Fourier series problems and answers

This section contains a selection of about 50 issues on the Fourier series with full solutions. The following topics relate to the following topics: Definition of the Fourier series and typical examples, Fourier series of functions with any period, even and odd extensions, complex form, convergence of the Fourier series, Bessel inequality and Parseval sentence, differentiation and integration of the Fourier series, orthogonal polynomials and generalized Fourier series. Each of the chapters contains appropriate definitions and formulae, followed by the resolved problems listed in order of increasing difficulties. For students, this material is a valuable addition to textbooks, for lecturers teaching calculus, a useful link. FOURIER SERIES1. Explain the periodic function with examples. Function f (x) is said to period T if for all x , f (x + T) = f (x), where T is an apositive constant. At least T >0 is called period f (x). Example : f (x)=sin x ; f (x +2p) sin=(x 2 +p) sin=x .2. State Dirichlet conditions for the feature to be extended as a series of Fourier. Let the function f (x) define in the interval c <x <c 2 + p with a period of 2p and meets the following conditions can be extended as the Fourier series in (c, c +2p) . (i) f (x) is a well-defined function. (ii) f (x) is final or limited. (iii) (f) (x) has only a limited number of discontinuous points. (iv) f (x) has only a limited number of highs and lows. 3. Indicate whether y = tan x can be expressed as a Fourier series. If so, how?. If not why? cannot be extended as a fourier series. Because tan x does not satisfy Dcondition.4. The state of convergence on the Fourier series. (i) The fourier series f (x) converge on f (x) at all points where f (x) is continuous. (ii) At the discontinuity point x0, the series shall be close to the mean of the left limit and the right limit f x) at x05. To what value does the sum of the Fourier series f (x) converge at the continuity point x =a? The sum of fourier series f (x) is close to f (a) in continuous pointx =a .6. To what value does the sum of the Fourier series f (x) converge at the point of discontinuity x = a ? At the discontinuous point x =a, the sum of fourier series f (x) converge on \ sinh x is a special function. \ a0 =0, =0. 10. Type the formulas for fourier constants for f (x) in the interval (-p, p). The fourier constant for f (x) in the interval (-p, p) is given by 11. Find a constant a0 from the Fourier series for the f (x)=x function at £0 x £2p. The function f (x) = |x| is an even function.14. Find billions in x2 expansion as a fourier series in (-p, p). Because f (x) = x2 is an even function, bn =015. Find the constant expression a0 in the fourier series corresponding to f (x)= x -x3 in(-π, π). Because f (x)=x -x3f (-x)=-x +x3=(x-x3)=f (x)i.e., f (-x)=-f (x)\ f (x) is the odd function in (-p,p) therefore a0 = 0,16. If f (x)=x2 -x4 is expanded as Fourier series in (-l,l), find billions . In the event that the sin nx , billion . As the Fourier series (x) consists only of cosine expressions.18. Find the constant a0 of the fourier series for f (x) = xcosx in - π < x < π.-π < x <. Πf (x) = x cos xf (-x) = x-cos x =f(x-)\ f (x) is a special function. Therefore, a0 =0 . 19. Write fourier sinus series k v (0,p). 20. Get a series of sinuses for unity in (0, π).22. If f (x) is defined at -£3 x £3, what is the value of the Fourier coefficients.23. Define the root value of the mean square function. Root mean y =f (x) in (a , b) is marked y . It is defined as24. Find r.M.S y =x 2 in (-p, p).25. Find the value R.M.S if f (x) = x2 in -π £x £.π26. Parseval identity state (or) sentence If f (x) is a periodic function of the period 2p in (c, c +2p) with Fourier coefficients27. Type the complex form of the Fourier series for f(x) defined in the interval (c, c+2l). The series for f x) defined in the interval (c, c +2p) and meeting the Dirichlet conditions can be given in the form28. What do you mean by harmonious analysis? The process of finding fourier series of periodic functions y =f (x)period 2l (or)2p using the numeric values x and yBar is known as harmonic analysis. PART B2) Get fourier series f(x) of period 2l and defined as followsHence provedODD A EVEN FUNCTION3. Find Fourier series Therefore f(x) is not even odd functionsConsived that the Series Fourier jeFOURIER SINE SERIESThis is the desired half range of fourier sine series. COSINE SERIES4 half-range) In the interval (0,2), a series of medium-range cosines is obtained for f(x)=(x-2)2. olution:Given f(x)=(x-2)2Sciently, that the fourier series of cosines half-range is This is the required Fourier seriesCOMPLEX FORM FOURIER SERIES6) Find the complex form of the Fourier SERIES HARMONIC ANALYSIS7)Calculate the first harmonic fourier series f(x) shown in tableX 1 T/6 T/3 T/3 T/2 2T/3 5T/6 TF(x) 1.98 1.3 1.05 1.3 -0.88 -0.25 1.98Solution: The first and last values are the same. Therefore, mix the last value. When x ranges from 0 to T ranges from 0 to 2p we know that the Fourier series is related topics: More lessons for engineering math math worksheets Series of free engineering math video lessons. Introduction to the Fourier series and how to calculate them This is the basic introduction to the Fourier series and how to calculate them. An example is given that illustrates the calculations. Such ideas are seen in university mathematics. How to calculate the Fourier series: an example? This video is a simple demonstration of how to calculate fourier series of simple given function. It deals with how to calculate Fourier coefficients through integration and simplification. The Fourier series is an important area of applied mathematics, engineering and physics that are used to solve partial differential equations such as heat equation and wave equation. The Fourier series is named after J. Fourier, the French who was the first to properly model the diffusion of heat. What are fouriersérie? Tutorial about the Fourier series and how to calculate them. Many examples are discussed to illustrate ideas. Fourier series + differential equations This video shows you how to solve differential equations through the Fourier series. A simple example is presented illustrating the ideas that are seen in university mathematics. View detailed solutions fourier series Representation of function This video shows you how to find fourier series Representation of a simple function. See step-by-step solutions Introduction to fourier series concepts See step-by-step solutions Try the free Mathway calculator and problem solver below to practice different math topics. Try the examples below, or enter your own problem and check for answers using step-by-step explanations. We welcome your feedback, comments and questions about this site or site. 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