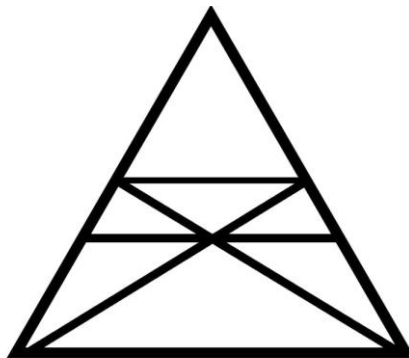




## Questions (Set-3)

1. Suppose you and your team of four scientists discover a small amount of a hypothetical resource, which could benefit both society and the scientific community. This resource could either be used to generate enormous amounts of energy to benefit society, or as a fuel to power rockets as it is very efficient. Two of the scientists want to share it with the community and the other two want to use it for society. As a scientist, what do you think is the most efficient way to use this limited resource? Can you think of any other way to resolve this conflict? Or do you agree with one group and why? And how would you work as a team to find a Consensus? - **(SB)**
2. A two-digit number is such that the sum of its digits is five times the difference of its digits. If the number exceeds the number formed by reversing its digits by 18. Find the number. -**(1M)**
3. In the given figure number of triangles are-**(3M)**



- (A) 20
- (B) 16
- (C) 17
- (D) 18



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4. Find the missing term **-(1M)**

2	6
80	24

3	?
120	36

- (A) 7                      (B) 8                      (C) 9                      (D) 10
5. A man wants to row to a place 308km along a stream from where he is right now. He uses a kayak with a speed of 18km/h in a lake while the speed of the stream in which he wants to row is 4km/h. How much time will he take to row to his destination and return back to where he was? **-(3M)**
- A) 32 hours  
B) 34 hours  
C) 36 hours  
D) 38 hours
6. The cost of a certain type of marble varies directly as the square root of its surface area when its thickness is constant. The cost of the same type of marble varies directly as the square of the thickness when the area is constant. If the cost of a marble slab of surface area is 1600 sq.cm and thickness 3cm is \$360, what is the cost of a marble slab of area 900 sq.cm and thickness 4cm? **-(5M)**
- A) \$360  
B) \$480  
C) \$540  
D) \$600
7. In a room there are 180 youngsters, 216 middle aged people and 324 old people. They are to be arranged in 'n' rows in such a way that each row has the same number of people and of the age group (i.e., youngsters, middle aged and old aged). Find the maximum value of n. **-(3M)**
8. If MASTER is coded as 26138402536 and GOVIND is coded as 142254481288, then how will BACKSPACE be coded as? **-(3M)**
- A) 4162238321625  
B) 5172339317125  
C) 4172393337125  
D) 5172933373215



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9. A bakery delivers cakes to a showroom. But in between 35% of the cakes were slightly damaged, 12% of the cakes were completely damaged and hence couldn't be sold. The slightly damaged cakes were sold for 69% of the original price. The bakery had the expectation that it would earn a profit of 25% by selling each cake at the marketed price. But now what is the percentage profit / loss margin in the whole consignment?-(5M)
- A) 9.6 profit
  - B) 19.2 profit
  - C) 9.6 loss
  - D) 19.2 loss
10. Six members of a family are X, Y, Z, U, V and W. One couple has a family of parents and their children. Z is the father of X and V is X's daughter. U is the daughter of W, who is V's mother. Which of the following couples are the couple's parents?   -(3M)
- A. ZW
  - B. XY
  - C. XW
  - D. YZ
11. Aditi wants to bake a cake in the oven for her mother's birthday. She has two-hour glasses to measure the time. With a 7-minute hourglass and a 3-minute hourglass, can you explain the quickest way to measure time for baking a cake for 8 minutes by Aditi. -(3M)
12. A line has a slope of  $m=2$ . The x-axis is now scaled down to 0.75 and the y axis is scaled up to 2. What is the new slope of the line? -(1M)
- (A)  $16/3$
  - (B) 8
  - (C)  $4/7$
  - (D) 2
13. Joe and John are playing marbles. If Joe loses one marble to John, they will both have the same number of marbles, but if John loses one marble to Joe, Joe will have twice the number of marbles as John. How many marbles do the two boys currently have?-(1M)



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14. The missing letters in columns from left to right in order are - **-(5M)**

A	I	T	M
Y	G		K
	E	P	
U	C	N	G

- A) Z,U,L
- B) W,R,L
- C) Z,R,I
- D) W,R,I

15. Read the following information and answer the following question carefully. “An employee working in an government organization, holding a very high post has recently sent a letter to the government stating that it is very wrong to retire a person while he/she is still capable of functioning well and that the age of retirement of all government employees should be extended to 65 years.” Which of the following **weakens** the statement made by the employee ? **-(3M)**

- (A) Many government organizations give a regular pension in order to help the employees with their payment in old age.
- (B) The number of educated unemployed youth is more than thrice the number of vacancies available in government organizations.
- (C) The trend of voluntary retirement in government organizations has led to a number of vacancies which remain unfilled due to strict recruitment criteria in these organizations
- (D) As transfers to various departments are a must in government organizations by the time a person reaches the age of retirement he/she has multi-dimensional experience.



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16. People travelling in city X face heavy traffic during peak hours which causes them delay and other difficulties"-A Survey

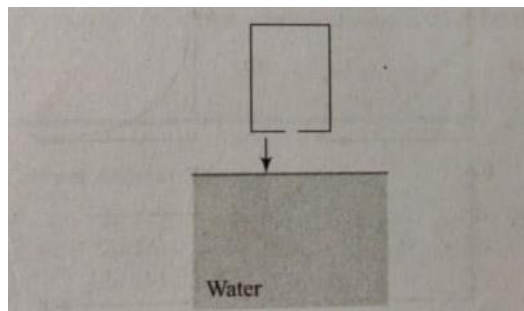
Which of the following may be a reason for the poor traffic condition in city X?

1. The number of vehicles on the road of city X has increased sustainability with a growth in the purchasing power of the people of city X
2. The scope of finding open spaces for parking has reduced remarkably over the last few years due to increased population of the city and this has led to unauthorised parking on road sides.
3. The State government has announced flexi timings policy for all government offices of the state. **-(3M)**

- (A) Both 1 and 2  
(B) Both 2 and 3  
(C) Only 1  
(D) Both 1 and 3  
(E) All of these

17. An empty container has a circular hole of radius  $r$  at its bottom. Now it's pushed into water slowly as seen in the below figure. Calculate the depth to which lower surface can be pushed so that water doesn't enter the container?

(Surface tension of water =  $T$  , Density of water =  $2\rho$ ) **-(3M)**



- (A)  $2T / \rho gr$   
(B)  $4T / \rho gr$   
(C)  $T / \rho gr$   
(D)  $T / 2\rho gr$



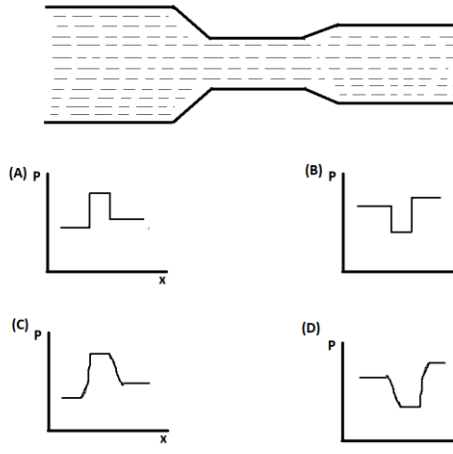
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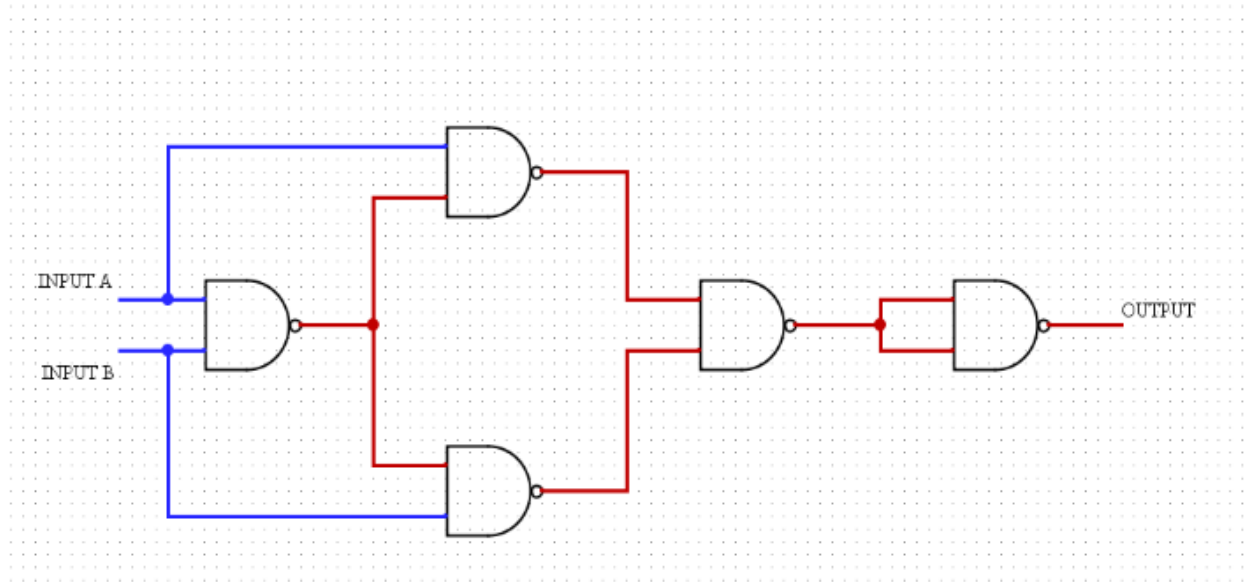
18. Water flows through a frictionless duct with a cross-section varying as shown in the figure. Pressure 'p' at points along the axis is represented by, **-(1M)**



19. Given that the orbit is circular, calculate the time period (in hours) of a satellite orbiting the Earth which is at a height of 20000 km. Given the mass of Earth to be  $5.98 \times 10^{24}$ . **-(2M)**



20. What is the output expression for the above circuit?-(2M)



- A)  $A'B + AB'$
- B)  $AB + A'B'$
- C)  $A + A'B$
- D)  $B + A'B$

21. A hypothetical gas( $\gamma=3/2$ ) is compressed to  $1/4$ th of its volume adiabatically. Then pressure of the gas changes by a factor of -(2M)

- (A) 4
- (B)  $1/4$
- (C) 8
- (D)  $1/8$



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## Answer Key

1. Common Question. Evaluated in the interview.
2. 64
3. (C) 17
4. (C) 9
5. (C) 36 hours
6. (B) \$480
7. 36
8. (A) 4162238321625
9. (C) 9.6 loss
10. (D) YZ
11. Start both the hourglasses together. Flip the 3-minute hourglass twice and once the 7-minute hourglass is emptied, flip the 3-minute hourglass again to measure 1 minute.  
Therefore,  $7+1 = 8$  minutes.
12. (D) 2
13. John = 5 ; Joe = 7
14. (D) W,R,I
15. (B)
16. (A)
17. (C)  $T / \rho g r$
18. Correct option isn't provided (Grace marks to all who have **attempted**)
19. 7.81 Hours
20. (B)  $AB+A'B'$
21. (C) 8