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DATE:**19-04-2018**

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**

B.SC. MATHEMATICS-VI SEMESTER

**SUPPLEMENTARY EXAMINATION: APRIL 2018**

MT 6212 : Mathematics -VIII

Time: 3hrs Maximum marks : 100

This question paper has five parts and four printed pages.

(For supplementary candidates)

Do not write the register number on the question paper

Please attach the question paper along with the answer script.

1. **ANSWER ANY EIGHT OF THE FOLLOWING (2x8=16)**
2. Draw the graph of the solution set satisfying the inequalities.



1. Find all the feasible basic solutions of the following equations.



1. Find the dual of the LLP



1. Find the Initial Basic Feasible solution of the transportation problem using North west corner rule and find the transportation cost.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Destination  source |  |  |  |  | Availability |
|  | 6 | 4 | 1 | 5 | 14 |
|  | 8 | 9 | 2 | 7 | 16 |
|  | 4 | 3 | 6 | 2 | 5 |
| Requirement | 6 | 10 | 15 | 4 |  |

1. Find the Euler’s equation for the functional 
2. Show that the Geodesic on a plane is a straight line.

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1. Find the curve passing through along which is an extremum.
2. Show that 
3. Find the Fourier cosine transform of 
4. Find the complex Fourier transform of  if 
5. Show that 
6. Show that 
7. **ANSWER ANY FIVE OF THE FOLLOWING (6X5=30)**
8. A tailor has got 16 square meters of cotton, 11 square meter of silk, and 15 square meters of wool sheets. A garment of type A requires one square meter of cotton, 2 square meter of silks and 3 square meters of wool. A garment of type B requires 2 square meter of cotton, onesquare meter of silks and one square meters of wool. If the profit per garment of type A is Rs 50, and the profit per garment of type B is Rs 30, how many of each type of garments should be prepared to maximize the profit, assuming that the remaining pieces of cotton, silks and wool cannot be utilized.
9. Solve by using graphical method



1. Solve the following LPP by simplex method



1. Solve the following LPP by Big-M method



1. Solve the following LPP by Dual simplex method



1. Obtain an initial solution for the following transportation problem using Vogel’s approximation method and find the transportation cost.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Destination  Origin | D | E | F | G | Availability |
| A | 11 | 13 | 17 | 14 | 250 |
| B | 16 | 18 | 14 | 10 | 300 |
| C | 21 | 24 | 13 | 10 | 400 |
| Requirement | 200 | 225 | 275 | 250 |  |

1. Check if the given transportation problem is optimal if not optimize.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | Supply |  |  | A | B | C |
| P | 16 | 20 | 12 | 200 |  | P | 180 |  | 20 |
| Q | 14 | 8 | 18 | 160 |  | Q |  | 120 | 40 |
| R | 26 | 24 | 16 | 90 |  | R |  |  | 90 |
| Demand | 180 | 120 | 150 | 450 |  |  |  |  |  |

1. **ANSWER ANY THREE OF THE FOLLOWING (6X3=18)**
2. Show that the necessary condition for where have a maximum or a minimum is that 
3. Show that extremal of the functional is a parabola.
4. Find the Geodesic on a right circular cylinder.
5. Prove that the sphere is the solid of revolution which for a given surface area  has maximum volume.
6. **ANSWER ANY FOUR OF THE FOLLOWING (6X4=24)**
7. Using Fourier integral method show that 
8. Show that the complex Fourier transform of 
9. Find the inverse complex Fourier transform of 
10. Verify the convolution theorem for the function 
11. By Employing the Parseval’s identity to the function. Show that 
12. Find Fourier cosine transform of by using Gamma function.
13. **ANSWER ANY TWO OF THE FOLLOWING (6X2=12)**
14. Prove thatis generating function of Legendrepolynomial.
15. Show that 
16. If and are the roots of ,then prove that 