SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Find the positive root of the equation $x^3 - 2x - 5 = 0$ by iterative method.

17. Solve the following equation by the method of triangularisation

$2x + y + 4z = 12$; $8x - 3y + 2z = 20$; $4x + 11y - z = 33$.

18. The following table given is the population of a town during the last 6 censuses. Using Newton's interpolation formula estimate the population in the year 1923

Year (x) :	1911	1921	1931	1941	1951	1961
Population (y) (in thousands) :	12	15	20	27	39	52

19. Fit a straight line trend to the data by the method of least squares:

Year :	1979	1980	1981	1982	1983	1984	1985
Output (Rs. in crores):	672	824	968	1,205	1,464	1,758	2,058

20. In a distribution exactly normal, 7% of the items are under 35 and 89% are under 63. What are the mean and standard deviation of the distribution?

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(For the candidates admitted from 2012–2013 onwards)

P.G. DEGREE EXAMINATION,
NOVEMBER/DECEMBER 2015.

Second Semester

Mathematics

NUMERICAL AND STATISTICAL METHODS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Write the iterative formula of Newton-Raphson method.

2. Write the bisection formula.

3. State the principle used in Gauss-Jordan and Gauss Elimination method.

4. Why Gauss-Seidel method is better method than Jacobi iterative method.

5. State Simpson's rule.

6. Write Stirling's formula.

7. Define positive correlation.

8. Write any two properties of multiple correlations co-efficient.

9. Write the probability function of Poisson distribution.

10. It was found that for a Binomial distribution, the mean is 5 and standard deviation is 3. Can it be true?

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Using the method of Falsi position find a root of the equation $x^3 - 3x - 5 = 0$.

Or

(b) Find a root of the equation $x^3 - 4x - 9 = 0$ correct to three decimal places by using the bisection method.

12. (a) Solve the system of equation by Gauss Jordan method $10x + y + z = 12$; $2x + 10y + z = 13$; $x + y + 5z = 7$.

Or

(b) Solve by Gauss Seidel method $10x - 5y - 2z = 3$; $4x - 10y + 3z = -3$; $x + 6y + 10z = -3$.

13. (a) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by Trapezoidal rule.

Or

(b) Obtain the value $f'(0.04)$ using Bessel's formula given the table below.

x	0.01	0.02	0.03	0.04	0.05	0.06
$f(x)$	0.1023	0.1047	0.1071	0.1096	0.1122	0.1148

14. (a) Calculate the co-efficient of correlation between x and y for the following data :

x : 10 12 13 16 17 20 25

y : 19 22 26 27 29 33 37

Or

(b) Find the rank correlation of the following data :

x : x 3 5 1 6 7 2 8 9 4

y : y 5 3 2 6 8 1 7 9 4

15. (a) The mean and variance of Binomial variate are 8 and 6. Find $P[X \geq 2]$.

Or

(b) If X is a Poisson random variable such that $P[X = 1] = 0.3$ and $P[X = 2] = 0.2$. Find $P[X = 0]$.