

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

**CLASS: BARCH  
BRANCH: ARCHITECTURE**

**SEMESTER: V<sup>TH</sup>  
SESSION: MO/2024**

**SUBJECT: AR302 BUILDING SERVICES - III (MECH. & FIRE SAFETY)**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions, each of 10 marks and a total of 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have the correct question paper.
  5. Tables/Data handbook/Graph paper, etc., to be supplied to the candidates in the examination hall.
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|        |  | CO    | BL  |
|--------|--|-------|-----|
| Q.1(a) | Discuss NBC provisions for classifying buildings according to occupancy use or character.  | [5] 4 | 2,5 |
| Q.1(b) | Describe various provisions in NBC for the design of fire exit doors.  | [5] 4 | 1,2 |
| Q.2(a) | Draw the Psychrometric chart to show the sensible heating and latent heating process on the Psychrometric table.   | [5] 2 | 3   |
| Q.2(b) | Air change per hour is a relative value, comment? Compare the case of an Assembly Hall and a welding workshop to predict their possible Air change per hour requirements.  | [5] 2 | 4   |
| Q.3(a) | Explain the location of the Supply and return duct in case of cooling and heating.   | [5] 5 | 3,5 |
| Q.3(b) | Discuss various steps considered for the design of a good ducting system.  | [5] 5 | 3,4 |
| Q.4(a) | Illustrate a suitable location for placement of boiler, chiller and cooling tower in case of a water-based centralized HVAC system for a multistorey building with a basement.   | [5] 1 | 5   |
| Q.4(b) | Discuss the classification of fires.   | [5] 4 | 2   |
| Q.5(a) | Differentiate between hydraulic lift and traction lift by drawing neat Sketches.   | [5] 3 | 1,2 |
| Q.5(b) | A residential building has 80 apartments, each with an average population of 5 people and a service visit requirement of 2 persons per apartment (altogether 7 persons per apartment). If the recommended handling capacity of a lift for the residential building is 12%, then how many lifts with a 6-person capacity should be installed in the building? | [5] 3 | 6   |

:::25/11/2024:::M