Benha University Faculty of Engineering- Shoubra Electrical Engineering Department First Year communications.



2nd semester - Midterm Exam Date: 21-04-2014 ECE121: Electronics I

Duration: 90 mins

- Answer all the following questions
- Illustrate your answers with sketches when necessary.
- No. of questions: 4 Total marks: 30Examiner: Dr. Abdallah Hammad

Question 1

- a- Assume each diode forward voltage = 0.7 V for the circuit in Figure (1). <u>Determine</u> I_{D1} and V_O if R_1 = 10 k Ω , R_2 = 5k Ω
- b- Draw the circuit for the full wave voltage doubler.

Question 2

- a- What are the specifications and approximation models of a zener diode?
- b- For the circuit shown in figure (2). <u>Determine</u> the range of V_i that will maintain V_L at 8 V and not exceed the maximum power rating of the Zener diode.

Question 3

a- "A LED array can be used in the design of traffic light circuits to increase the brightness of the traffic light and reduce the power requirements for the circuit".

For the LED traffic lifgt circuit shown in Figure (3), if the LED forward drop is 2.5 V

- I. Design the circuit so that the current in each LED is 20 mA
- II. Calculate the power dissipated in the circuit
- b- <u>Derive</u> an expression for the dynamic resistance of the diode.

Question 4

- a- For the circuit in Figure (4). Sketch vo and the transfer function (Assume practical diodes).
- b- Compare between LM7812, LM7912, LM317, LM337.

