TED (15/19) - 4024
(REVISION-2015/19)

N21-04134

Reg.No………………
Signature…………….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANGEMENT/ COMMERCIAL PRACTICE - NOVEMBER 2021

THERMAL ENGINEERING

(Maximum Marks:75)   (Time: 2¼ hours)

PART - A

Marks

I.   Answer *any three* questions in one or two sentences. Each question carries 2 marks.

1.   Define state of system.

2.   Write the expression for air standards efficiency of Otto cycle.

3.   Draw P-v diagram of four stroke diesel cycle.

4.   Define the term dryness fraction.

5.   What is heat exchanger.   (3 x 2 = 6)

PART - B

II   Answer *any four* of the following questions. Each question carries 6 marks.

1.   Define Boyle's law and Charles law of gases.

2.   With the help of examples explain different systems in thermodynamics.

3.   Compare SI and CI engine.

4.   Draw valve timing diagram of four stroke petrol engine.

5.   Differentiate between wet steam, Dry steam and super heated stream.

6.   Explain with example various mode of heat transfer.

7.   State function of an air compressor, what were the uses of compressed air.

(4 x 6 = 24)

PART – C

(Answer *any of the three units* from the following. Each full question carries 15 marks.)

UNIT - I

III   (a)   Explain laws of thermodynamics with the help of neat diagrams.   (9)

(b)   Derive an expression for characteristic gas equation.   (6)

OR

IV a) What is isothermal process? With help of PV and TS diagram derive an
expression for work done during the same. (7)

b) Explain with help of PV and TS diagram, explain Adiabatic process.
Also write expressions for work done, heat transfer and internal energy
during the process (8)

UNIT – II

V a) With the help of PV and TS diagram, explain diesel cycle. (7)

b) Derive an expression for air standard efficiency of otto cycle (8)

OR

VI a) Explain working of two stroke petrol engine. (9)

b) Calculate the air standard efficiency of an engine working on otto cycle
if the pressure at the beginning and end of compression are 1 bar and
7 bar respectively. Take γ as 1.4(pa201). (6)

UNIT – III

VII a) Explain Morse test of multi cylinder petrol engine. (7)

b) Define:

i) Mechanical efficiency   v) Indicated power
ii) Brake thermal efficiency   vi) Brake power
iii) Relative efficiency   vii) Frictional power
iv) Specific fuel consumption   viii) Volumetric efficiency (8)

OR

VIII (a) With the help of neat diagram explain working of double acting
steam engine. (7)

(b) Draw the line diagram of Rankine cycle. Explain each process in the cycle
using PV and TS diagrams. Also write expression for efficiency of the
Rankine cycle. (8)

UNIT – IV

IX (a) State Fourier law of heat conduction. Also derive an expression to find
heat conduction taking place through a composite wall. (10)

(b) Thermal radiation strikes a surface which has reflectivity of 0.55 and a
transmissivity of 0.032. The absorbed flux as measured indirectly by
heating effect works out to be 95 W/m2. Determine rate of incident flux. (5)

OR

X a) With suitable sketches explain different types of heat exchanger. (9)

b) With help diagram explain working of single stage reciprocating air
compressor. (6)

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