

SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution) Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai Accredited by NAAC-UGC with 'A++' Grade (Cycle III) & Accredited by NBA (B.E - CSE, EEE, ECE, Mech & B. Tech.IT) COIMBATORE-641 035, TAMIL NADU



B.E/B.Tech- Internal Assessment – I Academic Year 2024-2025 (Even Semester) Fourth Semester Agricultural Engineering 23AGT205 & Strength of Materials for Agricultural Engineering QUESTION BANK

PART A

- 1. How do different types of beam support conditions affect the structural stability and load distribution in real-world applications?
- 2. Define shear force and bending moment.
- 3. Give the relationship between shear force and bending moment?
- 4. How does the relationship between bending moment and deflection influence the design of long-span structures like bridges and skyscrapers?
- 5. Draw the shear stress distribution diagram for a rectangular section.
- 6. Name the different types of beams based on support conditions.
- 7. In what ways do shear force and bending moment impact the durability and safety of structural elements?"
- 8. Compare sagging and hogging moments in terms of their effects on beam behavior and structural integrity.
- 9. What is the relation between bending moment and deflection in beams?
- 10. State the assumptions made in the theory of simple bending
- 11. What is the sign convention for shear force?
- 12. What is the nature of the SF diagram for a simply supported beam under a point load?
- 13. Summarize and sketch the types of supports used for a beam indicating the reactions in each case
- 14. A cantilever beam of length 2 m carries the point loads of 800N at its free end, 600N at 0.8 m and 300N at 1.5 m from its free end. Draw the S.F diagram.
- 15. Sketch the SFD and Bending moment diagram for a cantilever beam carrying a point load at its free end.

PART B

Write the expression for S.F and B.M of a simply supported beam carrying:

(i) Point load at its midspan(i) Eccentric Point load

(7) (6)

Derive an expression for shear force and bending moment of a simply supported beam carrying a UDL of w/metre length throughout its span with a neat sketch.

A simply supported beam of length 10 m carries both UDL and point loads as shown in the figure below. Analyze the beam and plot its shear force and bending moment diagram.



16.

17.



19. Explain the theory of simple and pure bending and derive the bending equation.

A simply supported beam of a 9 m span is shown in the figure given below. Draw the B.M and S.F diagram indicating principal values.

20.

23.

28.



- 21. Discuss the concept of section modulus for rectangular and hollow rectangular sections
- The simply supported beam of length 5m carries a vertical load that increases
 uniformly from 800 N/m at the left end to a maximum value of 1600 N/m at the right end. Draw the shearing force and bending moment diagrams.

$$\frac{M}{I} = \frac{f}{y} = \frac{E}{R}$$

Derive the bending equation $\int g dx = R$ Explain the assumptions made in the theory of simple bending.

- Draw SFD and BMD for a simply supported beam of length 9m carrying a
 24. UDL of 10KN/m for a distance of 6m from the left end. Also calculate the Maximum BM on the section
- 25. Discuss the concept of section modulus for rectangular and hollow rectangular sections
- Draw SFD and BMD for a simply supported beam of length 10m carrying a
 26. UDL of 20KN/m for a distance of 6m from the left end. Also calculate the Maximum BM on the section

The simply supported beam of length 10m carries a vertical load that increases uniformly from 500 N/m at the left end to a maximum value of

27. Increases uniformly from 500 form at the fert end to a maximum value of 1000 N/m at the right end. Draw the shearing force and bending moment diagrams.

Draw SFD and BMD for a simply supported beam of length 20m carrying a UDL of 40KN/m for a distance of 10m from the left end. Also calculate the

Maximum BM on the section

29. The simply supported beam of length 10m carries a vertical load that increases uniformly from 1500 N/m at the left end to a maximum value of 3000 N/m at the right end. Draw the shearing force and bending moment diagrams.