Roll No. | | | | | | | | | | | | **Total No. of Pages : 2**

Total No. of Questions : 09

B.Tech. (AE) (Sem.–4)

INTERNAL COMBUSTION ENGINES

Subject Code : AE-202

Paper ID : [A0708]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION-A

l. Write briefly :

a) What do you mean by compression ratio of an engine?

b) How are I.C engines classified?

c) What are the drawbacks of a simple carburettor?

d) Define Cetane number of a fuel.

e) What do you mean by ignition lag?

f) What are the different stages of combustion in CI engine?

g) What are the different methods of turbocharging?

h) What is function of fins and why they are provided?

i) Differentiate between I.H.P. and B.H.P.

j) What are different additives used in lubricants?

SECTION-B

2. Draw the valve timing diagram of two stroke and four stroke engine and compare them with actual diagrams.

3. Explain the phenomenon of knocking in S.I engine and what is the effect of various engine variables on S.I engine knock?

4. What are the essential requirements of an automobile carburettor? Explain any one automobile carburettor with a suitable sketch.

5. What is an air cooling system and in which type of engine it is normally used?

6. What is the need for supercharging and explain the working of Turbocharger?

SECTION-C

7. A large four stroke cycle diesel engine runs at 2000 r.p.m. The engine has a displacement of 25 litres and brake mean effective pressure of 0.6MN/m^2. It consumes 0.018 kg/s of fuel and the calorific value of fuel is 42000 kJ/kg. Determine the brake power and brake thermal efficiency.

8. The following details were noted in a test on four cylinder, four stroke engine. Diameter = 100 mm,
   Stroke = 120mm,
   Speed of the engine =1600 r.p.m.,
   Fuel consumption = 0.2 kg/min,
   Calorific value of fuel = 44000 kJ/kg
   Difference in tension on either side of the brake pulley = 40 kg,
   Brake circumference = 300 cm.

   If the mechanical efficiency is 80 %. Calculate :

   i. Brake Thermal efficiency

   ii. Indicated thermal efficiency

   iii. Indicated mean effective pressure

   iv. Brake specific fuel consumption

9. Explain with a suitable sketch Dry sump and Wet sump lubrication system.