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A – 2317

Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)
08.806.16 : DESIGN OF IC ENGINES**

Time : 3 Hours

Max. Marks : 100

Note : a) *Use of approved data book is permitted.*
b) *Assume any missing data suitably.*

PART – A

(Answer **all** questions. **Each** question carries **4** marks.)

1. What do you meant by indicator diagram ? Mention its importance.
2. What do you meant by BMEP ? How it differs from IMEP ?
3. Differentiate between IHP and BHP.
4. Compare trapping efficiency and charging efficiency.
5. Explain the design procedure of IC engine manifolds.
6. How manifold absolute pressure is measured in IC engines ?
7. How numbering of IC engine cylinders is done ?
8. Give the design procedure of IC engine crankshaft.
9. Explain the working principle of eddy current dynamometer.
10. How selection of Poppet valves is done in four stroke IC engines ? **(10×4=40 Marks)**

P.T.O.



PART - B

(Answer any one question from each Module. Each question carries 20 marks.)

Module - 1

11. An 8-cylinder, four stroke engine of bore 10 cm and 9 cm stroke has a compression ratio of 7 is running at 4500 rpm on a dynamometer which has 54 cm arm. During a 10 minutes test the dynamometer scale beam reading was 48 kg and the engine consumed 4.4 kg of gasoline having a calorific value of 44000 kJ/kg. Air at 27°C temperature and 1 bar pressure was supplied to the carburetor at the rate of 6 kg/min. Find:
- The brake power delivered,
 - The brake mean effective pressure,
 - The brake specific fuel consumption,
 - The brake thermal efficiency,
 - The mechanical efficiency.

OR

12. A four stroke 3 litre V6 spark ignition engine has a maximum power output of 100 kW @ 5500 rpm and a maximum torque of 236 Nm @ 3000 rpm. The minimum BSFC is 0.090 kg/MJ @ 3000 rpm and the air flow is 0.068 m³/s. The compression ratio is 8.9 : 1 and the mechanical efficiency is 90 percent. The engine was tested under ambient conditions of 20°C and 1 bar. The fuel has a calorific value of 42 MJ/kg. Calculate :
- The power output @ 3000 rpm and the torque @ 5500 rpm.
 - BMEP and IMEP @ both speeds.
 - Volumetric efficiency and air fuel ratio @ 3000 rpm.

Module - 2

13. a) Explain the various methods involve in the scavenging of two stroke engines.
b) Explain uniflow scavenging.

OR



14. a) State the advantages and disadvantages of two stroke engines.
b) Compare supercharging and turbocharging.

Module - 3

15. A four stroke diesel engine has the following specifications : Brake Power = 5 kW, Speed = 1200 rpm, induced mean effective pressure = 0.35 N/mm², mechanical efficiency = 80%. Design the engine cylinder.

OR

16. Design a Poppet valve for an IC engine for the following specifications.

Diameter of port = 60 mm

Maximum gas pressure = 4 Mpa

Safe stress in bending for the valve material = 46 Mpa

The angle at which the valve disc is tapered = 30°.

(3×20=60 Marks)