



EASTERN UNIVERSITY, SRI LANKA
DEPARTMENT OF MATHEMATICS
FIRST EXAMINATION IN SCIENCE(2016/2017)
FIRST SEMESTER (Aug./Sept., 2018)
EN 1011 - BASIC MATHEMATICS

Answer all question

Time: One hour

1. (a) Simplify the following:

i. $\frac{(10a^{-3}b^{-2})^{-1}}{5a^{-1}b^2} \times \left(\frac{-2ab}{2b}\right)^2$;

ii. $(81y^4)^{1/4} \times (32x^{10})^{2/5} \div (8x^{-3})^{2/3}$.

(b) Solve the following equations:

i. $\log_2 a(a^2 - 1) - \log_2(a - 1) - \log_2(a + 1) = \log_2 32$;

ii. $5^x \times 5^{2x+1} = 125$;

iii. $\log_3[\sqrt{x+9} - 3] = 0$.

(c) If $4x^2 + y^2 = 68xy$ then prove that $2 \log\left(\frac{2x-y}{8}\right) = \log x + \log y$.

(d) Find the equation of a straight line that passing through $\left(\frac{2}{3}, \frac{7}{2}\right)$ and perpendicular to the straight line $y = -\frac{1}{3}x + 5$. (50 Marks)