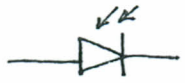
Mansoura University
Faculty of Engineering
Mechanical Eng Dept.

Electronics Eng Final Exam
Time: 3 hrs
Jun. 2013

ALL questions carry EQUAL weight

Q1) For each of the shown semiconductor devices state:

(a)The name (b)One application (c)The direction of use.

(i) 

(ii) 

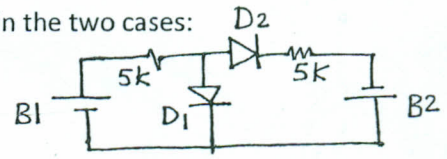
(iii) 

Q2) Compute the current through and the voltage across D1 and D2 in the two cases:

(a) B1=15v, B2=10v.

(b) B1=10v, B2=15v.

Be careful to indicate current directions,if any.



Q3) A bridge rectifier circuit has transformer ratio 20:1, 200v/50 Hz mains and load resistor 1K;

(a)Compute the DC output.

(b)Show how the DC output can be increased by 35% and compute the ripple factor.

(c)Repeat (a)and (b) when one diode is burnt out.

Q4) (a)Draw a transistor switch circuit.

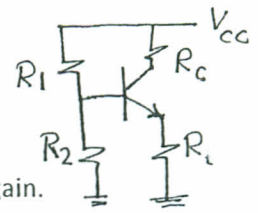
(b)Show that the switch in (a) is ON when V_i =6v,R_B =3.3K,V_{CC} =9v,R_C =270Ω,V_{CE} (on)=0.3v, V_{BE} (on)=0.7v and β=50.

(c)What is the minimum V_i that turns the above switch on?

Q5) (a) Compute V_C and V_B for the shown transistor circuit given that:

V_{CC} =10v,R1=24K,R2=8.2K,R_C =2.7K,R_E =2.2K,β=150,V_{BE} (on)=.7v.

(b)If the circuit in (a)can be used as amplifier;sketch it and compute its voltage gain.



Q6) (a) Using one op amp and necessary resistors sketch a circuit having V_o nd V_i such that:

(i)V_o =-5V_i (ii)V_o =5V_i (iii)V_o =V_i

(b) What is the name and advantage of the circuit in (iii) above?

(c) Draw an op amp circuit having inputs V1 and V2 and output V_o =V2-V1 using:

(i) two op amps (ii)single op amp.

END

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