



The Open University of Sri Lanka
Faculty of Engineering Technology
Industrial Studies Program

Final Examination- 2008

110

AEZ3238 Mathematics for Agriculture

Date : 02-04-2009
Time : 0930-1230 hours
Duration : Three (03) hours

SEPARATE SHEETS WILL BE PROVIDED TO ANSWER BOTH SECTIONS

Instructions

1. This question paper consists of two sections.

SECTION I

Contains FIFTEEN (15) questions. You are required to answer all questions.

You may spend about **one hour** to answer this section.

SECTION II

Contains SIX (06) questions. You are required to answer ANY FOUR (04) questions. You may spend about **two hours** to answer the questions in this section.

2. Read the questions carefully before answering.
3. Please remember to write your registration number and your index number correctly on each answer script.
4. In case of doubt, please consult the supervisor or an invigilator conducting the examination.
5. Draft papers will be provided.



SECTION I: Answer all questions.

1. Simplify the following algebraic expressions.

(i) $5x - (y - 6x) - [3y - 2(x+y)]$

(ii) $12a - [8 - (a - b) + 4b]$

2. Multiply the following expressions.

(i) $(2x-1)(3-5x)$

(ii) $(5x^2-3)(x^3-x+8)$

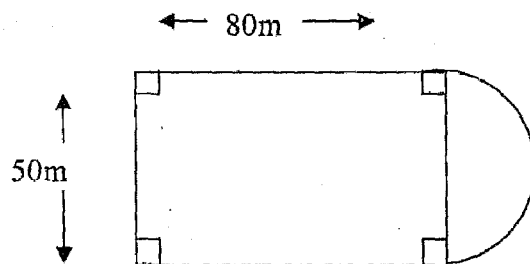
3. Divide $X^4 - 3x^3 + x^2 - 8$ by $(x^2 + 3)$ and write the quotient and the remainder.

4. Factorize the following

(i) $7x^2 - 16x + 4$

(i) $(a - b)^3 - (a+b)^3$

5. A rectangular land has length 80m and width 50m



If a semicircle of diameter 50 m is added to one end the land as shown above find the Total

- (i) Perimeter of the land
- (ii) Area of the land

Your answer should be correct to 1 decimal place. (Take $\pi \approx 3.142$)

6. Solve the following simultaneous equations

$$5x - 2y = 21$$

$$2x + 3y = 16$$

7. Solve the following quadratic Equations

(i) $2x^2 + 5x - 3 = 0$

(ii) $x^2 + 8x - 3 = 0$ (you can assume $\sqrt{76} = 8.72$ for part 11)

8. Convert the following angles in degrees to radians

(i) 30°

(ii) 72°

(iii) 225°

9. Convert the following angles measured in radians to degrees.

(i) $\frac{12\pi}{5}$

(ii) $\frac{\pi}{7}$

(iii) $\frac{3\pi}{2}$

(give your answer correct to nearest degree)

10. Prove the following trigonometric identity.

$$\sec^2 A \cdot \operatorname{cosec}^2 A = \tan^2 A + \cot^2 A + 2$$

11. Find the value of

(i) $\sin 75^\circ$

(ii) $\cos 225^\circ$

12. Differentiate the following with respect to x

(i) $Y = x^3 - ax^2 + bx - 3$ (where a and b are constant)

(ii) $Y = (x^2 + 1)(1 - 3x)$

13. Differentiate with respect to X

$$Y = \frac{x^2 + 2x - 1}{8x + 2}$$

14. Evaluate the following Integrals

(i) $\int_0^2 \frac{3}{2} x^5 dx$

(ii) $\int_0^{\pi} 5 \cos \theta d\theta$

15. Find the resultant of the following two forces

12N and 5N acting at 120° to each other. (Give your answer correct to 1 decimal place.)