

Hall Ticket Number :

**R-11 / R-13**

**Code: 1GC31**

II B.Tech. I Semester Supplementary Examinations October 2020

### **Mathematics-II**

( Common to CE & ME )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) If  $\{\lambda_1, \lambda_2, \lambda_3, \dots\}_n$  are the Eigen values of a matrix A, then prove that  $A^m$  has the Eigen values  $\{\lambda_1^m, \lambda_2^m, \lambda_3^m, \dots\}_n^m$  (m being a +ve integer) 7M
- b) find the Eigen values and Eigen vectors of  $A = \begin{bmatrix} 4 & 3 \\ 2 & 9 \end{bmatrix}$  7M
2. Obtain the Fourier series for  $f(x) = \left(\frac{f-x}{2}\right)^2$  in  $0 < x < 2f$  14M
3. a) Form a partial differential equation by eliminating the arbitrary constants  

$$2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$$
 7M
- b) Form a partial differential equation by eliminating the arbitrary function from  

$$z = f(x^2 - y^2)$$
. 7M
4. Using Newton's Interpolation formula, find the values of  $f(1.2)$  and  $f(2.0)$ , if  

$x$	1	1.4	1.8	2.2	14M
$f(x)$	3.49	4.82	5.96	6.5	
5. Using Taylor's series method, compute the value of  $y$  at  $x=0.2$  and  $x=0.4$  from  $\frac{dy}{dx} = x + y$ ;  $y(0) = 1$ . 14M
6. Evaluate  $\int_0^6 \frac{1}{1+x} dx$  by using  
(i) Trapezoidal rule , ii) Simpson's 1/3 rd rule, iii) Simpson's 3/8 rd rule 14M
7. Apply Cauchys Riemann conditions to  $f(z) = z^3$  and show that the function is analytic everywhere. 14M
8. Evaluate  $\int_C \frac{1}{(z-1)(z-3)} dz$  with C:  $|z| = 2$  using Cauchy's Integral Formula 14M

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