1. 請分別從結構性和功能性角度描述心衰竭的嚴重程度分類系統（10%），並說明心衰竭的處理流程（15%）。
2. 請閱讀下列節錄文章後，說明運動對於改善糖尿病的可能機轉（10%）。

Multiple types of physical activity enhance health and glycemic management in people with Type 2 Diabetes (T2D), although structured exercise training has been studied most frequently. Many of the proven benefits result from improved insulin sensitivity, postprandial hyperglycemia, and cardiovascular disease risk.

Short-term aerobic exercise training improves insulin sensitivity in adults with T2D, paralleling improved mitochondrial function. Vigorous aerobic exercise training for 7 days may improve glycemia without lowering body weight via increased insulin-stimulated glucose disposal and suppression of hepatic glucose production. Short-term aerobic exercise in individuals with obesity and T2D improves whole body insulin action through gains in peripheral insulin sensitivity more so than hepatic insulin sensitivity. Meta-analyses and systematic reviews have confirmed that regular aerobic exercise training improves glycemia in adults with T2D, with fewer daily hyperglycemic excursions and 0.5-0.7% reductions in hemoglobin A1C (A1C). Regular training also improves insulin sensitivity, lipids, blood pressure, other metabolic parameters, and fitness levels, even without weight loss.

Resistance exercise training in adults with T2D typically results in 10-15% improvements in strength, bone mineral density, blood pressure, lipid profiles, skeletal muscle mass, and insulin sensitivity. Combined with modest weight loss, resistance training may increase lean skeletal muscle mass and reduce A1C three-fold more in older adults with T2D compared to a calorie-restricted, non-exercising group that lost skeletal muscle mass. A recent meta-analysis of resistance exercise suggests that high-intensity training is more beneficial than low-to-moderate-intensity training for overall glucose management and attenuation of insulin levels in adults with T2D.

(以上內容修改自 Kanaley JA, Colberg SR, Corcoran MH, Malin SK, Rodriguez NR, Crespo CJ, Kirwan JP, Zierath JR. Exercise/Physical Activity in Individuals with Type 2 Diabetes: A Consensus Statement from the American College of Sports Medicine. Med Sci Sports Exerc. 2022 Feb 1;54(2):353-368.)

3. 根據上述文章內容，若你要進行一項研究「Effect of resistance vs. aerobic exercise in type 2 diabetes: a randomized controlled trial」，請說明運動介入內容與評估項目之設計（15%）。

Case Scenario: A 68-year-old patient is admitted to the hospital with an acute exacerbation of COPD. Current symptoms include increased dyspnea, productive cough with thick secretions, and decreased exercise tolerance. The patient demonstrates signs of respiratory muscle fatigue and SpO_2 is 90% on 2 L/min O_2 via nasal cannula. He has a history of osteoporosis and gastroesophageal reflux disease (GERD).

4. 簡述此患者此階段的物理治療目標。（10%）
5. 請簡述 3 個適合此患者的 CPT（chest physical therapy）技術及其作用原理。（30%）
6. 請簡述執行這些 CPT 技術時，針對此患者，需要注意的事項為何？（10%）

試題隨卷繳回