BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M TECH **SEMESTER : I**
BRANCH: CIVIL ENGG. **SESSION : MO/2022**

SUBJECT: CE501 ADVANCED SOLID MECHANICS

TIME: 3:00 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	What do you mean by body force & surface force?	CO5, level-1	[2]
Q.1(b)	What is the expression of boundary condition?	CO5, level-1	[3]
Q.1(c)	Write the expression of stress – strain relationship. Why poison's ratio in taken? How will you express stress & strain in Kronecker delta form?	Co4, level-2	[5]
Q.2(a)	What are the lame's constant?	Co1, level-1	[2]
Q.2(b)	What is third boundary problem?	Co1,level-1	[3]
Q.2(c)	What do you mean by plane stress & plane strain? write the expression of stress & strain relationship for plane problem.	Co1, level-1	[5]
Q.3(a)	How will you express normal stress in stress formulation?	Co5,level-2	[2]
Q.3(b)	What are the uses of polynomial expression?	Co2, level-2	[3]
Q.3(c)	What is the relationship of Cartesian co-ordinate & polar co-ordinate? Write the stress function in Axi symmetric distribution.	co1, level-2	[5]
Q.4(a)	Write the resolution of force with diagram for bending of a curved beam by a force at the end.	co4, level-2	[2]
Q.4(b)	What do you mean by torsion? What is the difference for bending & twisting.	co1, level-1	[3]
Q.4(c)	What do you mean by torsional rigidity? What is the role of torsional rigidity?	co1 level-1	[5]
Q.5(a)	What do you mean by strain energy?	Co1, level-1	[2]
Q.5(b)	Write the principle of virtual work & principle of least work.	Co1, level-1	[3]
Q.5(c)	Write the expression of Van Mishes failure theory.	co6, level-2	[5]

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