



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: DGE 1013
COURSE	: MATHEMATICS FOR TECHNOLOGIST
SEMESTER/SESSION	: 2-2024/2025
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. $5 + 10 \div 5 - 1 \times 4 + 2$ (2 marks)

ii. $-100 \div 10 - 10 \div 5 + 10$ (2 marks)

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

iv. $3 \times (30 - 10) \div 2 + 10$ (2 marks)

(b) Simplify the following expressions.

i. $(2b^4) \times (5b^{-3})$ (2 marks)

ii. $2\sqrt{3} \times 4\sqrt{2}$ (1 mark)

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

iv. $\frac{x^2y^3(2xy^2)^2}{8y}$ (5 marks)

QUESTION 2

(a) Solve the following inequalities.

i. $5x + 2 \leq 3$ (2 marks)

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

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

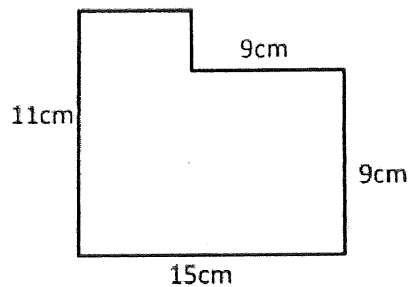
(b) Solve $|3x + 5| = 7$ (4 marks)(c) Solve $3^{2-x} = 27^{x+1}$ (4 marks)

QUESTION 3

- (a) Ayyub and Idris have sweets in the ratio 4 : 2. There are 30 sweets all together. How many sweets they own respectively. (3 marks)
- (b) If 4kg of watermelon cost RM 28.30, how much would 2kg cost? (3 marks)
- (c) 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)
- (d) 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)

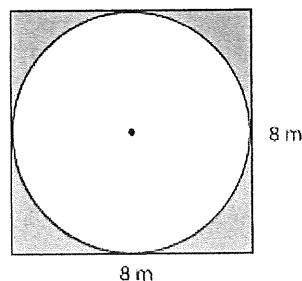
QUESTION 4

- (a) Radius of a circle is 8 cm. Calculate the circumference and the area of the circle. (4 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 $288\pi\text{cm}^3$. 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: (6 marks)
- 1, 5, 8, 14, 21

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

(14 marks)

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

DGE 1013 MATHEMATICS FOR TECHNOLOGIST

FORMULA	
$ a = \begin{cases} a, & a \geq 0 \\ -a, & a \leq 0 \end{cases}$	$x^m \cdot x^n = x^{m+n}$
$\frac{x^m}{x^n} = x^{m-n}$	$(x^m)^n = x^{mn}$
$(xy)^n = x^n y^n$	$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$
$x^{m/n} = \sqrt[n]{x^m}$	$(x)^{-n} = \frac{1}{x^n}$
$\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$	$\sqrt{a} + \sqrt{a} = 2\sqrt{a}$
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, $\bar{x} = \frac{\sum x}{n}$ Mean, $\bar{X} = \frac{\sum f_i x_i}{\sum f_i}$
Variance, $\sigma^2 = \frac{1}{N} \sum X^2 - \left(\frac{\sum X}{N}\right)^2$ Variance, $\sigma^2 = \frac{1}{N} \sum f_i (x_i - \bar{x})^2$	Standard deviation, $\sigma = \sqrt{\sigma^2}$