

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

•1 of 2

(05 Marks)

State and prove the Cauchy's integral formula. a.

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- Find the analytic function f(z) = u + iv, whose real part $u = x^2 y^2 + \frac{x}{x^2 + y^2}$. (05 Marks) b.
- Evaluate $\int_{C} \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2 (z-2)} dz$, where c: |z| = 3 using Cauchy's residue theorem. (06 Marks) c.

Module-4

The probability density function of a discrete random variable x given table. 7 a.

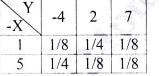
Xi	-2	-1	0	1	2	3
$p(\mathbf{x}_i)$	0.1	k	0.2	2k	0.3	k

Find K, also calculate mean and variance.

- b. When a coin is tossed 4 times, find the probability of getting. ii) At least two heads iii) Atmost two heads. Exactly one head i)
- If x is an exponential variate with mean 4, evaluate i) p(0 < x < 1)ii) p(x > 2)C. iii) p(- $\infty < x < 10$). (06 Marks)

OR

- Derive mean and variance of poisson distribution. 8 a.
 - In a normal distribution 31% of the items are under 45 and 8% are over 64. Find mean and b. standard deviation of the distribution. (05 Marks)
 - The joint probability distributions of two random variables x and y as follows: C.



ii) Are x and y are independent random variables? Determine, i) E[X], E[Y](06 Marks)

Module-5

- A dice was thrown 9000 times and a throw of 5 or 6 was obtained 3240 times on the 9 a. assumption of random throwing do the data indicate an unbiased dice. [1% level of (05 Marks) significance 2.58).
 - Ten individuals are chosen at random from a population and their heights in inches are b. found to be 63, 63, 66, 67, 68, 69, 70, 70, 71, 71. Test the hypothesis that mean height of the inverse is 66 inches ($t_{0.05} = 2.262$ for q.d.f). (05 Marks)

a Find the unique	fixed probability vector of the matri	v 1/4	3/4	- () (o Marks)
c. The the unique	fixed probability vector of the mat	5/6	1/6_	. (00	, Mai K 3)

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OR

- Define the following: i) Probability vector ii) Fixed points iii) State space. (05 Marks) 10 a. The theory predicts the projections of beans in the four groups G_1, G_2, G_3, G_4 should be in b. the ratio 9:3:3:1. In experiment with 1600 beans the number in the groups were 882, 313, 287 and 118. Does the experimental result support the theory? (05 Marks)
 - A students study habits are as follows if the studies one night, he is 70% sure not to study C. the next night. On the other hand, if he does not study one night he is 60% sure to study the next night. In the long run how often does he study? (06 Marks)



(05 Marks)

(05 Marks)

(05 Marks)