BE (second Semester)

Electronics and Telecommunication

Applied Mathematics - II - 300214(14)

2014 - Summer Session , New Scheme

Chapter 1

1 Select the correct answer. The real part of $(\sin\theta + i\cos\theta)^5$ is : **2**

(i) -cos 5θ

(ii) -sin 5θ

(iii) sin 5θ

(iv) cos 5θ

2 Prove that : **7**

$(a+ib)^{m/n} + (a-ib)^{m/n} = 2(a^2 + b^2)\cos((\text{frac}\{m\}\{n\}\tan^{\{-1\}}\text{frac}\{b\}\{a\}))$

3 if $e^{\alpha+i\beta} = \alpha+i\beta$ prove that : **7**

$\alpha^2 + \beta^2 = e^{-\pi\beta(4n+1)}$

4 Sum the series : **7**

$e^{\alpha}\cos\beta - \frac{e^{3\alpha}}{3}\cos3\beta + \frac{e^{5\alpha}}{5}\cos5\beta - .....\infty$

Chapter 2

1 Define and write linear differential equation of n^{th} order. **2**

2 Solve : **7**

$(D^2 + 4D + 3)\,y = x^2e^{2x} + \cos^2x$

3 Solve by the method of variation of parameters : **7**

$\frac{d^2y}{dx^2} + y = \tan x$

4 Solve : **7**

$(1+x)^2\frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = 4\sin(\log(1+x))$

Chapter 3

1 Represent $\int_0^{\pi/2} \sin^m\theta\cos^n\theta\,d\theta$ where m and n are positive integers, in terms of Gamma function. **2**

2 Find by double integration, the area lying between the parabola $y = 4x - x^2$ and the line $y = x$. **7**

3 Change the order of integration and evalute : 7

$\int_0^{2a} \int_0^{x^2/4a}$ xy dx dy

4 Compute : 7

$\int\int\int \frac{dxdydz}{(x+y+z+1)^3}$

if the region of integration is bounded by the co-ordinate planes and the plane x+y+z =1.

Chapter 4 CSVTUonline.com

1 A unit vector normal to the surface $xy^3z^2 = 4$ at the point (-1,-1,2) is 2

2 If $\overline{A} = (3x^2 + 6y)I - 14yzj + 20xz^2K$ evaluate $\int \overline{A}.\, d\overline{R}$ from (0, 0, 0) to (1, 1, 1) along the path x = t, y = t^2, z= t^3 7

3 Using divergence theorem evaluate 7

$\int_S \overline{F}.\, d\overline{S}$ *whare* $\overline{F} = 4xI - 2y^2j + z^2K$

and S is the surface bonding the region $x^2 + y^2 = 16$, z = 0, and z = 6.

4 If $f = (x^2 + y^2 + z^2)^{-n}$ find div grad f and determine n if div grad f =0 7

Chapter 5 CSVTUonline.com

1 The trnsformed equation of $x^3 - 6x^2 + 5x + 8$ =0 into another in which the second term is missing is 2

2 If α , β , γ be the roots of $x^3 - 7x + 6$=0 from an equation whose roots are : 7

$(\alpha - \beta)^2$, $(\beta - \gamma)^2$, $(\gamma - \alpha)^2$

3 Solve by cardan's method, the equation : 7

$x^3 - 3x + 1$=0

4 Solve by Ferrari's method, the equation : 7

$x^4 - 10x^3 + 35x^2 - 50x + 24$ =0