

## Algebra First Stage (2<sup>nd</sup> sec)

### Final Revision

Answer the following question

- 1) a) Graph the following functions, and from the graphs find range, discuss monotony and determine its type: (even or odd or otherwise)

$$i) f(x) = \frac{x^2 + 2x}{|x|}$$

$$ii) f(x) = \frac{3x + 7}{x + 2}$$

$$iii) f(x) = \begin{cases} x^2 & : x < 1 \\ 2 - x & : x \geq 1 \end{cases}$$

$$iv) f(x) = \begin{cases} x^2 - 1 & : -2 \leq x < 2 \\ 5 - x & : 2 \leq x \leq 5 \end{cases}$$

- b) Find the value of each of the following:-

$$i) \frac{\left(\frac{1}{9}\right)^{1-m} \times (49)^{m-1} \times (21)^{3-m}}{\sqrt[3]{7^{m^2-3m}} \times \left(\frac{1}{27}\right)^{-1-m}}$$

$$ii) \frac{\log_3 x^2 - \log_3 4x}{\log_3 (3x+6)}, \text{ given that } \log_3 5 = \frac{1}{2}$$

- c) If (4, b, c ...) is an arithmetic sequence, (2, b+3, 5c ...) is a geometric sequence. Find the value of b, c. Then find the sum up to infinity of terms of the G.S (5c, b+3, 2, ...)

Answer three only of the following questions

- 2) a) Graph  $f(x) = 3 - |x-4|$ , state its range & equation of its axis of symmetry.

Then solve the equation  $2 - |x-4| = 0$ .

- b) Determine the type of each of the following functions (Even, odd or otherwise)

$$i) f(x) = \frac{x^3 \sin x}{1 + x^4}$$

$$ii) f(x) = \frac{3x^2 - \cos x}{x^3 - 6x}$$

$$iii) f(x) = 5 \times 3^x - \frac{5}{3^x}$$

$$iv) f(x) = \left(\frac{x}{2} - \frac{2}{x}\right)^3$$

- c) In a decreasing A.S if the sum of sixth and seventh terms equals 64 and their product equals 1008, Find: i) The Sequence  
ii) The first -ve. term and the greatest possible sum of this sequence.  
iii) The maximum number of terms that could be taken from the first term such that the sum is +ve.