

## **SAMPLE QUESTION (QUESTION BOOKLET)**

### **Instructions**

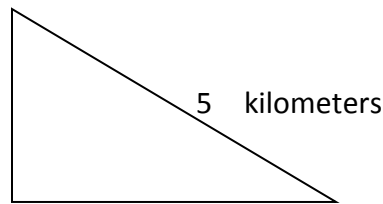
- A. You will have 55 minutes in which to work on this test, consisting of quantitative questions composed of mathematical concepts such as arithmetic, algebra, geometry, statistics, trigonometry, interpretations of graphs and tables.
- B. You will be given a separate answer booklet. Go through the questions (in the question booklet) carefully before you answer it. Question 1 to 23 is followed by five options for the correct answer. Choose only one correct answer from among the five choices. Follow the instructions given for Questions 24 to 30
- C. In the answer booklet shade your answer to the appropriate box of the relevant question with the pencil you have been provided with. You can erase any answer, but you have to erase it completely before you shade. Incomplete erasures may be read as intended answers. **Be sure that each mark is dark and completely fills the oval.** Mark only one answer to each question. No credit will be given for multiple answers. Do not be concerned if your answer sheet provides spaces for more answers than there are questions in each section.
- D. Your scores for the multiple-choice sections will be determined by the number of questions for which you select the best answer from the choices given. Questions for which you mark no answer or more than one answer are not counted in scoring. There will be no negative scoring for any incorrect answer. Therefore, to maximize your scores it is better for you to guess at an answer than not responding at all.
- E. Work as rapidly as you can without losing accuracy. Do not spend too much time on questions that are too difficult for you. Go on to the other questions and come back to the difficult ones later.
- F. There are several different types of questions; you will find special directions for each type in the test itself. Be sure you understand the directions before attempting to answer any question.
- G. Calculators or any calculating device is not allowed. Questions are given on one side of a page. You can write on the reverse side (blank page) of question booklet for any calculation.
- H. You are not allowed to discuss or talk during the test period. The question starts on page 2 of 10 pages of the question booklet.

1. A house cost Ms. Linda  $C$  dollars in 1989. Three years later she sold the house for 25% more than she paid for it. She has to pay a tax of 50% of the gain. (The gain is the selling price minus the cost.) How much tax must Ms. Linda pay?
- (A)  $(1/8)C$   
(B)  $(1/4)C$   
(C)  $(1/2)C$   
(D)  $C$   
(E)  $(2)C$
2. Find the value of:  $100.03 + 2.4 - 83.502$
- (A) 162.236  
(B) 180.532  
(C) 19.527  
(D) 20.437  
(E) 185.932
3. If  $A = \frac{1}{2}$  and  $B = 4 \cdot (\frac{3}{8})$ , what is the ratio of  $A : B = ?$
- (A) 1:1  
(B) 1:2  
(C) 1:3  
(D) 1:4  
(E) 2:5
4. If the length of a rectangle is increased by 20%, and the width of the same rectangle is decreased by 20%, then the area of the rectangle
- (A) decreases by 20%  
(B) decreases by 4%  
(C) is unchanged  
(D) increases by 20%  
(E) increases by 40%

5. Eggs cost 90C a dozen. Pepper cost 20c each. An omelet consists of 3 eggs and  $\frac{1}{4}$  of a pepper. How much will the ingredients for 8 omelets cost?
- (A) \$1.20  
(B) \$1.80  
(C) \$2.20  
(D) \$2.40  
(E) \$2.70
6. If the radius of a circle is increased by 6%, the area of the circle is increased by
- (A) 0.36%  
(B) 3.62%  
(C) 6.45%  
(D) 8.64%  
(E) 12.36%
7. For the integer  $N$ , if  $N^3$  is odd, which of the following statements is (are) true?
- I.  $N$  is odd  
II.  $N^2$  is odd  
III.  $N^2$  is even
- (A) I only  
(B) II only  
(C) I and II only  
(D) I and III only  
(E) II and III only
8. A circle graph shows how a technology company allocates its research and development budget: 14% microphotonics; 24% home electronics; 15% food additives; 29% genetically modified microorganisms; 8% industrial lubricants; and the remainder for basic astrophysics. If the arc of each sector of the graph is proportional to the percentage of the budget it represents, how many degrees of the circle are used to represent basic astrophysics research?
- (A)  $8^\circ$   
(B)  $10^\circ$   
(C)  $18^\circ$   
(D)  $36^\circ$   
(E)  $52^\circ$

9. If the average (arithmetic mean) of two number  $p$  and  $q$  is 210, and the average of  $q$  and  $r$  is 250, what is the difference between  $p$  and  $r$ ?
- (A) -40
  - (B) -80
  - (C) 60
  - (D) 100
  - (E) It cannot be determined from the information

10. The figure shows a land having a right triangular shape available for cultivation. If the hypotenuse 5 kilometers and the perimeter of the triangle is 12 kilometers, then what is the area of the land in square kilometers?



- (A) 2
  - (B) 3
  - (C) 4
  - (D) 5
  - (E) 6
11. If \$64 is 10 percent of 16 percent of a certain amount, what is the amount in \$?
- (A) 4000
  - (B) 3000
  - (C) 2000
  - (D) 1000
  - (E) 500
12. The table below shows the one-way driving distance, in miles between four cities: A, B, C, and D. For example, the distance between A and B is 200 kilometers. If the round trip between D and B is 32 kilometers further than the round trip between D and C, and the round trip between D and C is 48 kilometers less than the round trip between D and A, what is the value of P?

	A	B	C	D
A	0	200	260	320
B	200	0	220	P
C	260	220	0	Q
D	320	P	Q	0

- (A) 288
- (B) 312
- (C) 360
- (D) 400
- (E) 464

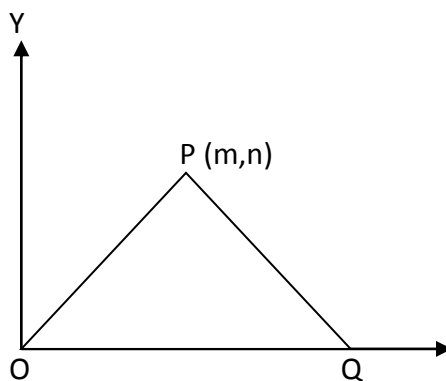
13. One hundred applicants for a job were given scores from 1 to 5 on their interview performance. Their scores are shown in the table below. What was the average score for the group?

Score	Number of Applicants
5	10
4	15
3	35
2	25
1	15

- (A) 2.20
  - (B) 2.50
  - (C) 2.80
  - (D) 3.00
  - (E) 3.20
14. A \$1,000 investment and a \$2,000 investment have a combined yearly return of 8% of the total of two investments. If the \$1,000 investment has a yearly return of 4%, what % yearly return does the \$2,000 investment have?

- (A) 7%
- (B) 8%
- (C) 9%
- (D) 10%
- (E) 11%

15. The average (arithmetic mean) of  $5X + 2$  and another number is  $3X$ . What is the average of the other number and  $X$ ?
- (A)  $X + 1$   
(B)  $X + 2$   
(C)  $4 - 3X$   
(D)  $2X + 3$   
(E)  $X - 1$
16. If  $\frac{9}{A} = 2$  and  $\frac{B}{2} = 3$ , then  $\frac{7+B}{A+2} = ?$
- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5
17. It is 185 miles from Binghamton to New York City. If a bus takes 2 hours to travel the first 85 miles, how many minutes must the bus take to travel the final 100 miles in order to average 50 miles an hour for the entire trip?
- (A) 102  
(B) 96  
(C) 85  
(D) 75  
(E) 60
18. If the area of the triangle POQ shown below is 2 square units, what are the co-ordinates of point Q?



- (A)  $(4/n, 0)$
- (B)  $(0, 4n)$
- (C)  $(n/2, 0)$
- (D)  $(2n, 0)$
- (E)  $(0, 2/n)$

19. A coin is tossed three times. What is the probability that it lands on tails *exactly* one time?

- (A) 0.125
- (B) 0.250
- (C) 0.333
- (D) 0.375
- (E) 0.500

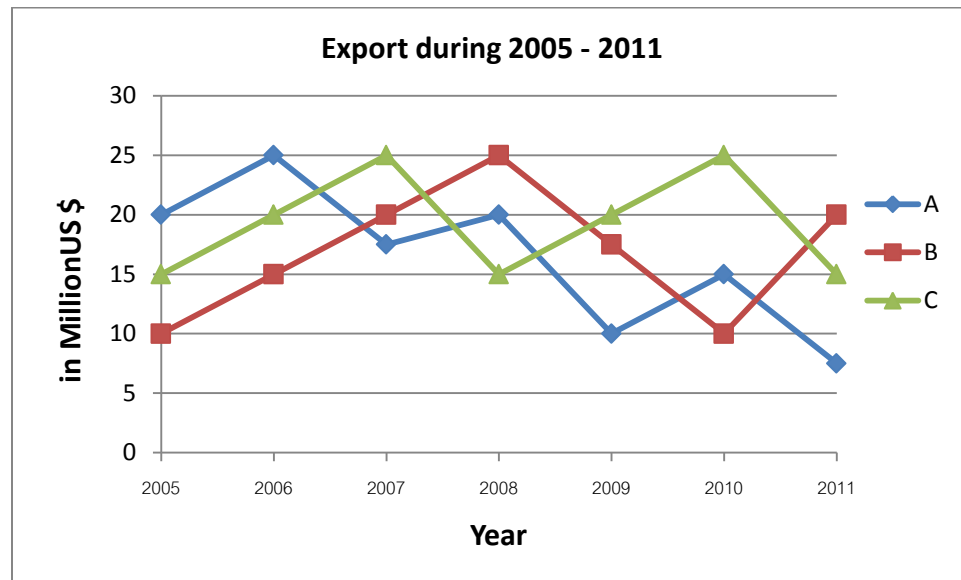
20. A public opinion survey explored the relationship between age and support for increasing the minimum wage. The results are summarized in the two-way table shown below.

	For	Against	No Opinion	Total
18-37	20	25	5	50
38-57	30	15	15	60
Over 58	50	30	10	90
Total	100	70	30	200

In the 18 to 37 age group, what percentage does not support increasing the minimum wage?

- (A) 25%
- (B) 40%
- (C) 50%
- (D) 60%
- (E) 75%

Study the following line graph showing the exports of three companies A, B and C during 2005 to 2011.



21. In which year was the sum of exports of Companies A and C the maximum?
- (A) 2005  
 (B) 2006  
 (C) 2008  
 (D) 2009  
 (E) 2010
22. In which year the difference between exports of Companies A and B was the highest?
- (A) 2007  
 (B) 2008  
 (C) 2009  
 (D) 2010  
 (E) 2011
23. In which year the difference between exports of companies B and C was the maximum?
- (A) 2006  
 (B) 2007  
 (C) 2008  
 (D) 2009  
 (E) 2010



## **DATA SUFFICIENCY PROBLEMS**

Each data sufficiency problem consists of a question and two statements, labeled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts, decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

For the data sufficiency problems, the answer choices are:

- A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- C. BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- D. EACH statement ALONE is sufficient.
- E. Statements (1) and (2) TOGETHER are NOT sufficient.

24. What is the value of  $p$ ?

- (1)  $p^2 < p^3$
- (2)  $p^4 = 81$

25. On a certain day of the week, a smart-phone dealer sold off  $\frac{3}{5}$  of the smart-phones on its lot (at the beginning of the week). If the smart-phones sold for an average of 500 each, how many smart-phones were on the dealer's lot at the beginning of the week?

- (1) The average value of the remaining smart-phones on the lot is \$400
- (2) The smart-phone dealer made \$ 3,600 in smart-phone sales over the week.

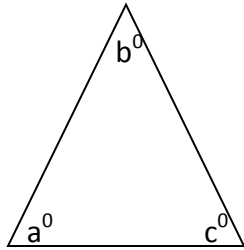
26. Two cyclists are racing up a mountain at different constant rates. Cyclist A is now 50 meters ahead of cyclist B. How many minutes from now will cyclist A be 150 meters ahead of cyclist B?

- (1) 5 minutes ago, cyclist A was 200 meters behind cyclist B.
- (2) Cyclist A is moving 25% faster than cyclist B.

27. If  $X + Y + Z = 72$ , what is the value of  $Y + Z$ ?

- (1)  $X=Y=Z$
- (2)  $X = 24$

28. Is the triangle shown below isosceles? (Figure not necessarily drawn to scale)



- (1)  $180^\circ - (a+c) = 60^\circ$   
(2)  $a = 2b - c$
29. What is the value of  $m-n$ ?
- (1)  $(m-n)^2 = 9$   
(2)  $n = m-3$
30. What is the area of rectangular region A?
- (1) Each diagonal of A has length 10.  
(2) The perimeter of A is 28.