

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

**THEORY OF STRUCTURES - I**

[Time : 3 hours

(Maximum marks : 100)  
[Note :—Sketches on 4<sup>th</sup> page.]

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define a force.
2. What do you mean by factor of safety ?
3. Define the term neutral layer of a section.
4. Classify the types of loading on the beam.
5. Define moment of resistance of a section in a beam.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Two forces 80 N and 70 N acts simultaneously act at a point O with angle between them is 90°. Find the magnitude and direction of resultant of force.
2. A simply supported beam AB of span 4 meter carries three point loads of 4 kN, 10 kN and 8 kN at a distance 1m, 2m and 3m respectively from the left hand support. Calculate the support reactions.
3. A member formed by connecting a steel bar to an aluminium bar of cross sectional area 2500 mm<sup>2</sup> is shown in the figure -1. Calculate the magnitude of the load P which will cause the total length of the member to decrease 0.25 mm. Take E for steel =  $2.1 \times 10^5$  N/mm<sup>2</sup> and E for aluminium =  $7 \times 10^4$  N/mm<sup>2</sup>.
4. Explain resilience, proof resilience and modulus of resilience.
5. A cantilever beam 3 meter long carries UDL of 2 kN/m over the entire span and a point load of 3kN at the free end. Draw the shear force and bending moment diagram.