Roll No. | | | | | | | | 18

B.E./B Tech.(Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011

MECHANICAL ENGINEERING BRANCH

SIXTH SEMESTER

ME 518 ADVANCED I. C. ENGINEERING

(REGULATIONS 2004)

Time : 3 hr Max Mark : 100

Answer ALL Questions

PART- A (10 x 2 = 20 Marks)

1. List down the air fuel ratio requirements of a S.I. engine.
2. Distinguish between multipoint and direct injection system.
3. What do you understand by DI and IDI engines?
4. Why only CI engines are turbocharged?
5. Draw the Europeon driving cycle.
6. Indicate any 4 sources of unburnt hydrocarbon emissions.
7. What do you understand by transesterification? Why vegetable oils have to be transesterified?
8. Compare the octane number and calorific value of methanol with gasoline.
9. Mention the principle of stratified charge engines. List down any two merits.
10. What do you understand by lean burn engines?

PART- B (5 x 16 = 80 Marks)

11. i). Explain the various stages of combustion in a S.I. engine with a p-θ diagram. **(6)**
    ii). With a block diagram explain the operation of a mono point injection system indicating the function of various sensors. **(10)**

12.a i). Explain with the help of a p-θ and heat release rate diagram the stages of combustion in a CI engine. **(10)**
    ii). Draw a neat sketch of a fuel spray showing the spray breakup length, spray tip penetration, spray width and spray cone angle and briefly explain the mechanism of fuel evaporation. **(6)**

(OR)

b i). Discuss the principle of M and Air cell combustion chambers employed in C.I. engines. **(10)**

ii). What do you understand by swirl and squish? Explain its importance in a diesel engine. **(6)**

13 a. i). Describe the mechanism of formation of CO, soot and NOx emissions. **(10)**

ii). What are particulate traps? Explain the construction of particulate trap with a neat sketch. **(6)**

(OR)

b. i). Discuss the principle of operation of a catalytic convertor indicating clearly the catalysts used for the reactions. **(8)**

ii). With the help of a neat sketch explain the principle of operation of chemiluminescent analyser. **(8)**

14 a. i). List the advantages and disadvantages of using LPG in engines. **(6)**

ii). Explain any two techniques of using neat ethanol in C.I engines indicating the salient features. **(10)**

(OR)

b. i). Compare the important properties of hydrogen with petrol. **(8)**

ii). Write notes on emission standards and driving cycles. **(8)**

15 a . i). With a neat sketch explain air assisted injection system indicating its advantages and disadvantages. **(10)**

ii). Explain the salient features of plasma ignition system. **(6)**

(OR)

b i). Discuss the characteristics of a homogeneous charge compression ignition engine. **(8)**

ii). Explain the principle of operation of laser doppler anemometer with a neat sketch. **(8)**

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