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Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
(ONLINE)  
SEMESTER II  
SESSION 2019/2020**

COURSE NAME : PHOTONIC DEVICES  
COURSE CODE : BED 40902  
PROGRAMMECODE : BEJ  
EXAMINATION DATE : JULY 2020  
DURATION : 3 HOURS  
INSTRUCTION : ANSWERS ALL QUESTIONS  
OPEN BOOK EXAMINATION

THIS QUESTION PAPER CONSISTS OF TWO (2) PAGES

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**TERBUKA**

- Q1** (a) Electron-hole pair or so called exciton can be separated or recombined.
- (i) Using a suitable figure, discuss the application of electron-hole separation in solar cell and photodetector. (12 marks)
- (ii) In laser diode, draw the suitable diagram illustrating the mechanism of laser generation using recombination of electron-hole pair. (13 marks)
- Q2** (a) A diode is the basic building block made of PN junction.
- (i) Discuss the pros and cons of mono and heterojunction by giving two examples. (10 marks)
- (ii) What is the importance of work function,  $\Phi$  in heterojunction solar cell and give an example of solar cell with different work function that theoretically will function. (15 marks)
- Q3** (a) A traffic light at a rural area was built without the consideration of power source. If the traffic light was built to run 24 hours, analyze and design the source of power suitable. Please draw the schematic and mechanism of the power source. (25 marks)

**-END OF QUESTIONS -**