NAME; ALE - ALABA OLUWASEUN OLUMIDE MATRIC NUMBER; 19 (ENGO6/064 DEPARTMENT; MECHANICAL COURSE ; ENG 222 [BASIC ELECTRICITY] Question 1; Describe a Zener diode regulator and; i) Sketch the Symbol and I-V characteristic Curve ii) Sketch and label the curcuit diagram Solution SYMBOL OF A ZENER DIODE and south and 0-Anode Cathode I-V CHARACTERISTIC CURVE 1 Forw and current +IF Forward Blas Region NZ -VR A >+VF Reverse Forward Bigs Bias Iz(min) zener Brea-Kdown VF 0.3-0.70 Region IZMAX constant Zener Voltage hererso current - IR

CIRCUIT DIAGRAM FOR A ZENER DIODE REGULATOR CIRCUT DUTEL 1 NUMBER 1 Tair +VO IS > -后山(四市市)过产 订上于两百百万 32 00 0 dia 1 ----Rs p admissi 1. and 101 Vin (Vs) 2= 5= j. m.C 1 TL 0--x ---13 - 1 VIV 2 Īz Vout = Vz RE 2 0 ovo 0-----

Page **2** of **3**

Question 2; A 5W maximum rated Zener diode has 500 mA Maximum current flowing through it. IF a 201 max bridge rectifier circuit is connected as input to the Calculate i) The minimum value of the Series resistor to the zener dude 1) The current across the diode at full load of 5002 Zhs Rs. 20Vmax ->IL IL 5000 SUDMA 3 RL VJc== 2Vmax = 2 × 20Vmax = 12-732V T A i) Minimum Value of Serves resistor $R_3 = V_s - V_z$ Vs = 12.732V I. V= = 9 I = = 500 MA = 500 X10 - 3A Pz= JzVz = 0.5A 5= 0.5 × Vz $V_{\bar{2}} = 5 = 10 \vee$. $R_s = V_s - V_z$ 0.5 I, hs = 12.732 - 10 -2.732 = 5.46452 = 500 × 10-3 6.5 i) Fie current across the didde at full load of subve $I_7 = I_8 = I_L =$ = 10 = 0.024R 500 $I_z =$ (0.5 - 0.02) A = 0.48 A