S3 Mathematics
Assignment 2
Chapter 2 Laws of Integral Indices

Marks
/35

Name: ( ) *Class:* *Date:*

Part A (10 marks)

For questions 1 – 5, each question carries two marks. Choose the best answer for each question.

1. $\frac{6^0}{3^{-2}}=$

   A. $-\frac{1}{6}$

   B. $-\frac{1}{9}$

   C. $\frac{2}{3}$

   D. 9

2. $(-2x^4)^3=$

   A. $-6x^7$

   B. $-8x^7$

   C. $-8x^{12}$

   D. $8x^7$

3. $2.49\times10^{-4}=$

   A. −0.000 249

   B. −0.000 024 9

   C. 0.000 249

   D. 0.000 024 9

4. $81_{10}=$

   A. 1010000_2

   B. 1010001_2

   C. 101000_2

   D. 101001_2

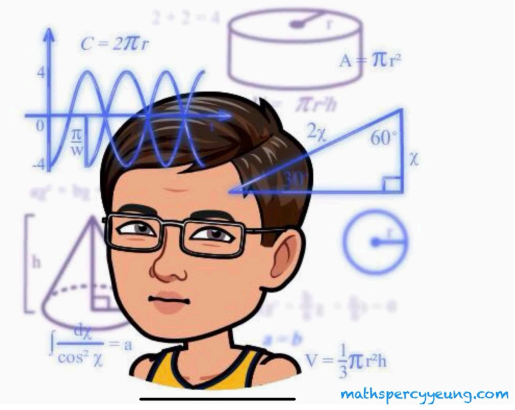
5. In which of the following numbers is the place value of the underlined digit the largest?

   A. $10\underline{1}1_2$

   B. $1\underline{0}0101_2$

   C. $999\underline{9}_{10}$

   D. $12\ 3\underline{4}5_{10}$



Part B (25 marks)

(Write your answers in the space provided.)

6. Simplify the following expressions and express your answers with positive indices.

(a) $\dfrac{a^{-5}b^{0}}{(2a^{-2}b^{4})^{-2}}$ (b) $(3p^{5}q^{-2})^{-1}\times\left(\dfrac{p^{3}}{q}\right)^{4}$ (6 marks)

7. Simplify the following expressions, where n is a positive integer, and express your answers with positive indices.

(a) $4^{n}+8^{0}\times(-2)^{2n}$ (b) $\left(\dfrac{4}{3}\right)^{2n}\times\left(\dfrac{16}{9}\right)^{1-n}$ (6 marks)

8. (a) Express the following numbers in scientific notation.

(i) 2 700 000

(ii) 0.000 056

(iii) -47×10^{-6}

(b) Without using a calculator, find the value of $\dfrac{2\,700\,000}{-47 \times 10^{-6} + 0.000\,056}$, and express your answer in scientific notation.

(6 marks)

9. (a) Without using a calculator, convert the following binary numbers into denary numbers.

(i) 10011111_2

(ii) 11000000_2

(b) Hence, arrange the following numbers in ascending order.

11000000_2, 180_{10}, 10011111_2

(7 marks)

Bonus Question

Write each of the following expressions as a binary number.

(a) $13+2^5+2^7+2^{10}$

(b) $5\times2^8+2^6+9\times2^3-2^3$

(7 marks)