

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)**  
**B.Tech.Sem - I MECHANICAL : : SUMMER - 2022**  
**SUBJECT : FUNDAMENTALS OF MECHANICAL ENGINEERING**

Day : Thursday  
Date : 2/6/2022

**S-23488-2022**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

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**N. B :**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Use of non-programmable **CALCULATOR** is allowed.
  - 4) Assume suitable data if necessary.
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**Q.1** State the second law of thermodynamics. A system undergoes a change of state from 1 to 2 along path A, during which heat transferred from the system is 50 kJ and work done on it is 65 kJ. Find the change in energy of the system. **(10)**

**OR**

Describe the working of a household refrigerator. **(10)**

**Q.2** Calculate the specific weight, mass density, specific gravity and specific volume of oil having a volume of 6 m<sup>3</sup> and weight of 44 kN. **(10)**

**OR**

Derive the formula for capillary rise in a tube inserted in a fluid. **(10)**

**Q.3** What is four bar chain? State its inversions. **(10)**

**OR**

State the mechanism used for intermittent motion transfer. Describe one of them in detail. **(10)**

**Q.4** What is bearing? State the different types of bearing? Draw the diagram of journal bearing. **(10)**

**OR**

Describe the construction of a spur gear and helical gear in detail. **(10)**

**Q.5** Define extrusion. Describe the process in detail. **(10)**

**OR**

What is welding? Describe are welding in detail. **(10)**

**Q.6** Draw the diagram of drilling machine and label all its parts. **(10)**

**OR**

What are the various operations performed on the centre lathe machine? **(10)**

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