**GATITU MIXED SECONDARY SCHOOL**

**MATHEMATICS FORM 3 CAT 2 TERM 3 2014**

**TIME: 1 ¼ HRS**

1. Given the ratio x:y = 2:3 find the ratio (5X -2 Y ) : (X + Y) 3mks
2. It would take 15 men 8 days to dig trench 240 metres long. Find how many days it would take 18 men to dig a trench 360 m long working at the same rate. 2mks
3. Given the column vectors

a = b= c=

 -3 4 5

 2 -6 -10

And that P = 2a – ½ b + 2/5 c express P as a column vector and hence calculate its magnitude /p/ correct to 2 decimals places. 3mks

1. Calculate the value of constant K if the coefficient of X 3 term in the expansion of (k +2x)4 is 160. 3mks
2. The probability that Mwangi passes his exams is 4/5. If he passes the probability that he gets employed is 5/8. If he fails, the probability that he is employed is **¾.** Using a tree diagram, find the probability that he is employed. 3mks
3. A coffee blender mixes grade A and B in the ratio 3: 2 respectively. If grade A costs shs. 40 per kg and B sh. 30 per kg, at what price per kg should he sell the mixture in order to make a profit of 20% 3mks
4. Expand ( 1 – X)5 1mk
5. Use the expansion above up to the term in X3 to approximate the value of (0.98)5 2mks
6. The figure below shows a triangle of vector in which OS: SP = 1:3, PR: RQ = 2:1 and T is the mid point of OR.



1. Given that OP=p and OQ =q, express the following vectors in terms of p and q.
2. OR 2mks
3. QT 2mks
4. Express TS in terms of p and q and hence show that the points Q, T and S are collinear.3mks
5. M is a point on OQ such that OM = kOQ and PTM is a straight line. Given that PT:TM = 5:1 , find the value Kk 3mks
6. A hot water tap can fill a bath in 5 minutes while a cold water tap can fill the same bath in 3 minutes. The drain pipe can empty the full bath in 4/15. The two taps and the drain pipe are fully open for 1 ½ minutes after which the drain pipe is closed. How long will it take to fill the bath? 10mks
7. Expand and simplify the expression 5mks

(10 +2/x) 5

1. Use the expansion in (a) above to find the value of 145 5mks