CLASS: MTECH   SEMESTER : III
BRANCH: SER   SESSION : MO/19

SUBJECT: SR611 FUNDAMENTALS OF TURBULENCE

TIME: 3 HOURS   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	How do you characterize turbulence?	[5]
Q.1(b)	Briefly explain the phenomena of origin of turbulence.	[5]
Q.2(a)	Using the Reynolds decomposition, obtain the Reynolds momentum equation.	[5]
Q.2(b)	Using the molecular collision theory, show that the kinematic viscosity is directly proportional to the mean free path of the molecules.	[5]
Q.3(a)	What do you understand by pure shear flow? Describe the role of viscous dissipation and turbulent production in a pure shear flow.	[5]
Q.3(b)	What is the significance of isotropic turbulence in a pure shear flow?	[5]
Q.4(a)	Using suitable diagrams, discuss the different types of free shear flows.	[5]
Q.4(b)	Derive the Logarithmic Friction law for turbulent flows.	[5]
Q.5(a)	What is the need of statistical analysis in case of a turbulent flow?	[5]
Q.5(b)	Justify that how can a three dimensional spectrum analysis could beneficial over one dimensional spectrum analysis.	[5]

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