

4E4145

Roll No.

Total No of Pages: 3

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B. Tech. IV Sem. (Back) Exam., May - 2019

Mechanical Engineering

4ME6A I. C. Engine

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

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Instructions to Candidates:

Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

UNIT- I

Q.1 Explain the working of a four stroke C.I. engine giving neat sketch. Also show in what respect the C.I. engine are superior to S. I. engine. [16]

OR

- Q.1 (a) Define the volumetric efficiency as applied to petrol engine. How does the volumetric efficiency of an engine limit the power output? [8]
- (b) Describe how the I.P. of a multi cylinder engine is measured? Mention the assumption made. [8]

UNIT- II

- Q.2 (a) What do you understand by ignition lag? Discuss the effect of different factors which affect the ignition lag. Why ignition lag should be minimum? [8]
- (b) What are the effects of sulphur content in the fuel on the performance of S.I and C.I engines? [8]

OR

- Q.2 (a) Explain the combustion stages of C.I. engines. [8]
- (b) What is meant by following terms in the refining of petroleum – [8]
- (i) Cracking
 - (ii) Polymerization
 - (iii) Blending
 - (iv) Isomerization

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UNIT- III

- Q.3 (a) Explain the working of a battery ignition system with the help of neat sketch. [8]
- (b) What do you understand by angle of advance? Why it is necessary with the ignition system? [8]

OR

- Q.3 What are the basic requirement of a good injection system? Also explain the working of a fuel injector with the help of neat sketch. [16]

UNIT- IV

- Q.4 (a) What modification are required if the existing engine is to be supercharged? [8]
- (b) What is the function of an additive? Discuss different types of additives and effects on the properties of lubricating oil? [8]

OR

- Q.4 (a) Why does turbo charging of C.I. engine lead to an improvement in fuel economy, while turbo charging a S.I. engine usually leads to decreased fuel economy? [8]
- (b) Explain the lubrication of the following parts with the help of a neat sketch – [8]
- (i) Crank Pin and Gudgeon pin,
 - (ii) Main bearing
 - (iii) Cylinder and piston

UNIT- V

Q.5 Define the dual fuel and multifuel engine. Also describe the working of dual fuel engine with neat sketch and discuss its performance characteristic. [16]

OR

- Q.5 (a) Explain the thermodynamics of free piston engine with the help of T – s diagram. <http://rtuonline.com> [8]
- (b) Discuss the performance characteristic of variable compression ratio engine with conventional I. C. engine. [8]

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