

March 2021

**ELEMENTS OF MECHANICAL ENGINEERING**

Time Allowed: 2 Hours

Full Marks: 35

Answer to Question No.1 is compulsory and Answer any five questions from the rest.

1. Answer the following questions (any ten): 10x1

Fill in the blanks:

- i) The modern motor cycles are usually \_\_\_\_\_ stroke.
- ii) Refrigerator absorb heat from sink and delivers into the \_\_\_\_\_.
- iii) Carburettor is not used in \_\_\_\_\_ engine.
- iv) Refrigerator works according to \_\_\_\_\_ statement.
- v) Modern high pressure boiler is a \_\_\_\_\_ type boiler.
- vi) First law of thermodynamics does not indicate \_\_\_\_\_ of heat flow.
- vii) Heat pump absorb heat from sink and delivers into the \_\_\_\_\_ .
- viii) Normal temperature & pressure is \_\_\_\_\_ and \_\_\_\_\_.

State True or False:

- ix) Throttle valve is an element of vapour compression refrigeration cycle.
- x) Pre ignition occurs only in petrol engine.
- xi) 4- Stroke cycle engine require lighter fly wheel than 2- stroke engine.
- xii) Fuel having larger calorific value increases evaporative capacity of a boiler.
- xiii) Compressor is an element of vapour compression refrigeration cycle.
- xiv) Heat Engine works according to Kelvin Plank statement.
- xv) Cooling coil is an element in domestic refrigerator.

- 2. State the law's of thermodynamics. Define – (a) Heat engine, (b) Heat pump, (c) Refrigerator. 2+3
- 3. Write down the difference between window air conditioning and split air conditioning. 5
- 4. What is priming? Explain with a neat sketch the working principle of a centrifugal pump. 2+3
- 5. Write down the working principle of centrifugal compressor. What Swept volume & FAD signify? 2+3
- 6. What do you mean by octane number and cetane number? How they are related with I.C. Engine. 5
- 7. Write short note on – (a) Two stroke diesel Engine, (b) Screw compressor. 5
- 8. Define boiler? Classify the boiler broadly. 2+3
- 9. Differentiate between Impulse and Reaction turbine. 5