SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOL(EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Building Services Engineering

Third Year, Second semester Examination – 2016

BSE 3203 – Air Conditioning and Ventilation

Instructions for Candidates:
Answer only **four** questions
All questions carry equal marks

No. of questions : 05
No. of pages : 02
Time : 02 hours

1) (a) Discuss the importance of 'better air flow around a building'. (10 marks)

(b) Explain the main two ventilation methods with examples. (15 marks)

[Total 25 Marks]

2) (a) What are the factors affecting the 'human thermal comfort' in air conditioning?

(05 marks)

(b) Explain the importance of 'correct size' of a supply duct system of an air conditioning unit and describe the disadvantages of under sizing or over sizing of them.

(05 marks)

(c) Explain the importance of following equipment in an HVAC system.

i) Filters

ii) Fans

iii) Dampers (15 marks)

[Total 25 Marks]

3) (a) Explain the importance of introducing a quantity of 'fresh air' to the return air duct.

(05 marks)

(b) Suppose a home with a floor area of 185 m^2. The height of the ceiling is 2.5 m and this space needs ventilation because the home is very tight. How many cubic meters of air per minute must be introduced to change 25% of the air per hour?

(20 marks)

[Total 25 Marks]

4) (a) What is meant by 'psychrometry'? (05 marks)

(b) Prove that, $\omega=0.622 \times ps/(p-ps)$, where ps is the vapour pressure and p is the total pressure.

(10 marks)

(c) If the air at 15 °C and relative humidity at 55% is passed at the rate of 0.5 m^3/s over a cooling coil which is at a temperature of 5 °C, calculate the amount of vapour which will be condensed.

Assume, the air is at 1.01426 bar and air leaving the coil is saturated.

(10 marks)

[Total 25 Marks]

5) (a) What are the most suitable materials for duct systems? (05 marks)

(b) Mention the methods of noise reduction in ducts, explaining the using materials for that purpose.

(10 marks)

(c) Explain two different types of more commonly-used duct systems. (10 marks)

[Total 25 Marks]