UNIVERSITY OF NEW BRUNSWICK
and
UNIVERSITÉ DE MONCTON

JUNIOR HIGH SCHOOL MATHEMATICS COMPETITION

May 25, 1990

GRADE 8

PART A

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1. During the school fair, the student council sold lemonade at 25 cents for each 260 ml. glass. Altogether they sold 420 glasses. The lemonade was purchased at a cost of 60 cents per liter. How much profit did the student council make?

    (A) \$33.18   (B) \$39.48   (C) \$65.52   (D) \$105   (E) none of the previous answers

2. The six students on a team shake hands with one another before a game. How many handshakes are there in all?

    (A) 10   (B) 15   (C) 16   (D) 20   (E) 36

3. In a televised quiz show, one wins 250 points for a correct answer, but looses 150 points for an incorrect answer. One contestant replied to 15 questions and obtained 2150 points. How many correct answers did she give?

    (A) 4   (B) 9   (C) 11   (D) 15   (E) none of the previous answers

4. Two candidates run in an election for president of a union. The winner obtains 75% of the votes and a majority of 154 votes. How many people voted?

    (A) 77   (B) 231   (C) 275   (D) 308   (E) none of the previous answers

5. A pair of jeans now on sale for \$32 has been reduced by 15% of its original cost. A sweater sells at 50% of its regular price of \$14.50. How much must you pay to buy both items?

    (A) \$12.05   (B) \$34.45   (C) \$39.25   (D) \$46.50   (E) none of the previous answers

6. One needs 4221 digits to number the pages of a book. How many pages does this book contain?

(A) 1108   (B) 1246   (C) 1332   (D) 1533   (E) none of the previous answers

7. A palindromic number reads the same back to front as front to back - like 3443. How many 3 digit palindromic numbers are there?

(A) 90   (B) 10   (C) 9   (D) 81   (E) 100

8. In 1988, Betty's birthday was on a cold Wednesday in January. In 1993, on what day will her birthday occur?

(A) Sunday   (B) Monday   (C) Tuesday   (D) Wednesday

(E) not enough information given

9. A prime is a whole number (larger than 1) whose only factors are 1 and itself. How many primes less than 100 have 3 as a digit?

(A) 14   (B) 10   (C) 11   (D) 2   (E) 9

10. Several pennies lie flat on a table. How many can be made to touch one particular penny?

(A) 4   (B) 5   (C) 6   (D) 7   (E) 8

PART B

11. It takes a child 90 seconds to climb the 60m. length of an escalator which is not working. When in operation, the escalator lifts a passenger from bottom to top in 60 seconds. How long does it take the child to cover the 60 meters, if she walks on the moving escalator?

    (A) 30 sec.   (B) 36 sec.   (C) 40 sec.   (D) 45 sec.   (E) 50 sec.

12. Isabelle has in her hand some pennies, nickels and dimes totalling 80 cents. If she has 15 coins and as many pennies as nickels, how many dimes does she have?

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

13. How many triangles are there in the following figure?
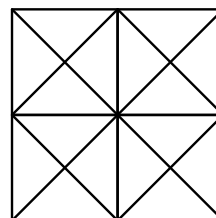
    (A) 20   (B) 32   (C) 36   (D) 40   (E) 44

14. A ladder 10m. long runs from the top of a wall to a point 6m. out from the foot of the wall. How high is the wall?

    (A) 7m.   (B) 8m.   (C) 9m.   (D) $2\sqrt{34}$ m.   (E) none of the previous answers

15. The base of a rectangle exceeds its height by 4 cm., and its perimeter by 40 cm. What is its area?

    (A) 90   (B) 92   (C) 94   (D) 96   (E) 98

16. In a woodlot a forest engineer has found that 3000 trees are ready for cutting. In this woodlot 40% of the trees are conifers, and 60% are "leafy" trees. Also 62% of the leafy trees are maples, while 25% of the conifers are pines. Altogether, how many maples and pines can be cut?

    (A) 1326   (B) 1416   (C) 1500   (D) 2610   (E) none of the previous answers

17. The edge of a sugar cube is about 1 cm. Roughly how many sugar cubes could you put in a dry, empty swimming pool which measures 25m. by 10m. by 5m.?

    (A) 125,000   (B) 500,000   (C) 50,000,000   (D) 1,250,000,000   (E) 50,000,000,000

18. George washes a car in 30 minutes and Marie washes the same car in 45 min. How many minutes will it take both working together to wash the car?

   (A) 25   (B) 20   (C) 37.5   (D) 15   (E) 18

19. A dog runs along a path near a square garden with side length 10m. It runs once around always staying exactly 1m. from the edge of the garden. To the nearest meter, how far does the dog run?
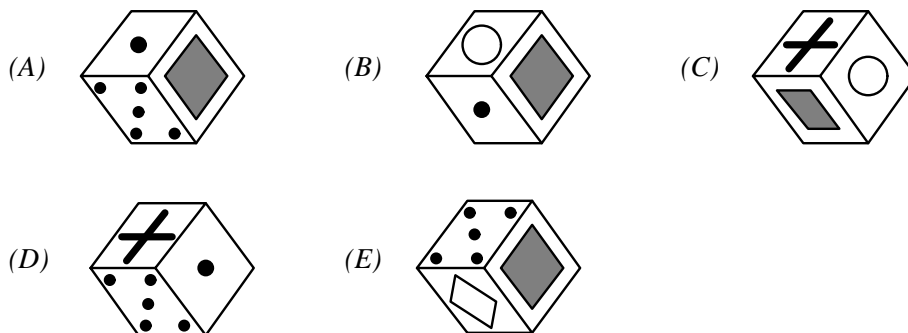
   (A) 40m.   (B) 44m.   (C) 46m.   (D) 48m.   (E) 50m.

20. A basketball team has won 30 games of 40 played. How many of the remaining 30 games must it win to have a 80% win record for the season?

   (A) 30   (B) 15   (C) 25   (D) 26   (E) 10
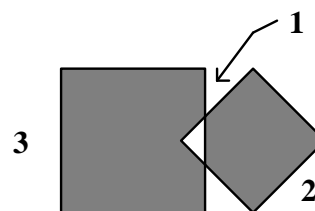
PART C

21. Just one of the following five pictures of the same cube is impossible. Which picture is impossible?

(A)

(B)

(C)

(D)

(E)

22. The average of the first 999,999 positive integers is

(A) 500,000   (B) 900,000   (C) 999,000   (D) 1,000,000   (E) 1,000,001

23. What is the difference between the areas of the shaded portions of the two squares?

(A) 1   (B) 5   (C) 8   (D) 2.5   (E) not enough information given

24. Evaluate the product of the following fractions:

$$\frac{\frac{1}{2}-\frac{1}{3}}{\frac{1}{3}-\frac{1}{4}} \cdot \frac{\frac{1}{4}-\frac{1}{5}}{\frac{1}{5}-\frac{1}{6}} \cdot \frac{\frac{1}{6}-\frac{1}{7}}{\frac{1}{7}-\frac{1}{8}} \cdot \ldots \cdot \frac{\frac{1}{98}-\frac{1}{99}}{\frac{1}{99}-\frac{1}{100}}$$

(A) $\frac{1}{2}$ (B) 2   (C) 0.02   (D) 50   (E) $\frac{1}{100}$

25. You are told that certain unknown positive integers p, q, r, s satisfy $\frac{p}{q} = \frac{r}{s}$. Which of the following statements must be true?

(A) $\frac{p}{s} = \frac{r}{q}$

(B) $\frac{p}{r} = \frac{s}{q}$

(C) $\frac{p}{q} = \frac{p+r}{q+s}$

(D) $\frac{r}{s}$ doesn't equal $\frac{r-p}{s-q}$

(E) None of (A), (B), (C), (D).

26. Mary buys 100 candies for $7.00. If Yips cost 5 cents each, Gups 6 cents each and Pips 7 cents each, how many more Pips than Yips did Mary buy?

(A) 50   (B) 60   (C) 70   (D) 100   (E) not enough information given