071604T4AUT

AUTOMOTIVE TECHNOLOGY LEVEL 4

ENG/OS/AUT/CC/2/4/A

Apply Basic Mathematics

Mar/Apr 2025

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

WRITTEN ASSESSMENT

INSTRUCTIONS TO CANDIDATE

1. This paper consists of two sections; **A** and **B.**
2. Attempt **ALL** questions in both sections.
3. Marks for each question are as indicated in the brackets.
4. You are provided with a separate answer booklet to answer the questions.
5. Do not write in this 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 (10 MARKS)

Attempt all questions in this section. Each question carries one mark

1. Change the improper fraction $\frac{55}{7}$ into a mixed number.

   A. $8\frac{1}{7}$

   B. 8

   C. $7\frac{6}{7}$

   D. 7

2. Simplify the expression $2r^3 \times 3r^2$.

   A. $5r^5$

   B. $6r^6$

   C. $6r^5$

   D. $5r$

3. Determine the L.C.M of 20,30 and 45.

   A. 180

   B. 5

   C. 90

   D. 120

4. Convert 0.05 to percentage.

   A. 0.05%

   B. 5%

   C. 50%

   D. 0.5%

5. Express 0.625 as a fraction in the simplest form.

   A. $\frac{78}{125}$

   B. $\frac{1}{4}$

   C. 6.25

   D. $\frac{5}{8}$

6. Expand and simplify $(x-3)^2$.
   A. x^2-6x+9
   B. $2x-6$
   C. x^2+9
   D. $18x$
7. Convert 100 Meters to Millimeter.
   A. 1000 mm
   B. 0.1mm
   C. 0.001mm
   D. 100,000 mm
8. The volume of a sphere is given by $V=\frac{4}{3}r^3$, given the radius of the sphere is 21cm
   Find the volume. (use $\pi=\frac{22}{7}$).
   A. $1848cm^3$
   B. $38{,}808cm^3$
   C. $2155.13cm^3$
   D. $35{,}919cm^3$
9. Area of parallelogram is given as;
   A. $\frac{1}{2}\times$ base $\times$ height
   B. base $\times$ height
   C. 2(length + width)
   D. length $\times$ width
10. If y is inversely proportional to x, given $y=3$ when $x=4$.
    Find the value of y when $x=6$.
    A. 2
    B. 3
    C. 4
    D. 12

SECTION B (40 MARKS)

Attempt ALL questions in this section.

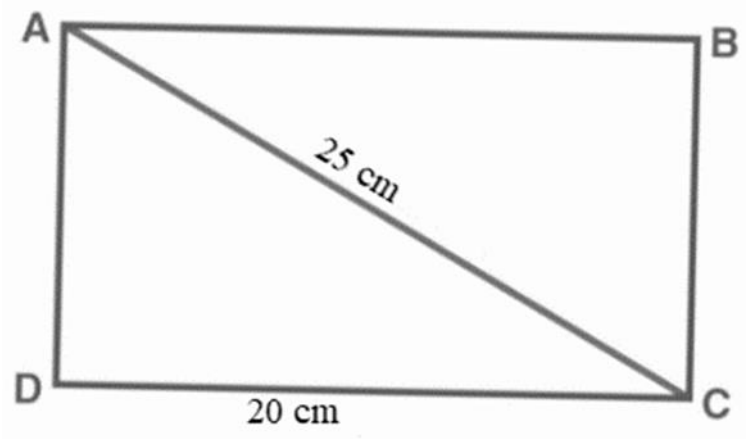
11. Braking distance, d of a car is directly proportional to square of its speed, V. When $d = 5, V = 10$. Find d when $V = 70$. (4 marks)

12. Solve the following simultaneous equation by substitution method. (4 marks)

$$2x + y = 10$$

$$x - y = 2$$

13. Find the area of rectangle ABCD in figure 1. (4 marks)



14. Simplify the following equation. (5 marks)

$$\frac{1}{11} \text{ of } (3\frac{9}{10} - 1\frac{4}{5}) - (2\frac{1}{3} - \frac{2}{3}) + \frac{13}{4}$$

$$\frac{21+325-350}{100}$$

$$\frac{346-350}{100} = \frac{-4}{100} = \frac{-1}{25}$$

15. Evaluate $log81 - log27 + log9$. (3 marks)

16. Use the quadratic formula to solve $x^2 - 17x + 38 = 0$ correct to four significant figures. (4 marks)

17. A rectangular park of length 30m and width 24m is surrounded by a 4m wide path as shown in figure 2. Find area of the path. (5 marks)

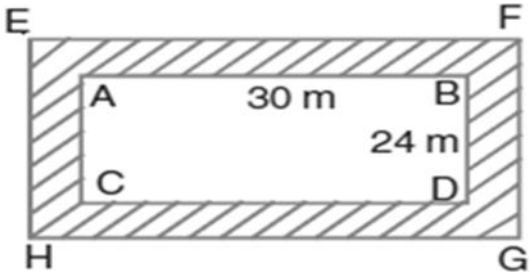


Figure 2

18. Figure 3 shows a cylinder with height 2.5cm and radius 3cm. Calculate the Volume of the cylinder correct to one decimal place. (use $\pi = 3.142$). (3 marks)

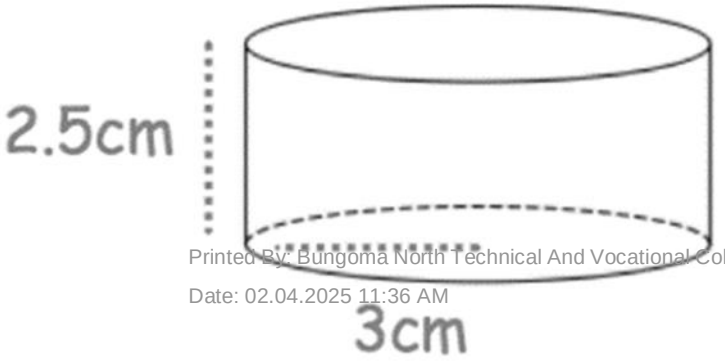


Figure 3

19. Figure 4 shows two semicircles drawn inside a square of side 14 cm. Find the area of the shaded region. (Use $\pi = \frac{22}{7}$) (4 marks)

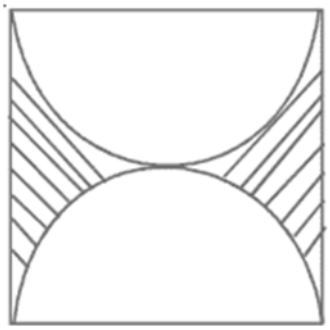


Figure 4

20. Find the G.C.D of 24, 36 and 40. (4 marks)