



UNIVERSITY
OF
JOHANNESBURG

FACULTY OF SCIENCE

SM	
EM	
FM	

DEPARTMENT OF APPLIED PHYSICS AND ENGINEERING MATHEMATICS

BEng Tech :URBAN & REGIONAL PLANNING

ENGINEERING MATHEMATICS 1

MODULE: MATM1B1

CAMPUS: DFC

EXAMINATION: JULY 2018

DATE: 20/07/2018

SESSION: 08:00

ASSESSOR:

MR EZ MORAPELI

INTERNAL MODERATOR:

MRS R DURANDT

DURATION: 2 HOURS

MARKS: 66

SURNAME INITIALS AND: _____

STUDENT NUMBER: _____

NUMBER OF PAGES: 14 (ensure that you have all the printed pages)

**INSTRUCTIONS: ANSWER ALL THE QUESTIONS
USE ONLY BLUE OR BLACK INK TO WRITE, NO PENCIL
WRITE YOUR SURNAME AND INITIALS ON THE FRONT OF YOUR
ANSWER BOOK.
IF YOU NEED MORE SPACE, YOU CAN USE THE BLANK PAGE 13.**

**REQUIREMENTS: ANSWER BOOKS
NON-PROGRAMMABLE SCIENTIFIC CALCULATOR**

QUESTION 1 [8]

1.1 Given a set of numbers: 2,3,4,6 ,

1.1.1 determine their GCD

(1)

1.1.2 determine their LCM

(2)

1.1.3 The carpenter is building a kennel. He has determined that he will need some 2 ft , 3 ft , 4 ft and 6 ft pieces of 2 in by 4 in lumber. If he can buy 2 in by 4 in in 8 ft , 10 ft , 12 ft and 16 ft pieces. Which lengths of lumber should he buy so that he can cut any of the needed lengths from each piece with no waste? (Assume he can only buy one length)

(3)

1.2 If you made a measurement that was halfway between $\frac{3}{4}\text{ in.}$ and $\frac{7}{8}\text{ in.}$, how could you express the exact measurement as a fraction?

(2)

QUESTION 2 [11]

2.1 John wants to nail two boards together. The boards have a combined thickness of $2\frac{7}{8}$ in. John has three nails that are the same size except in length. The nails are $2\frac{13}{16}$ in., $2\frac{15}{16}$ in. and $2\frac{3}{4}$ in. long. If he wants to use the longest nail that will not come out on the opposite side, what nail should John use? (4)

2.2 A speed reducer has a speed ratio of 14:64. If the large gear is missing and the smaller gear has 28 teeth, how many teeth should a replacement of larger gear have in order to maintain the ratio? (3)

- 2.3 If 15 men working 8hr per day complete a job in 22 days, how many men would it take to complete the job in fourteen 10hr days? (4)

QUESTION 3 [12]

- 3.1 While the paymaster is on vacation, you have the job of figuring the weekly earnings for the workers. There are seven mechanics who earn R5,70 per hour and three other workers who earn R4,10 per hour. How much is the total weekly payroll if the mechanics work 6 days and the other work days for 8 hr per day? They all receive time-and-half after 40 hours. (5)

3.2 You need to fence in your business parking lot, which measures $200m \times 150m$. You can buy German-made wire fencing in $20m$ rolls at $R59,40$ per roll or you can buy American made wire fencing in $50ft$ at $R47,70$ per roll. Which wire would be cheaper for you to use? (Hint: $1ft = 0.3048m$) (4)

3.3 A European publisher ordered $600kg$ of newspaper and neglected to specify the weight in pounds. How many pounds should you send him? (Hint: $1lb = 454g$) (3)

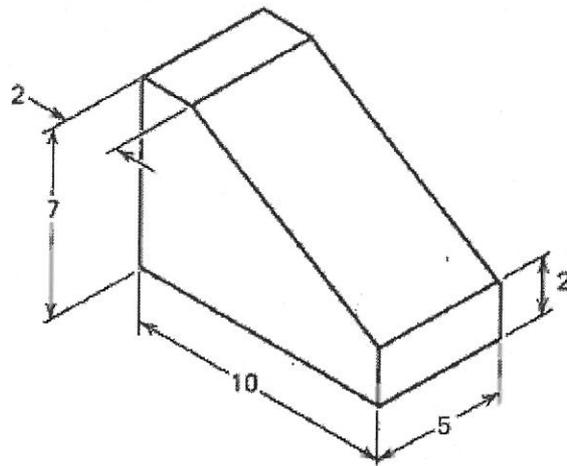
QUESTION 5 [16]

5.1 A rectangle is $8m$ longer than it is wide. If its area is $273m^2$, how wide is the rectangle? (4)

5.2 If printing machinery depreciates 20% during the first year and 15% for each of the next two years, what is your printing machinery worth after 3 years if it cost you R280000 originally? (3)

QUESTION 6 [9]

6.1 In the following figure, find:



6.1.1 Lateral Surface Area

(3)

6.1.2 Volume

(3)

