

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

**CLASS: BARCH
BRANCH: ARCHITECTURE**

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

**SUBJECT: AR6301 BUILDING SERVICES- IV (MECHANICAL AND FIRE SAFETY SERVICES)
TIME: 3.00 Hrs.**

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) List the four ways of heat transfer employed by human body? [2]
Q.1(b) What is a plenum ventilation system? Explain with help of a drawing. [4]
Q.1(c) Explain the basic evaluative parameters for HVAC system. [6]
- Q.2) Differentiate between:
(i) Window AC & Split AC [4]
(ii) Traction Elevator & Hydraulic elevator. [4]
(iii) Natural Ventilation & Mechanical Ventilation [4]
- Q.3(a) What are the comfort conditions for human in context of HVAC? [2]
Q.3(b) Explain briefly the fundamental requirements for ventilation and air conditioning. [4]
Q.3(c) Explain about summer air-conditioning as per Indian conditions, say for New Delhi in summer, with psychrometric chart sketch and basic apparatus sketch? [6]
- Q.4(a) What is wind induced natural ventilation? Explain with the help of ASHRAE equation. [2]
Q.4(b) Explain general guidelines for an effective natural ventilation. [4]
Q.4(c) Discuss three types of humidifiers used in air conditioning. [6]
- Q.5 Explain the following types of air conditioning system with their advantages and disadvantages-
Q.5(a) All Air System [6]
Q.5(b) Unitary System [6]
- Q.6(a) What are the advantages and disadvantages of a traditional traction elevator? [2]
Q.6(b) Write notes on-(i) passenger lift (ii) service lift [4]
Q.6(c) Explain the different components of elevator/lift system with the help of schematic plans and sections. [6]
- Q.7(a) Write a short notes on 'Automatic Sprinkler System' for fire fighting. [2]
Q.7(b) Show in a diagram the three ways to ventilate a multi storey complex for smoke discharge. [4]
Q.7(c) Write down few common guidelines for design to be incorporated by architects needed for fire fighting in a building. [6]

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