

Roll No.

Total Pages : 3

305307

December, 2019

**B. Tech. (ECE) - III SEMESTER
ENGINEERING MECHANICS (ESC01)**

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

PART - A

1. (a) Name the different types of trusses. (1.5)
- (b) Differentiate between first and second moments of area. (1.5)
- (c) Define Static Indeterminacy. (1.5)
- (d) What is Limiting Friction? (1.5)
- (e) Explain degrees of freedom. (1.5)
- (f) Define D'Alembert's Principle. (1.5)
- (g) What is Resonance? (1.5)

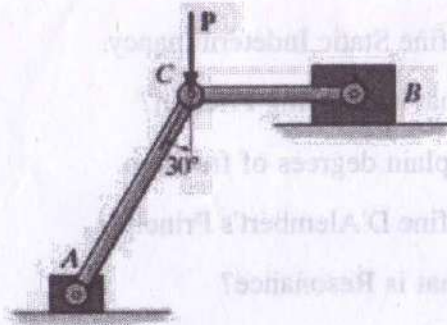
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- (h) Explain Equilibrium. (1.5)
- (i) What are Conservative Forces? (1.5)
- (j) Explain Wedge Friction. (1.5)

PART - B

2. Derive the equation for Newton's law for path variables. (15)
3. (a) Derive the relation for motion of a particle relative to a pair of translating axes. (5)
(b) Explain with an example the Method of sections for solving truss problems. (10)
4. Blocks A and B have a mass of 3 kg and 9 kg, respectively, and are connected to the weightless links shown in Fig. Determine the largest vertical force P that can be applied at the pin C without causing any movement. The coefficient of static friction between the blocks and the contacting surfaces is $\mu_s = 0.3$. (15)



5. (a) Define inertia quantities. (5)
(b) Derive the relation between mass inertia terms & area inertia terms. (10)
6. (a) Define the Method of minimum potential energy. (10)
(b) Derive the equation for minimum load to lower the load with a simple screw jack. (5)
7. Determine the moment produced by the force F in Fig. about point O. Express the result as a Cartesian vector. (15)

