MATHEMATICS HOLIDAY PACKAGE

INSTRUCTIONS

- Answer **ALL** questions in Section A and B.
- Any additional question(s) answered will not be marked.
- All necessary calculations must be done in the answer booklet provided. Therefore no papers should be given for rough work.
- Graph paper is provided.
- Silent non programmable scientific calculators and Mathematical tables with list of formulae may be used.

SECTION A

1. Simplify: $\left(\dfrac{16}{81}\right)^{\frac{-1}{4}}$ (04mks)

2. Find the equation of the line passing through the point $P(5,9)$ and parallel to the line joining the point $Q(15,-2)$ to point $R(-3,4)$. (04mks)

3. Musa bought a car at a discount of 5%. The market price of the car was 24,000,000/=. How much did he buy the car. (04mks)

4. Given that $R(2,3)$ and $S(5,8)$ are two points in a plane, determine the;
   (a) vector RS
   (b) magnitude of RS (04mks)

5. Solve the equation: $\log_{10}(7y+2) - \log_{10}(y-1) = 0$ (04mks)

6. In a class of 30 students, 15 liked Mathematics, 18 liked English and 4 liked neither Mathematics nor English. Find the number of students who like both Mathematics and English. (04mks)

7. The function $f(x) = ax^2 + 4x$. If $f(-1) = 3$. Find the value of a. (04mks)

8. The capacity of a cylindrical tin is 2 litres. Its radius is $8cm$, find its height. (04mks)

9.   Express 2.6363 … … … … …as a fraction in its simplest form.   (04mks)

10.   The scale on a map is $1:2000$. A building is represented on a map by an area of $3cm$.
        Find the actual areas in cm^2 occupied by building.   (04mks)

SECTION B

11.   If $h(x) = bx + 3$ and $h(4) = 23$
        (a)   find the value of;
                (i)   b
                (ii) $h(0)$
                (iii) $h(-5)$ (07mks)

        (b)   determine
                (i) $h^{-1}(x)$
                (ii) $h^{-1}(13)$ (05mks)

12.   A quantity x is partly constant and partly varies as the square of y. When $y = 2, x = 40$,
        when $y = 3,\ P = 65$.
        (a)   form an equation connecting x and y.   (08mks)
        (b)   determine y when x is 100.   (04mks)

13.   In a class of 40 students, 18 play Hokey (H), 15 play Tennis (T) and 22 play Football (F). 7
        play Hockey and Tennis, 9 play Tennis and Football, 8 play Hockey and Football. 4 play all
        the three games.
        (a)   Represent the given information on a venn diagram   (06mks)
        (b)   Find the number of students who do not play any of the three games.   (02mks)
        (c)   Find the probability that a student picked at random plays only:
                (i)   one game
                (ii)   two games   (04mks)

14.   A cyclist sets off from town A at $4:00\ am$ at a speed of $20km/hr$ to go to town B $100km$
        away. A motorist sets off from town A at $7:30\ am$ at a speed of $100km/hr$ to go town B.
        Find the:
        (a)   distance from A when the motorist over takes the cyclist.   (06mks)
        (b)   the time when the motorist over takes the cyclist.   (03mks)
        (c)   time the cyclist reached B.   (03mks)

15. In the figure below; $PQRS$ is a right pyramid with a rectangular base $PQ = 24cm$, $QR = 18cm$. The slanting edges are $25cm$ each.
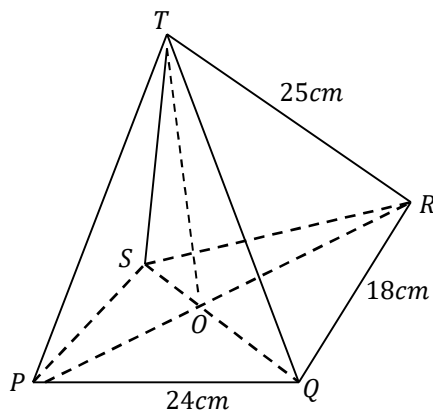
Calculate the:
(a) Height of the pyramid.   (06mks)
(b) Angle between slanting face QRT and the base.   (03mks)
(c) The volume of the pyramid.   (03mks)

16. Given that the point $A(-8, 6)$ and vector $\boldsymbol{AB} = \begin{pmatrix} 12 \\ 4 \end{pmatrix}$, M is the midpoint of AB.

(a) Find the:
   (i)   column vector $\boldsymbol{AM}$
   (ii) coordinates of M
   (iii) magnitude of $\boldsymbol{OM}$ (08mks)
(b) Draw the vector $\boldsymbol{AB}$ on a graph paper from your graph, state the coordinates of B.
                                                                               (04mks)

MY EFFORT MY FUTURE