R16

Code No: 135CH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, May/June - 2019
FUNDAMENTALS OF MECHANICAL ENGINEERING
(Common to CE, EEE, CSE, MIE)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Write the statement of zeroth law of thermodynamics.	[2]
b)	Write a short note on Global warming.	[3]
c)	Define Charle's law.	[2]
d)	What are fire tube boilers?	[3]
e)	Define Indicated power.	[2]
f)	Draw p-v and T-s plots of Otto cycle. Indicate all salient features.	[3]
g)	What is the working principle of rotary pump?	[2]
h)	Write a note on window air conditioner.	[3]
i)	What do you mean by disc type clutch?	[2]
j)	What are the applications of Abrasive materials?	[3]

PART - B

(50 Marks)

2.a) What is a prime mover? Explain various types in detail.
b) What do you mean by a fossil fuel? List out different types and their application. [5+5]

OR

3.a) Write a note on bio fuels.
b) Write a note on solar power. [5+5]

4.a) Why cannot a throttling calorimeter measure the quality if the steam is very wet?
b) A spherical shell of diameter 50 cm contains steam at a pressure of 40 bar and 0.85 dryness fraction. Calculate the mass of water and steam. [5+5]

OR

5. Discuss working of Chocran boiler with the help of a neat sketch. [10]

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6.a) An engine operating on a Carnot cycle works with in temperature limits of 600 K and 300 K. If the engine receives 2000 kJ of heat, evaluate the work done and thermal efficiency of the engine.

b) Draw the p-v and T-s plots of Otto cycle. Derive the expression for thermal efficiency of Otto cycle. [5+5]

OR

7.a) Write detailed classification of IC engines based on various aspects.

b) Write the differences between petrol engines and diesel engines. [5+5]

8.a) Differentiate between positive displacement compressors and dynamic compressors.

b) What is meant by multistage compression? Explain its significance. [5+5]

OR

9. Explain working of vapour absorption refrigeration system with the help of a neat sketches of layout and property plots. Derive expression for COP. [10]

10.a) Discuss the construction details of flange coupling.

b) Explain the working of gear drive. [5+5]

OR

11. Write a note on various metals that come under engineering materials. Discuss their applications. [10]

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