UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Sekolah Pendidikan Profesional dan Pendidikan Berterusan (UTMSPACE)

FINAL EXAMINATION / *PEPERIKSAAN AKHIR*
SEMESTER 2 – SESSION 2016 / 2017
PROGRAM KERJASAMA

COURSE CODE *KOD KURSUS*	:	DSM 0013 / DDSM 0013
COURSE NAME *NAMA KURSUS*	:	FOUNDATION MATHEMATICS *MATEMATIK ASAS*
YEAR / PROGRAMME *TAHUN / PROGRAM*	:	ENRICHMENT *PENGUKUHAN*
DURATION *TEMPOH*	:	2 HOURS 30 MINUTES *2 JAM 30 MINIT*
DATE *TARIKH*	:	MARCH / APRIL 2017

INSTRUCTION :
ARAHAN

1. Answer **ALL (7)** questions in the answer booklet(s) provided.
   *Jawab **SEMUA** (7) 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 *TAHUN / KURSUS*	:	.....
COLLEGE NAME *NAMA KOLEJ*	:	.....
LECTURER'S NAME *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 three significant figures.

Nilaikan ungkapan dan bundarkan jawapan kepada tiga angka bererti.

$$\frac{254\times 3500}{200}$$

(2M)

(b) Convert the following numbers to base 10.

Tukarkan nombor – nombor berikut kepada asas 10.

(i) 1100101_2 **(ii)** 6532_8

(4M)

(c) Convert 81_{10} to base 8.

Tukarkan 81_{10} kepada asas 8. **(2M)**

(d) Evaluate

Nilaikan

$$1110_2 + 110_2$$

(2M)

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

Permudahkan ungkapan berikut menggunakan hukum indeks.

(i) $\dfrac{a^{10}a^{-3}a^2}{a^{12}a^{-3}}$ **(ii)** $3^4 2^2 3^6 2^{-4}$

(4M)

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

Permudahkan yang berikut menggunakan hukum logaritma.

(i) $\log_2 4 + \log_2 \frac{1}{4} - \log_2 1$ **(ii)** $\log_{10} 1000$

(4M)

(c) Find the value of y in the following equation:

Dapatkan nilai y dalam persamaan berikut:

$$2^{5y-7} = 2^{3y+7}$$

(2M)

3. **(a)** **Given two points** A(−4, −5) **and** B(−3, 2), **find**

Diberi dua titik A(−4, −5) *dan* B(−3, 2), *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 point** (1, 1) **and parallel to the line** $y = -5x + 3$.

Dapatkan persamaan garis lurus yang melalui titik (1, 1) *dan selari dengan garis* $y = -5x + 3$.

(ii) **Find the equation of the straight line that passes through the point** (5, −5) **and perpendicular to the line** $y = \frac{1}{6} + 2x$.

Dapatkan persamaan garis lurus yang melalui titik (5, −5) *dan serenjang dengan garis* $y = \frac{1}{6} + 2x$.

(6M)

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

Dapatkan nilai-nilai k

(i) $2k + 5 = 15$ **(ii)** $(k + 3)(k - 6) = 0$

(4M)

(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.

$$x^2 + 6x + 3 = 0$$

(3M)

5. (a) **Change the angle** 320° **to radian in** π **form.**

Tukarkan sudut 320° *kepada radian dalam sebutan* π.

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

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

(4M)

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

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

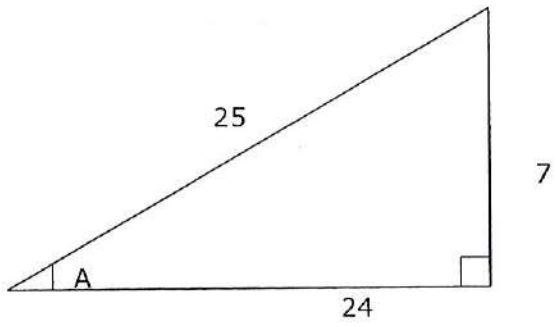


Figure 1/*Rajah 1*

(3M)

6. **Sketch the following graphs:**

Lakarkan graf-graf berikut:

(a) $y = 4x + 2$ **(b)** $y = x^2$

(4M)

7. (a) **Given**

Diberi

$$\begin{pmatrix} x & y-2x \\ z+x & 6 \end{pmatrix} = \begin{pmatrix} 4 & 20 \\ 0 & 6 \end{pmatrix}$$

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

dapatkan nilai-nilai bagi x, y *dan* z.

(4M)

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

Diberi matriks berikut, dapatkan:

$$A=\begin{pmatrix}1 & -1 & 3\\ 3 & 0 & 2\\ 3 & 4 & 0\end{pmatrix} \qquad B=\begin{pmatrix}2 & 1 & 4\\ 4 & 5 & -9\\ 0 & 3 & 0\end{pmatrix} \qquad C=\begin{pmatrix}1 & 0 & -2\\ 4 & -1 & 3\end{pmatrix}$$

(i) $A+B$ **(ii)** CA

(4M)

(c) **Find the value of x if the determinant is zero.**

Dapatkan nilai x jika penentu adalah sifar.

$$\begin{vmatrix}5x & -3\\ 3 & 2\end{vmatrix}=0$$

(2M)

(d) **Find the inverse of** $A=\begin{pmatrix}4 & 6\\ 1 & 3\end{pmatrix}$.

Dapatkan songsangan bagi $A=\begin{pmatrix}4 & 6\\ 1 & 3\end{pmatrix}$.

(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:**

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

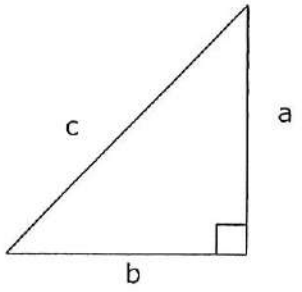
$\log_a\left(\frac{x}{y}\right) = \log_a x - \log_a y$

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

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