IIUM Mathematics Competition (IMC 2018)

FINAL ROUND
MULTIPLE CHOICE QUESTIONS

19th September 2018
1 HOURS (11.50 am - 12.50 pm)

Name : _____

I/C No. : _____

INSTRUCTIONS TO STUDENTS:

ARAHAN UNTUK PELAJAR:

1. This question paper consists of 4 printed pages with **10 questions**.
2. Answer **ALL** questions in the given Objective Answer Sheet.
3. Students are allowed to use pencil, pen, eraser, and ruler **ONLY**.
4. Students are **NOT** allowed to bring a book, calculator, briefcase, hand phone, protractor, compass, etc.
5. Students are **NOT** allowed to discuss the questions during the examination.

1.   If $(3x^2 - 2x - 1)^4 = a_8 x^8 + a_7 x^7 + \cdots + a_1 x + a_0$, then $a_7 + a_5 + a_3 + a_1$ equals

   Jika $(3x^2 - 2x - 1)^4 = a_8 x^8 + a_7 x^7 + \cdots + a_1 x + a_0$, maka $a_7 + a_5 + a_3 + a_1$ sama dengan

   (A) 256   (B) -256   (C) 128   (D) -128   (E) 0

2.   If for a given operation $\otimes$, it is known that
   Jika diberi suatu operasi $\otimes$, dan ianya dikenali sebagai

$$2 \otimes 4 = 20$$
$$3 \otimes 2 = 11$$
$$4 \otimes 3 = 67$$

   find the result of $5 \otimes 2$
   cari hasil bagi $5 \otimes 2$

   (A) 23   (B) 24   (C) 25   (D) 26   (E) 27

3.   How many couples of positive integers (n, k) have the property that $1=6n-3k$?
   Berapa banyak pasangan integer positif (n, k) yang mempunyai ciri 1=6n-3k?

   (A) 0   (B) 1   (C) 2   (D) 3   (E) infinitely many
                                                                        tidak terhingga banyak

4.   What is 50% of 60% of RM 70?
   Berapakah nilai 50% daripada 60% daripada RM 70?

   (A) RM35   (B) RM28   (C) RM21   (D) RM14   (E) RM7

5.   Two sides of an isosceles triangle are 18 and 41. Compute the area of the triangle.
   Panjang dua sisi sebuah segitiga bersudut tegak ialah 18 dan 41. Kira jumlah luas permukaan segitiga tersebut.

   (A) 340   (B) 360   (C) 380   (D) 420   (E) 440

6. If the digit 4 is replaced by the digit 3 in each of the numbers below, which number is reduced by the largest amount?

Jika digit 4 digantikan dengan digit 3 dalam setiap nombor-nombor di bawah ini, yang manakah dikurangkan dengan amaun yang paling banyak?

  (A) 45678   (B) 87654   (C) 95400   (D) 74000   (E) 99949

7. What is the value $2^8 \div 8^2$?

Apakah nilai $2^8 \div 8^2$?

(A) 8   (B) 4   (C) 1   (D) $\dfrac{1}{4}$ (E) $\dfrac{1}{8}$

8. Which of the following is midway between $\dfrac{1}{4}$ and $\dfrac{1}{8}$?

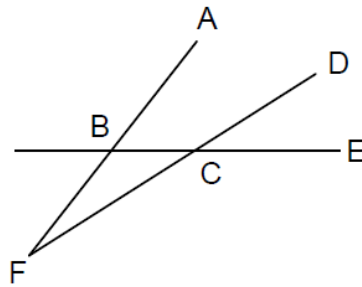*Nombor yang manakah di pertengahan antara $\dfrac{1}{4}$ dan $\dfrac{1}{8}$?*

(A) $\dfrac{1}{32}$ (B) $\dfrac{1}{16}$ (C) $\dfrac{3}{32}$ (D) $\dfrac{3}{16}$ (E) $\dfrac{7}{32}$

9. Between which of the following pairs of numbers is there the greatest difference?
Pasangan nombor yang manakah mempunyai perbezaan yanga paling besar?

(A) -3,8   (B) -5,-13   (C) 1,11   (D) 4, -5   (E) 6,-15

10. If the angle ∠ABE is 10 degrees greater than the angle ∠DCE, then compute ∠AFD.

   Jika sudut ∠ABE ialah 10 darjah lebih besar daripada sudut ∠DCE, maka kirakan sudut ∠AFD.

(A) $6^{°}$ (B) $8^{°}$ (C) $10^{°}$ (D) $14^{°}$ (E) $16^{°}$

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