UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Sekolah Pendidikan Profesional dan Pendidikan Berterusan (UTMSPACE)

**FINAL EXAMINATION / *PEPERIKSAAN AKHIR***
**SEMESTER 2 – SESSION 2015 / 2016**
**PROGRAM KERJASAMA**

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|---|---|---|
| COURSE CODE<br>*KOD KURSUS* | : | DSM 0013 / DDSM 0013 |
| COURSE NAME<br>*NAMA KURSUS* | : | FOUNDATION MATHEMATICS<br>*MATEMATIK ASAS* |
| YEAR / PROGRAMME<br>*TAHUN / PROGRAM* | : | ENRICHMENT<br>*PENGUKUHAN* |
| DURATION<br>*TEMPOH* | : | 2 HOURS 30 MINUTES<br>*2 JAM 30 MINIT* |
| DATE<br>*TARIKH* | : | APRIL 2016 |

INSTRUCTION :
*ARAHAN*

1. Answer **ALL** questions in the answer booklet(s) provided.
   *Jawab **SEMUA** soalan di dalam buku jawapan yang disediakan.*

2. **A list of formulae is given on the last page for reference.**
   *Senarai rumus diberikan pada muka surat terakhir untuk rujukan*

( You are required to write your name and your lecturer's name on your answer script )
*( Pelajar dikehendaki tuliskan nama dan nama pensyarah pada skrip jawapan )*

| | | |
|---|---|---|
| NAME / *NAMA* | : | ..... |
| I.C NO. / *NO. K/PENGENALAN* | : | ..... |
| YEAR / COURSE<br>*TAHUN / KURSUS* | : | ..... |
| COLLEGE NAME<br>*NAMA KOLEJ* | : | ..... |
| LECTURER'S NAME<br>*NAMA PENSYARAH* | : | ..... |

This examination paper consists of ...7... pages including the cover
*Kertas soalan ini mengandungi .....7..... muka surat termasuk kulit hadapan*

1. (a) **Evaluate and round off the answer to five significant figures.**

*Nilai dan bundarkan jawapan kepada lima angka bererti.*

$$\frac{1.0432 \times 3.01521}{5.004}$$

**(2M)**

(b) **Convert the following numbers to a number in base 10.**

*Tukarkan nombor – nombor berikut kepada nombor asas 10.*

(i) $101100_2$ (ii) $2327_8$

**(4M)**

(c) **Convert $2052_{10}$ to base 8.**

*Tukarkan $2052_{10}$ kepada asas 8.*

**(2M)**

(d) **Evaluate**

*Nilaikan*

$$110_2 + 101_2$$

**(2M)**

2. (a) **Simplify the following expressions using the rule of indices.**

*Permudahkan yang berikut menggunakan hukum indeks.*

(i) $\dfrac{x^5 x^{-4}}{x^{-3} x^2}$ (ii) $\dfrac{2^5 2^4}{2^3 2^6}$

**(4M)**

(b) **Simplify the following using the law of logarithm.**

*Permudahkan yang berikut menggunakan hukum logaritma.*

(i) $\log_3 6 + \log_3 9 - \log_3 18$ (ii) $\log_5 125$

**(5M)**

(c) **Find the value of $m$ in the following equation:**

*Dapatkan nilai $m$ dalam persamaan berikut:*

$$2^{2m-14} = 2^{m+6}$$

**(2M)**

3. (a) **Given two points** A(2, 7) **and** B(−8, 3), **find**

*Diberi dua titik* A(2, 7) *dan* B(−8, 3), *dapatkan*

(i) **The distance between A and B.**

*Jarak antara A dan B.*

(ii) **The midpoint of A and B.**

*Titik tengah antara* A *dan* B.

**(4M)**

(b) (i) **Find the equation of the straight line that passes through the points** (0, 2) **and** (3, 11).

*Dapatkan persamaan garis lurus yang melalui titik* (0, 2) *dan titik* (3, 11).

(ii) **Find the equation of the straight line that passes through the point** (4, 7) **and parallel to the line** $y = \frac{1}{4}x + \frac{10}{4}$.

*Dapatkan persamaan garis lurus yang melalui titik* (4, 7) *dan selari dengan garis* $y = \frac{1}{4}x + \frac{10}{4}$.

**(6M)**

4. (a) **Find the values of** $k$

*Dapatkan nilai-nilai k*

(i) $8k - 3(k+1) = 0$ (ii) $(k+3)(2k-3) = 0$

**(5M)**

(b) **Solve the quadratic equation by using the formula. Give your answer to two decimal places.**

*Selesaikan persamaan kuadratik dengan menggunakan rumus. Berikan jawapan anda kepada dua tempat perpuluhan.*

$$4x^2 + 2x - 1 = 0$$

**(2M)**

5. (a) **Change the angle $900^\circ$ to radian in $\pi$ form.**

*Tukarkan sudut $900^\circ$ kepada radian dalam sebutan $\pi$.*

(b) **Change the angle $\frac{3\pi}{2}$ radian to degrees.**

*Tukarkan sudut $\frac{3\pi}{2}$ radian kepada darjah.*

**(4M)**

(c) **Given a right angle triangle in Figure 1. Find $\sin A$, $\cos A$ and $\tan A$.**

*Diberi segitiga sudut tepat dalam Rajah 1. Dapatkan $\sin A$, kos $A$ dan $\tan A$.*

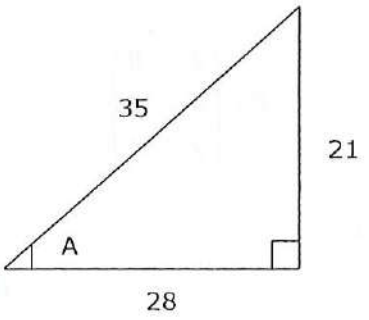



**Figure 1**/*Rajah 1*

**(3M)**

6. **Sketch the following graphs:**

*Lakarkan graf-graf berikut:*

(a) $y = x + 5$ (b) $y = x^2 + 3$

**(4M)**

7. (a) **Given**

*Diberi*

$$\begin{pmatrix} x & x-y \\ 0 & z \end{pmatrix} = \begin{pmatrix} 4 & 20 \\ 0 & 6 \end{pmatrix}$$

**find the values of $x$, $y$ and $z$.**

*dapatkan nilai $x$, nilai $y$ dan nilai $z$.*

**(4M)**

(b) **Given the following matrices, find:**

*Diberi matriks berikut, dapatkan:*

$$A = \begin{pmatrix} 1 & -1 \\ 3 & 0 \\ 3 & 4 \end{pmatrix} \qquad B = \begin{pmatrix} 2 & 8 \\ 4 & 6 \\ 2 & 4 \end{pmatrix} \qquad C = \begin{pmatrix} -8 & 4 & 0 \\ 4 & -6 & 1 \end{pmatrix}$$

(i) $2A + \frac{1}{2}B$ (ii) $AC$

**(5M)**

(c) **Find the inverse of the matrix A.**

*Dapatkan songsangan matriks A.*

$$A = \begin{pmatrix} 3 & 2 \\ 2 & 3 \end{pmatrix}$$

**(2M)**

**END OF QUESTION PAPER**

*KERTAS SOALAN TAMAT*

**LIST OF FORMULAE /** *SENARAI RUMUS*

1. **Rules of Index:**

$$a^m a^n = a^{m+n}$$

$$\left(a^m\right)^n = a^{mn}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$\frac{1}{a^n} = a^{-n}$$

2. **Rules of Logarithms:**

$$\log_a(xy) = \log_a x + \log_a y$$

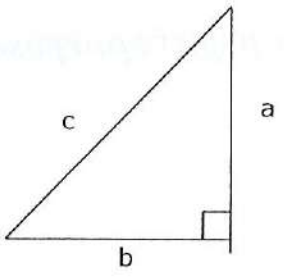
$$\log_a\left(\frac{x}{y}\right) = \log_a x - \log_a y$$

$$\log_a x^n = n\log_a x$$

3. **Quadratic Formula:**

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

4. **Pythagoras theorem:**




$$c^2 = a^2 + b^2$$

5. **Geometry Coordinates:**

**Distance** $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

**Area** $A = \frac{1}{2}\left|(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)\right|$

**Midpoint** $M(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

**Gradient** $m = \left(\frac{y_1 - y_2}{x_1 - x_2}\right)$

**Equation of lines:** $y - y_1 = m(x - x_1)$

6. **If** $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ , $|A| = ad - bc$.

7. **Inverse matrix for** $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ **is** $A^{-1} = \frac{1}{|A|}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$.