STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI - 600 086
(For candidates admitted from the academic year 2015-16 & thereafter)

SUBJECT CODE : 15MT/AC/MS45

B. C. A. DEGREE EXAMINATION, APRIL 2018
FOURTH SEMESTER

COURSE : ALLIED CORE
PAPER : MATHEMATICS FOR COMPUTER SCIENCE-II
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A

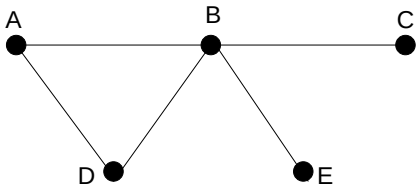
ANSWER ALL THE QUESTIONS: (10X2=20)

1. Define bipartite graph.
2. Draw any two trees with 8 vertices.
3. Write down the formula for Newton Raphson method.
4. How do you solve a system of equations by Gauss Jordan method?
5. What is interpolation?
6. Write down Stirling's interpolation formula.
7. Write down the expression for $\frac{dy}{dx}$ based on Newton's formula.
8. Write down Taylor's formula for solving ordinary differential equation.
9. Draw the scatter diagram for positive linear correlation and negative linear correlation.
10. What is regression?

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5X8=40)

11. Define degree of a vertex and diameter of a graph. Find the degree of each vertex and the diameter of the following graph:



12. Solve using Gauss elimination method the system of equations
$$x+2y+z=3$$
$$2x+3y+3z=10$$
$$3x-y+2z=13$$

13. Find a root of $x^2 - 9x + 1 = 0$ lying between 2 and 3 by bisection method.

14. Apply Gauss's forward central difference formula and estimate $y(3.5)$ from the following table.

x	2	3	4	5
y	2.626	3.454	4.784	6.986

15. Find the first derivative of $x^{1/3}$ at $x = 50$ from the following table using a suitable formula.

x	50	51	52	53	54	55	56
$y=x^{1/3}$	3.684	3.7084	3.7325	3.7563	3.7798	3.803	3.8259

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16. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by Simpson's three-eigth rule.

17. Find the rank correlation coefficient for the following data.

x	92	89	87	86	77	71	63	53	50	86
y	86	83	91	68	85	52	82	37	57	77

SECTION – C

ANSWER ANY TWO QUESTIONS: (2X20=40)

18. (a) Prove that a planar graph is 5-colorable.

(b) Find a positive root of $2x^3 - 3x - 6 = 0$ by Newton Raphson method correct to four places of decimals.

(10+10)

19. (a) Find the values of y at $x = 21$ and $x = 28$ from the following data.

x	20	23	26	29
y	.342	.3907	.4384	.4848

(b) Solve $\frac{dy}{dx} = y - x^2, y(0) = 1$ by Picard's method up to the third approximation. Hence find $y(.1)$ and $y(.2)$. (10+10)

20. (a) Find the coefficient of correlation for the following data.

x	35	40	60	79	83	95
y	17	28	30	32	38	49

(b) Find the line of regression of y on x.

x	1	2	3	4	5	8	10
y	9	8	10	12	14	16	15

(10+10)