UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DGE 1013
COURSE	: MATHEMATICS FOR TECHNOLOGIST
SEMESTER/SESSION	: 2-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains **7** questions. Answer **ALL** questions.
2. All answers should be written in the answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 5 PRINTED PAGES INCLUDING COVER PAGE

INSTRUCTION: ANSWER ALL QUESTIONS.

QUESTION 1

(a) Solve each of the following:

i. $30\times 2-10\div 5\times 4+2$ (2 marks)

ii. $-20+5\times 2-10\div 5+10$ (2 marks)

iii. $2^3\times 5-5+30\div 10-2$ (2 marks)

iv. $35\times(55-30)\div 2+10$ (2 marks)

(b) Simplify the following expressions.

i. $\left(6a^3\right)\times\left(2a^{-5}\right)$ (2 marks)

ii. $3\sqrt{6}\times 2\sqrt{3}$ (2 marks)

iii. $\dfrac{\left(2m^5n^3\right)\left(6mn^4\right)}{6m^2n}$ (4 marks)

iv. $\dfrac{x^2y^3\left(2xy^2\right)^2}{8y}$ (4 marks)

QUESTION 2

(a) Solve the following inequalities.

i. $5+2x\le 7$ (2 marks)

ii. $3x-5\ge x+1$ (3 marks)

iii. $x-3<4-2x<x+5$ (5 marks)

iv. $|3x+5|=7$ (4 marks)

(b) Solve $3^{2-x}=27^{x+1}$ (4 marks)

QUESTION 3

(a) There were 4 girls and 7 boys at the birthday party. What is the ratio of girls to boys? (1 mark)

(b) The ratio of red pens to blue pens is 2 : 1. There are 300 pens all together. How many red pens are there? (2 marks)

(c) If 4kg of watermelon cost RM 28.30, how much would 2kg cost? (3 marks)

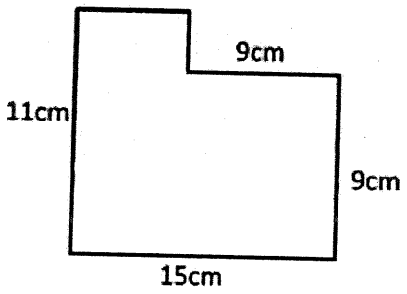
(d) The price of a pair of shoes is RM 120 after a 20% percent discount. What is the price of the shoes before discount? (3 marks)

(e) The price of a particular model of headphones was RM 25 in 2016. In 2020 the price of the same model headphones was RM 20. What is the approximate percent decrease in the price of the headphones? (2 marks)

QUESTION 4

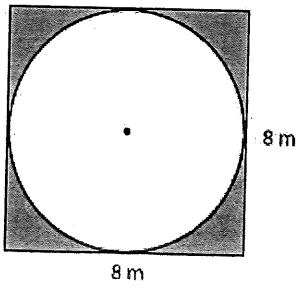
(a) A circle has a diameter of 36 cm. Calculate the circumference of the circle. (2 marks)

(b) Find the parameter and the area of the following shape.



(5 marks)

(c) A circle is inside the square. Find the area of the following shaded region.



(5 marks)

QUESTION 5

(a) The length of minor arc of a circle is 5.6 cm. The angle subtended at the centre of the minor arc is 43°. Find the radius, r of the circle and the area of the minor sector.

(5 marks)

(b) The volume of a sphere is $288\pi cm^3$. What are the radius and surface area?

(5 marks)

QUESTION 6

(a) A group of 7 students score 45, 55, 50, 45, 62, 71 and 53 for their mathematics exam. Calculate the mean, mode, median and range of this data.

(7 marks)

(b) Find the variance and standard deviation of the following data:

1, 5, 8, 14, 21

(6 marks)

QUESTION 7

Calculate the mean, variance and standard deviation of the following data:

Class	Frequency (f_i)
30 – 40	3
40 – 50	7
50 – 60	12
60 – 70	15
70 – 80	8
80 – 90	3
90 – 100	2

(16 marks)

----------END OF QUESTIONS----------

FORMULA	
$\lvert a\rvert = \begin{cases} a, & a \geq 0 \\ -a, & a \leq 0 \end{cases}$	$x^m \cdot x^n = x^{m+n}$
$\frac{x^m}{x^n} = x^{m-n}$	$\left(x^m\right)^n = x^{mn}$
$(xy)^n = x^n y^n$	$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$
$x^{m/n} = \sqrt[n]{x^m}$	$(x)^{-n} = \frac{1}{x^n}$
$\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$	$\sqrt{a} + \sqrt{a} = 2\sqrt{a}$
Circle : $C = 2\pi r = \pi d$ $A = \pi r^2$	Length Of Arc $= \left(\frac{n^\circ}{360^\circ}\right) \times 2\pi r$ Area Of Sector $= \left(\frac{n^\circ}{360^\circ}\right) \times \pi r^2$
Square : $P = 4a$ $A = a^2$	Rectangle : $P = 2l + 2w$ $A = l \times w$
Sphere: $SA = 4\pi r^2$ $V = \frac{4}{3}\pi r^3$	Mean, $\overline{x} = \frac{\sum x}{n}$ Mean, $\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$
Variance, $\sigma^2 = \frac{1}{N}\sum X^2 - \left(\frac{\sum X}{N}\right)^2$ Variance, $\sigma^2 = \frac{1}{N}\sum f_i \left(x_i - \overline{x}\right)^2$	Standard deviation, $\sigma = \sqrt{\sigma^2}$