HINTS AND ANSWERS OF Tutorial Sheet-2 AUTUMN 2018

MATHEMATICS-I (MA10001) *August 1, 2018*

1.a. 0, b. 1, c. e,
d. 1, e. 1, f. -1/2,
g. 1, h. 1, i. 1/e,
j. ∞, k. 1/120.

2.a. Ans. 1.22656, Hint: Consider a function f(x)= $\sqrt{1+x}$ and expand it using Taylor's Series Expansion with x=0.5.

b. Hint: Consider a function f(x)=$\sin x$ and expand it using Taylor's Series Expansion with x=46^o.

3. 1.105<$e^0.1$ < 1.1052

4. Hint: Use Taylor's theorem with Lagranges form of remainder.

5. Hint: Take the hypothesis $f(x) = a_0 + a_1(x - x_0) + E(x)(x - x_0)$ where $\lim_{x \to x_0} f(x) = a_0$.

6.a. $\sqrt{2}$ b. 0 c. 1 d. 3/2

7. Hint: Use Maclaurin's theorem with Lagranges form of remainder after n terms and show that $\lim_{n \to \infty} R_n = 0$

8.Ans. Can not expand. Hint:Expand the given function and get the limit which is not finite.

9. Hint: Use Maclaurin's Theorem with remainder and approximate the result.

10. Ans: $\frac{e^x}{1+e^x} = 1/2 + x/4 - x^3/48 + ...$, Hint: Get the derivatives of the given function and use Maclaurin's Theorem.