

**MURANG'A COLLEGE OF TECHNOLOGY**  
**BUILDING & CIVIL ENGINEERING**  
**BC/C/B/012D**  
**MATHEMATICS CAT**  
**DATE: 27<sup>TH</sup> AUGUST 2012**

Q1 (a) Transpose the formula

$$d = 2 \sqrt{n(2r-h)} \text{ to make } r \text{ the subject}$$

(b) Evaluate  $12x^3 - 2x^2 - 3x + 28 \div 3x + 4$

Q2.(a) Factorize

(i)  $x^3 - 4x^2y + xy^2 - 4y^3$

(ii)  $6x^2 + 11x + 3$

(b) Transpose the formula

$$F = \frac{1}{2\pi\sqrt{L}} \text{ for } L$$

Q3. (a) Factorize  $2x^4 - x^3 - 8x^2$  to  $x + 6$

(b) Solve the equations

(5. 4)  $x + 3 \times 8.2^{2x-1} = 4. 8^{3x}$

(c)  $7(14. 3)^{x+5} \times (6.4)^{2x} = 294$

Q4. (a) Solve:

$$5x = 2y = 14$$

$$3x - 4y = 24$$

(b)  $3x + 2y - Z = 19$

$$4x - y + 2Z = 4$$

$$2x + 4y - 5z = 32$$

(c)  $2(x + 2y) + 3(3x - y) = 38$

$$4(3x + 2y) - 3(x + 5y) = -8$$

Q5 (a) Given  $2 + 4 + 5 + 16 + \dots$  find  $S_5$  and  $T_{10}$

(b) Express in partial functions

$$\frac{2x^3 + 3x^2 - 54x + 50}{x^2 + 2x - 24}$$

(c) Express in partial functions

$$\frac{10x^2 + 7x - 42}{(x - 2)(x + 4)(x - 1)}$$