Exam Date & Time: 06-May-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

VI SEMESTER B.TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2024

THEORY OF IC ENGINES AND EMISSIONS [MME 4052]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Describe mass blowby with sketches. Describe how it affects hydrocarbon emissions. (4)

A)

B) Explain how non-exhaust emissions are formed in SI engines. (3)

C) Complete the following statements using one of two words(increases/decreases):

(a)Increase in load_____the knocking tendency in SI engines

(b)Excessive valve overlap____ the thermal efficiency. (3)

2) List and describe the different factors which influence the flame propagation in SI engines. (3)

A)

B) Describe four factors considered only in actual cycles. (4)

C) Draw sketches of two combustion chambers used in SI engines. Describe one of them. (3)

3) Describe good combustion chamber design principles of SI engines (3)

A)

B) Define octane number. Describe how octane number is measured. (3)

C) Describe the combustion inside a stratified charge engine with neat sketches. What are its merits? (4)

4) Discuss dissociation. Discuss its effects on maximum temperature of combustion and brake power of an engine with the help of diagrams. (3)

A)

B) Discuss the advantages of using Wankel engine. (3)

C) Demonstrate the working of a CI dual fuel engine with a figure. (4)

5) Describe three performance characteristics affected by front end volatility of the fuel. (3)

A)

B) With the help of a sketch, describe the construction of a three-way-catalytic convertor. (4)

C) Describe Reid Vapor pressure test with the help of a neat sketch. (3)

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