國立成功大學航太所 85 學年度碩士班入學考試
《電子電路》

1. 何謂 A 類、B 類及 C 類電壓（電流）放大器？其優缺點各為如何？（10%）

2. 對於圖一之電路，試求其
   a) 網目方程式(mesh equations)；（7.5%）
   b) 節點方程式(node equations)；（7.5%）
   c) 戴維寧(Thevenin)等效電路。（10%）

3. 圖二之電路，$V_S = a + b\sin(\varpi t)$ 而 Z_1、Z_2 及 Z_3 乃由純電阻 R、純電感 L 及純電容 C 所組成。
   a) 若希望 $V_O = a$，試求所須之 Z_1、Z_2 及 Z_3。
   b) 若希望 $V_O = b\sin(\varpi t)$，試求 Z_1、Z_2 及 Z_3。
   本題答案須包括（甲）Z_1、Z_2 及 Z_3 之組成，譬如 Z_i 為 R、或 Z_i 為 R 與之 L 並聯、等；（乙）Z_1、Z_2 及 Z_3 之中，R、L 及 C 之值。（15%）

4. 試證電容 C_1 及 C_2 並聯之等效電容為 $C_1 + C_2$，而它們串聯之等效電容為 $\dfrac{C_1 C_2}{C_1 + C_2}$。（10%）
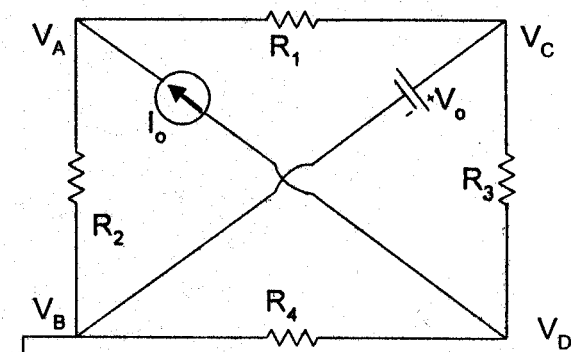
圖　一
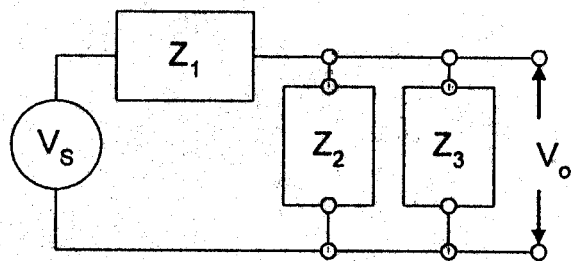
圖　二

ENGINEERING MECHANICS

5. As shown in Fig. 3, the motion of a particle P can be represented by

$$r(\theta) = \frac{p}{1 + e \cos \theta}$$

where p and e are constant.

    (a) Determine the velocity and acceleration of the particle at the position (r, θ) using e_r and e_θ as unit vectors. (10%)

    (b) Determine the velocity and acceleration of the particle at the position (r, θ) using unit tangent vector e_t and unit normal vector e_n. (10%)
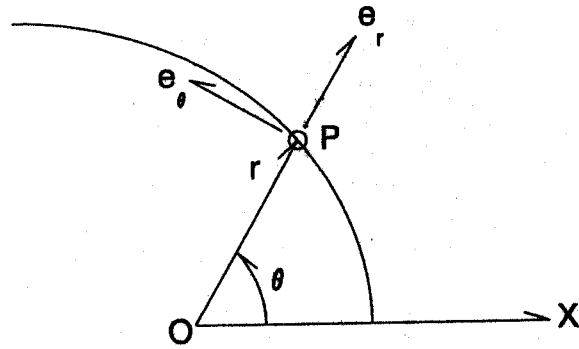

Figure 3

6. A boy, holding horizontally a flywheel of with constant angular velocity pointing to his left, is sitting on a chair, which can rotate freely about its vertical axis as shown in Fig. 4. Discuss what would happen if the boy rotates the flywheel clockwise as viewed from the boy's side. (20%)
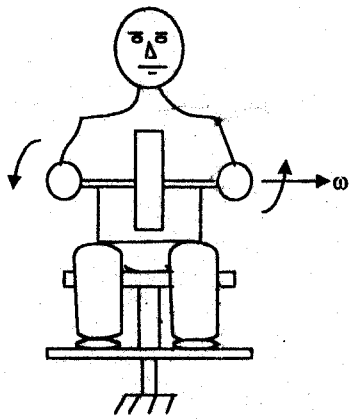

Figure 4