BACHELOR OF ARCHITECTURE EXAMINATION, 2022
(B. Arch. 3rd year 2nd Semester)

SUBJECT: SERVICES & EQUIPMENT- II

Instructions:

(1) Full Marks: 70; (2) Answer to Question number 05 (compulsory) and any other three; .
(3) Use sketches wherever necessary; (4) All answers should be hand-written only

Q.01. Draw and label a schematic diagram of a Refrigeration Cycle. Identifying the various physical states of the flowing refrigerant, describe in detail the significance of the cycle in cooling a space. Discuss the conditions of comfort. Describe the Window air conditioners and Split air conditioners used for residential installations. 20

Q.02. Describe in detail the various sources of heat that are taken into account for estimation and calculation of 'Cooling Load' in Air conditioning

Solve the following:
Given: Ventilation air;1500 cfm
Outdoor temperature: 80F and 50% RH
Indoor temperature: 75F and 45% RH
Find out:
(a) Ventilation air Sensible cooling load in BTU/Hr and
(b) Ventilation air Latent cooling load in BTU/Hr 20

Q.03. With the help of suitable sketches, describe the various types of Ducting arrangements in air conditioning. Citing a suitable numerical example, show how the circular and rectangular duct sizes are calculated. Describe how and under which conditions ducts can be partially or fully avoided without compromising indoor comfort.

Solve the following numerical problem:

Given:
Total air quantity required: 12000 cfm
Return air quantity : 8000 cfm
Return air temperature : 85F DB and 65F WB
Outdoor air quantity : 4000 cfm
Outdoor air temperature : 90F DB and 75F WB
Find: (a) DBT of air mixture and (b) WBT of air mixture 20

Q.04. With the help of a sketch of a Psychrometric chart, describe the various parameters that can be read in it. Describe how such multiple parameters are interdependent to one another and how such a chart helps in obtaining different properties of air.

Describe the concepts of 'sensible Heat' and 'Latent Heat'. Solve the following numerical problem:

Given: Window surface temperature: 45F
Indoor temperature: 75F
Find out:
(a) The RH at which Condensation is likely to form on the windows and
(b) The RH at which Condensation is likely not to form on the windows 20

Q.05. Write short notes on (any two): (5 X 2 = 10)

(i) Inverter AC vs. Non Inverter AC
(ii) Non Ductable Split air conditioning
(iii) Infiltration
(iv) Heat exchanger