MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Department of Mechanical Engineering
Question Bank - Academic Year (2020-21)

Course Code & Course Name : 16 MEE03 & ADVANCED I.C. ENGINES

Year/ Sem /Sec : IV / VII / B

Unit-I: Spark Ignition Engines
Part-A (2 Marks)

1. Discuses why a modern carburetor is being replaced by an injection system in SI engine?
2. Explain the factors that affect the process of carburetion?
3. What are different air –fuel mixture on which an engine can be operated?
4. How the power and efficiency of the SI engine vary with air- fuel ratio for different load and speed conditions?
5. Describe briefly the MPFI system with a neat sketch?
6. Explain port injection and throttle body injection system?
7. Explain the stages of combustion in SI engines elaborating the flame front Propagation
8. Explain the various factors that influence the phenomena of knock in SI engines?
9. Explain the effete of various engine variables on SI engine knock.
10. What are the various types of combustion chamber s used in SI engines? Explain them briefly?

Part-B (16 Marks)

1.	Explain with figures various types of combustion chambers used in CI engines.	(16)
2.	Explain Turbo charging in CI engines.	(16)
3.	What are the effects of trubocharging on CI engines?	(16)
4.	Compare induction swirl with compression swirl with respect to their advantages and disadvantages.	(16)
5.(i).	Bring out clearly the process of combustion in CI engines and also explain the various stages of combustion	(8)
(ii).	What is delay period and what are the factors that affect the delay period	(8)

Unit-II : Compression Ignition Engines
Part-A (2 Marks)

1. What are the stages of combustion in CI engine?
2. What is ignition delay period?
3. What are two delays occur in ignition delay period?

4. List the factors affecting the delay period?
5. Explain the effect of quality of fuel factor on the delay period?
6. Write the classification of combustion chamber in CI engine
7. What are the types of open combustion chamber?
8. What are the advantages and disadvantages of open combustion chamber type?
9. What is indirect injection type of combustion?
10. What are the applications of swirl chamber?

Part-B (16 Marks)

1. Bring out clearly the process of combustion in C.I. engines and also explain the various stages of combustion. (16)
2. Explain with figures various types of combustion chambers used in C.I. engines. (16)
3. Compare induction swirl with compression swirl with respect to their advantages and disadvantages (16)
4. What are the main factors affecting the penetration of the fuel spray in C.I. engines? (16)
5. i) Explain with heat sketch about the air vision (8)

   (ii) What is delay period and what are the factors that affect the delay period? (8)

Unit-III : Pollutant Formation And Control

Part-A (2 Marks)

1. What are the major exhaust emissions?
2. What are the causes for hydrocarbon emission from S.I. Engine?
3. What are the reasons for incomplete combustion in SI engine?
4. What are the reasons for flame quenching?
5. How the oil consumption increases in IC engines and what are the effects?
6. Write a short note on carbon monoxide emissions
7. What is photochemical smog?
8. What are soot particles?
9. Which is the most effective after treatment for reducing engine emissions?
10. List the materials used as catalyst.

Part-B (16 Marks)

1. Describe in detail the causes of hydrocarbon emissions from S.I. engines (16)
2. What are catalytic converters? (8)

   How are they helpful in reducing HC, CO and NOx emissions? (8)
3. Give a brief account of emissions from C.I. engines (16)
4. What is smoke and classify the measurement of smoke? (16)
5. (i) Explain the internationally accepted methods of measuring the following invisible emission (i) Oxides of nitrogen (8)

(ii) Carbon monoxide (8)

Unit-IV : Alternative Fuels

Part-A (2 Marks)

1. Write the advantage and disadvantage of alcohol as a fuel.
2. What is the problem with gasoline-alcohol mixture as a fuel?
3. Write the sources for methanol.
4. What are the techniques of using alcohol in diesel engine fuel?
5. List the advantages of hydrogen as an IC engine
6. Write the methods for hydrogen can be used in SI engines.
7. Write the two types of LPG used in automobiles engine.
8. What are the advantages of LPG?
9. Write theimprovements required for the LPG vehicle in future.
10. Write the disadvantages of LPG

Part-B (16 Marks)

1. (i) Explain the reasons for looking for alternate fuels for I.C. engines. (8)

   (ii) Explain alcohols as alternate fuels for I.C. engines bringing out their merits and demerits. (8)
2. Explain the possibility of using reformulated gasoline and water gasoline mixture as alternate fuel (16)
3. Explain with a neat sketch the surface-ignition alcohol engine. (16)
4. What are the advantages and disadvantages of using hydrogen in SI engine (16)
5. What is natural gas? List the advantages and disadvantages of using natural gas as alternate fuels (8)

   Give a brief account of LPG being used as an alternate fuel in S.I. engine (8)

Unit-V : Recent Trends

Part-A (2 Marks)

1. What is lean burn engine?
2. Why lean mixture is preferred in SI engine?
3. What are the modifications to be made to convert an existing engine as a lean burnengine?
4. How the stratified charge engine can be characterised?
5. List the advantages of the stratified charge engine
6. Write short notes on plasma jet ignition system
7. what are the main disadvantages of the stratified charge engine?
8. What are the reasons for automotive engines equipped with gasoline injection system?
9. What are the objectives of the fuel injection system?
10. What are the components of injection system?

Part-B (16 Marks)

1.	What is the necessity for gasoline injection? Explain with suitable sketch	(16)
2.	With neat sketch, explain the exhaust emissions with different air-fuel ratio lean burn sparkignition engines.	(16)
3.	What do you understand by charge stratification?	(8)
	Explain the method of achieving the same with suitable sketches.	(8)
4.	Explain briefly plasma – jet ignition system	(16)
5.	What is a learn burn engine? What are the advantages of using learn mixture in SI engine?	(8)
	Discuss the advantages and disadvantages of charge stratification.	(8)

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Course Faculty