

Examination for the issue of Amateur Radio Operator's License by the Telecommunications  
Regulatory Commission of Sri Lanka (Advance Class) – 2014

**(01) Advanced Electrical Technology and Radio Communication**

**Three hours**

\* Answer any **ten** questions only. All questions carry equal marks.

\* A minimum of 50% marks is required for pass.

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1. What are the reasons for measuring frequency in the Amateur Radio Stations? Give three names of tools which are used to measure frequency. (10 marks)
2. What are the steps that can be taken to minimise the damages due to lightning of an Amateur Station? (10 marks)
3. Describe the following semi-conductor devices with an example of one application for each.
  - (i) Zener diode (03 1/3 marks)
  - (ii) Field Effect Transistor (FET) (03 1/3 marks)
  - (iii) Silicon Controlled Rectifier (SCR) (03 1/3 marks)
4.
  - (i) What is electromagnetic induction? (3 marks)
  - (ii) Describe with the help of a diagram, how the electromagnetic induction works in a AC transformer (7 marks)
5.
  - (i) Draw the diagram of a half-wave rectifying circuit and sketch the output wave-form. (04 marks)
  - (ii) Explain, how the above circuit can be modified to a full wave rectifying circuit. (03 marks)
  - (iii) Draw the output and explain the operation. (03 marks)
6. Write short notes on the following.
  - (i) Radiation patterns (03 1/3 marks)
  - (ii) Half-wave dipoles (03 1/3 marks)
  - (iii) Standing wave (03 1/3 marks)
7.
  - (i) Explain about parallel tuned circuit and series tuned circuit with suitable diagrams. (04 marks)
  - (ii) What is the relationship in between capacitance and inductance when resonance Occurs? (2 marks)
  - (iii) Find the capacitance required to resonate a 10H choke to 500Hz. (4 marks)
8. State the modes of propagation and briefly explain them. (10 marks)

9. (i) State the purpose of a filter used in the transmitters. *(02 marks)*
- (ii) Draw the basic frequency responses of two commonly used filters. *(04 marks)*
- (iii) Name other two types of filters. *(04 marks)*
10. State the layer in the ionosphere and briefly explain each of them based on the height above ground level. *(10 marks)*
11. Write short notes on the following.
- (i) Dummy loads *(03 1/3 marks)*
- (ii) Modulation *(03 1/3 marks)*
- (iii) Directional antenna. *(03 1/3 marks)*
12. Explain the terms of reflection co-efficient and standing wave ratio of a transmission line. If the standing wave ratio of a transmission line is 5, find the reflection co-efficient. *(10 marks)*

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