RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2018

ECONOMICS (Honours)

Date : 20-06-2018 **Full Marks : 50** Time: 03·00 p.m – 4·30 p.m.

[Use a separate Answer Book for each group]

Group – A

Answer all the following questions :

1. a) Justify if the two functions, (x+5) and $\frac{x^2-25}{x-5}$ are same, where x is real. If not, then, what restrictions can we introduce to make them same? [2+2]

   b) Let $g(x+y)$, $g(x)\cdot g(y)$, & $g(x-y)$ are in A.P, for all real x, y and $g(0)\neq 0$. Find the value of g(0). [2]

2. a) A function is defined as follows :

   $f(x) = \frac{1}{2}-x$ for $0<x<\frac{1}{2}$

   $= \frac{1}{2}$ for $x=\frac{1}{2}$

   $= \frac{3}{2}-x$ for $\frac{1}{2}<x<1$

   Find the continuity of f(x) at $x=\frac{1}{2}$. [3]

   b) Show, using the definition of derivative, that $\frac{d}{dx}(\log(x))=\frac{1}{x}$. [3]

3. Integrate : $\int \frac{dx}{x^3(a+bx)^2}$. [6]

4. a) A determinant is chosen at random from the set of all determinants of order 2 with elements 0 or 1 only. Find the probability that the determinant chosen is non-zero. [3]

   b) Let T_n be the number of triangles which can be formed using the vertices of a regular polygon of 'n' sides. If $T_{n+1}-T_n=21$, find the value of n. [3]

5. Find the maximum value of $|x|+|y|$ when $x^2+y^2=1$. [6]

Group – B

[Essay Writing]

6. 'What will the Indian economy be like in the year 2050?'— Write an essay on this topic within 250 words. [20]

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