**Regulations:**

**A17**



**H.T No**

**Sreenidhi Institute of Science and Technology**

(An Autonomous Institution)

**Code No: 6H112 Date: 07-Jan-2020 (FN)**

**B.Tech I-Year I-Semester External Examination, Jan-2020 (Supplementary)**

**FUNDAMENTALS OF MATHEMATICS (BT)**

**Time: 3 Hours Max.Marks:75**

***Note: a****) No additional answer sheets will be provided.*

*b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.*

*c) Missing data can be assumed suitably.*

**Part - A Max.Marks:25**

**Answer all QUESTIONS.**

|  |  |  |
| --- | --- | --- |
| 1. | Express as the product of two trigonometric functions. | [3M] |
| 2. | Show that the vectors are orthogonal. | [3M] |
| 3. | Find the equation of straight line passing through (1,3) and perpendicular to the line | [3M] |
| 4. | Evaluate | [3M] |
| 5. | Evaluate | [3M] |
| 6. | Form the differential equation for the family of curves by eliminating the parameter *c*. | [2M] |
| 7. | Obtain value of . | [2M] |
| 8. | Define concurrent lines. | [2M] |
| 9. | Define differential equation. | [2M] |
| 10. | Find the unit vector in the direction of . | [2M] |

**Part – B Max.Marks:50**

**ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.**

|  |  |  |  |
| --- | --- | --- | --- |
| 11. | a) | Show that | [5M] |
|  | b) | Resolve into partial fractions. | [5M] |
|  |  |  |  |
| 12. | a) | Find the inverse of the matrix | [5M] |
|  | b) | Solve the system of equations  by using Cramer’s method. | [5M] |
|  |  |  |  |
| 13. | a) | Determine the angle between two straight lines | [5M] |
|  | b) | Find the vertex, axis, focus, directrix, length of the latus rectum of the parabola . | [5M] |
|  |  |  |  |
| 14. | a) | If then find. | [5M] |
|  | b) | Determine the lengths of the subtangent and subnormal to the curve  at (*a,a*). | [5M] |
|  |  |  |  |
| 15. | a) | Evaluate | [5M] |
|  | b) | Obtain the value of the definite integral | [5M] |
|  |  |  |  |
| 16. | a) | Form the differential equation of family of curves by eliminating the parameters *a* and *b*. | [5M] |
|  | b) | Solve by the method of variable separable. | [5M] |
|  |  |  |  |
| 17. | a) | If show that | [4M] |
|  | b) | If , find the acute angle between the vectors | [3M] |
|  | c) | For the hyperbola, find distance between the foci, distance between the directrices. | [3M] |
|  |  |  |  |
| 18. | a) | Examine the continuity of at | [4M] |
|  | b) | Evaluate | [3M] |
|  | c) | Form the differential equation of the family of circles of radius 5, with their centres on the y-axes. | [3M] |

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