



American
Mathematics Olympiad

PRIMARY 6 (GRADE 6) 2022 CONTEST PAPER

NAME: _____

Index Number:

SCHOOL: _____

--

INSTRUCTIONS:

1. Please **DO NOT OPEN** the contest booklet until the Proctor has given permission to start
2. TIME: **1 hour 30 minutes**.
3. There are 25 questions with 100 total points:
Section A: Questions 1 to 15 score 3 points each, no points are deducted for an unanswered or wrong answer.
Section B: Questions 16 to 20 score 5 points each, no points are deducted for an unanswered or wrong answer.
Section C: Questions 21 to 25 score 6 points each, no points are deducted for an unanswered or wrong answer.
4. Shade your answers neatly using a **2B lead pencil** in the Answer Entry Sheet.
5. PROCTORING: No one may help any student in any way during the contest.
6. No electronic devices capable of storing and displaying visual information are allowed during the course of the exam. Strictly **No Calculators** are allowed.
7. All students must fill and shade their **Name, School and Index Number** in the Answer Entry Sheet and Contest booklet.
8. MINIMUM TIME: Students must stay in the exam hall for at least 1 hour.
9. A student must show detailed working and transfer answers to the Answer Entry Sheet.
10. **No exam papers and written notes can be taken out by any contestant.**



SIU
CARBONDALE

SOUTHERN ILLINOIS UNIVERSITY
**STEM EDUCATION
RESEARCH CENTER**

ROUGH WORKING

Section A – 15 Multiple Choice Questions
3 points each

Question 1

Evaluate: $(5 \times 7 \times 2 \times 17) \div (14 \times 34 \times 35)$

- A. 14
- B. 0.71
- C. 0.071
- D. 17
- E. $\frac{1}{17}$

Question 2

What is the value of 0^1 ?

- A. 0
- B. 1
- C. ∞
- D. 10
- E. None of these

Question 3

A triangle has sides 35 cm, 37 cm, and 12 cm. Identify the type of triangle it is.

- A. Acute angle triangle
- B. Obtuse triangle
- C. Right-angled triangle
- D. It cannot be determined from knowing just the side lengths
- E. Open triangle

Question 4

A child gets \$10 pocket money every day. He saves \$1 on the first day, \$2 on the second day, \$3 on the third day, \$4 on the fourth day, and so on. On which day will he have saved enough to buy his sister a \$50 school bag?

- A. Day 50
- B. Day 25
- C. Day 9
- D. Day 10
- E. Day 5

Question 5

A photographer expands a photo diagonally in a software, to make it fit into a digital album. The bigger photo is neither squished nor stretched and looks proper. The original dimensions of the photo were 6 inches by 4 inches. Now the stretched photo is of the dimensions 12 inches by p inches. Find the value of p .

- A. 8 inches
- B. 12 inches
- C. 10 inches
- D. 2 inches
- E. None of the above

Question 6

How many lines of symmetry does a parallelogram have?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 0

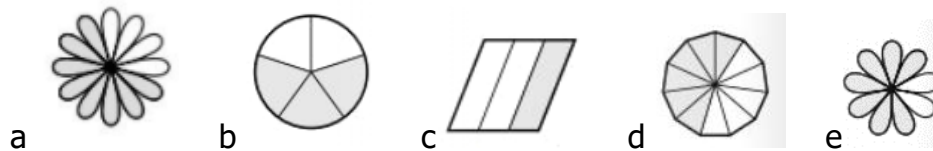
Question 7

Evaluate: $32.345 + 32.435 - 23.435$

- A. 88.215
- B. -23.435
- C. 41.345
- D. -23.525
- E. 23.345

Question 8

Assume that all sections within each of the given shapes are the same size. Consider only the area represented by the flower, the circle, etc. without including any surrounding area around it. Which figure has the smallest fraction of itself shaded?



- A. Shape a
- B. Shape b
- C. Shape c
- D. Shape d
- E. Shape e

Question 9

The number of shortest paths along a 3×3 grid from one corner to the diagonally opposite corner is:

- A. 1
- B. 2
- C. 3
- D. 6
- E. 12

Question 10

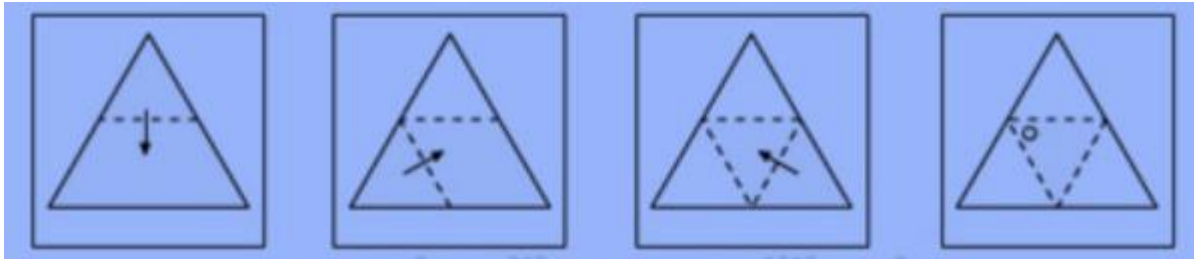
Look at the following table: Which two cars are going at the same speed?

	Distance traveled	Time taken to cover that distance
Car A	40 km	1 hour
Car B	30 km	2 hours
Car C	40 km	2 hours
Car D	20 km	30 minutes

- A. A & B
- B. B & C
- C. A & C
- D. A & D
- E. All are going at different speeds

Question 11

A paper is folded as shown below and punched in its folded state. When the paper is opened out again, what will be the pattern of holes formed?

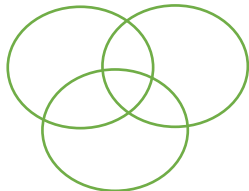


- A. 
- B. 
- C. 
- D. 
- E. None of these

Question 12

A sports club offers three sports – soccer, basketball and baseball. All their members play at least one sport. Which of the following Venn diagrams represents the members of the sports club? Assume that there are no limits to the number of sports one can play and that some people may be physically strong enough and able enough to play any or all sports.

A.



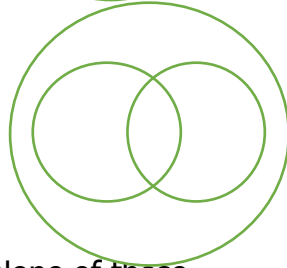
B.



C.



D.



E. None of these

Question 13

A rectangular park is to be fenced with a stone wall. There is a gate along the perimeter that is 2 m long, which is made of steel. Find the cost of fencing the park, if its dimensions are 100 m by 50 m. The entire perimeter may be taken to be the same height of 3 m. Take the cost of stone fencing as \$23 per m^2 and steel fencing as \$17 per m^2 .

- A. \$10,384
- B. \$6,900
- C. \$20,700
- D. \$456
- E. \$20,664

Question 14

How many three-digit natural numbers are divisible by 5? Natural numbers are positive integers starting from 1.

- A. 200
- B. 201
- C. 180
- D. 198
- E. 199

Question 15

The interest on \$1200 is more than the interest on \$1000 by \$30 in 3 years. Find the rate of interest for each year.

- A. 5%
- B. 6%
- C. 5.5%
- D. 4%
- E. Cannot be found

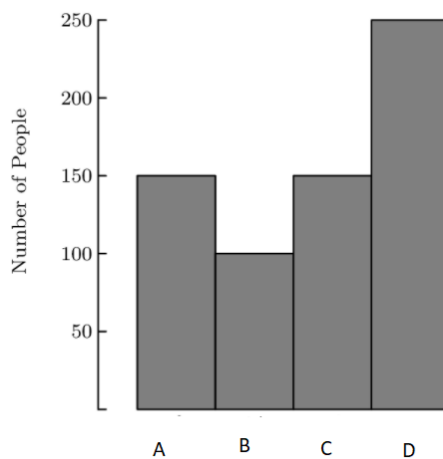
Section B – 5 Open-Ended Questions
5 points each

Question 16

Evaluate: $(45 \times 37 \times 27) \div 185$

Question 17

Several people were surveyed for their preference from 4 drinks A, B, C, D. All the people surveyed are represented in the graph below. If the fraction of people who preferred A to those who preferred D is $\frac{m}{n}$, what is $m + n$?



Question: 18

Find the smallest integer, which when divided by 7 gives a remainder of 0, but when divided by 10 gives a remainder of 1

Question 19

A steel cuboid is reshaped into a cube. Initially, its length, breadth, and depth were 270 cm, 100 cm, and 64 cm respectively. Find the sum of digits of the surface area of the cube.

Question 20

Two identical rectangular cards partially overlap. The area of overlap is a square with an area 4 cm^2 , and the total area of the regions of the faces of the two cards that do not overlap is 12 cm^2 . What is the area of one card?

Section C: 5 Open-Ended Questions
6 Points Each

Question 21

Find the sum of digits of the next number in the series:

11, 143, 2431, 46189, _____

Question 22

The mean of four consecutive odd numbers is 24. Find the sum of the middle two numbers in this set.

Solution:

Let the numbers be x , $x+2$, $x+4$, $x+6$,

$$\Rightarrow [x+(x+2)+(x+4)+(x+6)]/4 = 24$$

$$\Rightarrow 4x+12=96$$

$$\Rightarrow x = 21$$

The middle two numbers are 23, 25. Their sum is 48.

Answer: 48

Question 23

Find the largest four-digit number which when divided by 4, 7, and 13 leaves a remainder of 3 in each case.

Question 24

2^{400} can be equivalently written as a repeated product of the number 16. For example, $16 \times 16 \times 16 \times \dots$ (n times). What is the value of n ?

Question 25

Theo's football coaching starts at 6:30 am, and his mother wants him to wake up at 6 am to be on time for coaching. But currently, Theo wakes up late. Theo promises to wake up 5 minutes earlier than he did the day before. If Theo woke up at 6:50 am on a Sunday, and keeps his promise every day, on what day will he wake up on time for football coaching? Leave your answer as 0001 for Monday, 0002 for Tuesday, ..., and 0007 for Sunday.

ANSWER KEY

QUESTION 1	C
QUESTION 2	A
QUESTION 3	C
QUESTION 4	D
QUESTION 5	A
QUESTION 6	E
QUESTION 7	C
QUESTION 8	C
QUESTION 9	D
QUESTION 10	D
QUESTION 11	D
QUESTION 12	A
QUESTION 13	E

QUESTION 14	C
QUESTION 15	A
QUESTION 16	0243
QUESTION 17	0008
QUESTION 18	0021
QUESTION 19	0018
QUESTION 20	0010
QUESTION 21	0023
QUESTION 22	0048
QUESTION 23	9831
QUESTION 24	0100
QUESTION 25	0003