MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2018/2019 ACADEMIC YEAR

THIRD YEAR **SECOND** SEMESTER EXAMINATION FOR, DIPLOMA IN CIVIL ENGINEERING

SEB 1360 - BUILDING SERVICES

DURATION: 2 HOURS

DATE: 14/12/2018

TIME: 9 – 11 A.M.

Instructions to candidates:

1. Answer question One and Any Other Two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

a. Outline FOUR classes of fire stating the best extinguishing agent (5 Marks)

b. Using sketches, show the following types of floating floors as used in sound absorption

    i.   Timber floating floor

    ii.   Concrete floating floor (5 Marks)

c. Sketch the following types of valve stating where each is used:

    i.   Globe type stop valve

    ii.   The pillar tap (5 Marks)

d. State FOUR properties of dry lining materials (5 Marks)

e. Calculate the wave length of sound emitted by a turning fork of frequency 256Hz, taking the velocity of sound as 330ms^{-1} (5 Marks)

f. Find the total heat required to convert 5kg of ice at 0˚c to steam at 100˚c (Latent heat of ice is 330000J/Kg, Latent heat of steam 2250000 J/Kg, specific heat capacity of water is 4200 J/Kg) (5 Marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

a. With an aid of a diagram, describe the working principles of a septic tank (8 Marks)

b. A flat roofed hut has dimensions of 6m × 4m × 3m high. It suffers four air changes per hour. Calculate the total power loss when internal external temperature difference of 16k is maintained.

"U" values:

    Walls – 1.8wm^{-2}k^{-1}, Floors – 1.3wm^{-2}k^{-1} (temperature difference through floors is 8k), Roofs – 2.2wm^{-2}k^{-1} (12 Marks)

QUESTION THREE (20 MARKS)

a. By use of good diagrams, show how half an hour and two hours fire check doors are constructed (8 Marks)

b. With an aid of sketches, describe the following types of mechanical fans;

    i.   Propeller fan

    ii.   Axial flow fan

    iii. Centrifugal fan (12 Marks)

QUESTION FOUR (20 MARKS)

a. Outline the meaning of the following terminologies as used in air conditioning:

    i.   Dew point

    ii.   Dry bulb temperature

    iii.   Enthalpy

    iv.   Entropy   (8 Marks)

b. Use the following information to answer the question that follows;

MATERIALS	ABSORPTION COEFFICIENT AT SELECTED FREQUENCIES		
	125hZ	500hZ	2000hZ
Window glass	0.32	0.20	0.06
Plaster; Normal	0.01	0.02	0.04
Acoustic	0.15	0.35	0.50
Wood flooring	0.15	0.10	0.08
Curtains	0.10	0.50	0.70
Floor tiles	0.03	0.03	0.05
Thick carpet	0.08	0.20	0.50

Table of sound absorption values (average)

A rectangular room 10m by 5m by 3m high has $10m^2$ of window area in its walls. Walls are normal plastered and ceilings have acoustic plaster, flooring is thick carpeted. Calculate the reverberation time for the room for sound at 500Hz when it is unfurnished and unoccupied assuming the data of the above table is to apply. The effect of any door is to be ignored and windows are assumed to be closed   (12 Marks)