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FE - 2 (RC) 4

F.E. (Semester – II) (R.C.) Examination, Nov./Dec. 2008
BASIC MECHANICAL ENGINEERING

Duration : 3 Hours

Total Marks : 100

- Instructions :** 1) Answer **five** questions, selecting **one** from **each** Module.
2) **Illustrate** your answers with **neat** figures/sketches if required.
3) Assume **any** data if found **necessary** and state **clearly**.

MODULE – I

1. A) Answer the following :

- Show that the enthalpy of fluid before throttling is equal to that after throttling.
- Is differentials of heat (or work) exact ? Is it correct to say heat content by the system is 5 kJ ?
- What is essence of first law of thermodynamics ? Write down the expression for First law applied to (i) a cycle (ii) a process.
- State the limitations of the first law of thermodynamics. (4×3=12)

B) It is desired to compress 10 kg of gas from 15 m³ to 0.3 m³ at a constant pressure of 15 bar. During this compression process, the temperature rise from 20° C to 150° C and the increase in internal energy is 3250 kJ. Calculate the work done, heat interaction and change in enthalpy during the process. Draw the process on P-V diagram. 8

2. A) Answer the following :

- Give statements of second law of thermodynamics.
- Define thermal efficiency of heat engine. Can it be 100 percent ?
- Brief about the concept of "Absolute Temperature Scale".
- Define the terms compression ratio, clearance volume swept volume and total volume. (4×3=12)

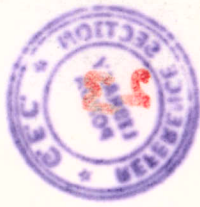
B) The following data pertains to petrol engine :

Cylinder bore (Dia.) = 13.7 cm; Stroke length = 13 cm

Clearance volume = 280 cm³

Calculate the air standard efficiency of the engine. 8

P.T.O.



MODULE - II

3. A) Distinguish between Petrol and Diesel engines.
B) Write a short note on domestic refrigerator.
C) What is function of carburetor and fuel pump in I.C. Engine ?
D) A diesel engine has brake thermal efficiency of 28 per cent. If calorific value of fuel is 42500 kJ/kg, find its brake specific fuel consumption. (5+5+5+5)
4. A) Explain the function of the following in steam power plant :
i) Boiler
ii) Feed water pump
iii) Condenser
iv) Turbine.
B) Define coefficient of performance and tonne of refrigeration.
C) Write a short note on Multi-Point Fuel Injection (MPFI).
D) Define specific fuel consumption and brake thermal efficiency. (6+4+6+4)

MODULE - III

5. A) Write a short note on the following :
i) Propeller shaft
ii) Universal joints.
B) What is clutch ? Where is clutch located ? And what are the features of good quality clutch ?
C) What is universal joint ? Where is it used ? (8+8+4)
6. A) Describe with a neat sketch the construction and working of a single plate clutches.
B) What are the requirements of good braking systems ? What are the functions of braking systems ?
C) What are the requirements of transmission systems ?
D) Give the classifications of automobiles. (5+6+5+4)