

TED (15)–4053

Reg. No.

(REVISION—2015)

Signature

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019**

MATERIAL SCIENCE & STRENGTH OF MATERIALS

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

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

1. Mention the concept of ductility.
2. Name the 2 processes by which riveting is carried out.
3. State Hookes law.
4. Define angle of friction.
5. What is the peculiarity of cantilever beam.

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. List 6 types of heat treatments.
2. State any 6 mechanical Properties.
3. List advantages and disadvantages of welded joint over riveted joint.
4. Enumerate the methods of failure of rivet and plate.
5. State the laws of solid friction.
6. Define :
 - (a) Sliding friction
 - (b) Rolling friction
7. Define the terms : shear force, bending moment and point of contraflexure.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Discuss the 4 types of alloy steels. 8
 (b) Draw cooling curve for pure iron. 7

OR

- IV (a) Mention application of plastics in Automobile. 8
 (b) Explain 3 non-ferrous metals and their alloys. 7

UNIT — II

- V (a) With sketch explain the salient points of a stress-strain curve. 8
 (b) A brass rod 1.5m long and 20mm diameter was found to deform 1.9mm under a tensile load of 40KN. Calculate the modulus of elasticity of the rod. 7

OR

- VI (a) A single riveted lap joint is made in 12mm thick plate with 22mm diameter rivets. Determine the strength of the rivet, if the pitch of the rivet is 60mm. Tube allowable stress in shearing as 60Mpa, bending as 150 Mpa and in tearing as 80 Mpa respectively. 8
 (b) List the 7 assumptions made while designing riveted Joints for structural use. 7

UNIT — III

- VII (a) Explain the terms normal reaction and angle of friction. 8
 (b) A body of weight 300N is lying on a rough horizontal plane having a coefficient of friction as 0.3. Find the magnitude of the force, which acting at an angle of 25° with the horizontal. 7

OR

- VIII (a) Find the center of gravity of a $100\text{mm} \times 150\text{mm} \times 30\text{mm}$ T-section. 8
 (b) Distinguish parallel axis and perpendicular axis theorem. 7

UNIT — IV

- IX (a) A cantilever beam AB 2m long carries a uniformly distributed load of 1.5KN/m over a length of 1.6m from the free end. Draw SF and BM diagrams for the beam. 8
 (b) List assumptions in the theory of simple bending. 7

OR

- X (a) A simply supported beam of 3m span carries the load of 5KN each at 1m and 2m from left hand support. Draw the shear force and the bending moment diagram for the beam. 8
 (b) A cantilever beam of 1.4m length carries a uniformly distributed load of 1.5KN/m over its entire length. Draw SF and BM diagrams for the cantilever. 7