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2 MARKS

1. State Cauchy's integral formula.

2. Evaluate $\int_C \frac{z^2+1}{(z-2)(z-3)}dz$ where c is $|z|=1$

3. Evaluate $\int_C \frac{3z^2+7z+1}{(z-3)}dz$ where c is $|z|=2$

4. Evaluate $\int_C \frac{2}{(z-1)(z+3)}dz$ where c is $|z-1|=2$

5. Evaluate $\int_C (z-3)^4 dz$ where c the circle is $|z-3|=4$

6. Evaluate $\int_C \frac{\cos \pi z}{z-1}dz$ if c is $|z|=2$

7. Using cauchy's integral formula evaluate $\int_C \frac{\cos \pi z^2}{(z-1)(z-2)}\ dz$ where c is $|z|=\frac{3}{2}$

8. Expand log(1+z) Taylor's series about z=0.

9. Find Laurent's series of $f(z)=z^2e^{\frac{1}{z}}$ about z=0.

10. Obtain the Laurent expansion of the function $\frac{e^z}{(z-1)^2}$ in the neighbourhood of its singular point. Hence find the residue at the point.

11. State Cauchy's Residue theorem.

12. Calculate the residue of $f(z)=\frac{e^{2z}}{(z+1)^2}$ at the pole

13. Find the residue of $f(z)=\frac{z^2}{(z-1)^2(z+2)}$ at z=-2.

14. Find the regularities of the function $f(z)=\frac{\cot \pi z}{(z-a)^3}$

15. Find the singular points of $f(z)=\frac{1}{\sin\frac{1}{z-a}}$ state their nature.

16 MARKS

1. Using Cauchy's Integral formula, evaluate $\int_c \frac{(z+4)dz}{(z^2+2z+5)}$,where c is the circle |z+1+i|=2.

2. Using Cauchy's Integral formula, evaluate $\int_c \frac{\sin \pi z^2 + \cos \pi z^2}{(z-2)(z-3)}dz$,where c is the

circle |z|=4.

3. Evaluate $\int_{|z|=3} \frac{\sin \pi z^2 + \cos \pi z^2}{(z+1)(z+2)} dz$,using Cauchy's residue theorem.

4. Evaluate $\int_c \frac{zdz}{(z-1)^2(z+1)}$ where c is |z| =2.

5. Expand f(z)=cos z in Taylor Series about the Point z=$\frac{\pi}{3}$

6. Find the Laurent's Series expansion of f (z) = $\frac{z}{(z^2+1)(z^2+4)}$ in the region 1<|z|<2.

7. Find the Laurent's Series expansion of f (z) = $\frac{1}{z^2+3z+2}$ in the region 1<|z|<2.

8. Expand $f(z) = \frac{z^2-1}{(z+2)(z+3)}$ in a Laurent's series for 2<|z|<3.

9. Find Laurent's series expansion of $\frac{z-1}{(z+2)(z+3)}$ valid in the region 2<|z|<3.

10. Find Laurent's series expansion of $f(z) = \frac{7z-2}{z(z-2)(z+1)}$ in 2<|z|<3