Roll No.									

B.E/B TECH. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APR/ MAY 2014

SEVENTH SEMESTER

MECHANICAL ENGINEERING

ME 518/ ME 9036 ADVANCED INTERNAL COMBUSTION ENGINEERING

(REGULATIONS 2004/2008)

Time : 3 Hours Max Mark : 100

Answer ALL Questions

PART- A (10 x 2 = 20 Marks)

1. Why a SI engine requires a rich mixture during cold starting and maximum power conditions?
2. What is a direct injection gasoline engine? Give its advantages?
3. What do you understand by knocking in a CI engine?
4. Define swirl and squish.
5. Mention the function of a particulate trap.
6. Indicate the principle of NDIR analyser.
7. What are the problems of using hydrogen in an engine?
8. List down four important properties of an alternative fuel for use in an engine.
9. What do you understand by variable geometry turbocharger?
10. What is a CRDI engine? Indicate its advantages.

PART-B (5 x 16 = 80 Marks)

11 i). Describe the various stages of combustion in a SI engine with a p-θ diagram. **(6)**
ii). Discuss the features of any two type of SI engine combustion chambers. **(6)**
iii). List any four factors that affect knocking in a SI engine. **(4)**

12 a i). Explain with a p-θ diagram the various stages of combustion in a CI engine. **(8)**
ii). Discuss the characteristics of DI and IDI diesel engines. **(8)**

(OR)

b i). With a neat sketch explain the fuel spray structure and the fuel spray behaviour. **(8)**
ii). Explain the principle of operation of a turbocharger with a neat sketch. **(8)**

13 a i). Discuss the mechanism of formation of CO, UBHC and NOx emissions. **(8)**
ii). Explain the principle of operation of a three way catalytic converter with a sketch. **(8)**

(OR)

b i). With a neat sketch describe the principle of operation of FID analyser. **(8)**
ii). Write notes on emission norms and driving cycles. **(8)**

14 a i). Explain the salient features of using ethanol in SI and CI engines. **(10)**
ii). List down the advantages and disadvantages of using LPG in engines. **(6)**

(OR)

b i). Compare the important properties of any biodiesel with diesel and explain. **(8)**
ii). How natural gas can be used in a SI engine? Explain. **(8)**

15 a i).What do you understand by air assisted combustion? Explain in detail. **(8)**
ii). Discuss the characteristics of a homogeneous charge compression ignition engine. **(8)**

(OR)

b i). Explain the principle of operation of a hybrid electric vehicle with a schematic. **(8)**
ii). With a neat schematic discuss the principle of operation of a fuel cell. **(8)**

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