KATHMANDU UNIVERSITY
End Semester Examination
July, 2018

Level	: B.E.	Course	: EPEG 423
Year	: IV	Semester	: II
Time	: 2 hrs. 30 mins.	F. M.	: 40

SECTION "B"

Attempt *ANY FIVE* questions.

1. a. What different laboratory and field measurements and measuring techniques can be performed to evaluate the performance of white solid-state lamp. [4]
   b. What different factors starting from power source to photons entering human eye effect the efficiency of a lighting system. Explain with necessary block diagrams and mathematical relations. [4]

2. a. With an appropriate example of lighting application, distinguish general, local and localized lighting. [3]
   b. Explain how LED performance is characterized by wall plug efficiency. [3]
   c. Briefly explain the concept of heterostructure and quantum well and its importance in enhancing wall plug efficiency. [2]

3. a. A LED lamp consists of three one-watt LED connected in series. The lamp is to be driven by 12 V battery system. Design driver circuit for the lamp using resistive ballast, linear regulator and constant current switch mode converter. [4]
   b. Draw VI characteristic curve of typical phosphor converted LED and explain why LEDs should have similar VI characteristics when connecting in cluster to create a LED based light bulb. [2]
   c. Write about CIE CRI and explain how low value of CRI can produce false impression while identifying colour of an object. [2]

4. a. Explain how thickness of phosphor effect the light extraction efficiency and CRI of LED based light source. [2]
   b. What are different types of OLED, distinguish the performance of white OLED and phosphor converted WLED. [3]
   c. Write about applications of solid state lighting. [3]

5. a. What different material available to be used as primary optics in LED. Describe their merits and demerits in terms of optical, mechanical, chemical and thermal properties. [3]
   b. What different lighting control scheme can be used to obtain energy efficient, constant and location-based lighting for Engineering block 08 of Kathmandu University? [5]

6.
   a. Explain photopic, scotopic and mesopic vision and explain how it is related to structure of human eye and RLEF? [4]
   b. Write about the effect of wall and floor colour, placement of object, and windows and doors in designing illumination for a typical household application. [2]
   c. What are the steps involved in designing illumination scheme for a road lighting system using DiaLux? [2]