

7. Give a brief account of air pollution due to engines. What is a thermal converter ? How does it help to reduce emissions from engines ?

**Unit-IV**

15 each

8. Explain briefly Brayton Cycle. Derive expression for optimum pressure ratio. Also describe with neat sketches the working of a simple constant pressure open cycle gas turbine.
9. Explain the various types of rotary compressors.

Roll No. : .....

Total No. of Questions : 9 ]

[ Total No. of Pages : 4

**3316**

B.Tech. (ME) 6th Semester (Supplementary)

Examination, July-2021

(G Scheme)

**INTERNAL COMBUSTION ENGINES AND GAS  
TURBINES**

Paper-PEC-ME-320-G

(Elective-I)

Time : Three Hours ]

[ Maximum Marks : 75

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :-** Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

1. (i) What are the various types of ignition system ?
- (ii) Define scavenging efficiency.

3316\_1650

( 4 )

**RD-3464**

3316\_1650

( 1 )

**RD-3464**

P.T.O.

(iii) Draw and explain  $p-v$  diagram of Sterling cycle.

(iv) Define cetane rating.

(v) Disadvantages of overcooling.

(vi) Application of gas turbines.

$2\frac{1}{2} \times 6 = 15$

**Unit-I**

15 each

2. What is the basic difference between Otto Cycle and Diesel Cycle? Derive the expression for the efficiency and mean effective pressure of the Diesel Cycle.

3. Derive an expression for air-fuel ratio of a simple carburetor. How are the injection system classified? Describe them briefly.

**Unit-II**

15 each

4. Briefly explain the stages of combustion in SI engines elaborating the flame propagation. Explain the various factors that influence the flame speed.

5. Explain and compare the wet sump dry sump lubrication systems. What are the various desired properties of a lubricant?

3316\_1650

( 2 )

**RD-3464**

**Unit-III**

15 each

6. The following observations were recorded during a trial of a four-stroke, single-cylinder oil engine. Duration of trial is 30 min; oil consumption is 4 litres; calorific value of the oil is 43 MJ/kg; specific gravity of the fuel = 0.8; average area of the indicator diagram =  $8.5 \text{ cm}^2$ , length of the indicator diagram = 8.5 cm; spring constant = 5.5 bar/cm; brake load = 150 kg; spring balance reading = 20 kg; effective brake wheel diameter = 1.5 m; speed = 200 rpm; cylinder diameter = 30 cm; stroke = 45 cm; jacket cooling water = 10 kg/min; temperature rise is  $36^\circ\text{C}$ .

Calculate :

(i) Indicated power

(ii) Brake power

(iii) Mechanical efficiency

(iv) Brake specific fuel consumption in kg/kWh

(v) Indicated thermal efficiency.

3316\_1650

( 3 )

**RD-3464**

P.T.O.