

# IIT ASHRAM BRINGS...



A QUEST FOR SCIENCE ASPIRANTS !

CLASS 8

## SCIENCE APTITUDE TEST

TIME : 3 HOURS

MAX MARK : 400

DATE : 28- 01- 2024

### INSTRUCTIONS

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

**Caution :** Class, as given on paper above MUST be correctly marked on the answer OMR sheet before attempting the paper. Wrong Class will give wrong results.

1. This booklet consists of 100 questions. Question paper consists of 4 sections. Marking scheme is given in table below:

Section	Subject	Questions No.	Making Scheme for each questions	
			Correct Answer	Wrong Answer
PART - I	Mental Ability	15	4	-1
PART - II	Mathematics	40	4	-1
PART - III	Physics & Chemistry	30	4	-1
PART - IV	Biology	15	4	-1

3. Answers have to be marked on the OMR sheet. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
4. Blank papers, cellular phones, smart watches, log tables, slide rule, calculator and electronic devices, in any form, are not allowed.

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## PART - I : MENTAL ABILITY

1. A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.

Which letter is in the middle of 13th letter from the left and 4th letter from the right?

- (a) R (b) I  
(c) J (d) S

2. Complete the Analogy

Grain : Stock :: Stick : ?

- (a) Bundle (b) String  
(c) Collection (d) Heap

3. 583 is related to 293 in the same way as 488 is related to \_\_\_\_

- (a) 291 (b) 378  
(c) 487 (d) 581

4. What should come in place of question mark (?) in the following number series?

132 156 ? 210 240 272

- (a) 196 (b) 182  
(c) 199 (d) 204

5. A girl introduced a boy as the son of the daughter of the father of her uncle. The boy is girl's

- (a) Brother (b) Son  
(c) Uncle (d) Son-in-law

6. If Z = 52 and ACT = 48, then BAT will be equal to

- (a) 39 (b) 41  
(c) 44 (d) 46

7. A man is facing north-west. He turns  $90^\circ$  in the clockwise direction, then  $180^\circ$  in the anticlockwise direction and then another  $90^\circ$  in the same direction. Which direction is he facing now?

- (a) South (b) South-west  
(c) South-east (d) East

8. In the following question, a matrix of certain characters is given. These characters follow a certain trend, row-wise or column wise. Find out this trend and choose the missing character accordingly.

1	7	9
2	14	?
3	105	117

- (a) 26 (b) 20  
(c) 16 (d) 12

9. If  $\times$  stands for 'addition',  $\div$  stands for 'subtraction',  $+$  stands for 'multiplication' and  $-$  stands for 'division', then  $20 \times 8 \div 8 - 4 + 2 = ?$

- (a) 80 (b) 25  
(c) 24 (d) 5

10. Arrange the words given below in a meaningful sequence.

1. Poverty 2. Population 3. Death  
4. Unemployment 5. Disease  
(a) 2, 3, 4, 5, 1 (b) 3, 4, 2, 5, 1  
(c) 2, 4, 1, 5, 3 (d) 1, 2, 3, 4, 5

11. What is the next number of the following sequence ?

21, 77, 165, 285, .....

- (a) 404 (b) 415  
(c) 426 (d) 437

12. Sam ranked 9th from the top and 38th from the bottom in a class. How many students are there in the class ?

- (a) 45 (b) 47  
(c) 46 (d) 48

*Space for Rough Work*

13. A bird lover was asked how many birds he had in the basket. He replied that there were all parrots but six, all pigeons but six, and all koel but six. How many birds he had in the basket in all ?
- (a) 8 (b) 18  
(c) 9 (d) 10
14. If FRIEND is coded as HUMJTK, how is CANDLE written in that code ?
- (a) EDRIRL (b) DCQHOK  
(c) ESJFME (d) DEQJOM
15. Find the odd one out
- (a) Flower : Petal (b) Circle : Arc  
(c) Cover : Page (d) Chair : Leg

## PART - II : MATHEMATICS

1. Rational numbers lying between 2 and 3 is/are:
- (a)  $\frac{5}{2}$  (b)  $\frac{1}{14}$   
(c) Both A and B (d) Neither A nor B
2. If the value of  $3 + 2x$  is equal to  $3 - 2x$ , then the value of  $5 + 3x$  is
- (a) 0 (b) 2  
(c) 3 (d) 5
3. The result of dividing a number of two digits by the number with digits reversed is  $\frac{5}{6}$ . If the difference of digits is 1, find the number.
- (a) 45 (b) 65  
(c) 87 (d) 67
4. A school collected Rs. 2304 as fees from its students. If each student paid as much rupees as there were students in the school, how many students were there in the school?
- (a) 48 (b) 50  
(c) 38 (d) 40
5. Find the compound, interest on 'Rs. 25000 for 3 years at 6% per annum compounded annually
- (a) 4128.30 (b) 4238.60  
(c) 4775.40 (d) 5239.50
6. Sneha bought a purse for Rs. 1000. She sold it to Neha at a gain of 6% and Neha sold it to Devi at a gain of 20%. How much did Devi pay for it?
- (a) Rs.1272 (b) Rs.1060  
(c) Rs.1256 (d) Rs.2000
7. The dimension of a metallic cuboid are  $100\text{cm} \times 80\text{cm} \times 64\text{cm}$ . It is melted and recast into a cube. Find the surface area of the cube.
- (a)  $3800\text{ cm}^2$  (b)  $38600\text{ cm}^2$   
(c)  $38400\text{ cm}^2$  (d)  $37200\text{ cm}^2$
8. The number of bricks of dimension  $15\text{cm} \times 25\text{cm} \times 7\text{cm}$  required to build a wall  $(3.5 \times 10 \times 12)\text{m}^3$  are
- (a) 160000 (b) 170000  
(c) 180000 (d) 200000
9. A conical tent is of diameter 12m at the base and its height is 8m. Find the area of the canvas ( $\text{in m}^2$ ) required to make the tent.
- (a) 188.57 m (b) 288 m  
(c) 400 m (d) 500 m
10. A number is increased by 10% and then it is decreased by 10%. What is the net increase or decrease?
- (a) 1% increase (b) 1% decrease  
(c) 2% increase (d) 2% decrease

*Space for Rough Work*

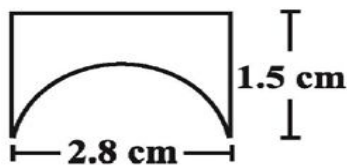
11. What per cent of an hour is 2 min?  
 (a) 3.2% (b) 3.3%  
 (c) 3.6% (d) 3.8%
12. Ravi and Sonu can do a job alone in 20 days and 30 days respectively. In how many days the job will be finished, if they work together?  
 (a) 10 days (b) 12 days  
 (c) 8 days (d) 13 days
13. Two pipes A and B can fill a tank in 24 hours and 30 hours respectively. The tank is emptied. How much time will be taken by them to fill it?  
 (a) 13 hours 20 min. (b) 16 hours 30 min.  
 (c) 14 hours 10 min. (d) 15 hours 40 min
14. Listed below are the temperatures in  $^{\circ}\text{C}$  for 10 days -6, -8, 0, 3, 2, 0, 1, 5, 4, 4. What is the range of the data?  
 (a)  $8^{\circ}\text{C}$  (b)  $13^{\circ}\text{C}$   
 (c)  $10^{\circ}\text{C}$  (d)  $12^{\circ}\text{C}$
15. The angles of quadrilateral are in the ratio 2 : 3 : 5 : 8. The smallest angle is  
 (a)  $60^{\circ}$  (b)  $40^{\circ}$   
 (c)  $20^{\circ}$  (d)  $50^{\circ}$
16. The ratio of two sides of a parallelogram is as 3 : 5, and its perimeter is 48 m, then the sides of the parallelogram is  
 (a) 9 m, 15 m (b) 3 m, 5 m  
 (c) 33 m, 25 m (d) none of these
17. If  $(3x - 2y) = 5$  and  $xy = 6$ . Find the value of  $27x^3 - 8y^3$   
 (a) 550 (b) 625  
 (c) 665 (d) 675
18. Simplify :  $(4x + 5y)(4x - 5y)$   
 (a)  $16x^2 - 25xy$  (b)  $16x^2 - 25y^2$   
 (c)  $16x^2 - 15y^2$  (d)  $16x^2 - y^2$
19. One of the equal sides of an isosceles triangle is 13 cm and length of the altitude drawn to unequal side is 5 cm. What is the area of the triangle?  
 (a)  $50 \text{ cm}^2$  (b)  $38 \text{ cm}^2$   
 (c)  $60 \text{ cm}^2$  (d)  $28 \text{ cm}^2$
20. How many solid lead balls of diameter 4 cm each can be made from a solid lead ball of radius 8 cm?  
 (a) 64 (b) 32  
 (c) 8 (d) 26
21.  $x - 1/x = 6$ , then find the value of  $x^2 + 1/x^2 = ?$   
 (a) 35 (b) 36  
 (c) 37 (d) 38
22. What will be the LCM of 32 and 48?  
 (a) 48 (b) 96  
 (c) 192 (d) 384
23. How many digits will be there in the cube root of 46656?  
 (a) 2 (b) 1  
 (c) 3 (d) 4
24. What is the smallest number by which 720 should be multiplied so that the product is perfect square?  
 (a) 5 (b) 4  
 (c) 3 (d) 2
25. The value of expression  $7a - 4b$  for  $a = 3$ ,  $b = 2$  is  
 (a) 13 (b)  $7a - 6b$   
 (c)  $21a - 8b$  (d) 29

Space for Rough Work

26. If  $x + y = 12$  and  $xy = 14$ , then the value of  $(x^2 + y^2)$  is

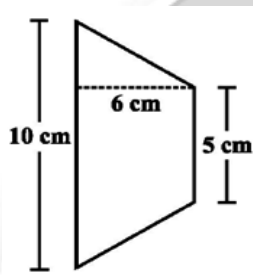
- (a) 144 (b) 158  
(c) 116 (d) none of these

27. The perimeter of the below figure is



- (a) 11.6 cm (b) 10.2 cm  
(c) 12.8 cm (d) none of these

28. The area of the given below figure is



- (a) 45 cm<sup>2</sup> (b) 11 cm<sup>2</sup>  
(c) 49 cm<sup>2</sup> (d) none of these

29. Value of  $(3^0 + 2^0) \times 5^0$  is

- (a) 1 (b) 25  
(c) 2 (d) 0

30. If  $\left(\frac{5}{3}\right)^{-5} \times \left(\frac{5}{3}\right)^{11} = \left(\frac{5}{3}\right)^{8x}$ , then the value of  $x$  is

- (a) 2 (b) 3/4  
(c) -1/2 (d) -2

31. Traveling 900 km by rail costs Rs. 280. What would be the fare for a journey of 360 km when a person travels by the same class?

- (a) Rs. 118 (b) Rs. 112  
(c) Rs. 119 (d) none of these

32. Find the number of diagonals of a 12-sided polygon.

- (a) 48 (b) 42  
(c) 54 (d) 60

33. If  $2(3x - 5) + 6(x - 7) = 7(x + 5) - 15$ , then what will be the value of  $x$ ?

- (a) 15.2 (b) 12.7  
(c) 14.4 (d) 7

34. 120 men have food provision for 200 days. After 5 days, 30 men died due to an cancer. How long will the remaining food last?

- (a) 260 days (b) 275 days  
(c) 250 days (d) none of these

35. On dividing  $x^3 + 3x^2 + 3x + 1$  by  $x$  we get remainder:

- (a) 1 (b) 0  
(c) -1 (d) 2

36. Factors of  $p^2 + 6p + 8$  are

- (a)  $(p + 2)(p - 4)$  (b)  $(p - 2)(p - 4)$   
(c)  $(p + 2)(p + 4)$  (d)  $(p - 2)(p + 4)$

37. Ordinate of the all the points on  $x$  - axis is:

- (a) 0 (b) 1  
(c) -1 (d) any number

38.  $\sqrt{50.41} + \sqrt{34.81} =$  \_\_\_\_\_.

- (a) 17 (b) 18  
(c) 13 (d) 12

39. A train 300m long crosses a pole in 15 s. Find the time train takes to cross a platform of length 180 m (in seconds)

- (a) 20 (b) 24  
(c) 30 (d) 26

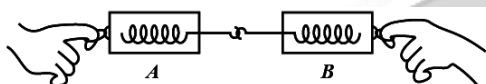
40. What will be the positive value of  $x$ , when  $4(x + 9)^2 = 676$ ?

- (a) 5 (b) 8  
(c) 4 (d) 6

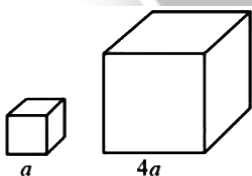
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## PART - III : PHYSICS &amp; CHEMISTRY

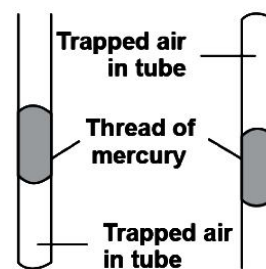
- A mountain climber experiences a nose bleed due to:
  - decrease in atmospheric pressure
  - increase in atmospheric pressure
  - more gravitational pull
  - None of these
- Consider two spring balances hooked as shown in the figure. We pull them in opposite directions. If the reading shown by A is 1.5 N, then the reading shown by B will be



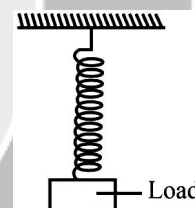
- 1.5 N
  - 2.5 N
  - 3.0 N
  - zero
- Air pressure is also known as atmospheric pressure. How is it caused?
    - By the heat energy in the air
    - By the wind that blows in the air
    - By water vapour in the air
    - By the air around us that presses on the surface
  - A cube of side 'a' rests on the floor as shown in the figure. Given that the pressure exerted by this cube on the floor is P, what is the pressure exerted by another cube of the same material of side 4a? (take  $g = 10 \text{ ms}^{-2}$ )



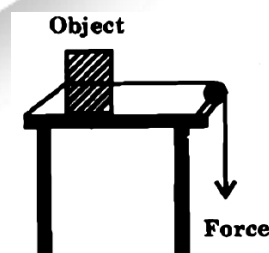
- P
  - 2P
  - 4P
  - 16P
- A thin tube contains a thread of mercury which traps air at the end of the tube. The other end of the tube is open to the atmosphere. When the tube is turned upside down, the volume of the trapped air increases. It is because \_\_\_\_.



- The air gets hotter when the tube is turned upside down
  - The atmosphere pushes less when it acts upwards on the mercury
  - The pressure in the trapped air is reduced
  - The trapped air molecules hit the mercury harder when travelling downwards
- Look at the diagram. When a weight of 100 g is hung from the spring, its length is 9 cm. When a weight of 150 g is hung from it, its length is 11 cm. What is the length of the spring when there's no weight hanging from it?



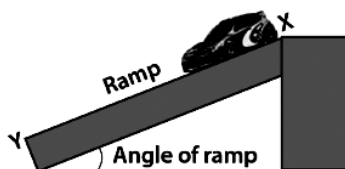
- 2 cm
  - 4 cm
  - 5 cm
  - 7 cm
- A force of 5 N is required to just move an object from rest. The value of static friction (f) is:



- 5 N
- $f > 5 \text{ N}$
- $f \leq 5 \text{ N}$
- 10 N

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8. A meteor burns up on entering earth's atmosphere due to:
- atmospheric pressure
  - heat of the earth
  - solar radiation
  - excessive friction
9. A toy car is released from point X of the ramp and travels towards point Y. What is/are the forces responsible for pulling the car towards point Y?



- Weight of the car
  - Earth's magnetic field
  - Frictional force between the wheels and the ramp
- (i) only
  - (i) and (ii) only
  - (ii) and (iii) only
  - All of these
10. A person is moving on a rough horizontal surface towards east. Then the direction of friction force on the person is towards
- West
  - East
  - North
  - South
11. The sound waves travel the slowest in –
- Dry air
  - Moist air
  - Liquid water
  - Ice
12. Two sound waves in air have frequency ratio 3:2. Then their wavelength ratio will be
- 1:3
  - 2:1
  - 2:3
  - 3:2

13. A bomb explodes on the moon. How long will it take for the sound to reach the earth?
- 10 seconds
  - 1000 seconds
  - 1 day
  - none of these
14. The amplitude of vibration and its frequency can change suddenly in a:
- pitch
  - musical sound
  - noise
  - all of the above
15. Which of the following are harmful effects caused due to noise pollution?
- Insomnia
  - Hypertension
  - Hearing impairment
- (i) and (ii) only
  - (ii) and (iii) only
  - (iii) and (i) only
  - (i),(ii) and (iii)
16. Which of the following applications of plastics show(s) that plastics are bad conductors of electricity?
- Refrigerators have an insulating wool of plastics.
  - Electric wires have a plastic coating.
  - Chemicals are stored in plastic containers.
  - Parachutes are made from plastics.
- II, III and IV only
  - III and IV only
  - I only
  - II only
17. Which one of the following is a fire-resistant plastic?
- Polythene
  - Polyvinyl chloride
  - Melamine
  - Bakelite

*Space for Rough Work*



18. Petroleum Conservation Research Association, under the Ministry of Petroleum and Natural Gas, does not encourage
- Driving at a very high speed
  - Maintenance of vehicle by regularly servicing
  - Maintaining correct levels of pressure in the tyres
  - Switching off the vehicle engine at traffic intersections
19. Which of the following petroleum components is used as a solvent for dry cleaning?
- Petrol
  - Kerosene
  - Paraffin wax
  - Lubricating oil
20. Assertion (A): Coal, petroleum and natural gas be prepared in the laboratory from dead organisms.  
Reason (R): They cannot be prepared in laboratory as their formation is a very slow process and conditions for their formation cannot be created in the laboratory.
- A is correct and R is the correct explanation of A.
  - A is correct and R is not the correct explanation of A
  - A is correct and R is wrong.
  - A is wrong and R is correct.
21. Riya found kitchenware which was resistant to fire and was able to tolerate heat better than other plastics, she wondered as to what could the material be. Can you guess the material?
- Melamine
  - Polythene
  - PVC
  - None of these
22. Which of the following substances can be used to extinguish a fire in an oil well?
- Water
  - Sand
  - Carbon dioxide
  - Sodium bicarbonate solution
23. 4.120 kg of a fuel was burnt to produce 178000 kJ of energy. The calorific value (in kJ/kg) of the fuel is
- $4.3203 \times 10^4$
  - $4.3203 \times 10^3$
  - $4.3203 \times 10^2$
  - $4.3203 \times 10$
24. What is the outcome of the release of carbon particles and smoke from factories?
- Increases the rate of respiration in plants.
  - Decreases the rate of photo- synthesis in plants.
  - Increases the absorption of carbon dioxide by plants.
  - Decreases the rate of transpiration in plants.
25. Identify the non-metal which exhibits yellow colour.
- Silicon
  - Phosphorus
  - Sulphur
  - Carbon
26. Which of the following non-metals exists in liquid state at room temperature?
- Chlorine
  - Nitrogen
  - Bromine
  - Hydrogen
27. Identify the metal that does NOT react with HCl
- Ag
  - Mg
  - Na
  - Fe
28. Identify the oxide of a non-metal which is neutral.
- $\text{SO}_2$
  - $\text{NO}_2$
  - $\text{P}_2\text{O}_3$
  - CO
29. Which of the following is called a noble metal?
- Mercury
  - Gold
  - Lithium
  - Caesium
30. Which of the following metals in their molten state cause galvanization of an iron article?
- Zinc
  - Copper
  - Carbon
  - Gold

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## PART - IV : BIOLOGY

1. Assertion (A): Grains should be dried properly before storing.  
Reason (R): Moisture content increases the chances of spoilage due to micro-organisms.  
(a) Both A and R are true and R is the correct explanation for A.  
(b) Both A and R are true and R is the not the correct explanation for A.  
(c) A is true and R is false  
(d) A is false and R is true
2. The salivary enzymes convert  
(a) simple sugars into complex sugars  
(b) proteins into amino acids  
(c) starch into simple sugars  
(d) fats into fatty acids and glycerol
3. In amoeba, digestion of food takes place inside  
(a) Stomach (b) Food pipe  
(c) Gizzard (d) Food vacuole
4. Peristalsis is  
(a) Assimilation of food  
(b) Contraction and expansion of muscles of oesophagus  
(c) Upward movement of digested food  
(d) Slow movement of water
5. The process of chewing of food is called  
(a) Mastication (b) Emulsification  
(c) Digestion (d) Ingestion
6. Hump of a camel is used to-  
(a) tread on the desert land  
(b) store food  
(c) store water  
(d) both b and c
7. Adaptation is-  
(a) Biotic and abiotic component of the environment.  
(b) Adjustment to environment  
(c) Living part of the environment  
(d) Impurities present in the environment
8. The big pieces of soil in the ploughed field are called  
(a) crumbs (b) flakes  
(c) lumps (d) all of these
9. Which one of the following cause(s) plant disease?  
(a) Viruses (b) Bacteria  
(c) Fungi (d) All of these
10. Chemical substances which are used to kill insects are called  
(a) fungicide (b) insecticide  
(c) weedicide (d) all of these
11. We get  $\text{CO}_2$  from sugar by the action of -  
(a) Bacterial (b) Algae  
(c) Fungi (d) Virus
12. Small pox is caused by  
(a) Virus (b) Bacteria  
(c) Housefly (d) Mosquito
13. The microorganism which has the ability to fix nitrogen is -  
(a) Virus (b) Euglena  
(c) Rhizobium (d) Amoeba
14. Soil erosion can be prevented by  
(a) increase in bird population  
(b) afforestation  
(c) over-grazing  
(d) removal of vegetation
15. A sperms combine with egg and to form  
(a) zygote (b) urethra  
(c) ovaries (d) testes

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## ADMISSION OPEN

### IIT-JEE

XI & XII

### NEET

XI & XII

### FOUNDATION

VI to X

## Courses Offered

1 & 2 YEAR  
**PRE-FOUNDATION**

CLASSES : VI to VIII

1 & 2 YEAR  
**IIT-JEE**  
CLASSES : XI & XII

**1 YEAR REPEATER  
& WEEKEND**

IIT JEE / NEET  
CLASSES : XII Pass &  
XII Running

1 & 2 YEAR  
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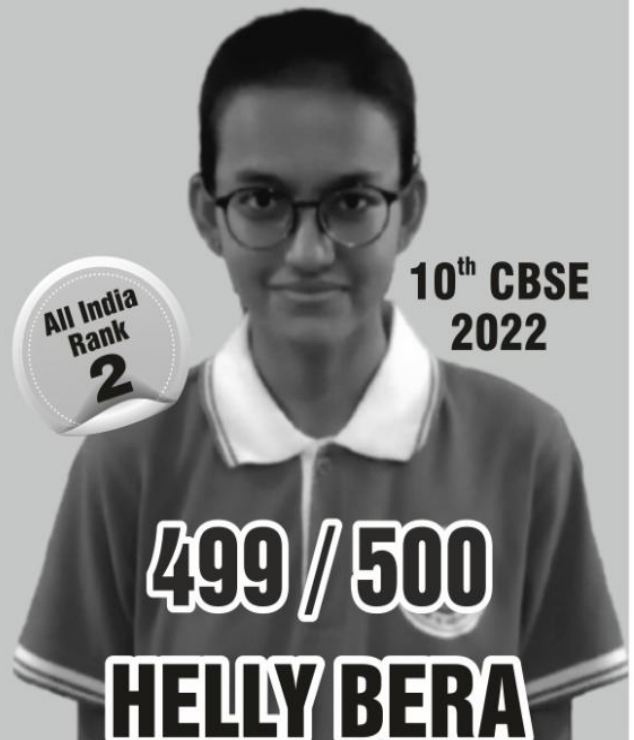
CLASSES : IX & X

1 & 2 YEAR  
**NEET**  
CLASSES : XI & XII

**CRASH COURSE  
(PCM / PCB)**

IIT JEE / NEET  
Just After XII Board  
Exam.

### GUJARAT TOPPER



### RESULT OF LAST 19 YEARS

# 939

in **JEE Advanced**

# 4802

in **JEE Main**

# 520

in **NEET**

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