

B.TECH SEM – IV (2007 COURSE) (MECHANICAL ENGG.) :
WINTER - 2017
SUBJECT : INTERNAL COMBUSTION ENGINES

Day : **Tuesday**
Date : **21/11/2017**

W-2017-2426

Time : **02.30 PM TO 05.30 PM**
Max. Marks : **80**

N. B. :

- 1) **Q. No. 1 and Q. No.5 are COMPULSORY.** Out of remaining **Any TWO** questions from each section.
- 2) Answers to both the sections should be written in the **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Use of Non-programmable electronic pocket **CALCULATOR** is allowed.
- 5) Assume suitable data, if **WHEREVER** necessary.

SECTION - I

- Q.1**
- a) Explain acceleration pump with neat sketch. **(05)**
 - b) Explain battery ignition system with neat sketch. **(05)**
 - c) Explain valve timing diagram for four stroke engine. **(04)**
- Q.2**
- a) Classify ignition systems and explain any one lubrication system with neat sketch. **(06)**
 - b) Explain the function of governor and explain any one governing method with neat sketch. **(07)**
- Q.3**
- a) Derive the expression for ASE of Otto cycle. **(06)**
 - b) Give the basic components of Internal Combustion Engines with neat block diagram. **(07)**
- Q.4**
- a) Explain with neat block diagram fuel feeding system of diesel engine. **(07)**
 - b) Explain the functions of carburetor and explain fuel pump with neat sketch. **(06)**

SECTION- II

- Q.5**
- a) Give the classification of dynamometers and explain rope brake dynamometer with neat sketch. **(05)**
 - b) Explain different stages of combustion in C I engines. **(05)**
 - c) Explain the concept of hybrid vehicles. **(04)**

P.T.O.

- Q.6 a)** Explain and define the following : **(05)**
i) Brake specific fuel consumption
ii) Thermal efficiency
iii) Mechanical efficiency
- b)** A four stroke petrol engine 80 mm bore, 100 mm stroke, is tested at full throttle at constant speed. The fuel supply is fixed at 0.068 kg/min and the plugs of the four cylinders are successively short circuited without change of speed, brake torque being correspondingly adjusted. The brake power measurements are as following : **(08)**
With all cylinders firing = 12.5 kw
With cylinder no 1 cutoff = 9 kw
With cylinder no 2 cutoff = 9.15 kw
With cylinder no 3 cutoff = 9.2 kw
With cylinder no 4 cutoff = 9.0 kw
Determine: IP of the engine. Also determine the indicated thermal efficiency. Calorific value of fuel is 44000 kJ /kg. Compare this efficiency with the air standard value. Clearance volume of one cylinder is $70 \times 10^3 \text{ mm}^3$.
- Q.7 a)** Explain stages of combustion in C.I. Engines. **(06)**
- b)** Explain with neat sketch combustion chambers in S.I. Engines. **(07)**
- Q.8 a)** Explain with neat sketch gas analyzer used in measurement of exhaust emissions. **(06)**
- b)** Write short note on “Alternative fuels for I.C. Engines”. **(07)**

* * * * *