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M.E. / M.TECH. DEGREE EXAMINATIONS, DEC 2019

Third Semester

IC18008 – FLOW VISUALIZATION TECHNIQUES FOR I.C. ENGINES*(Internal Combustion Engineering)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

PART A - (10 X 2 = 20 Marks)

	CO	RBT
1. Why is laser source used in flow visualization?	1	R
2. What parameters of flow can be studied by flow visualization process?	1	R
3. What are the properties of material used in optical engine?	2	R
4. Name the methods to determine the optical processing of material	2	U
5. Explain the timeline and path line in 2D geometric flow	3	U
6. Can a conventional photographic camera be used for flow visualization? Justify.	3	R
7. Write the classification of numerical flow visualization techniques.	4	U
8. Describe the interference phenomena in light waves.	4	
9. Write Briefly about Mie Scattering technique.	5	U
10. Distinguish between direct and geometric flow visualization.	5	R

PART B - (5 X16 = 80 Marks)

11. (a) Explain with a neat sketch the construction and working of particle image velocimetry (PIV) (16) 1 U
- (OR)**
- (b) Explain the principle of velocity measurement by laser Doppler velocimeter with a neat diagram in IC engines. (16) 1 U
12. (a) Explain with neat sketches the various methods of optical Access in combustion chamber used in I.C engines. (16) 2 U

(OR)

- (b) With a neat sketch explain the steps followed for design of Optical Engine used diesel engine. (16) 2 R
13. (a) Explain the visual experiment of in-cylinder flow by Laser sheet method used in IC engines. (16) 3 R
- (OR)**
- (b) With the neat sketches explain the photographic measurement techniques used in IC Engine. (16) 3 R
14. (a) Explain with the neat sketch in-cylinder imaging diagnostics with highly efficient UV-Transparent Endoscopes. (16) 4 R
- (OR)**
- (b) Describe the dense geometric flow visualization as applied to I.C engine (16) 4 R
15. (a) Explain the different methods used in Geometric Flow visualization for 2D and 3D flow for I.C engine (16) 5 R
- (OR)**
- (b) Draw and explain the different types of numerical flow visualization used in IC engines (16) 5 R