



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

(A) 34

(B) 54

(C) -54

(D) -34

2 The relative error E_R is defined by

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

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

(C) None of these

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

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

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

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

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

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

4 $\Delta[(x+1)(x+2)] = \underline{\hspace{2cm}}$

(A) $4-2x$

(B) $2x-4$

(C) $2x+4$

(D) $4x+4$

SECTION-B

- 5 If $y(15)=25$, $y(20)=34$, $y(25)=42$ and $y(30)=50$, then the value of $\Delta^3 y_0$ is
- (A) 1
(B) 2
(C) 3
(D) 0
- 6 The relative error of the number 8.6, if both of its digits are correct, is _____.
- (A) 0.058
(B) 0.0058
(C) 0.00058
(D) 0.58
- 7 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) 2.125
(B) 2.135
(C) 2.145
(D) 2.115
- 8 $\frac{1}{h} \left(\Delta - \frac{\Delta^2}{2} + \frac{\Delta^3}{3} - \frac{\Delta^4}{4} + \dots \right) =$ _____
- (A) D
(B) μ
(C) None of these
(D) E

SECTION-C

- 9** 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) $1+2x-x^2$
- 10** If (2.5, 4.32), (3.0, 4.83), (3.5, 5.27), (4.0, 5.47) and (4.5, 6.26), then $\Delta^4 y_{-2} = \underline{\hspace{2cm}}$.
- (A) 0.5
- (B) 1
- (C) -1
- (D) 0
- 11** An approximate value of π is given by 3.1428571 and its true value is 3.1415926, then the relative error is
- (A) - 0.0004
- (B) - 0.00403
- (C) None of these
- (D) - 0.000403

- 12 The absolute error in the product of two numbers 56.54 ± 0.005 and 12.4 ± 0.05 is
- (A) 1.889
 - (B) 0.889
 - (C) None of these
 - (D) 2.889
- 13 Using Newton-Raphson method, the real root of the equation $\sin x = 1 - x$ correct up to three decimal places is
- (A) 0.0511
 - (B) 0.511
 - (C) 0.5251
 - (D) 0.521
- 14 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) 3.78
 - (B) 4.78
 - (C) None of these
 - (D) 2.78

SECTION-D

- 15** 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) 0.3155
(B) 0.3145
(C) 0.3135
(D) 0.3165
- 16** 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 ± 0.13
(B) 472.95 ± 0.15
(C) None of these
(D) 472.95 ± 0.14
- 17** Using Bisection method, the real root of the equation $x^3 - 2x - 5 = 0$ correct up to four decimal places is
- (A) 2.1946
(B) 2.0946
(C) None of these
(D) 2.2946

18 The table gives the value of $f(x)$, then $f(1.91) =$ _____.

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

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

