



**Final Examination -2013/14**

Date: 05-08-2014 (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) Formation of the igneous rocks is part of the rock cycle.

- (i) Write down four (04) types of textures that can be observed in igneous rocks. (08marks)
- (ii) Briefly explain the difference between "concordant bodies" and "discordant bodies" during the formation of igneous rocks (08 marks)
- (iii) Explain the mineralogy, composition and the textures of "Dolerite dikes" (04 marks)

(Q2) Majority of Sri Lankan basement is underlain by metamorphic rocks belong to Precambrian Era.

- (i) Briefly explain about two (02) factors which influence the formation of metamorphic rock. (08 marks)
- (ii) Write down four (04) types of textures that can be observed in metamorphic rocks (04 marks)
- (iii) Name the metamorphic equivalent of following rock types.
  - (a) Sandstone (02 marks)
  - (b) Limestone (02 marks)
  - (c) Shale (02 marks)
  - (d) Granite (02 marks)

(Q3) Volcanic eruptions and earthquakes cause huge destruction on both lives and property.

- (i) Write down and describe the factors that are responsible for formation of a volcano. (10 marks)
- (ii) What is meant by "tectonic earthquakes" and "non-tectonic earthquakes" (04 marks)
- (iii) Briefly explain the difference between "Primary waves" and "Secondary waves", which generate during an earth-quake. (06 marks)



- (Q4) Behaviour of groundwater is heavily governed by the underlying geology of a particular area.
- Write down **three (03)** factors which influence the infiltration and percolation processes. (06 marks)
  - Name **four (04)** factors which govern the water extraction capability of a sedimentary rock formation (04 marks)
  - Briefly explain the possibility of igneous rocks as potential aquifers. (10 marks)
- (Q5) Coastal erosion is heavily affected along the southern coast of Sri Lanka.
- Explain the stages of forming “abrasive coasts” and “accumulative coasts” using neat sketches (08 marks)
  - Write a brief account on effects of wave action on alteration of sea coasts. (08 marks)
  - Name **four (04)** protective structures that can be used against the destructive action of waves (04 marks)
- (Q6) Erosion rates of River beds in Sri Lanka have drastically increased in recent past due to human activities.
- State the **three (03)** factors that govern the stream bed erosion. (06 marks)
  - Briefly explain the process of forming “river valleys”. (09 marks)
  - What is meant by “alluvial fans and cones”. (05 marks)
- (Q7) Carrying out an engineering geological investigation is imperative before planning any large scale civil engineering project.
- Write down **three (03)** main objectives of an engineering geological investigation. (06 marks)
  - Briefly describe about the stages of an engineering geological investigation program. (10 marks)
  - Name **four (04)** factors that should be considered when planning an investigation program. (04 marks)
- (Q8) Obtaining detailed engineering properties of rock mass is essential in design of cast-in-situ bored piles, which sockets into the bedrock.
- Briefly describe the rock coring process that is carried out in an investigation with instruments used and the rock parameters that can be obtained. (08 marks)
  - Describe briefly about following in-situ tests. Your answer must include the methodology and the parameters that these tests provide.
    - Standard Penetration test. (04 marks)
    - Field Vane Shear test (04 marks)
    - Plate Bearing Test (04 marks)

