KERALA AGRICULTURAL UNIVERSITY
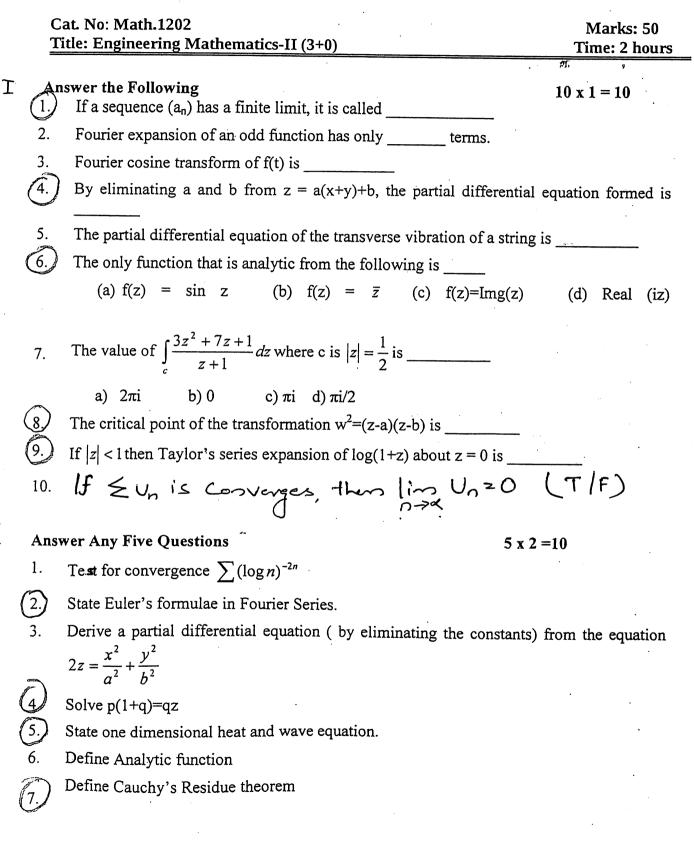
B.Tech (Agrl.Engg) Degree programme 2015 Admission

IInd Semester Final Examination- June/July-2016

Cat. No: Math.1202

Title: Engineering Mathematics-II (3+0)

Marks: 50

Time: 2 hours

I Answer the Following   10 x 1 = 10

1. If a sequence (a_n) has a finite limit, it is called _____

2. Fourier expansion of an odd function has only _____ terms.

3. Fourier cosine transform of f(t) is _____

4. By eliminating a and b from $z = a(x+y)+b$, the partial differential equation formed is _____

5. The partial differential equation of the transverse vibration of a string is _____

6. The only function that is analytic from the following is _____

   (a) $f(z) = \sin z$ (b) $f(z) = \bar{z}$ (c) $f(z) = Img(z)$ (d) Real (iz)

7. The value of $\int_c \frac{3z^2 + 7z + 1}{z+1} dz$ where c is $|z| = \frac{1}{2}$ is _____

   a) $2\pi i$ b) 0   c) πi d) $\pi i/2$

8. The critical point of the transformation $w^2 = (z-a)(z-b)$ is _____

9. If $|z| < 1$ then Taylor's series expansion of $\log(1+z)$ about $z = 0$ is _____

10. If $\sum u_n$ is converges, then $\lim_{n\to\infty} u_n = 0$ (T/F)

Answer Any Five Questions   5 x 2 =10

1. Test for convergence $\sum (\log n)^{-2n}$

2. State Euler's formulae in Fourier Series.

3. Derive a partial differential equation (by eliminating the constants) from the equation $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$

4. Solve $p(1+q)=qz$

5. State one dimensional heat and wave equation.

6. Define Analytic function

7. Define Cauchy's Residue theorem

Answer Any Five Questions   5 x 4 =20

1. Discuss the convergence of the series $\sum_{n=1}^{\infty} \frac{n!}{(n^n)^2}$

2. Define even and odd functions.

3. Solve $(p^2 + q^2) y = qz$

4. Find the deflection of a vibrating string of unit length having fixed ends with initial velocity zero and initial deflection $f(x) = k (\sin x - \sin 2x)$

5. Discuss the transformation $w = \cosh z$.

6. State and prove Cauchy's Integral formula.

7. Explain singularities of an analytic function

Answer Any One Question

$1 \times 10 = 10$

1. An infinitely long p[lane uniform plate is bounded by two parallel edges and an end at right angles to them. The breadth is π; this end is maintained at a temperature u_0 at all points and other edges are at zero temperature. Determine the temperature at any point of the plate in the steady state.

2. By integrating around a unit circle, evaluate $\int\limits_{0}^{2\pi} \dfrac{\cos 3\theta}{5 - 4\cos\theta} d\theta$.

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