

G.R. No.	
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DECEMBER 2021 - ENDSEM EXAM
B. TECH. (MECHANICAL) (SEMESTER - I)
COURSE NAME: COMPUTATIONAL FLUID DYNAMICS
COURSE CODE: MEUA40181B
(PATTERN 2018)

Time: [1Hr]

[Max. Marks: 30]

(*) Instructions to candidates:

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data wherever required

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| Q.1 a | Interpret Boundary conditions for flow through pipe problem in case of Vorticity-Stream Function Formulations. | [4 Marks] |
| b | Discretize Navier-Stokes Equations using FDM (MAC Algorithm). | [6 Marks] |
| OR | | |
| Q.2 a | Write vorticity and stream function equations and Interpret each term. | [4 Marks] |
| b | Formulate vorticity-stream function equations using FDM. | [6 Marks] |
| Q.3 a | Discretize steady diffusion equation using FVM. | [4 Marks] |
| b | Formulate unsteady convection- diffusion equation using FVM | [6 Marks] |
| OR | | |
| Q.4 a | Interpret Finite Volume Method in brief. | [4 Marks] |
| b | Formulate unsteady diffusion equation using FVM. | [6 Marks] |
| Q.5 a | Interpret Central Difference Scheme. | [4 Marks] |
| b | Discretize Navier-Stokes Equations using FVM | [6 Marks] |
| OR | | |
| Q.6 a | Interpret Second – Order Upwind Scheme. | [4 Marks] |
| b | Interpret Boundary conditions for SIMPLE Algorithm using flow through pipe problem. | [6 Marks] |