

TTL763 Technical Textiles

Major

Duration: 2 hrs

Max. Points: 40

1. What is the conventional way of making car seats?[2] Compare the advantages and disadvantages of the alternate new methods.[3]
2. What is the structure of the typical headliner in a car? [2] Discuss about the alternate materials and methods that are being tried out by the industry.[3]
3. The maximum tolerable load for humans is 3000 lb. The level of strain for three ropes at the survival load is as follows:
Steel rope = 0.01; Rope A = 0.1; Rope B = 0.32
Determine the possible fall factors for threshold survivability for a climber of 180 lb for all the three ropes. Assume linear stress – strain relationship for all the three ropes. [5]
4. In what way a fibre rope is superior to wire rope?[2] Compare the properties of fibre ropes with different constructions.[3]
5. What is the role of textile felts in the paper making process?[2] How do different types of press felts used for making paper differ in the structure and performance?[3]
6. Mention 3 survivability characteristics of geotextiles that are usually tested and explain testing of anyone of them briefly. [2]
Given a 200-lb./in.² truck tire inflation pressure on a stone base course consisting of 2 in. maximum size stone with a geotextile beneath it, calculate (a) the required grab tensile stress on the geotextile, and (b) the global factor of safety for a geotextile whose ultimate grab strength at 33% is 125 lb. with a sum of partial factors of safety of 1.5. [3]
7. What are the advantages in using textile structures for composites and mention the difficulties associated with using textile structures for composites? [2.5] Mention four types of hybrid yarns for thermoplastic composites and discuss their potential to provide uniform mixing of matrix forming fibres and the reinforcing fibres.[2.5]
8. How electrically charged fibres are manufactured for filtration applications? [2] Explain under what conditions one can get a) concave-up b) concave-down and c) linear drag Vs. time curves. [3].