Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18MA3001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED MATHEMATICAL METHODS IN ENGINEERING** | **Max. Marks :** | **100** |

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| **Q. No.** |  | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. |  | Find the extremal for the following functional:  given x(0) = 0, ,  y(0) = 0 and . | CO1 | 16 |
|  |  |  |  |  |
| 2. |  | Solve the boundary value problem defined by   given  y (0) = 0, y (1) = 0  by the Rayleigh-Ritz method. | CO2 | 16 |
|  |  |  |  |  |
| 3. |  | Find the dominant eigen value and corresponding eigen vector using Power method. Also find the least and third eigen values.  . | CO3 | 16 |
|  |  |  |  |  |
| 4. |  | An infinitely long rectangular plate with insulated surface is 10cm wide. The two long edges and one short edge are kept at zero temperature, while the other short edge x = 0 is kept at temperature given by . Find the steady – state temperature distribution in the plate. | CO4 | 16 |
|  |  |  |  |  |
| 5. |  | Transform the differential equation  to a Fredholm integral equation and find the corresponding Green’s function. | CO5 | 16 |
|  |  |  |  |  |
| 6. |  | Solve by Horner’s method and correct to 3 decimal places.  . | CO2 | 16 |
|  |  |  |  |  |
| 7. |  | Solve the following equations using relaxation – method.  10x – 2y – 2z = 6, -x + 10y – 2z = 7, -x – y + 10z = 8. | CO1 | 16 |
|  |  |  |  |  |
|  | | **COMPULSORY QUESTION (1 x 20 = 20 Marks)** |  |  |
| 8. |  | Show that the process  is a wide sense process (WSS), where‘A’ and ‘B’ are random variables, if  (i) , (ii), (iii)  . | CO6 | 20 |