**FORM TWO MATHEMATICS**

**END TERM EXAMINATIONS**

**MARCH/APRIL 2016**

**TIME:2HOURS**

**NAME………………………………….……………...ADM.NO:………………………………...**

**SCHOOL………………………………..**

## INSTRUCTIONS TO STUDENTS

1.  Answer all questions in this question paper.

2.  All your answers must be written in the spaces provided in this question paper.

1.  Evaluate without using tables or calculators. (3mks)

$$\frac{0.036 \times 0.0049}{0.07 \times 0.048}$$

2.  The sum of interior angles of a regular polygon. Find the size of each exterior angle. (3mks)

3.  The length of an arc of a circle is $\frac{1}{5}$ of its circumference. If the area of the circle is 346.5cm$^2$, find the angle subtended by the arc at the Centre of the circle. (4mks)

4.  Given that x=2y and 3y=5z. find the ratio x:y:z  hence or otherwise find the amount  of money Ali got if Ali, Ben and Chris shared Kshs. 36000 in the ratio x:y:z respectively. (4mks)

5.  A plane leaves town A for town B at 0540 hours. If the journey takes 6.5 hours, at what time does the plane reach its destination? (3mks)

6. A cylindrical solid metal is 3m long and has a mass of 4kg. if its density is 5.6g/cm$^3$, find the radius of its end. (take π=3.142) (4mks)

7. Express the number 9000 as a product of its prime factors. (1mk)

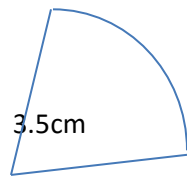b) Find the value of P if the number 9000P is a perfect cube. (2mks)

8. Find the value of T given that T=$\frac{ab}{a^a + bc}$ and a=2, b=-1,and c=-3 (3mks)

9. A shop keeper sells a shirt for Kshs. 350 thereby making a profit of 40%. Calculate the buying price of the shirt. (3mks)

The GCD of three numbers is 45 and their LCM is 18900. Two of the numbers are 675 and 540. Find the other possible numbers. (2mks)

10. Find the perimeter of the figure below. (Take $\pi$=22/7). (3mks)

3.5cm

$75^0$

John is twice as old as his friend Peter. Peter is 5 years older than Alice. In 5 years John will be three times as old as Alice. How old is Peter now? (3mks)

11. Ondieki had travelled from Texas to Kenya and arrived with U$17500 on 12/2/2013. On arrival he changed the dollars into Kenya shillings and immediately used Kshs. 850,000. Later on 15/2/2013 he had some immediate use of £3600 and therefore c hanged all the money he had into sterling pounds. Finally on 18/2/2013 he converted what remained to Kenya shillings.

|  | Buying | Selling |
|---|---|---|
| Kshs. | Kshs. | |
| 12/2/2013 U$ | 82.36 | 85.74 |
| 15/2/2013 £ | 110.14 | 118.26 |
| 18/2/2013 £ | 112.64 | 119.56 |

How much did he remain with in Kenya shillings? (3mks)

12. The sum of the digits of a two digits number is 13. If the digits are reversed the number decrease by 27. Find the number. (3mks)

13. A man walks to work at 16km/hr and back home at 5km/hr. find the distance from his work place if the whole journey takes him 2 hours 12 minutes. (3mks)

14. If $3 = \dfrac{1}{-4x} = \dfrac{1}{8x}$, find the ratio $\dfrac{1}{2x} + 2 : \dfrac{1}{3x} + 1$

(3mks)

**SECTION II (50 MARKS)**

**ANSWER ANY FIVE QUESTIONS**

15. (a) Using a ruler and a pair of compasses only construct a triangle ABC such that AB=4cm, BC=5cm and $\angle ABC=120^0$. Measure AC. (4mks)

b) On the diagram, construct a circle which passes through the vertices of the triangle ABC. Measure the shortest distance from the centre of the circle to line BC. (4mks)

c) Measure the radius of the circle. (2mks)

16. Two aero planes P and Q leave an airport at the same time. P flies on a bearing of $240^0$ at 900km/h while Q flies due East at 750km/h.

   a) Using a scale drawing of 1cm to represent 100km, make a scale drawing to show the positions of the planes after 40 minutes. (5mks)

b) Determine the bearing of

    i)   P from Q                                                                  (2mks)

    ii)  Q  from P                                                   (2mks)

c) Find the shortest distance between plane P and plane Q after 40 minutes.       (1mk)

17. A construction company requires to transport 144 tonnes of stones to sites A and B. the company pays Kshs. 24000 to transport 48 tonnes of stone for every 28 km. kimani transported 96 tonnes to a site A, 49km away.

a) Find how much he paid.                                       (3mks)

b) Kimani spends Kshs. 3000 to transport every 8 stones to the site. Calculate his total profit. (4mks)

c) Achieng transported the remaining stones to sites B, 84km away. If she made 44% profit, find her transport cost. (3mks)

18. A tank has two inlet taps P and Q and an outlet tap R. when empty, the tank can be filled by tap P in $4^1/2$ hours and by tap Q in 3 hours. When full the tap can be emptied in 2 hours by tap R.

a) The tank is initially empty, find how long it would take to fill up the tank;

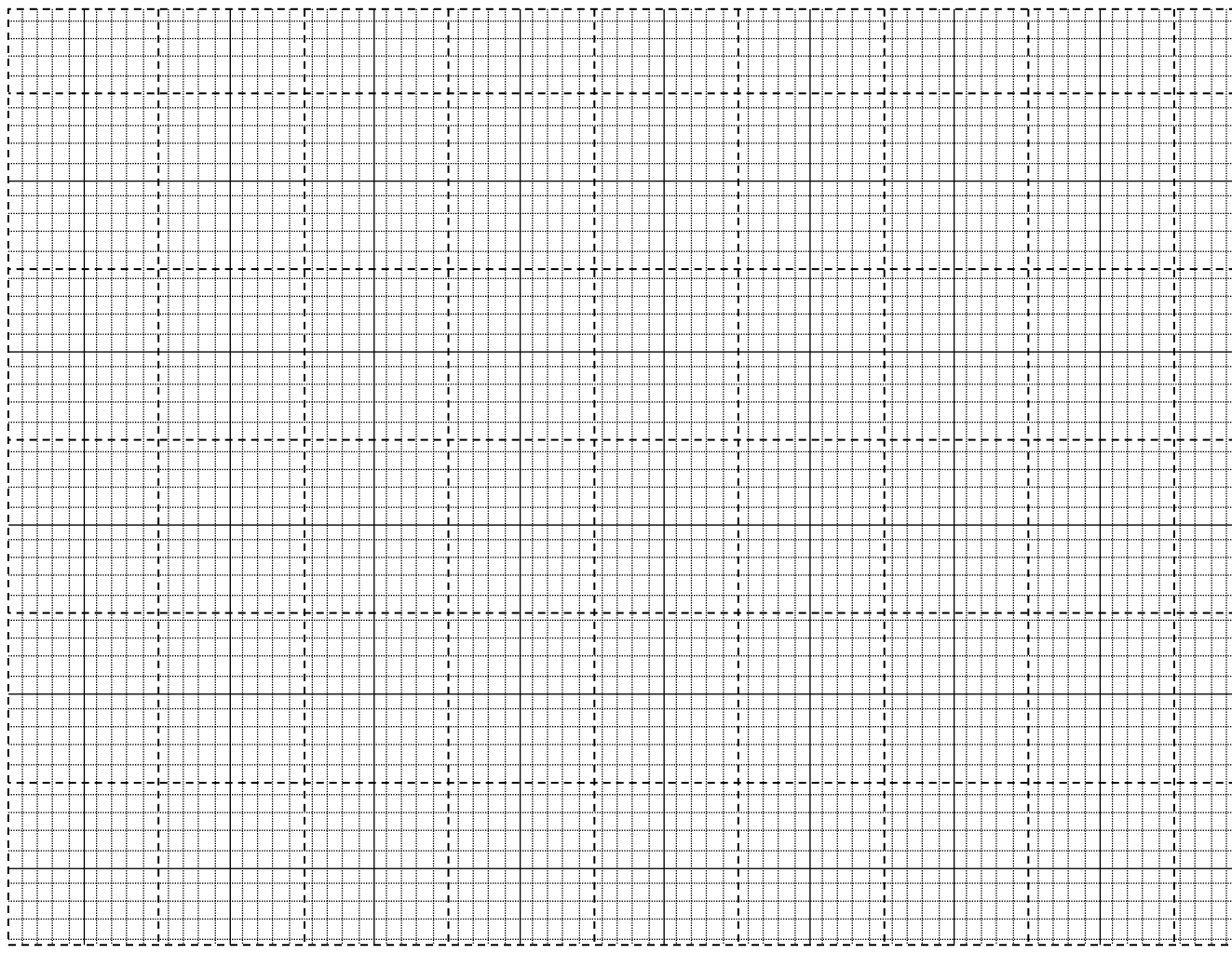    i) If tap R is closed and taps P and Q are opened at the same time. (3mks)

    ii) If all the three taps are opened at the same time. (3mks)

b) Find the fraction of the tank that would be filled by 9.00am if initially the tank is empty and the taps are opened as follows. (4mks)

P at   8.00 am               R at   9.00 am

Q at   8.45 am

*Turn Over*

19. a) Plot the graphs of the equations y=2x + 3 and y=-$\frac{1}{2}$x +3.
   (4mks)

   b)   Use your graph to find the coordinates of the point of intersection of the two lines.    (2mks)

c)  Hence, state the solutions to the equations y=2x + 3 and y=-$\frac{1}{2}$x +3.                    (2mks)

d)  Find the angle made by the line y=2x+3 and the x-axis.                    (2mks

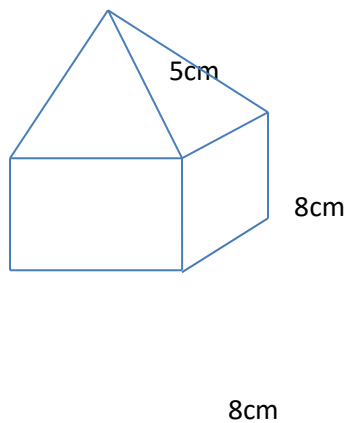20. A coffee farm was surveyed and its measurements entered in a field book as shown below.
    (Take XY=400m as the baseline.)

```
                        |  |
                        Y
  360    80 to Q
  to R 80      280
  to S 160     200
  40    200 to P
                        |  |
                        X  |
```

a)  Using a scale of 1cm to represent 40m, draw the map of the coffee farm.                    (3mks)

b)  Find the area of the coffee farm in hectares.                    (7mks)

21. A model of a tent consists of cube and a pyramid on a square base as shown below.

5cm

8cm

8cm

a) Draw accurately the net of the model.                                              (2mks)

b) Use the net to calculate the total surface area of the model. (4mks)

c) If the ratio of the area of the model to the area of the actual is 1:10000, find the area of the material required to make the tent (floor area inclusive) in $m^2$. (4mks)

22. a) Water and alcohol are mixed in the ratio 1:4. Find the density of the mixture if the density of water is $1g/cm^3$ and that of alcohol is $0.8g/cm^3$. (4mks)

b) 40 $cm^3$ of water is poured into an empty measuring cylinder. A stone of mass 129g is put into the cylinder. If the density of the mixture of the stone is $8.6g/cm^3$, find the new reading of the cylinder. (4mks)

c) Convert $8.6g/cm^3$ into $kg/m^3$. (2mks)

*Turn Over*