

THE HONG KONG POLYTECHNIC UNIVERSITY  
HONG KONG COMMUNITY COLLEGE

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**Subject Title** : Electronic Circuits

**Subject Code** : CCN2268

**Session** : Semester Two, 2015/16

**Numerical Answers**

**Question 1**

- (b) Simple zeros: 0, 10 rad/s  
Simple pole: 400 rad/s;  
Double pole at  $10^5$  rad/s.

**Question 2**

- (b) Zero: 0 rad/s;  
Repeated poles: 10 rad/s.  
(c)  $\omega_0 = 10$  rad/s  
Bandwidth = 20 rad/s  
Q factor =  $\frac{1}{2}$

**Question 3**

- (b) For the Zener diode D1:  $V_s < 11.4V$ .  
For the Zener diode D2:  $V_s > -11.4V$ .  
(e) 5.715 V

**Question 4**

- (d) 2  
(e) 1000 rad/s and 200 rad/s

**Question 5**

- (b)  $I_B = 16.127 \mu A$ ,  $I_C = 1.6127$  mA,  $V_{CE} = 5.5493V$ .  
(d)  $A_v = -143.1376$  and  $R_i = 1460.8206 \Omega$

**Question 6**

- (b)  $k = 0.55555$  mA/V<sup>2</sup>  
(c)  $V_G = 9.7143V$ ,  $V_{GSQ} = 5.9898$  V,  $i_{DQ} = 0.4966$  mA,  $V_{DS} = 9.35029$  V.  
(d)  $Z_{in} = 4.0476$  M $\Omega$ ,  $Z_o = 2.2$  k $\Omega$ ,  $A_v = 7.26$