Assignment 8

Due on 2020-11-11, 23:59 IST.

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

1.\[ k \text{ is a field.} \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: True

2. \[ \text{Let } R \text{ be a ring with no nilpotent elements. Then } R \text{ is artinian.} \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: True

3. \[ \text{Let } R \text{ be an } \mathbb{P}/\mathbb{I} \text{-graded ring and } S \text{ an } \mathbb{P}/\mathbb{I} \text{-graded ring. Then if } \mathbb{P}/\mathbb{I} \text{ is a maximal ideal of } R \text{ and } R/\mathbb{P}/\mathbb{I} \text{ is a graded } \mathbb{P}/\mathbb{I} \text{-ideal of } S \text{ then } S \text{ is a graded ideal of } R. \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: True

4. \[ \text{Let } R \text{ be a finitely generated artinian } k \text{-algebra. Then the rank of } R \text{ as a } k \text{-vector space is at most the number of maximal ideals of } R. \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: False

5. \[ \text{Let } R \text{ be a finitely generated artinian } k \text{-algebra. Then the rank of } R \text{ as a } k \text{-vector space is at most the number of maximal ideals of } R. \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: False

6. \[ \text{Let } R \text{ and } S \text{ be graded rings such that their Hilbert functions are the same. Then } R \text{ is isomorphic to } S. \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: False

7. \[ \text{Let } R \text{ be a } \mathbb{P}/\mathbb{I} \text{-graded ring and } \mathfrak{m} \text{ a maximal ideal of } R \text{. Then } \text{grade}(R) \simeq k[\mathfrak{m}] \text{.} \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: True

8. \[ \text{Let } R \text{ be a } \mathbb{P}/\mathbb{I} \text{-graded ring and } \mathfrak{m} \text{ a maximal ideal of } R \text{. The Hilbert- Samuel polynomial } \Phi_{R/\mathfrak{m}} \text{ is } 2x. \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: True

9. \[ \text{Let } k \text{ be a field and } \{ x, y \} \text{ a system of parameters for } k[[x, y]]/(xy). \] 1 point
   - True
   - False
   - No, the answer is incorrect
     Score: 0
     Accepted Answer: False

10. \[ \text{Let } R \text{ be the Rees algebra of } k[x] \text{ with respect to the generating set } \{ x^2 \} \text{ of the ideal } (x^2) \text{ is isomorphic to } k[x, y]. \] 1 point
    - True
    - False
    - No, the answer is incorrect
      Score: 0
      Accepted Answer: True