



JARAMOGI OGINGA ODONGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DEGREE OF SCIENCE IN:

RENEWABLE ENERGY TECHNOLOGY AND MANAGEMENT

2ND YEAR 1ST SEMESTER 2015/2016 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TET 3214

COURSE TITLE: ENGINEERING SURVEYING I

EXAM VENUE: W/S STREAM: BSc RE. ENERGY TECH AND MGT

DATE: 26/4/16 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) Using a well labeled diagram, describe the stages of power supply and distribution in Kenya. (8 Marks)
- b) Outline factors that determine the choice of a wiring system. (8 Marks)
- c) The IEE regulation for electrical equipment in buildings details four main switch gear requirement. Briefly mention the requirements (3 Marks)
- d) A domestic lighting sub-circuit is installed with a fuse rating of 5A. If the available lamps have a rating of 20Watts each and rated at a supply voltage of 240V, what is the maximum number of lamps connected in parallel that can be connected to this circuit? (3 Marks)
- e) The IEE regulation has two types of wiring for socket outlet circuit namely radial circuit and ring circuit. Briefly describe them citing their advantages and disadvantages. (4 Marks)
- f) State four factors that affect the heating effects of cables for a particular use. (4 Marks)

QUESTION TWO

- a) Two energy saver lamps rated at 240V 14Watts and 240V 18Watts respectively are connected in series to a 240V supply. Calculate the voltage across each. (6 Marks)
- b) Discuss the following methods of installation of wiring systems
 - i) PVC sheathed cables,
 - ii) Steel conduits,
 - iii) PVC conduits,
 - iv) Mineral insulated copper covered cables (MICC),
 - v) Cable trunking,
 - vi) Flow Ducts and scattng trunking,
 - vii)PVC insulated/ sheathed steel wires armour/cable. (14 Marks)

QUESTION THREE

- a) I.E.E providesfour main requirements for safe use and protection of motors. Briefly discuss them (8 Marks)
- b) (i) Explain why it is necessary to seal some types of cable terminations against the ingress of moisture. (2 Marks)

- (ii) Name two types of cables which require sealing giving reasons. (2 Mark)
- c) Briefly explain the reasons why PVC cables are considered not suitable for use in extremes of high or low temperatures.(4 Mark)
- d) On conduit systems why is it important that:
- i) the conduit is erected before the cables are drawn in
 - ii) all the conductors of the same circuits, are drawn into the same conduit (4Marks)

QUESTION FOUR

- a) Power factor is a factor that takes into account that not all the current being carried by a conductor in the AC circuit delivers power to the load.
- i. State the effects of a poor power factor. (4 Marks)
 - ii. Describe two ways to reduce the power factor (4 Marks)
- b) State;
- i. the inverse square law
 - ii. cosine law (4 Marks)
- c) A 200cd luminaire is suspended 2m above the centre of a circular table 2m in diameter. Calculate the illumination at;
- i. the centre of the table
 - ii. the edge of the table (8 Marks)

QUESTION FIVE

An office measuring 12m by 18m is to be provided with an illumination level of 320 lux using 85W fluorescent tubes having an efficiency of 40 lumens per watt. If the utilization factor is 0.65 and maintenance factor is 0.8;

- i. Determine the number of tubes required,
- ii. Make a plan of the office and show the spacing of the tubes. (20 Marks)