Week 6: Assignment 2

The due date for submitting this assignment has passed.

Due on 2021-09-08, 23:59 IST.

As per our records you have not submitted this assignment.

Mechanical Assignment

1) To stop swelling, retention plates are required in: ***1 point***

a) Cylindrical Cell b) Prismatic cell c) Pouch cell

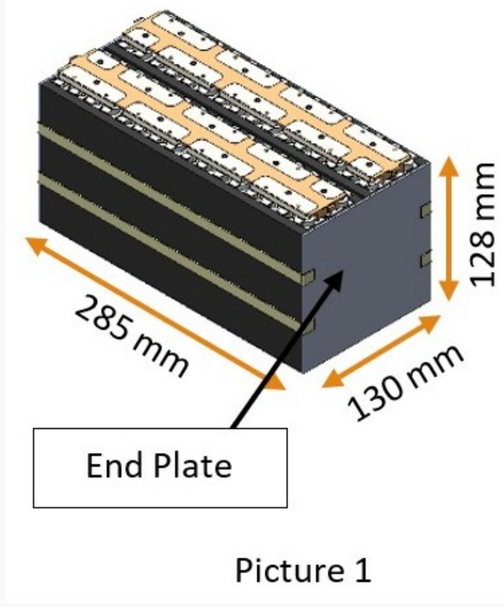
- Only a
- Only c
- Both b and c
- All a, b, and c

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both b and c

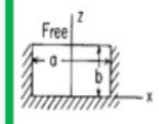
For the below battery pack, End plates and Side strips are required to be designed. Material selected for this purpose is Aluminum 6061 T6.

Aluminum 6061 T6	Young's Modulus - 68900 Mpa	Yield strength - 290Mpa



Picture 1

The dimensions of Endplate are 138mmx128mmx2mm. Pressure applied (q) on it is 0.1N/mm^2 and boundary conditions are as defined in the picture 2. Calculate the stress generated at (x = 0, z = b) of End plate in Mpa.

Rectangular plate; three edges fixed, one edge (a) free 	10a. Uniform over entire plate	$(\text{At } x=0, z=0)\quad (\sigma_b)_{max}=\frac{-\beta_1 qb^2}{t^2}$ and $R=\gamma_1 qb$ $(\text{At } x=0, z=b)\quad \sigma_a=\frac{\beta_2 qb^2}{t^2}$ $\left(\text{At } x=\pm\frac{a}{2}, z=b\right)\quad \sigma_a=\frac{-\beta_3 qb^2}{t^2}$ and $R=\gamma_2 qb$

a/b	0.25	0.50	0.75	1.0	1.5	2.0	3.0
β_1	0.020	0.081	0.173	0.321	0.727	1.226	2.105
β_2	0.016	0.066	0.148	0.259	0.484	0.605	0.519
β_3	0.031	0.126	0.286	0.511	1.073	1.568	1.982
γ_1	0.114	0.230	0.341	0.457	0.673	0.845	1.012
γ_2	0.125	0.248	0.371	0.510	0.859	1.212	1.627

2) Stress generated is _____ Mpa

No, the answer is incorrect.
Score: 0

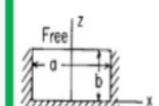
Accepted Answers:
(Type: Range) 100,130

1 point

3) 4 Battery packs of mass 10Kg, 15Kg, 20kg and 25kg, having overall stiffness of 12.5N/m, 18N/m, 15N/m and 40N/m respectively. The pack with least natural frequency is: ***1 point***

Natural frequency, $\omega = \sqrt{\frac{stiffness,(k)}{mass,(k)}}$

- Pack 1
- Pack 2

Rectangular plate; three edges fixed, one edge (a) free 	10a. Uniform over entire plate	$(\text{At } x=0, z=0)\quad (\sigma_b)_{max}=\frac{-\beta_1 qb^2}{t^2}$ and $R=\gamma_1 qb$ $(\text{At } x=0, z=b)\quad \sigma_a=\frac{\beta_2 qb^2}{t^2}$ $\left(\text{At } x=\pm\frac{a}{2}, z=b\right)\quad \sigma_a=\frac{-\beta_3 qb^2}{t^2}$ and $R=\gamma_2 qb$

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