

# 國立虎尾科技大學 105 學年度第二學期博士班資格考試題

系別：動力機械工程系機械與機電工程博士班

第 1 頁 共 2 頁

科目：機械設計

注意事項：

- (1) 本試題共有 4 題，合計一百分。
- (2) 請依序作答於答案卷上並註明題號。
- (3) 可使用計算機；close book。

1. (a) What is the “coupling”? (b) Show any four types of couplings in text or graph. (20%)
2. A shaft with mounted belt drives has tensile forces applied as shown in Fig.1 and frictionless journal bearings at locations A and B. Please show (a) moment diagram in x-z plane; (b) moment diagram in x-y plane; (c) torque diagram. (30%)

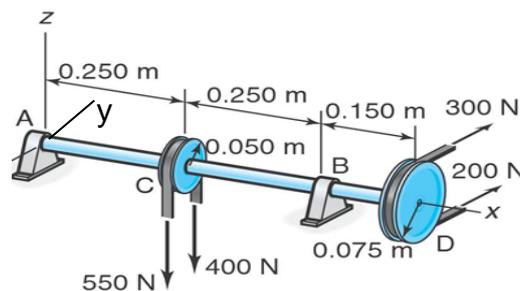


Fig. 1

3. Please briefly introduce (a) Maximum-Shear-Stress Theory; (b) Distortion-Energy Theory. (30%)

4. A planetary gear train shown in Fig. 2 is used as part of a transmission for a forklift truck. The sun gear (太陽齒輪) is driven by the engine at 3000 rpm, the ring gear (環齒輪) is bolted to the machine frame, and the arm (行星臂) is connected to the track drive system. The sun has 16 teeth, the ring has 84 teeth, and there are three planets (行星齒輪), each with 34 teeth. Please show the angular velocities of the arm and planet. (20%)

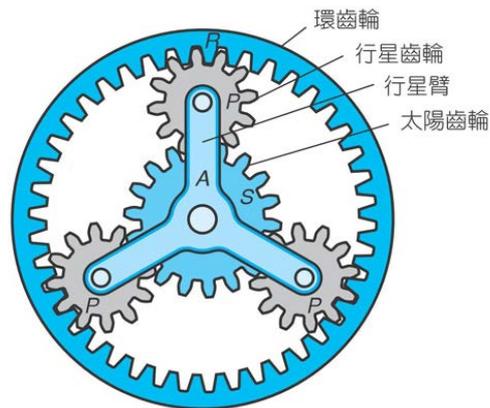


Fig. 2