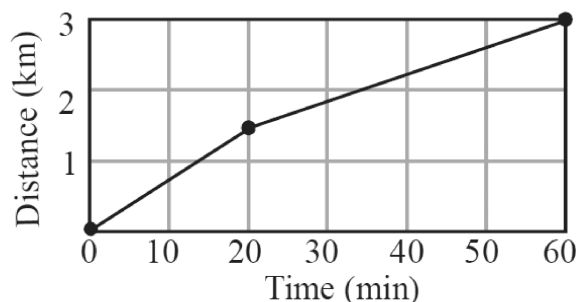
PART-I : SCIENCE

[SINGLE CORRECT CHOICE TYPE]

- Which of the following statements about sound waves is correct ?
 - Sound waves are not affected by the medium through which it travels
 - Sound waves travel faster in air than in liquid
 - Sound waves travel faster in solid than in air
 - Sound waves cannot travel through a solid
- Which of the following is NOT an example of action-reaction pair ?
 - To walk, we push the ground in the backward direction by feet
 - When a bullet is fired from a gun, the gun recoils
 - A rocket engine moves up by ejecting gases downwards
 - A book kept on a table is acted upon by two forces, the force exerted by earth (gravitational force) due to weight of the book and the normal force, applied by the table
- Three objects are introduced into the same liquid. as shown – below. Which of the following is in descending order of relative density of the objects ?



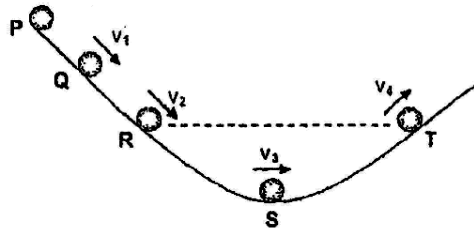
- P, Q, R
 - Q, P, R
 - R, P, Q
 - Q, R, P
- For which of the following physical quantity it is necessary to indicate direction along with magnitude?
 - Speed
 - mass
 - Force
 - Temperature
 - Which of the following statement is correct
 - A body cannot exert force on another body without making contact with it.
 - Force acting on an object may cause change in its state of motion or a change in its shape.
 - Only (i)
 - only (ii)
 - both are correct
 - both are wrong
 - The graph below shows distance over time.



Which of these situations could be represented by this graph?

- (A) A student walks 1.5 km to a friend's house in 40 minutes. The two students then walk another 1.5 km to school in 20 minutes.
- (B) A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 40 minutes.
- (C) A student walks 1.5 km to a friend's house in 30 minutes. The two students then walk another 1.5 km to school in 30 minutes.
- (D) A student walks 1.5 km to a friend's house in 20 minutes. The two students then walk another 1.5 km to school in 60 minutes.

7. P, Q, R, S and T are five points on a smooth curved rail. Point R is directed along point T as shown in the diagram. A marble released from rest at point P slides along the rail. The speeds of the marble at points Q, R, S and T are v_1 , v_2 , v_3 and v_4 respectively. Then which of the following relation is correct?



- (A) $v_4 > v_3 > v_2 > v_1$ (B) $v_1 > v_2 > v_3 > v_4$ (C) $v_4 = v_2 > v_3 > v_1$ (D) $v_3 > v_4 = v_2 > v_1$

8. The physical state of a substance depends upon its
 (1) Temperature (2) Mass (3) Volume (4) All of the above
9. The molecular weight of a compound having atomicity five is 160, then it is
 (1) Ca_3P_2 (At. Wt. of Ca=40, P=31) (2) Fe_2O_3 (At. Wt. of Fe=56, O=16)
 (3) Al_2O_3 (At. Wt. of Al=27, O=16) (4) Mg_3N_2 (At. Wt. of Mg=24, N=14)
10. The ratio of oxygen atoms present in one molecule of cupric nitrite and ferric sulphite is
 (1) 4 : 9 (2) 2 : 3 (3) 1 : 2 (4) 1 : 3
11. Column (I) contains inorganic compounds and column (II) contains their uses.

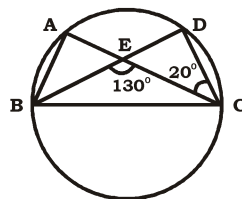
Column (I)	Column (II)
(i) SO_2	(a) In cold drinks
(ii) CO	(b) In glass formation
(iii) CaO	(c) As bleaching agent in sugar industry
(i)	(ii) (iii)
(1) b	a c
(2) a	b c
(3) c	a b
(4) c	b a

12. In which of the following cases will the mass of the substance changes ?
(1) The freezing of water (2) The burning of wood
(3) The glowing of an electric bulb (4) The melting of ice
13. The first fully man made fibre was :
(1) Nylon (2) Silk (3) Cotton (4) Terylene
14. Tungsten is used in electric bulbs because -
(1) it has high melting point (2) it is metallic in nature
(3) it has high tensile strength (4) it has high density
15. Mitochondria are the seat of :
(1) Electron transport (2) Cellular respiration
(3) ATP formation (4) All of these
16. Protein synthesis occurs on
(1) Ribosome (2) Nucleus (3) lysosome (4) Centrosome
17. Collenchyma is-
(1) Commonly present in roots (2) Always present in roots
(3) Rarely present in roots (4) Never present in roots
18. Algae are
(1) Autotropic (2) Heterotropic (3) Both (4) None
19. The opposite to innate Immunity is-
(1) Phagocytosis (2) Passive immunity (3) Acquired immunity (4) None of these
20. Forest and wildlife are which kind of natural resources-
(1) Renewable (2) Non-renewable (3) Inexhaustible (4) None above
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PART-II : MATHEMATICS

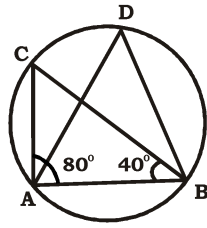
[SINGLE CORRECT CHOICE TYPE]

21. The ratio of the volume of a cube to that of a sphere which will fit inside the cube is:
 (1) $4 : \pi$ (2) $4 : 3\pi$ (3) $6 : \pi$ (4) $2 : \pi$
22. A rectangle of length 'a' and width 'b' is rolled about its length. The volume of the resulting cylinder is:
 (1) $2\pi ab^2$ (2) $2\pi ab$ (3) $\frac{a^2b}{4\pi}$ (4) $\frac{b^2a}{4\pi}$
23. Two goats are each tied to two adjacent corners of a square plot of side 28 m with ropes of 14m long. Then area not grazed by goats in square meter is :
 (1) 308 (2) 784 (3) 476 (4) 392
24. In a class there are a total of 80 boys and girls. Which of the following can't represent the ratio of the number of boys and girls in the class :
 (1) 3 : 5 (2) 1 : 3 (3) 1 : 6 (4) data insufficient
25. A certain number of horses and an equal number of men are going somewhere. Half of the owners are on their horses' back while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there ?
 (1) 10 (2) 12 (3) 16 (4) 14
26. One of the factor of $x^4 + 4$ is :
 (1) $x^2 + 2$ (2) $x + 1$ (3) $x^2 - 2x + 2$ (4) $x^2 - 4$
27. Without actual substitution, the value of $x^6 - 19x^5 + 69x^4 - 151x^3 + 229x^2 + 166x + 26$, when $x = 15$ is :
 (1) 41 (2) 30 (3) 15 (4) 40
28. A father tells his son, "I was of your present age when you were born". If the father is 36 now, how old was the boy 5 years back ?
 (1) 13 (2) 15 (3) 17 (4) 20
29. 'Once some cats saw some rats'. If each cat caught one rat, there would be a cat without a rat. Should each rat now be shared by two cats there would be a rat not caught by the cats." Tell me, how many cats I am talking about ?
 (1) 3 (2) 4 (3) 5 (4) Data insufficient
30. In the given figure, A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle BEC = 130^\circ$ and $\angle ECD = 20^\circ$, then $\angle BAC$ is



- (1) 50° (2) 70° (3) 130° (4) 110°

31. In the given figure, $\angle CAB = 80^\circ$, $\angle ABC = 40^\circ$. The sum of $\angle DAB + \angle ABD$ is equal to



- (1) 80° (2) 100° (3) 120° (4) 140°
32. If $x = \sqrt{2 + \sqrt{2 + \sqrt{2 + \sqrt{2 + \dots}}}}$, then x is
- (1) 1 (2) 2 (3) 3 (4) None of these
33. __ _ aba __ _ ba _ ab
- (1) abbba (2) abbab (3) baabb (4) bbaba
34. In a row of girls, Sheela and Munni occupy the ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, both occupy seventeenth place from the right and eighteenth place from the left, respectively. How many girls are there in the row?
- (1) 25 (2) 26 (3) 27 (4) None
35. Unit digit of the expression will be $x^3 - 6x^2 + 6x$
- (1) 0 (2) 5 (3) 2 (4) can't find
36. If $a + \frac{1}{a} = 3$, then the value of $a^2 + \frac{1}{a^2}$ is:
- (1) 6 (2) 7 (3) 9 (4) can't be determined.
37. If $x = 4^{200}$ and $y = 8^{100}$, then the relation between x and y is
- (1) $x < y$ (2) $x > y$ (3) $x = y$ (4) none of these
38. 2, 5, 9, (...), 20, 27
- (1) 14 (2) 16 (3) 18 (4) 24
39. The square root of $(272^2 - 128^2)$ is -
- (1) 144 (2) 200 (3) 240 (4) 256
40. If the perimeter of a triangle is 300 cm and its sides are in the ratio 5 : 12 : 13, then area of the triangle will be(in square centimeter)
- (1) 300 (2) 3000 (3) 200 (4) 2000

PART-III : REASONING

[SINGLE CORRECT CHOICE TYPE]

41. 4, 5, 9, 18, 34, (.....)

- (1) 43 (2) 49 (3) 50 (4) 59

42. Find out the wrong number in each case

1, 2, 5, 14, 41, 124

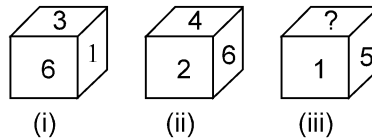
- (1) 5 (2) 14 (3) 41 (4) 124

43. Find out the missing number:

8	7	5
10	7	5
9	7	?

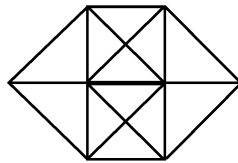
- (1) 2 (2) 5 (3) 1 (4) 25

44. On the basis of the following figures you have to tell which number will come in place of '?'



- (1) 2 (2) 3 (3) 6 (4) 4

45. How many triangles are there in the following figure ?



- (1) 20 (2) 24 (3) 28 (4) 32

46. In following letter series, some of the letters are missing which are given in that order as one of the alternatives belows it. Choose the correct alternative.

ac _ cab _ baca _ aba _ acac

- (1) aacb (2) acbc (3) babb (4) bcbb

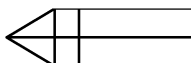
47. If $>$ denotes $+$, $<$ denotes $-$, \div denotes \div , Δ denotes \times , $=$ denotes $=$, \times denotes $>$ and $=$ denotes $<$ choose the correct statements in each of the following questions.

- (1) $6 + 3 > 8 = 4 + 2 < 1$ (2) $4 > 6 + 2 \times 32 + 4 < 1$
 (3) $8 < 4 + 2 = 6 > 3$ (4) $14 + 7 > 3 = 6 + 3 > 2$

48. X and Y start walking in opposite directions X walked 7 kms, Y walked 8 kms. There after both turned to their left and X walked 2 kms and Y walked 3 kms. They terned to left again and walked 4 kms. How much distant apart are they from each other ?

- (1) 8 kms (2) 7 kms (3) 6 kms (4) 9 kms

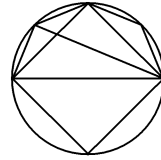
49. How many rectangles are there in the given figure?



- (1) 6 (2) 7 (3) 8 (4) 9

50. Count the number of triangles in the following figure ?

- (1) 8
(2) 10
(3) 11
(4) 12



51. If \times stands for 'addition', \div stands for 'subtraction', $+$ stands for 'multiplication' and $-$ stands for 'division', then

$$20 \times 8 \div 8 - 4 + 2 = ?$$

- (1) 80 (2) 25 (3) 24 (4) 5

52. The year next to 1996 will have the same calendar as that of the year 1996 :

- (1) 2001 (2) 1996 (3) 1997 (4) 1999

Directions for 53 to 54:

Read the information carefully and answer the questions based on it.

A group of seven singers, facing the audience, are standing in a line on the stage as follows :

- (i) D is to the right of C (ii) F is near G
(iii) B is to the left of F (iv) E is to the left of A
(v) C and B have one singer between them (vi) A and D have one singer between them

53. Who is on the extreme right ?

- (1) D (2) F (3) G (4) E

54. If we start counting from the left, on which number is C ?

- (1) 1st (2) 2nd (3) 3rd (4) 5th

55. A, B, D, G, ?

- (1) M (2) L (3) K (4) H

$$5 \quad 3 \quad 5$$

$$2 \quad \textcircled{196} \quad 3 \quad 1 \quad \textcircled{144} \quad 6 \quad 2 \quad \textcircled{?} \quad 1$$

$$4 \quad 2 \quad 6$$

- (1) 270 (2) 196 (3) 256 (4) 320

57. 16, 33, 65, 131, (?), 523

- (1) 261 (2) 521 (3) 613 (4) 721

58. 5, 2, 17, 4, (?), 6, 47, 8, 65

- (1) 29 (2) 30 (3) 31 (4) 32

59. If the Angle of elevation of sun increases from 0° to 90° then the change in the length of shadow of Tower will be -

- (1) No change in length of shadow (2) length of shadow increases
(3) length of shadow decreases (4) length of shadow will be zero

60. The perimeter of square and circumference of Circle are equal, the area of square is 121 m^2 then the area of circle is -

- (1) $7 \pi \text{ m}^2$ (2) $14 \pi \text{ m}^2$ (3) $21 \pi \text{ m}^2$ (4) $49 \pi \text{ m}^2$