

Roll No. :

Total No. of Questions : 9] [Total No. of Pages : 3

22607

M.Tech. (ME) 1st Semester
Examination, March-2021
(CBCS Scheme)

COMPUTATIONAL FLUID DYNAMICS
Paper-MTME21D3

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Attempt *five* questions in all, selecting at least *one* question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Write a note on CFD.
- (b) What is Finite Volume method ?

- (c) Explicit method
- (d) Simple algorithm 5×4=20

Unit-I

- 2. (a) Explain the historical background of computational fluid dynamics.
- (b) Explain the basic steps in CFD. 10,10
- 3. Discuss in detail beam advance in computational techniques. 20

Unit-II

- 4. Write in detail about types of governing differential equations related with problem formulation. 20
- 5. Discuss about the following :
 - (a) Finite element method
 - (b) Spectral method 10,10

Unit-III

- 6. Discuss in detail about one dimensional heat conduction transfer through a pin-fin. 20

- 7. Write about the following :

- (a) Implicit method
- (b) Stability of numerical methods 10,10

Unit-IV

- 8. Discuss in detail about viscous incompressible flows calculation of flow field using the stream function vorticity method. 20
- 9. Write about the following :
 - (a) Types of fluid flow
 - (b) Navier-Stokes equation 10,10