Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

1) Choose True/False for the following assertion: “Direct notation is independent of the coordinate system.”
   - True
   - False
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) True
   (b) False

2) Choose True/False for the following assertion: “A free index can occur only once in a symbol group but can be different in different symbol groups.”
   - True
   - False
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) True
   (b) False

3) Choose True/False for the following assertion: “A dummy index can occur at most twice in a symbol group but can be different in different symbol groups.”
   - True
   - False
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) True
   (b) False

4) Which one of the below indicial notation is valid for $C = AB$ where all quantities are second order tensors?
   - $(a_i)_j = A_{ik}B_{kj}$
   - $(a_i)_j = C_{ij}$
   - $(a_i)_j = B_{ij}$
   - $(a_i)_j = D_{ij}C_{ij}$
   - All of these
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) $(a_i)_j = A_{ik}B_{kj}$
   (b) $(a_i)_j = C_{ij}$
   (c) $(a_i)_j = B_{ij}$
   (d) $(a_i)_j = D_{ij}C_{ij}$
   (e) All of these

5) Which of the following expressions are valid?
   - $(A_{ij}B_{jk})_i = 9$
   - $(A_{ij}B_{jk})_i = 0$
   - $(A_{ij}B_{jk})_i = 1$
   - $(A_{ij}B_{jk})_i = 2$
   - $(A_{ij}B_{jk})_i = 3$
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) $(A_{ij}B_{jk})_i = 9$
   (b) $(A_{ij}B_{jk})_i = 0$
   (c) $(A_{ij}B_{jk})_i = 1$
   (d) $(A_{ij}B_{jk})_i = 2$
   (e) $(A_{ij}B_{jk})_i = 3$

6) Which of the following are correct expressions for the vector identities given below?
   - $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi (\nabla \times m)$ in indicial notation can be written as $A_{jk}B_{ij}h_{jk}$
   - $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi \nabla \times m$ in indicial notation can be written as $A_{jk}B_{ij}h_{jk}$
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi (\nabla \times m)$
   (b) $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi \nabla \times m$
   (c) $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi (\nabla \times m)$
   (d) $(\nabla \times (\phi x m)) = \nabla \phi \times m + \phi \nabla \times m$

7) Choose True/False for the following assertion: “The double contraction of a symmetric and an antisymmetric tensor is zero.”
   - True
   - False
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) True
   (b) False

8) Which of the following assertions are correct?
   - (a) A second order tensor maps a vector to another vector.
   - (b) All second order tensors can be written as a dyad.
   - (c) A fourth order tensor maps a second order tensor to another second order tensor.
   - (d) Any tensor in two-dimension can be expressed a linear combination of two dyads provided the first vectors of the two dyads are linearly independent.
   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   (a) A second order tensor maps a vector to another vector.
   (b) All second order tensors can be written as a dyad.
   (c) A fourth order tensor maps a second order tensor to another second order tensor.
   (d) Any tensor in two-dimension can be expressed a linear combination of two dyads provided the first vectors of the two dyads are linearly independent.