CORK INSTITUTE OF TECHNOLOGY INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Semester 2 Examinations 2007/08

Module Title: Electrical Installation Practice

Module Code:	ELEC 6001	
School:	Electrical and Electronic Engineering	
Programme Title:	Bachelor of Engineering in Electrical Engineering Stage 1	
Programme Code:	EELEC_7_Y1	
External Examiner(s):	Mr. M. Hennessy, Prof. E. McQuade	
Internal Examiner(s):	Mr. J. C. Duggan	
Instructions:	Answer SIX questions. All questions carry equal marks. Do not spend more than 20 minutes per question.	
Duration:	2 hours	
Sitting:	Summer 2008	
Requirements for this examination: Tables: Extracts for ET101:2006		

Note to Candidates: Please check the Programme Title and the Module Title to ensure that you have received the correct examination paper.

If in doubt please contact an Invigilator.

Q1. (a) (b) (c)	Name and define the voltage bands covered by Chapter 36 of ET 101:2006. List <u>four</u> services included in ET 101: 2006 under the term safety service. Explain why cables of safety services are separated from cables in (normal) non services.	(7 marks) (4 marks) a-safety (6 marks)	
Q2. (a)	With regard to cables with enhanced fire performance, explain what is meant by(i) Fire Retardance(ii) Fire Resistance	<i>י</i> :	
	(iii) L.S.O.H.	(9 marks)	
(b)	Describe a FP 200 cable. Outline its performance in a fire situation.	(8 marks)	
O3 (a)	(a) With the aid of next labelled sketches, describe the construction of a SWA multi-core		
QJ. (a)	nower cable	(9 marks)	
(b)	Under what conditions would you consider the use of the following in an armou	() marks)	
(b) Order what conditions would you consider the use of the following in an armoured			
	(ii) shaped conductors		
	(ii) aluminium conductors		
	(iv) stranded phorphor bronze armour	(8 marks)	
	(iv) stranded photphot bronze armour	(o marks)	
Q4. (a)	Explain the classification system for enclosures intended to house electrical equipment –		
	the IEC "IP" system.	(8 marks)	
(b)	A run of steel conduit contains two bends and has a length of 3.5 m.		
	It is intended to install the following stranded copper / PVC wires in this conduit.		
	$10 \text{ x} 1.5 \text{ mm}^2$		
	$4 \text{ x } 2.5 \text{ mm}^2$		
	$3 \times 4 \text{ mm}^2$		
	Using the tables supplied, select the minimum conduit size.	(9 marks)	
Q5.	A new sub-main cable is to be installed to supply a fuseboard in a factory.		
	This cable is to be 50 mm ² copper, XLPE/SWA/PVC two-core installed on a perforated		
	steel tray with two similar cables. The length of run is 40 m and ambient of up to 32°C are encountered. An allowance of 3.5 V should be made for the voltage drop in the final circuits. Determine the maximum value of the kW load which may be supplied from this		
	fuseboard.	(17 marks)	

- Q6. (a) Describe the construction and application of:
 - (i) perforated steel cable tray
 - (ii) steel cable ladder
 - (iii) cable basket

(b) To make provision for a new machine a conduit was run which contained 10 x 1.5 mm², brown, PVC wires. The installation of the machine was delayed. Eventually when it was in place, it was found that the wires were unmarked.
 Describe a procedure to identify the ends of each wire. (8 marks)

(9 marks)

Q7.(a) The supply to an installation is TN-C-S.

The fault loop impedance, measured at the intake point is 0.35 Ω. A NEOZED(UDE
063) fuse of 25A rating is used to protect a socket-outlet circuit.
Determine, using tables 61C from ET 101:2006 (supplied), the maximum value of fault
loop impedance acceptable. (7 marks)

(b) The intake position to consumer unit distance in the above installation is 12 m.
 The 'tails' have a resistance of 8mΩ/m. The final circuit wiring to the socket-outlets uses cable with conductor resistance 24mΩ/m.

Determine the maximum length of cable run acceptable in conformity with ET 101 rules. (10 marks)

- Q8. (a) Annex 61E of ET 101:2006 outlines the measurement of resistance of a P_E according to rules 612.6. Explain how this test is carried out. (7 marks)
 (b) Describe one form of underfloor trunking system suitable to use in open plan offices. Why are trunkings often compartmented? (10 marks)
- Q9. (a) Describe a high current bus-bar trunking system. (7 marks)
 (b) Explain the factors influencing the bus-bar shape. (5 marks)
 (c) A machine shop is to contain a high number of small loads, which may be subject to occasional changes in layout. Suggest a suitable wiring system. (5 marks)