CLASS
10

MODULUS ACADEMY
IIT | NEET | PRE-FOUNDATION

Dream *Believe* *Achieve*

Intelli-Mind Sample Paper

MAXIMUM TIME : 2 Hrs. || **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 quesstions.
- 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 उतर 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 उतर के लिए उतर 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]

1. An object is put one by one in three liquids having different densities. The object floats with 1/9, 2/11 and 3/7 parts of their volumes outside the liquid surface in liquids of densities d_1, d_2 and d_3 respectively. Which of the following statement is correct?

   (1) $d_1 > d_2 > d_3$ (2) $d_1 > d_2 < d_3$ (3) $d_1 < d_2 > d_3$ (4) $d_1 < d_2 < d_3$

2. Which of the following statements is/are false

   A. A steam engine converts the heat energy of steam into mechanical energy

   B. A motor converts electrical energy into mechanical energy

   C. A battery converts chemical energy into mechanical energy

   D. The energy possessed by a body due to its motion is called kinetic energy

   (1) A and D (2) C and D (3) only C (4) A and C

3. When a body is negatively charged by friction, it means

   (1) The body has acquired excess of electrons

   (2) The body has acquired excess of protons

   (3) The body has lost some electrons

   (4) The body has lost some neutrons

4. A body covers half the distance with a speed of 20m/s and the other half with a speed of 30m/s. The average velocity of the body during the whole journey is

   (1) 24m/s (2) 25m/s (3) 26m/s (4) none of these

5. Which of the following statement is correct

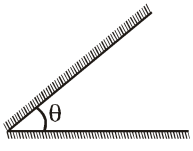
   (1) Sound can travel in vacuum

   (2) Sound cannot travel in liquid

   (3) The number of oscillations per second of a vibrating object is called its time period

   (4) None of the above is correct

6. Two mirrors are inclined at an angle θ as shown in the figure. Light ray is incident parallel to one of the mirrors. The ray will start retracting its path after third reflection if



   (1) $\theta = 45°$ (2) $\theta = 30$ (3) $\theta = 60°$ (4) all three

7. 1kg of water at 100ºC is mixed with 2kg of water at 400ºC. The final temperature of the mixture is (Specific heat capacity of water is1 Kcal/kgC° i.e. 1 Kcal heat is required to increase the temperature of one kg of water by one degree Celsius)

   (1) 200C (2) 250C (3) 300C (4) 50 0C

8. 10 g sugar is dissolved in 100 g of water. Percentage mass by mass concentration of sugar solution is

   (1) 10% (2) 1% (3) 9.09% (4) 11.11%

9. Any element 'X' has 10 electrons, 10 protons and 11 neutrons. Another element 'Y' is an isotope of 'X', number of electrons present in Y^{3-} are

(1) 10 (2) 7 (3) 11 (4) 13

10. Which of the following can be beaten into thin sheets?

(1) Zinc (2) Phosphorus (3) Sulphur (4) Carbon

11. Which of the following statements is/are correct

A. Rusting of iron is a chemical change

B. Melting of wax is a physical change

C. Evaporation of water is a chemical change

D. Melting of iron metal is a physical change

(1) A and B (2) C and D (3) A, B and D (4) All

12. Which of the following element when dissolved in cold water gives a solution which turns red litmus blue

(1) Al (2) K (3) Hg (4) Fe

13. When the gases sulphur dioxide and hydrogen sulphide mix in the presence of water, the reacction $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$ occurs. Here hydrogen sulphide is acting as

(1) an oxidising agent (2) a reducing agent (3) a dehydrating agent (4) a catalyst

14. Which acid is produced in the stomach which help in the digestion of food :

(1) H_2SO_4 (2) HNO_3 (3) HCl (4) CH_3COOH

15. The human eye forms the image of an object at its-

(1) cornea (2) pupil (3) iris (4) retina

16. Which termdescribes boron ?

(1) Metal (2) Noble gas (3)Metalloid (4) Nonmetal

17. Which vitamins are water soluble-

(1) Vitamin B and C (2) Vitamin A and B

(3) Vitamin A and C (4) Vitamin C and D

18. Respiratory structures in the insects are -

(1) Gills (2) Skin (3) Lungs (4) Trachea

19. Which one of the following is connected with transport of water in plants?

(1) Phloem (2) Xylem (3) Epidermis (4) Cambium

20. Every plant cell has a dump for waste products. It is

(1) Cytoplasm (2) Central vacuole (3) Golgi apparatus (4) Lysosome

PART-II : MATHEMATICS

[SINGLE CORRECT CHOICE TYPE]

21. A circular wire of radius 15 cm is cut and bent so as to lie along the circumference of a loop of radius 120 cm. The angle subtended by it at the centre is

(1) 30° (2) 45° (3) 60° (4) none of these

22. The value of tan 1° tan 2°.....tan 89° is

(1) 0 (2) 1 (3) –1 (4) None of these

23. In a class, 20% of the members own only two cars each, 40% of the remaining own three cars each and the remaining members own only one car each. Which of the following statements is definitely true from the given statements?

(1) Only 20% of the total members own three cars each

(2) 48% of the total members own only one car each

(3) 60% of the total members own at least two cars each

(4) 80% of the total members own at least one car.

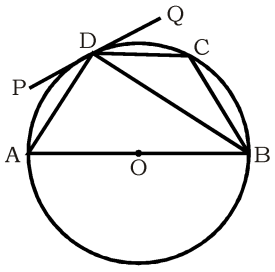
24. Robin says, "If Jai gives me Rs. 40, he will have half as much as Atul, but if Atul gives me Rs. 40, then the three of us will all have the same amount". What is the total amount of money that Robin, Jai and Atul have between them?

(1) Rs. 240 (2) Rs. 320 (3) Rs. 360 (4) Rs. 420

25. In a caravan in addition to 50 hens, there are 45 goats and 8 camels with some keepers. If the total number of feet be 224 more than the number of heads in the caravan, the number of keepers is :

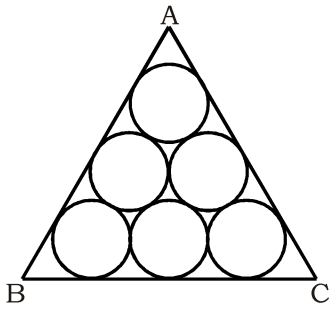
(1) 5 (2) 8 (3) 10 (4) 15

26. In the adjoining figure 'O' is the centre of the circle and AB is the diameter. Tangent PQ touches the circle at D. $\angle BDQ = 48°$. Then the ratio of $\angle DBA : \angle DCB$ is



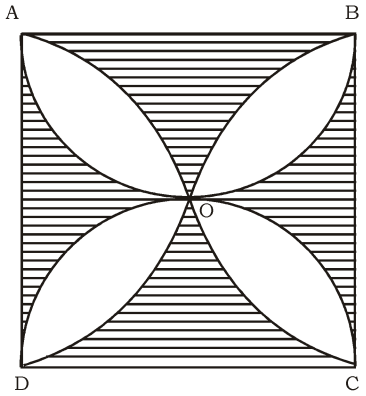
(1) $\frac{22}{7}$ (2) $\frac{7}{22}$ (3) $\frac{7}{12}$ (4) can't be determined

27. The diagram shows if equal circles inscribed in equilateral triangle ABC. The circles touch externally among them selves and also touch the sides of the triangle. If the radius of each circle is R, area of the triangle is



(1) $\left(6+\pi\sqrt{3}\right)R$ (2) $9R^2$ (3) $R^2\left(12+7\sqrt{3}\right)$ (4) $R^2\left(9+6\sqrt{3}\right)$

28. In the figure ABCD is a square of side 2 cm and four semicircles are drawn taking each of the sides of the square as diameters. Then area of the shaded region is (in sq. cm).



(1) $\frac{1}{2}\left(4-\frac{\pi}{2}\right)$ (2) $16-2\pi$ (3) $8-2\pi$ (4) none of these

29. One card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a face card ?

(1) $\frac{3}{13}$ (2) $\frac{1}{4}$ (3) $\frac{9}{52}$ (4) $\frac{1}{13}$

30. Find the largest number of four digits exactly divisible by 12, 15, 18 and 27.

(1) 5400 (2) 9720 (3) 9460 (4) 9620

31. If $x=\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{1+.....}}}}$, then the positive value of x is :

(1) $\frac{\sqrt{7}+1}{2}$ (2) $\frac{\sqrt{6}+1}{2}$ (3) $\frac{\sqrt{3}+1}{2}$ (4) $\frac{\sqrt{5}+1}{2}$

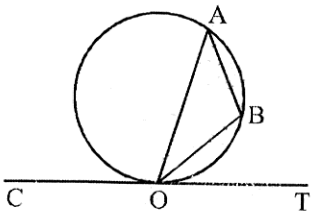
32. The value of $0.0\overline{37}$, where $0.0\overline{37}$ stands for the number 0.0373737..... is

(1) $\frac{37}{1000}$ (2) $\frac{37}{990}$ (3) $\frac{1}{37}$ (4) $\frac{1}{27}$

33. The 10th common term between the series 3 + 7 + 11 + ... and 1 + 6 + 11 + ... is

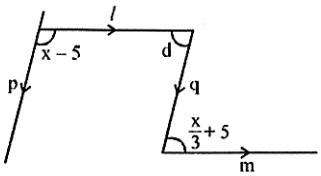
(1) 191 (2) 193 (3) 211 (4) none of these

34. In the below figure, AB = OB and CT is the tangent to the circle at O. If $\angle COA = 125^\circ$, then $\angle OAB$ is :



(1) 55° (2) $27\frac{1}{2}^\circ$ (3) $82\frac{1}{2}^\circ$ (4) 45°

35. In the given figure lines p and q are parallel. Find value of x so that lines *l* and m be parallel



(1) 45° (2) 100° (3) 135° (4) 60°

36. If $x+1$ is a factor of x^n+1 then the value of n is

(1) even (2) odd (3) any integer (4) none

37. If the equation $(3x)^2 + (27 \times 3^{1/k} - 15)x + 4 = 0$ has equal roots, then k is

(1) –2 (2) $-\frac{1}{2}$ (3) $\frac{1}{2}$ (4) 0

38. A conical vessel whose internal radius is 10 cm and height 48 cm is full of water. If this water is poured into a cylindrical vessel with internal radius 20 cm, the height to which water rises in it is :

(Take $\pi = 3.14$)

(1) 3 cm (2) 4 cm (3) 5 cm (4) 6 cm

39. A right circular cone is cut off at the middle of its height and parallel to the base. Call the smaller cone so formed A and the remaining part B, then :

(1) Vol. A < Vol. B (2) Vol. A = Vol. B (3) Vol. A > Vol. B (4) Vol. A = $\frac{1}{2}$(Vol.B)

40. The number of triangles with any three of the lengths 1, 4, 6 and 8 cms is -

(1) one (2) two (3) three (4) four

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

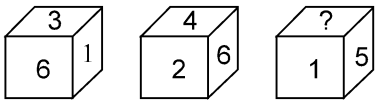
(1) 5 (2) 14 (3) 41 (4) 124

43. Find out the missing number:

8	7	5
10	7	5
9	7	?

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

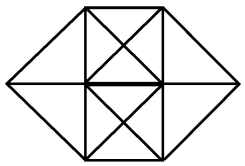
44. On the basis of the following figures you have to tell which number will come in place of '?'



(i) (ii) (iii)

(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 –, + denotes ÷, $\wedge$ denotes ×, – denotes =, × dentotes > and = denotes < choose the correct statements in each of the following questions.

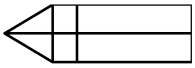
(1) $6 + 3 > 8 = 4 + 2 < 1$ (2) $4 > 6 + 2 \times 32 + 4 < 1$

(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 ?

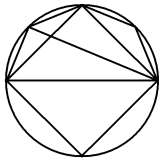
(1) 8 kms (2) 7 kms (3) 6 kms (4) 9 kms

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 × stands for 'addition', ÷ 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) Ist (2) 2nd (3) 3rd (4) 5th

55. A, B, D, G, ?

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

56.

5	3	5
2 (196) 3	1 (144) 6	2 (?) 1
4	2	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 πm^2 (2) 14 πm^2 (3) 21 πm^2 (4) 49 πm^2