

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

R18

Max. Marks: 60

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2021 **MECHANICS OF SOLIDS**

(Civil Engineering)

Time: 3 hours

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'ART-A

	(Answer all the Questions 5 x $2 = 10$ Marks)	
a	Define lames theorem and formula.	2 M
b	Define parallel axis theorem with equation.	2M
c	Define determinate and indeterminate structures.	2M
d	Write general equation for three moment equation.	2M
e	What is degree of indeterminacy?	2 M

What is degree of indeterminacy?

PART-B

(Answer all Five Units $5 \ge 10 = 50$ Marks)

UNIT-I

Derive an expression for hoop and radial stresses across thickness of the thick cylinder. 2 **10M**

OR

A thick spherical shell of 200 mm internal diameter is subjected to an internal fluid 3 **10M** pressure of 7 N/mm². If the permissible tensile stress in the shell material is 8 N/mm², Find thickness of the shell.

UNIT-II

- A masonry dam of rectangular section, 20 m high and 10 m wide, has water upto a height of 16 4 **10M m** on its one side find:
 - i) Pressure force due to water on one-meter length of the dam.

ii) Position of centre of pressure.

iii) The position at which the resultant cuts the base and Maximum and minimum intensities at the base of the dam. Take weight density of masonry is 19.62 kN/m^3 and of water 9.81 kN/m³

OR

- 5 Determine the centroidal moment of inertia of the equal section $30 \times 30 \times 10 \text{ mm}^3$ **10M** UNIT-III
- Calculate the central deflection and slope at ends of a simply supported beam carrying a U.D.L. 10M 6 'w' per unit length over the whole span.

OR

7 Analyze the truss shown in Figure below. Assume that the cross sectional area of all **10M** members are same.



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- -V mody spinistical shell of \$200 area invested digitated is subjected to an internal fluid 10M graveur of 7 Wrava⁵. If the pressivable tagsile tagsile transit in the shell material is a P(mim²).

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 - (ii) The position of while the constant cata the base of Maximum and Wiston, intensities at the base of the data. Take weight density of masoney is 19.62 hikkn² and of water 9.81 kNBa².

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- Calculate: the central deflection and slope of each of a simply supported boun earlying a 0.805 (* 1000 "9" part and kingth over the whele spin

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UNIT-IV

8 A Fixed beam of span 8 m is subjected a UDL of 3 kN/m on the left half of the span and a 10M point load of 8 kN at the middle of the right half of the span. Draw the SFD and BMD.

OR

9 A continuous beam ABC of uniform section with span AB and BC as 5 m each, is 10M fixed at A and simply supported at B and C. The beam is carrying a uniformly distributed load of 8 kN/m run throughout its length. Find the support moments and the reactions using theorem of three moments. Also draw SFD and BMD.

UNIT-V

10 Analyze the continuous beam as shown in figure below by slope deflection method. Support B 10M sinks by 10 mm. Take E = 200 GPa and $I = 16 \times 10^7$ mm⁴. Draw the bending moment diagram.



OR

11 Analyze the portal frame shown in figure using moment distribution method.



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