M.E. Second Semester (Mechanical Engineering (Thermal Engineering)) (New-CGS)

13515 : Advanced Internal Combustion Engines : 2 MTE 1

P. Pages : 2 | **AW - 3807**

Time : Three Hours | Max. Marks : 80

Notes :
1. Answer **three** question From Section "A" and **three** question from Section "B".
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and Chemicals equations should be given wherever necessary.

SECTION - A

1. a) With neat sketch Explain various phases of combustion in S.I Engine. **7**

b) Explain the effect of following parameters on ignition lag **6**
1) Mixture strength
2) Initial temperature
3) Electrode gap.

2. a) Discuss the A : F mixture required for best power & best economy with the help of suitable graph. **7**

b) What is the importance of phases of flame propagation in S.I engine? What are the parameters effecting this process? **6**

3. a) List & explain various stages of combustion in C.I engine. **7**

b) Discuss the effect of following parameters on Delay period. **6**
1) Injection timing
2) Load on engine
3) Fuel droplet size.

4. a) With reference to the spray structure of C.I engine fuel, explain the importance of **6**
1) Atomization
2) Spray penetration
3) Droplet size distribution

b) What are the requirements of C.I engine combustion chamber? Discuss why the design of C.I engine combustion chamber is mainly governed by methods of generation of strong air Swirel. **7**

5. a) Take a detailed review of various parameters affecting knocking tendency of diesel engine. **7**

b) Sketch the following types of combustion chambers used in S.I engine. Discuss their relative merits & demerits. **7**
1) 'F' head C.C
2) Hemispherical C.C.

SECTION - B

6.	a)	Discuss the cause of hydrocarbon emission from S.I engines. What are it's ill effects on environment & human health.	7
	b)	Take a review of existing BIS IV emission norms in India.	6
7.	a)	What are the particulates? Discuss its harmful effects on human health. How particulate emission can be controlled.	7
	b)	With neat sketch explain the construction & working of NDIR gas analyzer.	7
8.	a)	Discuss the suitability of C.N.G as C.I engine fuel.	7
	b)	Discuss in detail "suitability of alcohols as I.C. engine fuel.	6
9.	a)	Discuss the problems associated with use of straight vegetable oils as C.I engine fuels.	6
	b)	Discuss the advantages & drawbacks of using hydrogen as a fuel for I.C. engines. State only one technique for using hydrogen on fuel in C.I engine.	7
10.	a)	With suitable sketch Explain the basic concept of stratified charged engine using ford combustion process.	7
	b)	What is homogeneous charge compression ignition? State & explain various ways it can be controlled.	6

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