

M. TECH.-II (MECHANICAL CAD/CAM) (CBCS – 2015
COURSE) : SUMMER - 2018

SUBJECT: ADVANCED FINITE ELEMENT METHOD

Day: Monday
Date: 11/06/2018

S-2018-3010

Time: 11.00 AM TO 02.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non- programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

SECTION-I

Q.1 Explain the Rayleigh Ritz method? How it can be applied to any mechanical component, explain with case study? (10)

OR

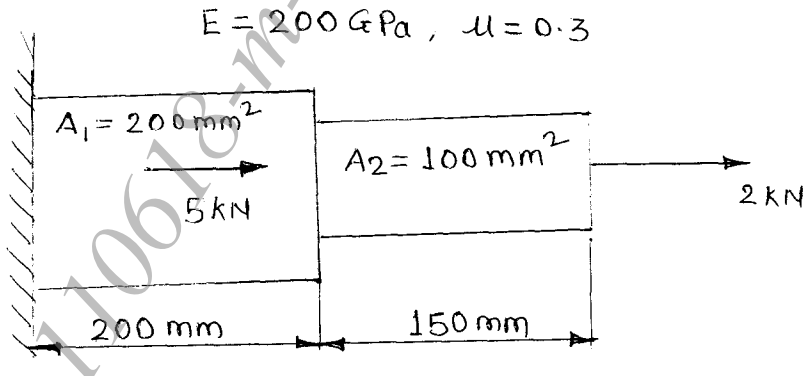
Q.1 Derive strain displacement matrix and stress- strain matrix for 1D bar element? (10)

Q.2 Write short notes on: (10)

- a) Subdomain method
- b) Galerkin's method

OR

Q.2 Calculate displacement and stresses induced in the body as shown in fig. Using Elimination approach. (10)



Q.3 Write a short note on: (10)

- a) Constant strain triangle
- b) Midlin plate element

OR

Q.3 Derive the global stiffness matrix for CST element using potential energy approach? (10)

P.T.O.

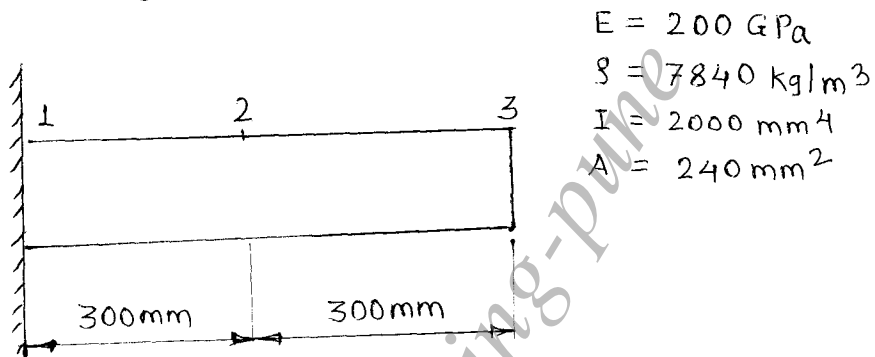
SECTION-II

Q.4 Derive shape function for Four Noded quadrilateral element? (10)

OR

Q.4 Derive the Body force and Traction force vector for Isoparametric element. (10)

Q.5 Evaluate the lowest Eigen value and the corresponding Eigen mode for the beam shown in fig. (10)



OR

Q.5 Give brief note on steady state and Transient Vibration analysis? (10)

Q.6 Write down the steps required to carry out the linear buckling analysis? (10)

OR

Q.6 Write short note on: (10)

- a) Sub modelling
- b) Sub structuring

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