UNIVERSITY OF NEW BRUNSWICK

UNIVERSITÉ DE MONCTON

39th NEW BRUNSWICK MATHEMATICS COMPETITION

Friday, May 10th, 2024

GRADE 7

INSTRUCTIONS TO THE STUDENT:

1. Do not start the examination until you are told to do so.

2. You are permitted to use rough paper. No other aids are necessary.

3. This is a multiple-choice test. Each question is followed by five answers marked A, B, C, D, E. Only one is correct. When you have decided on your choice, mark the appropriate letter on your answer sheet using the pencil provided.

4. Problems are worth 3 points each in part A, 4 points each in part B, and 5 points each in part C. The penalty for incorrect answers is one quarter of the points assigned for that question. No penalty is assessed for answers which are left blank.

5. Diagrams are NOT drawn to scale. They are intended as aids only.

6. You have 60 minutes to answer the questions.

7. The use of calculators in the examination room is not allowed.

Part A

1. What is the value of the following numerical expression $\frac{1}{5} + \frac{1}{50} + \frac{1}{500}$?

   (A) 0.111 (B) 0.222 (C) 0.333 (D) 0.444 (E) 0.555

---

2. The value of $\frac{4}{4-\frac{4}{5}} + \frac{4}{4+\frac{4}{5}}$ is closest to :

   (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

---

3. When a natural number is divided by 8, the remainder is an odd number. This number could be

   (A) 18 (B) 24 (C) 53 (D) 74 (E) 86

---

4. The length of a metal rod increases by 4 mm each time the temperature is increased by 10 degrees. What would be the lengthening of the rod (in centimetres), if the temperature was increased by 150 degrees ?

   (A) 3 (B) 4 (C) 5 (D) 6 (E) 7

---

5. A car travels 80 km in 50 minutes. What is its speed in kilometers per hour ?

   (A) 76 (B) 86 (C) 96 (D) 106 (E) 116

---

6. Lina buys 3 millefeuille desserts and 4 tart desserts for \$50.30. If a millefeuille dessert and a tart dessert cost \$14.70, what is the price of a single tart dessert ?

   (A) \$5.30 (B) \$6.20 (C) \$7.10 (D) \$8.20 (E) \$8.50

---

7. In a Lucas sequence, the first two terms are 2 and 1. Each of the following terms is the sum of the two terms preceding it. Then the eighth term is equal to

   (A) 11 (B) 18 (C) 29 (D) 47 (E) 76

---

8. Olfa draws this large rectangle on the ground. She starts on the box with the value 2 and she jumps from one box to the next box provided that each time, the number increases by 4. On which number will she stop ?

2	5	8	11
6	10	14	17
24	23	18	21
20	19	22	25

(A) 14 (B) 19 (C) 21 (D) 22 (E) 24

9. The perimeter of a rectangular piece of land is 84 meters. If the width measures 2 meters less than the length, what is the width, in meters, of this land ?

(A) 10 (B) 20 (C) 30 (D) 40 (E) 50

10. If 40 % of a number X is 10 % of another number Y, then $\frac{X}{Y}$ is

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) 1 (D) 2 (E) 4

Part B

11. The average of two numbers is 9. When a third number is added, the average becomes 8. What is this third number ?

(A) 3 (B) 5 (C) 6 (D) 7 (E) 8

---

12. Currently, Paul's age is three times his son's age and 5 years ago Paul's age was 5 times his son's age. What is the sum of Paul and his son current ages ?

(A) 30 (B) 35 (C) 40 (D) 45 (E) 50

---

13. Justin had some money. He used half of that money to buy a book. Then he gave half of the rest to his sister Audrey, and finally he used half of what was left to buy a game for his cat. Justin has \$5 left, how much money did Justin have at the beginning ?

(A) \$20 (B) \$40 (C) \$60 (D) \$80 (E) \$100

---

14. We have two car rental agencies. The first agency charges \$60 per day, plus \$0.25 per kilometer, and the second charges \$45 per day, plus \$0.45 per kilometer. If a car is rented for a day in each of these agencies, at how many kilometers will the overall rental price be the same for both agencies ?

(A) 50 km (B) 75 km (C) 100 km (D) 125 km (E) 150 km

---

15. Three children share 42 cm of yarn. Bob takes 4 cm more yarn than Carla. Alix takes 5 cm less yarn than Bob. What is the length of yarn did Bob take ?

(A) 14 cm (B) 15 cm (C) 16 cm (D) 17 cm (E) 18 cm

---

16. A man's will leaves \$560,000 to his family. According to his will, his money is to be divided as follows : His three children have equal shares, while his wife and sister each have half the share of one child. What is his wife's share ?

(A) \$50,000 (B) \$60,000 (C) \$70,000 (D) \$80,000 (E) \$90,000

---

17. In a school, the number of students in grade five is 5 times the number of students in grade six. Knowing that the number of students in the grade 6 is 45, what is the total number of students in these two grades of this school ?

(A) 180 (B) 230 (C) 270 (D) 310 (E) 370

18. What is the next term in the sequence of numbers 12, 7, 35, 40, 8, 3, ...?

(A) 8 (B) 15 (C) 20 (D) 25 (E) 30

19. Bilal ate 150 cookies in 6 days. Everyday, he eats 8 more cookies than the previous day. How many cookies did he eat on the first day ?

(A) 5 (B) 8 (C) 12 (D) 16 (E) 20

20. Let the number made up of 2024 digits and which is obtained by juxtaposing the digits of the number 2024 : 202420242024.....2024.
What is the maximum number of digits that must be removed from this number to have a new number whose sum of its digits is 2024 ?

(A) 506 (B) 1012 (C) 1518 (D) 2024 (E) 4048

Part C

21. A group of 16 tourists wants to spend the night in a hotel. The hotel offers rooms with 3 single beds for \$150 a night and rooms with 5 single beds for \$200 a night. If each person occupies a single bed, what is the least this group of tourists have to pay to spend the night in this hotel ?

(A) \$600 (B) \$700 (C) \$900 (D) \$1,100 (E) \$1,300

---

22. A car leaves Moncton towards Halifax at a speed of 120 km/h. Taking the same path in the opposite direction, another car leaves at the same time from Halifax towards Moncton at a speed of 100 km/h. Knowing that the distance on this path between the two cities is 253 km, after how long will the two cars pass each other ?

(A) 49 minutes (B) 69 minutes (C) 75 minutes (D) 80 minutes (E) 89 minutes

---

23. The sum of the eight digits of the date 05/10/2024 is equal to 14 (14=0+5+1+0+2+0+2+4). How many dates in 2024 have the sum of their eight digits equal to 27 ?

(A) 0 (B) 3 (C) 5 (D) 10 (E) 15

---

24. In a class, 2/5 of the students are boys. If 1/3 of the girls in this class wear glasses, what proportion of the students in the class are girls who wear glasses ?

(A) 1/3 (B) 2/3 (C) 1/5 (D) 2/5 (E) 3/5

---

25. How many ways can we write 10 as the sum of three positive integers, which can be repeated, but the order in which the sum is written is not important ? For example, $10 = 1 + 4 + 5$ is one of these sums and is the same sum as $10 = 4 + 1 + 5$.

(A) 5 (B) 6 (C) 7 (D) 8 (E) 10

---

26. Five boys weigh themselves in pairs, trying all the possible combinations. The different measurements obtained are : 90 kg, 92 kg, 93 kg, 94 kg, 95 kg, 96 kg, 97 kg, 98 kg, 100 kg and 101 kg. What is the total weight of the five boys ?

(A) 225 kg (B) 239 kg (C) 539 kg (D) 956 kg (E) 1274 kg
