Assignment-04

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-02-17, 23:59 IST.

1) Which of the following is true?  
   (1 point)
   
   □ There is a constant $C > 0$ such that if $u$ is a harmonic function in $\Omega$ and $\overline{V} \subset \subset \Omega$, then $\sup_{\overline{V}} u \leq C \inf_{\overline{V}} u$.
   
   □ There is a constant $C > 0$ such that if $u$ is a non-negative harmonic function in $\Omega$ and $\overline{V} \subset \subset \Omega$, then $\sup_{\overline{V}} u \leq C \inf_{\overline{V}} u$.
   
   □ A non-positive, non-constant harmonic function $u$ in $\Omega$ satisfies $u \leq -C < 0$ on any compact set $\overline{V} \subset \subset \Omega$, for some $C > 0$.
   
   □ Any harmonic function satisfies $\sup_{\overline{V}} u \geq C \inf_{\overline{V}} u$, in any $\overline{V}$ such that $\overline{V} \subset \subset \Omega$, where $C$ depends on $\overline{V}$.

No, the answer is incorrect.
Score: 0
Accepted Answers:

2) If $u$ solves $\Delta u = |Vu|^2 + 1$ in an open connected set $\Omega$, then  
   (1 point)
   
   □ $u$ attains maximum in $\overline{\Omega}$.
   
   □ $u$ cannot attain maximum on $\partial \Omega$.
   
   □ Mean value property holds for every $B(x, r) \subset \Omega$.
   
   □ $u$ is the unique solution of the problem.

No, the answer is incorrect.
Score: 0
Accepted Answers:

3) Let $u(x, y) = \log(x^2 + y^2)$ in $B(0, 1)^c = \mathbb{R}^2 \setminus B(0, 1)$. Then  
   (1 point)
   
   □ $u$ is harmonic in $B(0, 1)^c$.
   
   □ $u$ has a maximum in $B(0, 1)^c$.
   
   □ $u$ attains minimum in $B(0, 1)^c$.
   
   □ $u$ admits neither maximum, nor minimum in $B(0, 1)^c$.

No, the answer is incorrect.
Score: 0
Accepted Answers:

4) The problem $\Delta u = 0$, $u(x, 0) = 1$ in $\mathbb{R} \times (0, \infty)$ has  
   (1 point)
   
   □ no solution.
   
   □ a unique solution.
   
   □ at least two solutions.
   
   □ infinitely many solutions.

No, the answer is incorrect.
Score: 0
Accepted Answers:

5) Which of the following is true? (Assume the functions not to be identically zero.)  
   (1 point)
   
   □ Zeros of harmonic functions are isolated.
   
   □ Zeros of harmonic functions are not isolated.
   
   □ Zeros of holomorphic functions are isolated.
   
   □ Zeros of holomorphic functions are never isolated.

No, the answer is incorrect.
Score: 0
Accepted Answers:

Zeros of harmonic functions are never isolated.

Zeros of holomorphic functions are isolated.