Note:

☐ Make sure to write all your answers on the answer sheet. Only the answer sheet will be graded.
☐ Each question only has one correct answer.
☐ Print your name clearly and legibly below.

Name ___________________
Code ___________________
Room ___________________
Time End ________________
1. \(0 \times 100 + 100 \times 10 + 0 \times 10 + 1 = \) __.
   A. 110  B. 1111  C. 1011  D. 1001  E. 1101

2. If my bad hair day began 700 minutes before 7:20 pm, then my bad hair day began at __.
   A. 1:40 pm  B. 1:00 pm  C. 7:40 am  D. 9:00 am  E. 7:00 am

3. \(150 + 250 + 350 + 450 + 550 = 10 \times \) __.
   A. 160  B. 175  C. 165  D. 185  E. 190

4. Of the whole numbers 1, 2, 3, …, 98, 99, how many are greater than the sum of their digits?
   A. 88  B. 89  C. 91  D. 90  E. 99

5. 3 is a prime number, so October 3rd is a prime day. In all, October has __ prime days.
   A. 9  B. 10  C. 11  D. 12  E. 13

6. 500 nickels + 25 dimes + 75 pennies = ___ quarters.
   A. 113  B. 24  C. 104  D. 33  E. 48

7. If a square’s side-lengths are integers, its perimeter couldn’t be __.
   A. 104  B. 12  C. 8  D. 15  E. 24

8. \(\sqrt{169} = \sqrt{16} + \sqrt{x}\), then \(x = \)__.
   A. 49  B. 64  C. 81  D. 100  E. 153

9. By how much does the sum 19 + 28 + 37 + 46 + 55 + 64 + 73 + 82 + 91 exceed the sum 18 + 27 + 36 + 45 + 54 + 63 + 72 + 81 + 90?
   A. 9  B. 10  C. 81  D. 90  E. 100
10. What’s the largest odd factor of 243?
A. 81  B. 243  C. 27  D. 9  E. 3

11. The smallest whole multiple of 10 that’s greater than $8 \times 8 \times 8$ is ___.
A. $5.2 \times 10$  B. $52 \times 100$  C. 520  D. $26 \times 10 + 30$  E. $5.2 \times 100 + 10$

12. Uncle Wang eats two books a week; Aunt Wang eats one book every two months. In a year, Uncle eats ___ more books than Aunt.
A. 45  B. 20  C. Between 80 and 96  D. Between 97 and 101  E. Greater than 101

13. At most how many students can sit in a row of 33 chairs, if seated students must be separated by at least one empty chair?
A. 19  B. 17  C. 18  D. 16  E. 15

14. In a rectangle with perimeter 40 cm and area 36 cm$^2$, the longer side’s length is ___ cm more than that of the shorter side.
A. 4  B. 6  C. 18  D. 10  E. 16

15. If $x \otimes y = \frac{x + y}{x - y}$, then $(3 \otimes 5) \otimes 4 =$ ___.
A. 0  B. $-1$  C. $-2$  D. 2  E. 1

16. Carlos Montado was born on Saturday, November 9, 2011, on what day of the week will Carlos be 708 days old?
A. Sunday  B. Monday  C. Tuesday  D. Wednesday  E. Friday

17. If the sum of two whole numbers is 36 more than their difference, then one of them must be ___.
A. 9  B. 12  C. 18  D. 24  E. 15
18. \((x^2 - 4y^2)(2x^2 - 3x + 1) = \)____.
A. \((x + 2y)(x - 2y)(x + 1)(2x + 1)\)
B. \((x + 2y)(x - 2y)(x - 1)(2x - 1)\)
C. \((x + 2y)(x + 2y)(x - 1)(2x + 1)\)
D. \((x + 2y)(x - 2y)(x + 1)(2x - 1)\)
E. \((x + 2y)(x - 2y)(x + 2)(2x + 1)\)

19. A square with a perimeter of 32 is split into 8 identical triangles, as shown, what’s the sum of the areas of 3 shaded triangles?

A. 12  B. 20  C. 32  D. 24  E. 40

20. Today is my birthday. My age, today, in months, is 72 times my age 5 years ago, in years. My age today, in years, is ____.
A. 6  B. 7  C. 8  D. 9  E. 12

21. At most ____ circles of radius 1 with non-overlapping interiors can fit inside a square with side-length 6.
A. 8  B. 10  C. 9  D. 11  E. 12

22. \(\sqrt[3]{81 \times 81 \times 81} = \)____.
A. 3  B. 9  C. 27  D. 36  E. 81

23. Of 2011 integers whose product is even, at most ____ can be odd.
A. 0  B. 1  C. 2009  D. 2010  E. 2011
24. Which of these numbers equals one-ninth of its own reciprocal?

A. 3  B. $\frac{1}{3}$  C. 9  D. $\frac{1}{9}$  E. $\frac{1}{6}$

25. In the figure shown, there are parallelograms of many sizes. How many total parallelograms are there in the diagram?

![Parallelogram Figure]

A. 4  B. 6  C. 8  D. 9  E. 5

26. In a rectangle $ABCD$, \[
\frac{\text{the area of } \triangle ADE}{\text{the area of quadrilateral } ABCE} = 1.
\] What’s the ratio of the length of segment $DE$ to the length of segment $CE$?

![Rectangle Figure]

A. $\frac{2}{3}$  B. $\frac{3}{4}$  C. $\frac{1}{3}$  D. $\frac{2}{5}$  E. $\frac{5}{2}$

27. Ten years ago, the sum of the ages of Ted and his twin brother Todd was 22. How old is Ted now?

A. 15  B. 16  C. 21  D. 32  E. 42
28. \((11^3 - 5^3) - (11^2 - 5^2) = \) ___.
A. 1110  
B. 1060  
C. 1070  
D. 1080  
E. 1090

29. The sum of three consecutive odd integers is –159. What’s the difference of the largest and the smallest integers?
A. 2  
B. 4  
C. –50  
D. –52  
E. –54

30. Given \(a = 2\) and \(b = 3\), find \(x\) if \(x = (\frac{1}{a} - \frac{1}{b}) \div (\frac{3}{4a} - \frac{3}{4b})\).
A. 0.75  
B. 1.6  
C. 0.6  
D. 1.3  
E. None of them

31. If \((4^x)(16) = 256\). What’s the value of \(x\)?
A. 16  
B. 4  
C. 1  
D. 2  
E. 8

32. If \(\frac{5}{33}\) is expressed in decimal form, what digit is in the 94th place to the right of the decimal point?
A. 1  
B. 3  
C. 5  
D. 2  
E. 4

33. The quotient of two consecutive positive integers is 1.05. What’s the product of these two integers?
A. 41  
B. 43  
C. 210  
D. 360  
E. 420

34. What’s the value of \(a + f + d - b - c - e\)?
A. 0  
B. 90  
C. 180  
D. 360  
E. 720
35. All the even integers between 11 and 2011 are multiplied together. The last digit [units digit] of the product is

A. 0  B. 2  C. 4  D. 6  E. 8

36. It takes 10 toothpicks to build the 1st figure as shown, and 15 toothpicks to build the 2nd one. How many toothpicks are needed to build the 7th figure?

![Images of toothpick figures]

A. 38  B. 44  C. 45  D. 40  E. 46

37. A right triangle $ABC$ has sides of 5, 12, and 13. The width of a rectangle, whose area is equal to the area of the triangle, is 5. The perimeter of this rectangle is ___.

A. 14  B. 22  C. 24  D. 28  E. 36

38. What’s the total number of turns that the hour hand, minute hand, and second hand go around a circular clock in one day?

A. 144  B. 733  C. 1466  D. 1440  E. 86400

39. $0.01\% = 1\% - \_\_\_\_$.

A. 9.9%  B. 99%  C. 0.09  D. 0.99%  E. 0.99
40. $4^3 \cdot 4^3 = \_\_\_.$

A. $16^9$  B. $16^6$  C. $4^9$  D. $4^6$  E. $8^3$

TIE BREAKER PROBLEMS:

41. Consecutive letters of the alphabet, starting with A, are given increasing consecutive integer values. If $H + K + L = 2011$, then the average of all 26 of the consecutive integers is \_\_\_.

A. 650  B. 673.5  C. 655.5  D. 663  E. 670

42. What’s the last digit [units digit] of $13_{2011}$

A. 3  B. 1  C. 9  D. 7  E. 5