

BACHELOR OF ARCHITECTURE EXAMINATION, 2025
(3rd year 2nd Semester)

SUBJECT: SERVICES & EQUIPMENT- II

Time: 3 Hours

Full Marks: 100

Instructions:

- (1) Answer for 100 marks**
- (2) Use sketches wherever necessary**

- Q.01. Describe the conditions of comfort. Make a sketch of a 'Refrigeration Cycle' and describe how the various apparatus interlinked in this system works and how the refrigerant behaves at the points of entry and exit into each of these apparatuses. Name any three different types of air conditioning systems used in residential and public areas. Discuss how masonry walls contribute toward optimizing indoor thermal condition through passive solar heating and cooling. 25
- Q.02. Mention the different sources of heat that are important to be considered for conditioning air in an enclosed area. Describe how the heats so generated from the various sources are quantified for calculation of 'Cooling Load' in an enclosed area 25
- Q.03. Mention any two methods adopted in calculating the sizes of ducts in air conditioning. Discuss in brief any one of such methods. Discuss the benefits and shortcomings of ducts of cross sections of rectangular and circular types. Make a schematic layout of arrangement of provision of air conditioning through FCU to each room through ducting with a spinal main duct running through a central corridor flanked by 6 rooms (to be air conditioned) on either side of the corridor. 25
- Q04. For a commercial application, solve the following:
- Given: Air required in main supply duct: 20000 cfm
Air velocity permitted: 1600 fpm
Length of main supply duct: 150 ft
- Find: (a) Main supply duct diameter for circular cross section and any two recommendable rectangular sizes and (b) Friction loss 25
- Q05. What do you understand by the term "Enthalpy"?
Describe (a) the process of cooling and dehumidification and (b) Heating and humidification
- Given: Initial DBT: 80F
Initial WBT: 70F
Final DBT: 55F
Final WBT: 50F
- Find: A. Sensible heat removed
B. Latent heat removed and
C. Total heat removed
- Calculation should be supported by Psychrometric chart 25

[Turn over

Q06. Write short notes on (any five):

(5 X 5) = 25

- (i) 1 TR
- (ii) Infiltration
- (iii) Heat exchanger
- (iv) Cooling tower
- (v) Concept of Saturation and Dewpoint in Psychrometry
- (vi) Thermal conductivity formula and Sensible Heat equation
- (vii) 'U' Factor
- (viii) Purpose of AHU and usual area in proportion with the floor area it serves
- (ix) Why do we feel cool when we blow off spirit placed on our skin?
- (x) Name any 5 air conditioner manufacturers