MATHEMATICS

STRUCTURE AND SCHEME OF THE EXAMINATION

The examination will consist of **two** papers: Paper 1 will be Objective Test and Paper 2 will be Essay**.**

1. **PAPER 1 (OBJECTIVE)**
   This will consist of 40 compulsory objective questions and will last for 1 hour. This will carry 40 marks.

2. **PAPER 2 (ESSAY)**
   This will consist of six questions and candidates are expected to answer four out of the six questions**.** The Paper will last 1 hour and will carry 60 marks.

3. **WEIGHTING OF THE EXAMINATION**

Paper	Marks	Scaling factor	Total marks
1 (Objective)	40	1	100
2 (Essay)	60	1	

SAMPLE QUESTIONS

PAPER 1 (OBJECTIVE)

1. Write 2,748,595 correct to the nearest 10,000.
   A. 2,700,000
   B. 2,740,000
   C. 2,750,000
   D 2,800,000

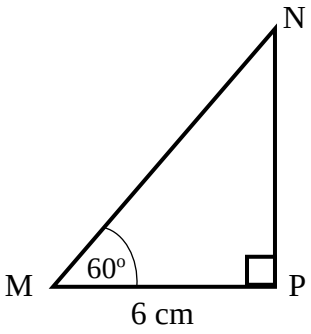
2. Find the product of 0.0409 and 0.0021, leaving the answer in standard form.
   A. 8.589×10^{-6}
   B. 8.589×10^{-5}
   C. 8.589×10^{4}
   D. 8.589×10^{5}

3. A student spent ¼ of her money on books and $^1/_3$ on transport. What fraction of the money was left?
   A. $^7/_{12}$
   B. $^5/_{12}$
   C. $^6/_7$
   D. $^5/_7$

   Given that $P = \{b, d, e, f\}$ and $Q = \{a, e, f, g\}$ are subsets of the universal set $\mu = \{a, b, c, d, e, f, g\}$.

4. Find $P \cup Q$.
   A. $\{e, f\}$
   B. $\{a, b, d, e, f, g\}$
   C. $\{a, b, g\}$
   D. $\{a, b, d, g\}$

5. Convert $3\frac{1}{5}$ to a decimal fraction.
   A. 3.7
   B. 3.6
   C. 3.3
   D. 3.2

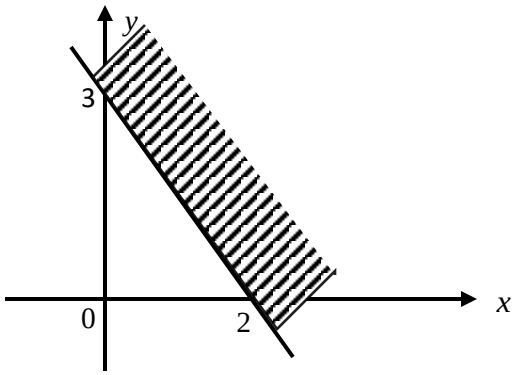


Not Drawn to Scale

In the diagram, $\angle PMN = 60^{o}$, |MP| = 6 cm. |.
[Take tan $60^{\circ} = \sqrt{3}$]

6. Find the length of |NP|.
   A. $6\sqrt{3}$
   B. $3\sqrt{6}$
   C. $2\sqrt{6}$
   D. $2\sqrt{3}$

7. Simplify: $\sqrt{2} + \sqrt{3} + \sqrt{8} + \sqrt{27}$
   A. $3\sqrt{2} + 4\sqrt{3}$
   B. $4\sqrt{2} + 3\sqrt{3}$
   C. $2\sqrt{2} + 3\sqrt{3}$
   D. $3\sqrt{2} + 2\sqrt{3}$



8. Which of the following inequalities represents the shaded region in the diagram?
   A. $3x + 2y \geq 6$
   B. $3x + 2y \leq 6$
   C. $2x + 3y \geq 6$
   D. $2x + 3y \leq 6$

9. Given that vector $\mathbf{m} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$ and $\mathbf{n} = \begin{pmatrix} -4 \\ 1 \end{pmatrix}$, evaluate $2\mathbf{m} - \mathbf{n}$.
   A. $\begin{pmatrix} 10 \\ 3 \end{pmatrix}$
   B. $\begin{pmatrix} 10 \\ -3 \end{pmatrix}$
   C. $\begin{pmatrix} -10 \\ 3 \end{pmatrix}$
   D. $\begin{pmatrix} -10 \\ -3 \end{pmatrix}$

10. A fair die and a fair coin are rolled together **once**. Find the probability of obtaining a head and an even number.
    A. $\frac{1}{4}$
    B. $\frac{1}{3}$
    C. $\frac{1}{2}$
    D. $\frac{2}{3}$

PAPER 2 (ESSAY)

Answer **four** questions **only.**

All questions carry equal marks

1. (a) Simplify: $7\frac{1}{2} - (2\frac{1}{2} + 3) \div \frac{33}{2}$

   (b) Philip and Emelia shared a number of oranges in the ratio 3: 5. If Emelia received 20 more oranges than Philip, find the total number of oranges they shared.

[15 marks]

2. Awo shared 80 acres of land among her 3 children. She gave 5 acres to the first child for taking care of the land and shared the rest of the land equally among the three children.
   (a) How many acres of land did the first child have?
   (b) What percentage of the land did the other children have?

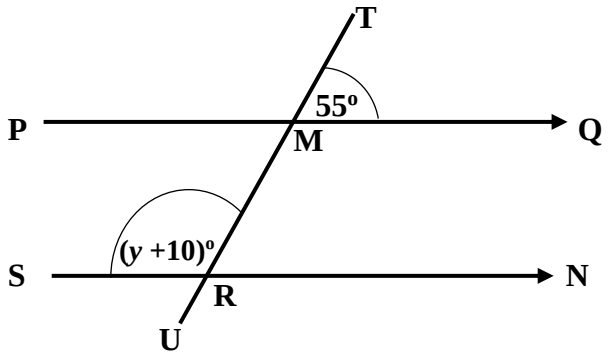
[15 marks]

3. A fair coin is tossed **twice**.
   (a) List all the possible elements in the sample space.
   (b) Find the probability of obtaining:
      (i) a head and a tail;
      (ii) exactly two tails;
      (iii) no tail;
      (iv) at **least one** tail.

[15 marks]

4. (a) Solve: $\frac{3}{4}h + \frac{1}{3}(21 - h) = 12$

   In the diagram, *PQ* is parallel to *SN* and *UT* is a transversal. Angle *QMT* = 55° and $\angle SRT = (y + 10)^\circ$.



Not Drawn to Scale

   (b) Find the value of *y*.

[15 marks]

5. The data shows the marks obtained by 10 students in a test.
7, 6, 10, 8, 4, 5, 7, 12, 6, 5
Find the:
(a) range;
(b) median;
(c) mean.

[15 marks]

6. A ladder leaned against a school building at a point *P* from the same horizontal ground. The angle of elevation from the foot of the ladder to *P* is 60^o and the distance from the foot of the ladder to the base of the building is 3m.
[Take $\cos 60^o = \frac{1}{2}$ and $\tan 60^o = \sqrt{3}$]
(a) Illustrate the information in a diagram;
(b) Find the
(i) length of the ladder;
(ii) height of the building at point *P*.

[15 marks]