Unit 9 - Week 8 : Unit 8

Week 8 Assignment 8

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2018-09-26, 23:59 IST.

1) In which case a functional $J$ will have a minima?

   a) $\nabla^2 J > 0$
   b) $\nabla^2 J = 0$
   c) $\nabla^2 J < 0$
   d) $\nabla^2 J < 0$

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

2) The direction on which a function $f$ will have largest rate of increase is:

   a) $\text{div}(f)$
   b) $-\text{grad}(f)$
   c) $\text{grad}(f)$
   d) $\tan^{-1}(f_x/f_y)$

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   c
3) For any positive definite matrix $A$, minimization of $j(x) = \frac{1}{2} x^T A x - b^T x$

will give solution of

a) $Ax=b$

b) $1/2(A^T + A)x = b$

c) $A^T x = b$

d) None of the above

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

4) If the $k$-th iteration residual in a steepest descent algorithm is $r_k = b - Ax_k$ then

a) $r_k$ is unit vector

b) $r_k$ and $r_{k+1}$ are orthogonal

c) $\|r_k\| > \|r_{k+1}\|$

d) $Ar_k = 0$

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

5) Minimum residual iterative method is an

a) orthogonal one-dimensional projection method

b) orthogonal and multi-dimensional projection method

c) oblique and one-dimensional projection method

d) oblique and multi-dimensional projection method

No, the answer is incorrect.
Score: 0
Accepted Answers:
6) Rate of convergence in a residue norm method depends on
   a) Spectral condition number of $A$.
   b) Condition number of $A$.
   c) Spectral condition number of $A^T$.
   d) Spectral condition number $A^T A$.

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

7) $A = B - B^T$. B is not symmetric, Which of the iterative methods will work for $Ax = b$?
   a) Steepest descent
   b) Jacobi
   c) Residue norm
   d) Minimum residue

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

8) Which of the iterative methods minimize the L2 norm of $b - Ax$
   a) Residue norm
   b) Minimum residue
   c) Steepest descent
   d) Conjugate gradient

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   b
9) A steepest descent algorithm contains
   a) Only vector vector products
   b) Matrix-vector and vector-vector products
   c) Recursive relations
   d) All of the above

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

10) Which method may not work for a diagonally dominant matrix with all positive elements
   a) Gauss-Seidel
   b) Minimum residual
   c) Residue norm
   d) Steepest descent

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