JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DEGREE OF SCIENCE IN:

BUILDING CONSTRUCTION AND MANAGEMENT

3ʳᵈ YEAR 1ˢᵀ SEMESTER 2015/2016 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TCM 3314

COURSE TITLE: BUILDING SERVICES II

EXAM VENUE: CR   **STREAM: BSc IN CONSTRUCTION**

DATE: 28/4/16   **EXAM SESSION: 9.00 – 11.00 AM**

TIME: 2 HOURS

Instructions

1. **Answer Question 1 (compulsory) and ANY other two questions**
2. **Candidates are advised not to write on question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE

a) By aid of sketches differentiate between a radial and a ring circuit connection stating the advantage of ring circuit over radial connection.   (8 marks)

b) Explain any TWO functions of isolation and switching systems in a circuit.   (2 marks)

c) Explain the stages involved in planning of electrical wiring work.(8 marks)

d) Define the term fire stop.   (2 marks)

e) With the aid of a sketch explain how a three phase power output is generated.   (6 marks)

f) An alternating current completes 5 cycles in 8 ms. Calculate its frequency.   (4 marks)

QUESTION TWO

a) By aid of sketches differentiate between natural and artificial ventilation.   (8 marks)

b) Outline any FOUR factors affecting ventilation.   (4 marks)

c) Outline any FOUR requirements of a good ventilating system.(4 marks)

d) Define the term air conditioning.   2 marks)

e) List any TWO functional requirements of air filters in air conditioners.   (2 marks)

QUESTION THREE

a) Define the term fire load.   (2 marks)

b) Given a floor area of $90m^2$, containing 15×10^3 J/N. Calculate the fire load.   (5 marks)

c) Outline any THREE factors that limit the spread of a fire.   (3 marks)

d) Describe the following fire protection systems.
   i)   Automatic sprinklers system
   ii)   Carbon dioxide system
   iii)   Foam system.   (6 marks)

e) List any FOUR causes of fire in a building.   (4 marks)

QUESTION FOUR

a) Define the term priming as used in pumps.   (2 marks)

b) Outline the principles involved in pumping water from a source.(4 marks)

c) With the aid of a sketch explain the working principle of a centrifugal pump.   (6 marks)

d) A pump lifts 45,000 lts/h against a total head of 18 m. Compute the water horsepower. If the pump has an efficiency of 65%, What size of prime mover is required to operate the pump? If a direct driven electrical motor having an efficiency of 80% is used to operate the pump, calculate the cost of electrical energy in a month of 30 days. The pump is operated for 8 hours daily and the cost of electricity is Ksh. 2.50 per unit.   (6 Marks)

e) Explain the condition under which suction lift exist in a pump.   (2 marks)

QUESTION FIVE

a) Define an escalator. (2 marks)
b) Describe the THREE typical configuration options for escalators. (3 marks)
c) List any FOUR factors that affect the design of escalators. (2 marks)
d) Discuss the following components of escalators;
    i)   Landing platform
    ii)   Truss
    iii)   Tracks
    iv)   Steps
    v)   Hand rail. (10 marks)
e) Discuss safety in terms of fire protection in escalators. (3 marks)