MACHAKOS UNIVERSITY

University Examinations 2019/2020

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS, STATISTICS AND ACTUARIAL SCIENCE

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

ARTISAN IN FOOD AND BEVERAGE

GARMENT MAKING

ELECTRICAL ENGINEERING

MOTOR VEHICLE ENGINEERING

MATHEMATICS

DATE: 26/3/2020 **TIME: 2.30-5.30 PM**

INSTRUCTIONS:

Answer all the questions from this section

SECTION A (24 MARKS)

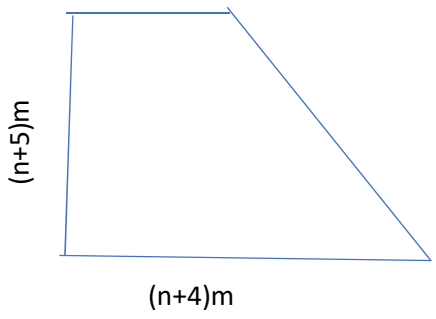
1. a) Evaluate: $3\frac{1}{2} \times 4^{2}/_{3} \div 6^{5}/6)$ (2 marks)

   b) Simplify:-

$$\frac{2^3 \; x \; 16^{\frac{1}{2}} \; x \; 4^2}{8^3}$$

(2 marks)

2. Find the area of the trapezium given: (3 marks)



3. Solve the equations:

(i) $\frac{3x}{5} - \frac{x-3}{2} = \frac{x}{7}$ (2 marks)

(ii) $4x + 3y = 2$

$3x - 2y = -7$ (2 marks)

4. In what time would Sh.1600, amount to Sh. 1960 at 13.5% simple interest per annum? (2 marks)

5. Convert the recurring decimal $1.8\dot{1}4\dot{3}$ into a mixed fraction. (2 marks)

6. A runner covers a distance of 120km in 5 hrs. How long would it take to cover the next ½ km if he ran at the same speed? (2 marks)

7. A quotient of 18 and a remainder of 5 is obtained when a number is divided by 15. What is the number? (2 marks)

8. The following are marks scored by 15 candidates in a Mathematics test:

11, 6, 6, 9, 8, 8, 13, 5, 13, 10, 9, 5, 3, 4, 5

Determine:-

i. The mode (1 mark)

ii. The median (2 marks)

iii. The mean score (2 marks)

SECTION B (16 MARKS): Answer any two questions from this section

9. a) A line passes through k (3, -2) and has a gradient -2/3. What is the equation of the line? (4 marks)

b) The ages of John and James are in the ratio of 12:4. If John is 30 years older than James, find the sum of their ages. (4 marks)

10. a) Solve the equation: $\frac{2x-5}{3} - \frac{3x-1}{2} = \frac{3}{4}$ (4 marks)

b) A shirt costs Ksh.132 with a discount of 12%. Find the marked price. (4 marks)

11. a) Find how many ball bearings with a radius of 1.6cm can be made from melting down a solid metal cylinder with radius of 10cm and a height of 25cm. (4 marks)

b) The length of a rectangle is 2cm more that its width. If its area is 440cm^2. Determine its dimensions. (4 marks)