

**THIRD SEMESTER**

**B.Tech. [EP]**

**Class Test-1**

**September-2020**

**EP-203: MATHEMATICAL PHYSICS**

**Time: 1.5 Hours**

**Max. Marks: 20**

**Note :** Answer **ALL** questions.  
Assume suitable missing data, if any.

1. Discuss the application of tensor analysis to thermal expansion. (5)
2. Use Runge-Kutta method to find  $y$  when  $x= 1.1$ , given that  $\frac{dy}{dx} = x^2 + y^2$   
and  $y(1) = 1.5$ . (5)
3. Define skew-symmetric tensor. Show that a skew-symmetric tensor of the  
second order has only  $\frac{1}{2} n (n-1)$  different non-zero components. (3)
4. Define dextral and real index in tensors. Give examples. (3)
5. Define shift operator and derive the relation between the *Mean operator*  
and *Central difference operator*. (4)