GIET UNIVERSITY, GUNUPUR – 765022
M. Tech (Third Semester – Regular) Examinations, December – 2020
MPETE 3021 – THEORY OF COMBUSTION AND EMISSION
(Heat Power and Thermal Engineering)

Time: 2 hrs   Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A   **(2 x 10 = 20 Marks)**

Q.1. Answer *ALL* questions

  a. What are the air-standard assumptions?

  b. Define the term co-efficient of performance of refrigerator and heat pump?

  c. Draw the simple ideal Rankine cycle and label the four processes?

  d. Draw the P-V diagram of the reversed Carnot cycle?

  e. Write the properties of gasoline fuels?

  f. Define the term 'Diesel ignition delay'?

  g. List the various alternative fuels used for spark ignition engines?

  h. List the various biodiesel fuels used for compression ignition engines?

  i. List the major emissions from internal combustion engines?

  j. Define stokers?

PART – B   **(6 x 5 = 30 Marks)**

Answer *ANY FIVE* questions   Marks

2. With effect of compression ratio on the performance describe the analysis of air-standard diesel cycle?   (6)

3. Describe the following statements of the second law of thermodynamics i) Clausius Statement ii) Kelvin–Planck Statement iii) Entropy Statement   (6)

4. In an air standard Otto cycle the compression ratio is 6 and the isentropic compression begins at 100 kPa and 373 K. Heat is added at constant volume until the pressure reaches 3500 kPa. Determine pressure and temperature at all points and efficiency of cycle.   (6)

5. Describe the various process of abnormal combustion in spark ignition engines?   (6)

6. Explain the various stages of Diesel combustion process?   (6)

7. With neat sketch explain the pulverised coal burner system and list the various burners used to burn the pulverised coal?   (6)

8. A cold storage is to be maintained at 268 K surrounding temperature is 308 K. The heat leakage from surrounding to cold storage is 29 Kw. Actual COP of refrigeration plant is one third of ideal plant . Find out the power required to drive the unit.   (6)

9. What are the factors affecting knocking and pre ignition in CI engine and explain the effects of variation in these factors in knocking and pre ignition.   (6)

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