

Code No: R1931035

R19

SET - 1

**III B. Tech I Semester Supplementary Examinations, June/July-2022**  
**IC ENGINES & GAS TURBINES**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**  
All Questions Carry Equal Marks

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**UNIT-I**

1. a) Compare otto cycle for same peak pressure and temperature by illustrating the cycle on PV and TS diagrams. [8M]  
b) Write in detail about actual and air fuel cycles? [7M]

**(OR)**

2. a) In an ideal diesel cycle, the pressure and temperature are 1.03 bar and 27°C respectively. The maximum pressure in the cycle is 47 bar and the heat supplied during the cycle is 545 kJ/kg. Determine [8M]  
(i) the compression ratio  
(ii) the temperature at the end of compression  
(iii) the temperature at the end of constant pressure combustion  
(iv) the air standard efficiency.

Assume  $\gamma = 1.4$  and  $C_p = 1.004$  kJ/kg K for air.

- b) Write a short note on (i) Heat loss factor (ii) loss due to gas exchange process. [7M]

**UNIT-II**

3. a) Write the nomenclature of basic engine. [4M]  
b) Differentiate between two stroke and four stroke petrol engine. [6M]  
c) Explain fuel pump with the help of a diagram. [5M]

**(OR)**

4. a) With the help of a diagram explain the battery ignition system. [8M]  
b) Explain about Thermosyphon cooling system. [7M]

**UNIT-III**

5. a) Draw and explain divided combustion chamber. [8M]  
b) What is effect of engine variables on knocking? [7M]

**(OR)**

6. a) What are the various properties of fuel? Explain. [8M]  
b) Compare knocking in SI and CI engines? [7M]

**UNIT-IV**

7. a) Write and explain hydraulic dynamometer? [8M]  
b) What is indicated power? Explain the measurement of indicated power using indicator diagram. [7M]



(OR)

8. a) What is flow meter? Explain gravimetric flow meter in detail? [8M]  
b) What are the various factors that affect the performance in engine? [7M]  
Explain.

UNIT-V

9. a) Draw and explain the centrifugal compressor in gas turbine. [8M]  
b) Draw and explain the various jet engines and explain their features. [7M]

(OR)

10. a) Explain the working of closed cycle gas turbine with preheating by [8M]  
using schematic diagram.  
b) Draw and explain turbojet and turbo propeller engine. [7M]

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