Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (AE) (2018 Batch)   (Sem.–3)
STRENGTH OF MATERIALS
Subject Code : BTAE301-18
M.Code : 76399

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1. What is the difference between thick and thin cylinders?

2. Define the term modulus of rigidity.

3. What is the use of section modulus?

4. Define neutral axis.

5. What are principal planes?

6. What do you mean by buckling of beams?

7. State Saint Venant's principal.

8. Define the term plasticity.

9. What do you mean by rupture strength?

10. What do you mean equivalent modulus of elasticity?

SECTION-B

11. Derive the relationship for the extension due to self-weight in bar of uniform strength?

12. Derive the relationship between modulus of elasticity (E) and bulk modulus of elasticity (K).

13. Draw the shear stress and bending moment diagram of a SSB of length 10m with point load of 5 kN and the mid-point of the beam.

14. A beam 30 cm deep of symmetrical section has I = 8000 cm^4 and is simply supported over a span of 8 meters. Calculate the uniformly distributed load it may carry if the maximum stress INS not exceeds 110 N/mm^2.

15. Determine the slopes at the ends and the deflection at the mid-span of a SSB of length L m carrying udl of w kN/m over its whole length. Also plot the slope and deflection diagrams for the beam.

SECTION-C

16. A solid shaft of 250 mm diameter has the same cross-sectional area as the hollow shaft of the same material with inside diameter of 200 mm. Find the ratio of power transmitted by the two shafts for the same angular velocity and compare the angle of twist in equal lengths of these shafts, when stressed to same intensity.

17. Drive the bending moment equation stating all the assumptions and using simple theory of bending.

18. Drive the Euler's formula for long columns having both the ends hinged.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.