Yashawantrao Chavan Maharashtra open University, Nashik

Home Assingnment   Sem- I and III   max marks-20

Program code :- V57   Sem-III   Course code :- Code :S24031

Q.1- Let N and N` be normed linear spaces over the same field K and let T: N→N` be a linear transformation . Then T is continuous on N if and only if T is continuous at origin in N (5 Marks)

Q.2- Let B and B` be Banach space over the same field K and let T: B →B` be linear and onto map . Then if T is continuous, then T is open . (T maps open sets in B onto open set in B`) (5 Marks)

Q.3- M and N are closed linear subspaces of Hilbert space H such that M $\perp$ N then the M + N is closed linear subspace of H. (5 Marks)

Q.4- Let H be finite n-dimensional Hilbert space and let T be a continuous linear operator n H . Then the eigenvalues of T constitute a non-empty finite subset of the complex plane and the number of points in this set does not exceed the dimension n of H . (5 Marks)

Program code :- V57   Sem-III   Course code :- Code :S24032

Q.1- A graph G is connected if it has a spanning tree (5 Marks)

Q.2- The product of two lattices is a lattice . (5 Marks)

Q.3- Prove that the complete disjunctive normal form of Broleon function in three variables in redneced Identically to zero (5 Marks)

Q. 4- Among the integers 1 to 300 . find how many are not divisible by 3 nor be 5 . find also how many are divisible by 3 but not by 7 . (5 Marks)

(Program code :- V57   Sem-III   Course code :- Code :S24033

Q.1- Solve the linear Diophantine eqnation $172x + 20y = 1000$ (5 Marks)

Q.2- Prove that there are infinite number of primes of the form $(4n + 3)$ (5 Marks)

Q.3- Prove that the function μ is multiplicative function (5 Marks)

Q.4- Prove that there are infinitely many primes of the form $4k +1$ (5 Marks)

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Home Assingnment   Sem- I and III   max marks-20

Program code :- V57   Sem - III   Course code :- Code :S24034

Q.1- Convert I. V. P. $y'' + xy' + y = 1$; $y(0) = 1$; $y'(0) = 0$ to the integral equation . **(5 Marks)**

Q.2- Convert $y'' + xy = 1$; $y(0) = 0$; $y(1) = 1$ into an integral equation . **(5 Marks)**

Q.3- Solve the fredholm integral equation $g(s) = 1 + \int_0^1 (1 - 3st)\, g(t)\, dt$

by determining resolvent kernel . **(5 Marks)**

Q.4- Five the resolvent kernel of the voltra integral equation with the kernel $k(s,t) = 1$. **(5 Marks)**

Program code :- V57   Sem- III   Course code :- Code :S24035

Q.1- Prove that the convex null of S is the set of all finite convex linear combination of points is S . **(5 Marks)**

Q.2- Prove that the convex polyhedron is a convex set . **(5 Marks)**

Q.3- if $x_1 = 2$, $x_2 = 3$, $x_3 = 1$ be a feasible solution of linear programming problem **(5 Marks)**

$$Max \quad z = x_1 + 2x_2 + 4x_3$$

Subject to $2x_1 + x_2 + 4x_3 = 11$

$3x_1 + x_2 + 5x_3 = 14$

$x_1, x_2, x_3 \geq 0$

Q.4- Write the dual of the problem **(5 Marks)**

$$Mini \quad z = 3x_1 + x_2$$

Subject to $2x_1 + 3x_2 \geq 2$

$x_1 + x_2 \geq 1$

And $x_1, x_2 \geq 0$

== XOX ==