Full Marks: 20 CSE(Math-2213)-CT-1 Time: 25 Min

1. Form a partial differential equation by eliminating arbitrary function ϕ from $\phi(x+y+z,\ x^2+y^2-z^2)=0$. What is the order of this PDE? 10
2. Find the integral surface of $(2xy-1)p+(z-2x^2)q=2(x-yz)$ which passes through the line $x=1,\ y=0$. 10

Class Test –Nov.'26, 2018
II/CSE(A), Math-2213

1. (a) Separate the real and imaginary of $f(z)=\sqrt{z}$. 02
   (b) Find the roots of $z^4+a^4=0$ 03
   (c) Find an equation for a circle of radius 3 with centre at (-3,4) in complex plane. 03
2. (a) Evaluate $\lim_{z\to\pi i}\frac{d}{dz}\left\{(z-\pi i)^2\frac{e^z}{(z^2+\pi^2)^2}\right\}$ 04
   (b) Find the branch point of $w=f(z)=\sqrt{z^2+1}$ 03
   (c) If $v=x^2-y^2+2y$, then find a function u such that $f(z)=u+iv$ is analytic 05

Department of Math
II/CSE(A), Class Test -III, 26th January'19

Math-2213 Time:25 mins

1.(a) Define complex integration $\int_C f(z)dz$ and apply Green's theorem on $\int_C f(z)dz$ and then find its result after using Cuchy-Riemann equation 05
   (b) Evaluate $\int_C \frac{e^{2z}}{(z-4)^3}dz$, where C is the circle (i) $|Z|=2$ (ii) $|Z|=5$ (2+3) 05
2. (a) Evaluate $\int_C \frac{zdz}{(9-z^2)((z+i)}$ where C is the circle $|Z|=2$
   (b) Evaluate $\int_C \frac{e^z}{(z^2+1)}dz$ where C is the circle $|Z|=2$ 05

Full Marks:20 CSE-CT-2(Math-2213) Time:25 min.

1. State and prove Rodrigue's Formula. 12
2. Show that $\int_0^1 xJ_n(\alpha x)J_n(\beta x)\,dx=0$ where α and β are the roots of $J_n(x)=0$. 08