## Unit IV

8. Describe the aspects for grid generation in commercial CFD softwares, also describe the pre-processing and post processing.
9. Describe the ANSYS workbench for geometrical modeling and turbulence modeling.
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## BB-95

M. Tech. (ME) EXAMINATION, Dec. 2017
(Second Semester)
(Re-appear Only)
(ME)
MET-520-B
Computational Fluid Dynamics
Time : 3 Hours]
[Maximum Marks : 75
Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt Five questions in all, selecting at least one question from each Unit. All questions carry equal marks. Assume suitable values for missing parameters (if any).
(2-63/19) M-BB-95
P.T.O.

## Unit I

1. (a) Write your own comments on "CFD as a design tool".
(b) Describe and derive the energy equation and comments on it.

8
2. (a) Write the equations for inviscid flow and explain the terms invovled.

7
(b) CFD is different from analytical techniques. Discuss in details.

8

## Unit II

3. State and explain the difference among parabolic, elliptic and hyperbolic type questions. Explain with taking suitable example of your choice.

15
4. (a) Discuss the Finite Difference Method in details by taking suitable example of heat transfer.

10
(b) Elaborate the Galerkin's emthod for 1-D.
5. (a) State and explain SIMPLE and SIMPLR algorithms.

7
(b) Describe the Crank-Nicholson method using partial differential equation : 8

$$
\frac{\partial u}{\partial t}=\frac{\partial^{2} u}{\partial x^{2}}
$$

subject to : $u(x, 0)=\sin (\pi x), 0 \leq x \leq 1$, $u(0, t)=t(1, t)=0$.
6. For heat transfer problem in 2-D :

Use $\frac{\partial}{\partial x}\left(k \frac{\partial T}{\partial x}\right)+\frac{\partial}{\partial y}\left(k \frac{\partial T}{\partial x}\right)=0$. Discretize the element and approach towards solution.
7. Solve the equation $\Delta^{2} u=-9\left(x^{2}+y^{2}+9\right)$ over square with sides $x=y=0, x=y=3$ with $u=0$ on the boundary and mesh length of 2 unit.
p.T.O.

