

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: IMSC
BRANCH: FOOD TECH**

**SEMESTER : VI
SESSION : SP/19**

SUBJECT: IMF6003 FOOD ENGINEERING III

TIME: 3 Hours

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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| Q.1(a) | Discuss first law of thermodynamics. | [2] |
| Q.1(b) | Discuss the limitations of first law of thermodynamics. | [4] |
| Q.1(c) | Derive equations of specific heat at constant volume and constant pressure processes. | [6] |
| Q.2(a) | State and prove carnot theorems. | [6] |
| Q.2(b) | Discuss the difference between heat engine, heat pump and refrigerator with a neat sketch. | [6] |
| Q.3(a) | Write down the advantages of multiple compressor refrigeration system. | [2] |
| Q.3(b) | Discuss briefly the classification of primary refrigerants? | [4] |
| Q.3(c) | Discuss the different methods of producing low temperatures. | [6] |
| Q.4(a) | Explain the classification of condenser and evaporator with a neat sketch? | [6] |
| Q.4(b) | Discuss the working principle of different types of compressors with a neat sketch? | [6] |
| Q.5(a) | Discuss the common sources of heat? | [2] |
| Q.5(b) | Discuss the following cooling load.
(i) Wall gain load
(ii) Air change load | [4] |
| Q.5(c) | Discuss simple vapor absorption refrigeration cycle with a neat sketch? | [6] |
| Q.6(a) | Discuss simple vapor absorption refrigeration cycle with a neat sketch? | [6] |
| Q.6(b) | Discuss the different instruments used for the measurement of flow properties of fluid foods. | [6] |
| Q.7(a) | Discuss the different types of modelling of thermal properties of frozen foods. | [6] |
| Q.7(b) | Explain the experimental approach to measure thermal properties of foods.
(i) Dilatometry
(ii) Differential Thermal Analysis | [6] |

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