

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.) DEGREE COURSE 2016-17

Semester	: II (V Dean)	Academic Year	: 2016-2017
Course No.	: DE-204	Course Title	: Thermodynamics
Credits	: 1+1=2	Total Marks	: 50
Day & Date	: Saturday, 17.06.2017	Time	: 11.00 to 13.00 Hrs.

- Note :
- 1) Section "A" is Compulsory.
 - 2) Solve **Any Three** questions from Section "B"
 - 3) The use of scientific tables, charts and calculator is allowed in case of engineering courses.

SECTION –‘A’

- Q. 1. A) Answer in Following questions. (05)
- i) Write the S.I. unit of Specific heat.
 - ii) Write the S.I. unit of Temperature.
 - iii) What is the relation between the unit of pressure bar and N/m^2
 - iv) What is the relation between Celsius scale and Fahrenheit scale?
 - v) Give the formula for work.
- B) Define the following. (05)
- i) Thermal equilibrium
 - ii) Thermodynamic cycle
 - iii) Specific heat
 - iv) Thermodynamic Process
 - v) Internal Energy
- Q. 2 A) State whether True or False. If false, rewrite the statement after making necessary corrections. (05)
- i) Absolute pressure = Atmospheric pressure + Vacuum pressure.
 - ii) $1 \text{ kPa} = 1 \text{ N/m}^2$
 - iii) Entropy of working substance is depending on heat.
 - iv) Otto cycle is also known as constant volume cycle.
 - v) In a steady flow process, the mass flow rate is constant.
- B) Choose the most appropriate answer from the options given below. (05)
- i) First law of thermodynamic deals with
 - a) Conservation of heat
 - b) Conservation of Energy
 - c) Conservation of momentum
 - d) None of these
 - ii) Kelvin-Planck's law deals with
 - a) Conservation of heat
 - b) Conservation of mass
 - c) Conservation of work
 - d) Conversion of heat into work
 - iii) Atmospheric pressure is equal to
 - a) 1.013 bar
 - b) 101.3 kN/m^2
 - c) 760 mm of Hg
 - d) All of these

(P.T.O.)

- iv) Second law of thermodynamic defines
- | | |
|------------|--------------------|
| a) Heat | b) Work |
| c) Entropy | d) Internal energy |
- v) The value of gas constant (R)
- | | |
|----------------|-----------------|
| a) 287 J/kg K | b) 28.7 J/ kg K |
| c) 2.87 J/kg K | d) 0.287 J/kg K |

SECTION –‘B’

- Q. 3 A) Define a thermodynamic system? Explain its different types. (05)
B) Derive the expression for the air standard efficiency of an Otto cycle engine. (05)
- Q. 4 A) Write brief notes on thermodynamic equilibrium. (05)
B) Explain the Zeroth law and second law of thermodynamics. (05)
- Q. 5 A) What do you mean by terms compression and expansion of gases? (03)
B) Write notes on thermodynamic temperature scale. (03)
C) Enlist and Explain temperature measuring devices. (04)
- Q. 6 A) Write short notes on entropy. (03)
B) Calculate the quantity of heat required to raise the temperature of a steel forging of mass 180 kg from 300 K to 1265 K. The sp. Heat of steel is 0.49 kJ/kg K. (03)
C) Give the difference between two stroke and four stroke engine. (04)
- Q. 7 Explain two stroke and four stroke engines in detail with neat sketch along with their timing diagrams. (10)
