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JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

UNIVERSITY MAIN EXAMS 2017/2018

SECOND YEAR SECOND SEMESTER EXAMINATIONS
FOR THE
DEGREE OF BACHELOR OF CONSTRUCTION MANAGEMENT
&
DEGREE OF BACHELOR OF QUANTITY SURVEY

ABC 2211: BUILDING SERVICES

DATE: AUGUST 2018

TIME: 2 HOURS

INSTRUCTIONS

- (a) This paper consists of five (5) questions.
- (b) Answer Question ONE and any other THREE questions.
- (c) Apart from Question One, all other Questions carry equal marks.

QUESTION ONE (25 marks)

- (a) Josepas developers have 5 acres of land in Kitengela on which they are putting up three blocks of a mixed commercial development of up to 20 floors each. Their land gently slopes to the North. You have been appointed as their Services Engineer.
 - i) List and explain two ways in which the developers can distribute water to the development. (4 marks)
 - ii) With the aid of a diagram, explain to the developers how to get water to the tenants of the residential houses and comment on how they will ensure clean drinking water is supplied (6 marks)
 - iii) With aid of sketches, clearly illustrate the two types of above ground drainage systems which may be applicable in the development and state the both the advantages and disadvantages of each. (8 marks)
 - iv) The above development will most likely use pumps to supply water at higher floor levels, discuss four pump parameters which may be considered in the pump selection. (4 marks)
- (b) State four disadvantages of relying on natural ventilation in buildings. (2 marks)
- (c) What is a refuse chute. (1 mark)

QUESTION TWO (15 marks)

- (a) A client wishes to develop a mansionette in her piece of land. Using line schematic diagram, explain the indirect cold water supply system to her. (3 marks)
- (b) Explain three ways in which traps lose their water seal. (6 marks)
- (c) Discuss three considerations taken into account when designing drainage services (6 marks)

QUESTION THREE (15 marks)

- (a) Discuss three categories of mechanical ventilation system clearly stating the application of each. (6 marks)
- (b) A client has sought your advice with regard to ventilation system they wish to use in their commercial building. Explain to the client how the performance of such system may be assessed. (3 marks)
- (c) Discuss three types of air conditioning systems which can be applied in a mixed use development. (6 marks)

QUESTION FOUR (15 marks)

- a) Using a sketch, explain how a dry riser works (4marks)
- b) Design a septic tank that would be adequate to treat waste discharge from Hall 2 in JKUAT which has a population of 450 students. (7 marks)
- c) Solid waste management is an important aspect in maintaining our environment; using the 3Rs, classify waste management options in order of their environmental impact giving one example in each.(3 marks)
- d) What is subsoil drainage?(1 marks)

QUESTION FIVE (15 marks)

- a) What are the advantages and disadvantages associated with the three types of below ground drainage? (6 marks)
- b) A centrifugal pump equipped with a variable frequency (speed) drive running at 2500 rpm is discharging 120m³ per minute corresponding with a head of 80m. The horsepower is 36. If the pump's speed is reduced to 2100 rpm, what will be the revised flow rate, head, and power required. (4 marks)
- c) Explain the following terms as used in fire protection:
 - i) Fire triangle (1 mark)
 - ii) Active fire protection (1 mark)
 - iii) Passive fire protection (1 mark)
 - iv) Fire load (1 mark)
 - v) Firefighting medium (1 mark)