

SERIES TEST I

TIME: 1 HOUR 30 MINUTES

INSTRUCTIONS;

Answer **ALL** Questions.

1. A geometric progression has the sum of the first and second terms equal to -4, if the sum of the fourth and the fifth terms is 108. Calculate the;
(a) first term
(b) common ratio of the progression. (5marks)
2. How many terms of the G.P $2 + 2 \times (1.1) + 2 \times (1.1)^2 + \dots$ must be taken for the sum to exceed 100? (5marks)
3. The first, second and fourth terms of an arithmetic progression form a geometric progression. Find the common ratio of the G.P (5marks)
4. A man pays premium of 100 dollars at the beginning of every year to an insurance company on an understanding that at the end of 15 years they can receive back the premium he had paid with 5% compound interest. what did he receive? (5marks)
5. The n^{th} term of a series is $3^n + 4n$. Calculate the sum of the first 20 terms of the series. (5marks)
6. The first terms of the arithmetic progression (A.P) and geometric progression (G.P) are equal. The common ratio of a G.P is equal to the common difference of the A.P while the third term of the AP is also equal to the second term of the GP. If the fourth term of an AP is 10, find the two possible values of their first term. (7marks)
7. Mary operates an account with a bank which offers a compound interest of 5% per annum. She opened the account at the beginning of 2019 with shs 800,000 and continue to deposit the same amount at the beginning of every year. How much will she receive at the end of 2022 if she made no withdrawal within this period? (6marks)
8. a) The eighth term of an arithmetic progression is twice the third term and the sum of the first eight terms is 39. Find the first three terms of the progression and show that its sum to n terms is $\frac{3n}{8}(n + 5)$. (6marks)
b) Find how many terms of the series $1 + \frac{1}{5} + \frac{1}{25} + \frac{1}{125} + \dots$ must be taken so that the sum will differ from the sum to infinity by less than 10^{-6} . (6marks)

END