**University of Mumbai**

Program: \_First Year (All Branches) Engineering- SEM-I

Curriculum Scheme: Rev 2019

Engineering Mathematics-I

**Question Bank**

===========================================================================

|  |  |
| --- | --- |
| **Q1.** | **Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** |
| 1. | The real part of is |
| Option A: |  |
| Option B: | 2 |
| Option C: | - |
| Option D: |  |
|  |  |
| 2. | The Cartesian form of 4 is equal to |
| Option A: | 2i |
| Option B: | -2i |
| Option C: | 4i |
| Option D: | 4 |
|  |  |
| 3. | Find the value of - i ) |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 4. |  |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 5. |  |
| Option A: | 1 |
| Option B: | -1 |
| Option C: | 0 |
| Option D: |  |
|  |  |
| 6. |  |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 7. | Stationary point is a point where f(x,y) has |
| Option A: | = 0 |
| Option B: | = 0 |
| Option C: | = 0 , = 0 |
| Option D: | < 0 > 0 |
|  |  |
| 8. |  |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 9. | For the unitary matrix , find A-1 |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 10. | If , then rank of A is |
| Option A: | 2 |
| Option B: | 3 |
| Option C: | 1 |
| Option D: | 0 |
|  |  |

|  |  |  |
| --- | --- | --- |
|  | |  |
| **Descriptive Questions** | | |
|  | Prove that | |
|  | Prove that | |
|  | Find the Rank of the following matrix by reducing to Normal Form  A = | |
|  | Find a, b, c if A is orthogonal matrix where A =.  Hence find inverse of A. | |
|  | Divide 24 into 3 parts such that the continued product of the first, square of second and cube of the third is maximum using Lagrange’s method. | |
|  | If , then show that | |
|  | Solve: | |
|  | If Prove that | |
|  | Express the matrix as a sum of Hermitian and skew Hermitian matrix. | |
|  | If , then prove that | |
|  | Find the nth derivative of | |
|  | If , prove that  , | |
|  | Test for consistency the following system & solve them if consistent | |
|  | Prove that | |
|  | Prove that | |
|  | If prove that . | |
|  | If , Find the value of | |
|  | Examine the function For extreme values. | |
|  | Solve the equation | |
|  | Find the values of and | |
|  | If | |
|  | Find the extreme value of the function | |
|  | Reduce to normal form and find its rank given A = | |
|  | Separate into real and imaginary parts | |
|  | If | |
|  | Find all the values of | |
|  | If P.T  + + | |
|  | For what value of the equations , have a solution and solve them completely in each case. | |
|  | If prove that  + + = 0 | |
|  | If find | |
|  | Find the real part of the principal value of | |
|  | Expand in a series of cosines of multiples of | |
|  | If z = , find + | |
|  | If , find | |
|  | If A = find non singular matrices Pand Q such that PAQ is in normal form and find its rank | |
|  | Express the following skew Hermitian matrix A as P + i Q where P is real and skew symmetric and Q is real and symmetric given  A = | |
|  | If then prove that | |
|  | Prove that | |
|  | If then prove that | |
|  | Determine the values of k for which the following equations are consistent. Also solve for any one values of k.  x+2y+z=3 , x+y+z =k , 3x+y+3z=k2 | |