Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(TAKE HOME)
SEMESTER I
SESSION 2020/2021

COURSE NAME	:	OPTOELECTRONICS
COURSE CODE	:	BWC 40603
PROGRAMME CODE	:	BWC
EXAMINATION DATE	:	JANUARY / FEBRUARY 2021
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS **OPEN BOOK EXAMINATION**

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 (a) Name **FOUR (4)** light phenomena in nature. Explain the physical principles of **ONE (1)** of the chosen light phenomena.

(10 marks)

(b) Discuss the procedure to align laser light to a sample on a control motorized workstation. The alignment procedure should include at least **FOUR (4)** optical components. Explain the purpose of each components used in the alignment procedure.

(10 marks)

Q2 (a) By sketching a related diagram, explain the acousto-optic modulation.

(10 marks)

(b) What are the differences between step-index and graded-index optical fiber? By sketching a simple diagram, explain further the propagation of light for both of them.

(10 marks)

Q3 (a) Propose a design of your home made He-Ne laser with optical power of 1.5 mW and wavelength of 632 nm. Explain your proposed design in detail.

(10 marks)

(b) What is the equipment used to identify the spectrum of laser irradiation? Explain the working principles of that equipment.

(10 marks)

Q4 (a) Sketch a diagram of an epitaxially growth GaN LED heterostructure. Explain the light generation process by the GaN LED.

(10 marks)

(b) Discuss how the LED technology can improve the brightness quality of LCD television.

(10 marks)

Q5 (a) Discuss on how to improve the optical-electrical conversion efficiency of solar cells.

(10 marks)

(b) Discuss the challengers of free space optical communications nowadays.

(10 marks)

- END OF QUESTIONS –