

HOME ASSIGNMENT 2026
M.A./M.Sc. in MATHEMATICS
(THIRD SEMESTER)
CENTRE FOR DISTANCE AND ONLINE EDUCATION
DIBRUGARH UNIVERSITY

(Full Marks : 20 for each course)

(ALL THE QUESTIONS GIVEN BELOW ARE COMPLUSORY)

Course: MATH-301 (Topology)

Assignment 1

Marks -5+5

- (i) For a subset A of a topological space, show that $\bar{A} = A \cup A'$
- (ii) Show that compactness is closed hereditary.

Assignment 2

Marks -5+5

- (i) Prove that if a subspace of the real line R is connected then it is an interval.
- (ii) Show that no countable subset of R is connected.

Course: MATH-302 (Measure theory)

Assignment 1

Marks -5+5

- (i) Justify that every countable set has measure zero.
- (ii) Give an example of a function which is Lebesgue integrable but not Riemann integrable. Justify.

Assignment 2

Marks -5+5

- (i) Show that the union of two outer measurable sets is outer measurable.
- (ii) State and prove dominated convergence theorem.

Course: MATH-303 (Advanced Fluid Dynamics)

Assignment 1

Marks -10

- (i) Derive Navier-Stokes equations of motion for a viscous incompressible fluid.

Assignment 2

Marks -10

- (i) Discuss the flow between two concentric rotating cylinders.

Course: MATH-304 (Numerical Analysis)

Assignment 1

Marks -10

- (i) Discuss Secant method to find a root of the equation.

Assignment 2

Marks -10

- (i) Using LU-decomposition method, solve the following system of equations
$$\begin{aligned}x_1 + x_2 + x_3 &= 3 \\2x_1 - x_2 + 3x_3 &= 16 \\3x_1 + x_2 - x_3 &= -3\end{aligned}$$
