

24260

B.Tech. 5th Semester (M.E.)

Examination, December–2015

**INTERNAL COMBUSTION ENGINE AND GAS  
TURBINES**

**Paper–ME-307-F**

*Time allowed : 3 hours]*

*[Maximum marks : 100*

*Note : Attempt any five questions in all. Question No. 1 is compulsory and select at least one question from each section.*

1. (a) How will you classify the I.C. Engine ?
  - (b) What should be the properties of a lubricating oil ?
  - (c) What are the main pollutants from S.I. and C.I. Engine ?
  - (d) Explain the main component of a Gas Turbine plant.
- 4×5=20

**Section–A**

2. The stroke and cylinder diameter of a compression ignition engine are 250 mm and 150 mm respectively. If the clearance volume is  $0.0004 \text{ m}^3$  and fuel injection takes place at constant pressure for 5 percent of the stroke. Determine the efficiency of the engine. Assume the engine working on the diesel cycle. 20

( 2 )

**24260**

3. Explain the mixture requirements for various operating condition in S.I. Engine. 20

**Section-B**

4. Explain the combustion phenomenon in S.I. engine with neat sketch. 20
5. Explain the following :  
(a) SAE rating of a lubricant  
(b) Necessity of a Engine cooling. 10,10

**Section-C**

6. A four cylinder, four stroke S.I. Engine develops a maximum brake torque of 160 Nm at 3000 rpm. Calculate the engine displacement, bore and stroke. The Brake mean effective pressure at the maximum engine torque point is 960 Kpa. Assume bore is equal to stroke. 20
7. Explain the different methods for emission control in S.I. and C.I. Engine with neat diagram. 20

**Section-D**

8. Explain the Axial flow compressor with their degree of reaction polytropic efficiency and their performance characteristics. 20
9. Explain the methods that can be used for improvement of the basic gas turbine cycle. 20