

073205T4BLD

BUILDING TECHNOLOGY LEVEL 5

CON/OS/BUT/CC/01/5

Apply Basic Mathematics

November/December 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) printed pages

Candidate should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (40 MARKS)*Answer ALL questions in this section*

1. Expand the following as a power series as far as the term in X^5 , $\sinh 3x$ (4 Marks)
2. Write $\frac{1}{2} \log 16 + \frac{1}{3} \log 27 - 2 \log 5$ as the logarithm of a single number. (3 Marks)
3. Determine the value of $(3.039)^4$, correct to 6 significant figures using the binomial theorem. (3 Marks)
4. A rectangular piece of metal having dimensions 4 cm by 3 cm by 12 cm is melted down and recast into a pyramid having a rectangular base measuring 2.5 cm by 5 cm. Calculate the perpendicular height of the pyramid. (3 Marks)
5. Transpose the formula $V = \frac{4}{3} \pi r^3$ to make r the subject. (4 Marks)
6. Use elimination method to solve the following set of simultaneous equation:

$$3X + 4Y = 18$$

$$5X + 6Y = 28 \quad (4 \text{ marks})$$

7. The total number of pupils who play tennis and volleyball in a class is 14. If they are six more pupils playing volleyball than tennis, find the number of pupils in each game given that no pupil plays more than one game. (4 Marks)
8. Juma, Ali and Hallan share profit of their business in the ratio 3:7:9 respectively. If Juma received Ksh 60000, how much profit did the business yield. (3 Marks)
9. Simplify

$$\frac{3x^2y^3 + 2xy^2}{6xy} \quad (4 \text{ Marks})$$

10. Evaluate the following correct to 4 significant figures;

a. $\operatorname{Cosech} 0.543$ (4 Marks)

b. $\operatorname{Coth} 1.843$ (4 Marks)

SECTION B (60 MARKS)*Answer ANY THREE questions in this section*

11.

- a. There are various types of books in school library. They have 200 short story books, 100 travelogue books, 50 Biographies, 25 children comics, and 125 novels. Make a pie chart based on the above data. (8 Marks)

- b. The seventh term of an arithmetic progression is twice its third term. Given that the sum of the first seven terms of the progression is 175 determine:

- Common difference
- First term.
- Least value of n given that the n th term of the progression is greater than 145. (8 Marks)

- c. A circle has a radius of 5cm. Find the;

- Circumference of the circle.
- Area of the circle. (4 marks)

12.

- a. A Lady sells blouses at Ksh 1500 each. She makes a profit of Ksh 150 for each blouse. How much does she pay for each? (3 Marks)

- b. Using the exchange rates in the table below convert:

- 100,000 Japanese Yen to Kenyan Shillings (3 Marks)
- 4,500 Swiss Francs to Sterling Pounds. (6 Marks)

CURRENCY	BUYING	SELLING
100 Japanese Yen	97.1512	97.3492
1 Swiss Franc	117.0969	117.3655
1 Sterling pound	149.8565	150.1576

- c. The total surface area of a solid cone is 486.2cm^2 and its slant height is 15.3cm . Determine its base diameter. (8 Marks)

13.

- a. Given $Ae^{-x} + Be^{-x} = 4\text{chx} - 5\text{shx}$, determine the values of A and B. (4 Marks)

b. A chain hangs in the form given by $y=40 \operatorname{ch} \frac{x}{40}$. Determine correct to 4 significant figures;

- i. Value of y when x is 25 and
- ii. Value of x when y is 54.30 (8 Marks)

c. Use the binomial theorem to expand $\sqrt{4+x}$ in ascending powers of x to four terms. Give the limits of x for which the expansion is valid. (8 Marks)

14. Table 1 below shows the number of candidates who missed classes due to sickness in a term. Determine from the grouped data:

a. Mean

b. Median

c. Mode

d. Standard deviation. (20 Marks)

Number of days off sick	1-5	6-10	11-15	16-20	21-25
Frequency	10	11	14	8	7

TABLE 1