Test No 1, Prestressed Concrete, Semester (8), 14/4/2025.

Allowed Time: One & Half Hours. ِ Answer ALL Questions

QUESTION 1. A prestressed concrete beam, 200 mm wide and 300 mm deep, is used over an effective span of 6 m to support an imposed load of 4 kN/m. The density of concrete is 24 kN/m3. At the quarter-span section of the beam, find the

magnitude of:

(a) the concentric prestressing force necessary for zero fiber stress at the

Soffit (bottom) when the beam is fully loaded, and,

(b) the eccentric prestressing force located 100 mm from the bottom of the

beam which would nullify (make zero) the bottom fiber stress due to loading.

QUESTION 2. A prestressed concrete beam of rectangular cross-section 300 mm and 600 mm is 12 m long supports a live load 12 kN/m (including its self-weight). The beam is prestressed by a cable of high-tensile wires of area 2000 mm2 stressed to 800 N/mm2. The cable is straight and located at 175 mm from the soffit (bottom) of the beam. Determine the shift in the pressure line at one quarter span and center of span, when the beam supports the service load.

**1-إحرص على كتابة اسمك على كل الصفحات حتى يسهل التعرف عليها.**

**2-ترقيم الصفحات حسب تسلسل الحل ضرورى جدا.**

**3-ترسل الحلول على الواتساب عند انتهاء الزمن أو قبله.**

**بالتوفيق**