Mahakal Institute of Technology, Ujjain

Department of Mathematics

PYQ's Unit -V

Q.N.	Question	Marks	RBT Level	CO
Q1	Verify Gauss Divergence theorem for $F = x^3i+y^3j+z^3k$ taken over the cube bounded by x=0 , x=a, y=0,y=a,z=0,z=a. dec2023			
Q2	Using Green's theorem ,Find the area of the region in the first quadrant bounded by the curve Y=X, Y=1/X, Y=x/4. June 2023			
Q3	Find the directional derivative of $f(x,y,z) = e^{2x}\cos yz$ at (0,0,0) in the direction of the tangent to the curve x= a sint , y= a cost , z =at at $t=\pi/4$. June 2023			
Q4	Show that the vector $(x^2-yz)i+(y^2-zx)j+(z^2-xy)k$ is irrotational .Find its scalar potential . NOV 2022			
Q5	Verify Green's theorem for $\int[3x^2-8y^2]\,dx+[4y-6xy]\,dy$. Where C is the region bounded by x=0 ,y=0 and x+y=1. NOV2022			
Q.6	Verify Gauss Divergence theorem for $F = x^2i+y^2j+z^2k$ over the cube bounded by the planes x=0 , x=a, y=0,y=b ,z=0,z=c. june2022.			
Q.7	Prove that $r^n\bar{r}$ is solenoidal if n=-3. June 2022			
Q.8	Find the angle between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point (2,-1,2). June 2022			
Q.9	Find dir(curl F) where $F=x^2yi+xzj+2yzk$. June 2020, NOV2019			
Q.10	Using Gauss's divergence thorem , Find $\iint_C F.n\,ds$ where $F=(2x+3z)I-(xz+y)j+(y^2+2z)k$ and S is the surface of sphere with center (3,-1,2) and radius 3. Nov2019			
Q.11	If $F=3xyi-y^2j$, evaluate $\int_c F.dr$,where C is the arc of the parabola $y=2x^2$ from (0,0) to (1,2).			
Q.12	Evaluate $\iint_S A.nds$, where $A=(x+y^2)i-2xj+2yzk$ and S is the surface of plane 2x+y+2z=6 in the first octant . may2019			

Q13	Solve $\int_0^{1+i}(x-y+ix^2)\,dz$ along the real axis from z=0 to z=1 and then along a line parallel to imaginary axis from z=1 to z=1+i . june 2023		
Q14	Prove that $\Delta^2 f(r) = f''(r) + \frac{2}{r} f'(r)$ june 2023		
Q15	Prove that curl $(r^n r) = 0$ Dec 2023		
Q16	Write short note on: 1. Stokes theorem. Dec 2023		