

**A****DF-3016****B. Sc. (Sem. III) Examination****March/April - 2016****Mathematics - MTH - 303****(Numerical Analysis - I)**

Time : Hours]

[Total Marks : 50

Instructions :

(1)

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|--|---|
| नीचे दशांशविक निशानीवाणी विगतो उत्तरवली पर अवश्य लभवी. 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"/> |
| 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. Sheetની 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 relative error E_R is defined by

(A) $\frac{\text{Percentage error}}{\text{True value}}$

(B) $\frac{\text{Absolute error}}{\text{True value}}$

(C) $\frac{\text{Absolute value}}{\text{True value}}$

(D) None of these

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

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

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

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

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

3 $\Delta[(x+1)(x+2)] = \underline{\hspace{2cm}}$

(A) $4x+4$

(B) $4-2x$

(C) $2x-4$

(D) $2x+4$

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

(A) -34

(B) 34

(C) 54

(D) -54

SECTION-B

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

SECTION-C

- 9 An approximate value of π is given by 3.1428571 and its true value is 3.1415926, then the relative error is
- (A) - 0.000403
 - (B) - 0.0004
 - (C) - 0.00403
 - (D) None of these
- 10 The absolute error in the product of two numbers 56.54 ± 0.005 and 12.4 ± 0.05 is
- (A) 2.889
 - (B) 1.889
 - (C) 0.889
 - (D) None of these
- 11 Using Newton-Raphson method, the real root of the equation $\sin x = 1 - x$ correct up to three decimal places is
- (A) 0.521
 - (B) 0.0511
 - (C) 0.511
 - (D) 0.5251

- 12** 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) 2.78
 - (B) 3.78
 - (C) 4.78
 - (D) None of these
- 13** 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) $1 + 2x + x^2$
- 14** 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
 - (B) 0.5
 - (C) 1
 - (D) -1

SECTION-D

15 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 ± 0.14

(B) 472.95 ± 0.13

(C) 472.95 ± 0.15

(D) None of these

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

(A) 2.2946

(B) 2.1946

(C) 2.0946

(D) None of these

17 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) 5.91

(B) 7.91

(C) 9.91

(D) None of these

18 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) 0.3165
- (B) 0.3155
- (C) 0.3145
- (D) 0.3135

