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Fifure Vision By K B Hemanth Raj

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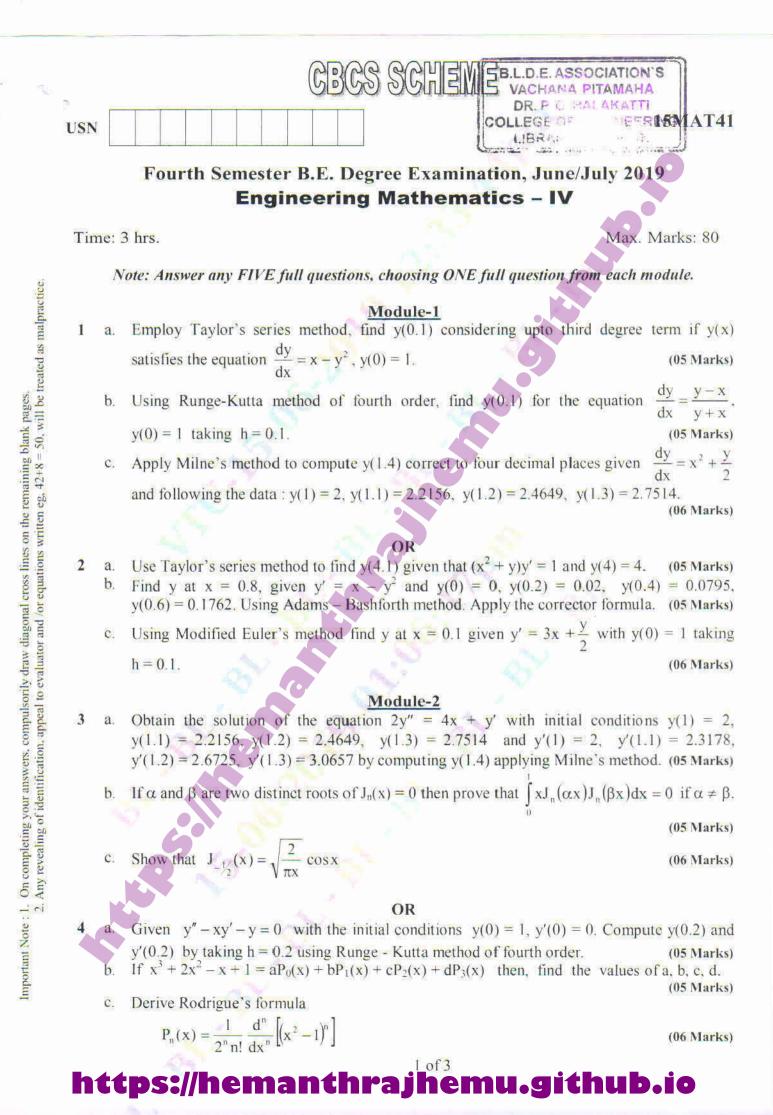
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### Module-3

- State and prove Cauchy-Reimann equation in polar form. 5 a. (05 Marks) (05 Marks)
  - b. Discuss the transformation  $w = z^2$ .
    - Find the bilinear transformation which maps the points z = 1, i, -1 into w = 2, i, -2. C. (06 Marks)

### OR

- Find the analytic function whose real part is 6 a.  $\frac{x^4 - y^4 - 2x}{x^2 + y^2}$ 
  - State and prove Cauchy Integral formula. b.

(05 Marks)

(05 Marks)

 $\int \frac{e^{2z}}{(z+1)(z-2)} dz$  where c is the circle : |z| = 3 using Cauchy's Residue Evaluate C. theorem.

(06 Marks)

### Module-4

The probability function of a variate x is 7 a.

X	0	1	2	3	4	5	6	7
p(x)	0	k	2k	2k	3k	k <sup>2</sup>	$2k^2$	$7k^2 + k$

- (ii) Evaluate  $p(x \le 6)$ ,  $p(x \ge 6)$  and  $p(3 \le x \le 6)$ . (i) Find k (05 Marks)
- b. Obtain mean and standard deviation of Binomial distribution. (05 Marks)
- The joint distribution of two discrete variables x and y is f(x, y) = (2x + y) where x and C y are integers such that  $0 \le x \le 2$ ;  $0 \le y \le 3$ .
  - Find : (i) Marginal distribution of x and y. (ii) Are x and y independent.

(06 Marks)

OR

The marks of 1000 students in an examination follows a normal distribution with mean 8 a. 70 and standard deviation 5. Find the number of students whose marks will be (i) less than 65 (ii) more than 75 (iii) between 65 and 75 [Given  $\phi(1) = 0.3413$ ]

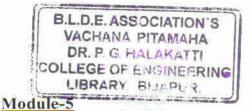
(05 Marks) If the probability of a bad reaction from a certain injection is 0.001, determine the chance b.

that out of 2000 individuals, more than two will get a bad reaction. (05 Marks) The joint distribution of the random variables X and Y are given. Find the corresponding C. marginal distribution. Also compute the covariance and the correlation of the random variables X and Y. (06 Marks)

$X \setminus Y$	1	3	9
2	1/8	1/24	1/12
4	1/4	1/4	0
6	1/8	1/24	1/12

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### 15MAT41

- 9 a. Explain the terms: (i) Null hypothesis (ii) type-I and type-II errors (iii) Significance level (05 Marks)
  - b. In 324 throws of a six faced 'die', an odd number turned up 181 times. Is it reasonable to think that 'die' is an unbiased one? (05 Marks)
  - c. Three boys A, B, C are throwing ball to each other. A always throws the ball to B and B always throws the ball to C. C is just as likely to throw the ball to B as to A. If C was the first person to throw the ball find the probabilities that after three throws (i) A has the ball (ii) B has the ball (iii) C has the ball.

#### OR

**10** a. Find the unique fixed probability vector for the matrix

	0	2/3	1/3	
<b>P</b> =	1/2	0	1/2	
	1/2	1/2	0	

- b. A random sample for 1000 workers in company has mean wage of Rs. 50 per day and standard deviation of Rs. 15. Another sample of 1500 workers from another company has mean wage of Rs. 45 per day and standard deviation of Rs. 20. Does the mean rate of wages varies between the two companies? (05 Marks)
- c. A die is thrown 264 times and the number appearing on the face (x) follows the following frequency distribution.

X	1	2. ( • .	3	4	5	6
f	40	32	28	58	54	60

Calculate the value of  $\chi^2$ .

(06 Marks)

(05 Marks)

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