Total No. of Questions—**8**] [Total No. of Printed Pages—**4**

Seat No.	

[5667]-103

F.E. (Common) (Second Semester) EXAMINATION, 2019

BASIC MECHANICAL ENGINEERING

(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data, if necessary.

(*iv*) Use of non-programmable electronic calculator is permitted.

(*v*) Attempt four questions out of eight : Q. No. **1** *or* Q. No. **2**, Q. no. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

1. (*a*) Draw neat diagrams of : [6]

(*i*) Disc Brake

(*ii*) Single plate clutch.

(*b*) Define the following mechanical properties of materials : [6]

(*i*) Ductility,

(*ii*) Malleability,

(*iii*) Brittleness,

P.T.O.

(*iv*) Fatigue,

(*v*) Resilience

(*vi*) Creep.

Or

2. (*a*) How are couplings classified ? With neat sketch explain Rigid Flange coupling. [6]

(*b*) Compare Belt Drive, Chain Drive and Gear Drive. [6]

3. (*a*) Explain Turning, Facing, Parting and Chamfering operations performed on lathe machine. [6]

(*b*) Differentiate between hot forging and cold forging process (any *four* points). Draw neat sketch of Hot forging process set up. [7]

Or

4. (*a*) Explain any *four* operations performed in sheet metal working process. [6]

(*b*) Draw block diagram of Radial Drilling Machine and explain tapping and countersinking operation on it. [7]

5. (*a*) Explain with sketch, open system, closed system and an isolated system. Give *one* example of each. [4]

(*b*) Define Atmospheric pressure, Gauge pressure and Absolute pressure and state unit of pressure. [4]

(*c*) A heat pump is used to maintain the house at 24°C. The house is losing the heat at the rate of 1800 kJ/min. to the surrounding. If the heat pump is driven by an electric motor of power rating 12 kW, find : [5]

(*i*) The amount of heat absorbed from surrounding

(*ii*) The COP of the heat pump.

Draw the sketch of system.

Or

6. (*a*) Explain with sketch, concept of Heat Engine and Refrigerator. [4]

(*b*) State and explain two statements of second law of thermodynamics. [4]

(*c*) A U tube manometer with one arm open to the atmosphere is used to measure pressure in a steam pipe. The level of mercury in open arm is 10 cm greater than that in the arm connected to the pipe. Some of the steam in the pipe condenses in the manometer arm connected to the pipe. The height of this column is 3.5 cm. If the atmospheric pressure is 76 cm of mercury, find the absolute pressure of steam. [5]

7. (*a*) Draw sketch of thermal power plant. State advantages and limitations of thermal power plants. [6]

(*b*) Explain working of four-stroke cycle spark ignition engine with neat sketches. [6]

Or

8. (*a*) What is Refrigeration ? Explain vapour compression refrigeration cycle. [6]

(*b*) Explain with neat sketch, single acting single stage reciprocating air compressor. [6]