1. Given that P is the sum of all prime numbers between 1 and 10, while Q is a number Formed when all the square numbers between 1 and 10 inclusive are arranged in an ascending order. Evaluate $-P^2 + Q$ (3marks)

2. Evaluate without using a calculator leaving your answer in the form $\frac{a}{b}$ where a and b are integers

$$\frac{-12 \div (-3) \times 4 - (-15)}{-5 \times 6 \div 2 + (-5)}$$ (3marks)

3. The ratio of boys to girls in a certain mixed secondary school is 3:4. If there are 70 more girls than boys, find the number of students in the school (3marks)

4. Given that; $x = \frac{1}{2}$ $y = \frac{1}{4}$ and $z = \frac{2}{3}$

Find the numeral values of $\frac{y - y^2 z}{y + x^2}$ (3marks)

5. Find the least number which must be multiplied by 1176 to make it a perfect square hence find the square root of the resulting number using prime factor method (3marks)

6. Three bells ring at intervals of 9 minutes, 15 minutes and 21 minutes. The bells will next ring together at 11:00 pm. Find the time the bells had last rang together. (3mks)

7. Using square and square root table only to evaluate $(10.706 \times 20.5\ )^2 + \sqrt{32.28}$ correct to 4 significant figures (4marks)

8. Find the greatest number which when divided by 179 and 234 leaves a reminder of 3 in each case. (3marks)

9. A number K is formed by writing all composite numbers less than 10 in ascending order. Another number h is formed by writing all the square numbers between 0 to 10 in ascending order. Evaluate (k-h) hence , find the least number which must be subtracted from (k-h) to make it divisible by 11 (4marks)

10. Evaluate without using tables or calculator $\frac{\frac{2}{5} \div \frac{4}{7}(1\frac{1}{6} - 3\frac{1}{9})}{\frac{1}{3} + \frac{5}{8} \times 2\frac{1}{2}}$ (3marks)

11. A room whose measurements are 4.5m by 5.25m is to be carpeted by square tiles. Find the maximum number of square tiles to completely cover the room. (3marks)

12. Hassan invested Ksh. 144,000 in two companies X and Y Company X pays dividend of 45% while company Y pays a dividend of 42%. From his total investment he obtains a return of 43%. How much did he invest in each company? (3marks)

13. Convert 3.2468 into a fraction in its simplest form (3marks)

14. The GCD of two numbers is 12 and their LCM is 240 if one of the number is 60, using prime factorization , find the other number (3marks)

15. A rectangular piece of ground measuring 780m by 494m is marked off exactly into equal square plots.
    (a) Find the maximum area of a plot (2marks)
    (b) The number of plots (2marks)

16. Six men can dig 3 acres of land in 4 days. How many days will it take 8 men working at a ¼ the rate to dig 12 acres of land (3marks)

17. In the year 2018 the school farm produced 10 8 7 2 kg of maize in 2019production increased by 30% . In 2020 the production was a half that produced in both 2018 and 2019 . Given that one bag of dry maize is 90kg . Calculate

(a) The total number of bags produced during three seasons (4marks)

(b) The school uses five bags of maize for feeding program . How many days did the maize produced in 2019 lasted (3marks)

(c) The farmers were paid at a rate of sh.75 per 3kg of maize produced . Calculate the total amount of money paid to the farmers in 3years (3marks)

18. a school hired a number of buses and matatus to transport a group of students to Olkaria Geothermal station. The number of matatus was three times the number of buses. The hire charges were ksh 3 500 per matatu and ksh 6 500 per bus. The total cost of hiring the vehicles was ksh 17 000. Each matatu can carry thirteen students while a bus can carry five times as many.

a) determine the number;

i) of buses hired (4mks)

ii) of matatu hired (1mk)

b) calculate the number of students transported to Olkaria if each vehicle was full to capacity and no vehicle made a double trip. (3mks)

c) each student contributed ksh 85 towards the cost of the trip and the school paid the remaining amount. How much money did the school pay? (2mks)

19. (a) Write in decimal notation

Five hundred and sixty nine and seventy eight millionths (1mark)

(b) Simplify the algebraic fraction below in its simplest form $\frac{1}{2}ab + \frac{a+b}{2ab^2+2ba^2}$

(4marks)

(c) (I)Express the $\frac{p^2-2pq}{p^2}$ - $\frac{5p^2-q-15p^3q}{2p^3}$ as a single fraction in its lowest form

(2marks)

(ii) Simplify the algebraic expression (3marks)

$$\frac{3bx-3by-4ax-4ay}{4a-3b}$$

20. a) In a form one class there are five more boys than girls. On a certain day, one-quarter of the boys and one-fifth of the girls went for a music festival. If eight students from this class went to the music festival, find the number of students in the class. (3mks)

b) the sum of four consecutive even number is 108. Find the numbers. (2mks)

c) i) find the greatest common divisor of the terms $9x^3y^2$ and $4xy^4$ (1mk)

ii) hence factorize completely the expression $9x^3y^2$ and $4xy^4$ (1mk)

d) Evaluate $\sqrt{\frac{5\frac{3}{4}\times 1\frac{3}{4}+8\frac{1}{3}\div\frac{5}{9}}{5\frac{1}{6}\times 1\frac{1}{5}}}$ (3mks)

21. Three business partners Shawn, Karl and Moraa contributed Ksh .360, 000, ksh480, 000 and ksh600,000 respectively to start a business . They agreed to share their profit as follows: 40% of the profit to be shared in the ratio of the contribution 35% of the remaining profit to be shared equally and remaining profit to be retained for the remaining of the business. If the total profit for the 2020 was Ksh. 576, 00 calculate.

(a) .Amount shared equally (2marks)

(b) Amount retained for the running of the business (2marks)

(c) Amount received by each partner (6marks)