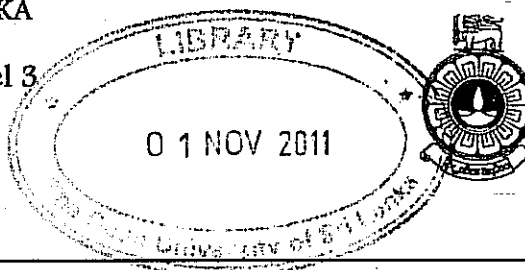


THE OPEN UNIVERSITY OF SRI LANKA

Diploma in Technology (Civil) - Level 3

CEX3230 – Construction Materials

Final Examination -2011



Date: 01-03-2011 (Tuesday)

Time Allowed: Three(03) hours

Answer Five (05) questions out of Eight (08) questions.

Answers should be illustrated with sketches and diagrams with assumptions stated, clearly and neatly

(Q1) Cement is available in the market under different brand names and it is one of the essential raw materials in the construction Industry .

- (i) Name and explain three (03) types of Portland Cements with their Applications in the construction industry. (04 marks)
- (ii) Briefly explain the process of storing cement outside, especially when using it for daily consumption. (04 marks)
- (iii) With the help of figures explain how the strength of cement varies with time after manufacture. (06 marks)
- (iv) With the help of a neatly sketched diagram explain how the strength of cement varies with fineness of cement particles. (06 marks)

(Q2) From early days Lime has been used in the local construction industry and it provides a wide variety of applications, especially in preparation of mortars.

- (i) Briefly explain what are 'Non-Hydraulic Limes' and how these are obtained and produced (06 marks)
- (ii) Briefly explain Methods of Slaking Lime. (05 marks)
- (iii) Propose mix proportion for mortar for,
 - (a) Internal wall plaster
 - (b) Plastering below Ground Level (05marks)
- (iv) Are the proportion values for question(iii) (a) and (b), different or same for both? If different, explain the reason for it. (04 marks)

(Q3) Plastics show a great versatility in construction industry applications .

- (i) Name Four (04) factors that will affect the durability of plastics. (04marks)
- (ii) Name and explain Four (04) applications of plastics in the construction Industry. (06 marks)
- (iii) State Three (03) ways that a mechanical failure can occur in Plastics. (05 marks)
- (iv) State Four (04) advantages of using UPVC pipes. (05 marks)



(Q4) The importance in metals as construction materials is almost invariably related to their load bearing capacity, in either tension or compression.

- (i) Name and explain Three (03) mechanical properties of metals (05 marks)
- (ii) Draw the characteristic Diagrams of Tensile Test Curve of Stress versus Strain for Mild steel and Copper, marking and naming/explaining? all the important points. (05 marks)
- (iii) State and briefly explain Two (02) corrosion protection measures done to protect steel structures. (05 marks)
- (iv) Name Four (04) factors that are considered in selection of structural steel for a specific construction application. (05 marks)

(Q5) Bitumen and tar are the two basic materials used in road construction work as binding materials.

- (i) Briefly describe the "asphalt" used in road construction work. (06 marks)
- (ii) Differentiate five (5) characteristics between Bitumen and Tar. (10 marks)
- (iii) What is meant by "Bituminous Macadams or Pavements" in road construction work (04 marks)

(Q6) Painting and Varnishing are integral parts of the finishing work in most construction works.

- (i) State Five(05) essential components in a paint. (05 marks)
- (ii) What precautions would you take in order to achieve a good quality in painting New Timber. (05 marks)
- (iii) What precautions would you take in order to achieve a good quality repainting work on an already painted Timber. (05 marks)
- (iv) Briefly explain the process of varnishing. (05 marks)

(Q7) Recent developments in Geosynthetic materials have created a great versatility in their applications in Construction Industry

- (i) Briefly describe what are 'Geomeshes' and State three(03) Construction Industry Applications of it. (07 marks)
- (ii) Briefly describe how geosynthetics can be employed in reinforcement applications. (07 marks)
- (iii) Briefly describe Two (02) applications of 'Natural Fibre Geotextiles' (06marks)

(Q8) Copper, Lead and their alloys have vast variety of applications in any Industry

- (i) State Five(05) Physical properties of Pure Copper. (06marks)
- (ii) State Four(04) Physical properties of Pure Lead. (06marks)
- (iii) State and explain Four(04) Construction Industry applications of Lead and its alloys. (08 marks)