



DF-3016

B. Sc. (Sem. III) Examination

March/April - 2016

Mathematics - MTH - 303

(Numerical Analysis - I)

Time : Hours]

[Total Marks : 50

Instructions :

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. Sc. (SEM. 3)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="MATHEMATICS - MTH - 303"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="6"/>	Section No. (1, 2,.....) : <input type="text" value="1,2,3,4"/>
	<input type="text" value="Student's Signature"/>

- (2) The question paper has four sections and 18 questions in all.
- (3) All sections and questions are compulsory.
- (4) Follow usual notations.
- (5) Use of non-programmable calculator is allowed.
- (6) These are to be answered by writing the correct option in your answer sheet.

SECTION - A : Q. 1 to 4 Multiple Choice Questions : (1 mark)

SECTION - B : Q. 5 to 8 Multiple Choice Questions : (2 marks)

SECTION - C : Q. 9 to 14 Multiple Choice questions : (3 marks)

SECTION - D : Q. 15 to 18 Multiple Choice Questions : (5 marks)

***O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ
O.M.R. Sheet-ની પાછળ છાપેલ છે.***

***Important instructions to fillup O.M.R. Sheet
are given on back side of the provided O.M.R. Sheet.***

SECTION-A

- 1 The first approximation to the root of $f(x)=0$ in false-position method is given by

(A) $\frac{af(a)-bf(b)}{f(b)-f(a)}$

(B) $\frac{af(b)+bf(a)}{f(b)+f(a)}$

(C) $\frac{af(b)-bf(a)}{f(b)-f(a)}$

(D) $\frac{bf(b)-af(a)}{f(b)-f(a)}$

- 2 $\Delta[(x+1)(x+2)] = \underline{\hspace{2cm}}$

(A) $2x-4$

(B) $2x+4$

(C) $4x+4$

(D) $4-2x$

3 If $(0, 12)$, $(1, 25)$ and $(2, 4)$, then $\nabla^2 f(x_2) = \underline{\hspace{2cm}}$

(A) 54

(B) -54

(C) -34

(D) 34

4 The relative error E_R is defined by

(A) $\frac{\textit{Absolute value}}{\textit{True value}}$

(B) None of these

(C) $\frac{\textit{Percentage error}}{\textit{True value}}$

(D) $\frac{\textit{Absolute error}}{\textit{True value}}$

SECTION-B

- 5 Using Bisection method, a the root of the equation $x^3 - 2x - 5 = 0$ between 2 and 3 correct to two decimal places at the third iteration is
- (A) 2.135
 - (B) 2.145
 - (C) 2.115
 - (D) 2.125
- 6 $\frac{1}{h} \left(\Delta - \frac{\Delta^2}{2} + \frac{\Delta^3}{3} - \frac{\Delta^4}{4} + \dots \right) = \underline{\hspace{2cm}}$
- (A) μ
 - (B) None of these
 - (C) E
 - (D) D
- 7 If $y(15) = 25$, $y(20) = 34$, $y(25) = 42$ and $y(30) = 50$, then the value of $\Delta^3 y_0$ is
- (A) 2
 - (B) 3
 - (C) 0
 - (D) 1
- 8 The relative error of the number 8.6, if both of its digits are correct, is $\underline{\hspace{2cm}}$.
- (A) 0.0058
 - (B) 0.00058
 - (C) 0.58
 - (D) 0.058

SECTION-C

- 9 Using Newton-Raphson method, the real root of the equation $\sin x = 1 - x$ correct up to three decimal places is
- (A) 0.511
 - (B) 0.5251
 - (C) 0.521
 - (D) 0.0511
- 10 Using method of false-position, the real root of the equation $2x - \log_{10} x - 7 = 0$ correct up to two decimal places is
- (A) 4.78
 - (B) None of these
 - (C) 2.78
 - (D) 3.78
- 11 The second degree polynomial which satisfies the set of values (0, 1), (1, 2) and (2,1) is
- (A) $1 - 2x - x^2$
 - (B) $1 + 2x + x^2$
 - (C) $1 + 2x - x^2$
 - (D) $1 - 2x + x^2$

12 If $(2.5, 4.32), (3.0, 4.83), (3.5, 5.27), (4.0, 5.47)$ and $(4.5, 6.26)$, then

$$\Delta^4 y_{-2} = \text{_____} .$$

(A) 1

(B) -1

(C) 0

(D) 0.5

13 An approximate value of π is given by 3.1428571 and its true value is 3.1415926, then the relative error is

(A) - 0.00403

(B) None of these

(C) - 0.000403

(D) - 0.0004

14 The absolute error in the product of two numbers 56.54 ± 0.005 and 12.4 ± 0.05 is

(A) 0.889

(B) None of these

(C) 2.889

(D) 1.889

SECTION-D

15 Using Bisection method, the real root of the equation $x^3 - 2x - 5 = 0$ correct up to four decimal places is

- (A) 2.0946
- (B) None of these
- (C) 2.2946
- (D) 2.1946

16 The table gives the value of $f(x)$, then $f(1.91) = \underline{\hspace{2cm}}$.

x	1.7	1.8	1.9	2.0	2.1
$f(x)$	5.47	6.05	6.68	7.39	8.17

- (A) 9.91
- (B) None of these
- (C) 5.91
- (D) 7.91

17 The table gives the value of $f(x)$, then $f(32) = \underline{\hspace{2cm}}$.

x	25	30	35	40
$y = f(x)$	0.2707	0.3027	0.3386	0.3794

(Using Gauss's Forward Difference Interpolation Formula)

- (A) 0.3145
- (B) 0.3135
- (C) 0.3165
- (D) 0.3155
- 18 The sum of the numbers 0.1532, 15.45, 0.000354, 305.1, 8.12, 143.3, 0.0212, 0.643 and 0.1734 is . (Where each number is correct to the digits given)
- (A) 472.95 ± 0.15
- (B) None of these
- (C) 472.95 ± 0.14
- (D) 472.95 ± 0.13

