073105T4PLM

PLUMBING LEVEL 5

CON /OS/PL/CC/0 1 /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 **THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer book.
5. Do not write on the question paper.

This paper consists of FIVE (5) printed pages

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

SECTION A (40 MARKS)

1. An electric pole is supported to stand vertically on a level ground by a tight wire. The wire is pegged at a distance of 10 meters from the foot of the pole. The angle the wire makes with the ground angle it makes with the pole. Calculate the length of the wire. (4 Marks)
2. Determine the value of x which satisfies the equation: $24^2 = 64^{-3}$. (4 Marks)
3. The diagonal of a rectangular sheet of metal measures 15 meters while its width measures 9 m. Calculate the perimeter of the sheet of metal. (4 Marks)
4. Given that $\sin\theta = \frac{4}{5}$ where θ is an acute angle, find $\tan\theta$. (3 Marks)
5. A plumbing job has parts costing Ksh 12,500 and labor costing Ksh 8,000. If a profit margin of 20% is added to the total cost, calculate the final price quoted to the customer. (4 Marks)
6. Solve for x in the equation: $3(x - 4) = 2x + 5$. (4 Marks)
7. A ladder 24 meters long leans against a building and reaches a point on the building that is 18 meters above the ground. How far from the bottom of the building is the foot of the ladd (4 Marks)
8. A piece of timber of length 5.5 meters is cut into three smaller pieces in the ratio 1:2:5. Determine the length of each piece. (4 Marks)
9. A ladder 24 meters long leans against a building and reaction on the building that is 18 meters above the ground. How far from the bottom of the building is the foot of the ladder. (2 Marks)
10. Determine: $(4n + 3z)(n - 7z)$. (3 Marks)

SECTION B; (60 MARKS)

11. Prove that:

a. $(\tan\theta + \sec\theta - 1)(\sec\theta + 1) = (1 + \sin\theta)/\cos\theta$ (10 Marks)

b. A retail business has the following data for the year. (5 Marks)

Opening stock: $60,000, Closing stock: $80,000, Net purchases: $400,000

Gross profit 30%. Calculate

i. Cost of goods sold (COGS)

ii. Average stock

iii. Stock turnover ratio

iv. Sales revenue

c. A company produces a product with: Selling price per unit: $25, Variable cost per unit: $15, Fixed costs: $120,00. Calculate. (5 Marks)

i. Contribution margin per unit

ii. Break-even point in units

iii. Break-even points in dollars

iv. Units needed to achieve a target profit of $50000

12. Table 1 shows marks scored by 80 students in a Highway Engineering Technician test;

Table 1

Marks	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50
No of students	5	13	32	27	3

Using an assumed mean of 25.5, you are required to calculate:

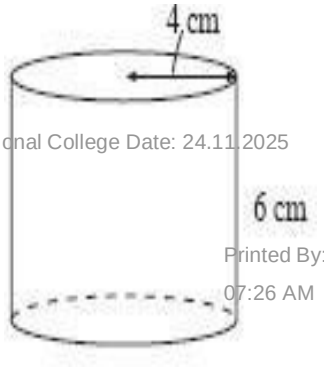
i. actual mean. (7 Marks)

ii. Standard deviation. (7 marks)

iii. Median. (6 Marks)

13. Calculate

a) the volume and total surface area of the cylinder shown. (10 Marks)



b) A 38-hectare farm is divided as follows:

i. Potatoes - 8 ha
ii. Tomatoes – 4.5 ha
iii. Maize - 7 ha
iv. Pineapples - 5 ha

v. Bungalow - 6 ha
vi. Vegetables and paths7.5 ha

Draw a pie chart for the above calculations. (10 Marks)

14. Mrs. Otieno earns a monthly salary of Ksh 12,400, a of Ksh 8000 per month and a medical allowance of Ksh 2,400 per month she claims a personal relief and contributes Ksh 1000 towards a pension scheme.

a) Calculate her net income. (10 Marks)

b) John earns k£ 13636 pa. and is housed by his employer. Calculate his P.A.Y.E and his net income. (10 Marks)