Reg. No.										

MANIPAL UNIVERSITY

FIFTH SEMESTER B. ARCH. DEGREE EXAMINATION – NOVEMBER 2015

SUBJECT: ARC 311 - BUILDING SERVICES III

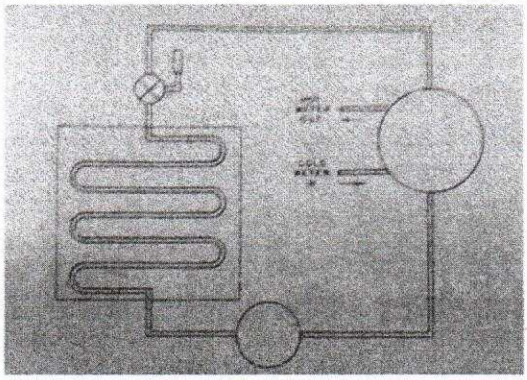
(2010 SCHEME)

Thursday, November 26, 2015

Time: 10:00 – 13:00 Hrs. Max. Marks: 50

- **Answer FIVE questions.**
- **Answer all parts of a question with necessary sketches.**

1. On the schematic diagram shown in the figure below:



1A. Identify the components of the refrigeration system.

1B. Briefly state the function of each component.

1C. Indicate the direction of the flow of the refrigerant.

1D. Fill in, using a solid color, the piping where the refrigerant is a liquid; leave the piping as shown where the refrigerant is a gas. Use labels to indicate the high and low pressures throughout the cycle.

(2½+2½+2½+2½ =10 marks)

2. Explain various types of Duct Configuration Systems with neatly labelled sketches.

(10 marks)

3A. What are the types of air distribution – outlets?

3B. Describe the three major factors which determine the number, location and types of supply outlets.

3C. Write short notes on duct shapes and duct materials.

(3+3+4 = 10 marks)

4A. Explain the behavior of sound waves in an enclosure with the help of examples and neat sketches.

4B. Briefly explain the acoustical problems in contemporary architectural design.

(5+5 = 10 marks)

5A. Explain variable absorbers.

5B. Sketch schematic illustrations of variable absorbers which provide means for altering the absorption and reverberation time.

5C. What are air-borne and structure-borne sound?

(2+5+3 = 10 marks)

6A. Write short notes on sound insulating material.

6B. What are the acoustical considerations in the architectural design of lecture halls?

6C. A good sound absorber is an efficient sound transmitter and consequently an inefficient sound insulator. Justify.

(4+3+3 = 10 marks)