

**D****DF-3043****B. Sc. (Sem. III) Examination****March / April - 2016****Mathematical Methods****(Elective Generic)****(New Course)**

Time : 2 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"/>
B. Sc. (Sem. 3)	<input type="text"/>
Name of the Subject :	<input type="text"/>
Mathematical Methods (Elective Generic) (New)	<input type="text"/>
Subject Code No. : <input type="text"/> 3 <input type="text"/> 0 <input type="text"/> 4 <input type="text"/> 3	Section No. (1, 2,.....): <input type="text"/> 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) Figures to the right indicate marks of the question.
- (7) Questions 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.**

1 $x^{(-1)} = \underline{\hspace{2cm}}$.

(A) $\frac{1}{(x+1)(x+2)}$

(B) $\frac{1}{(x+1)}$

(C) $\frac{1}{(x-1)}$

(D) $\frac{1}{(x-1)(x-2)}$

2 $\Delta \equiv \underline{\hspace{2cm}}$.

(A) $\delta E \frac{1}{2}$

(B) δE

(C) None of these

(D) $\delta E \frac{1}{2}$

3 $\Delta y_n = \underline{\hspace{2cm}}$.

(A) $y_n + y_{n-1}$

(B) $y_{n+1} - y_n$

(C) None of these

(D) $y_n - y_{n-1}$

4 What is order of the difference equation :

$$f^3(x)f^4(x+1) - 2f(x)f(x+2) + 4f^2(x+3) = f(x)$$

(A) 3

(B) 2

(C) 1

(D) 4

5 The general solution of the difference equation

$$f(x+2) - 2f(x+1) + f(x) = 0 \text{ is}$$

(A) $(c_1 + c_2)x$

(B) $(c_1 - c_2)x$

(C) $c_1 + c_2x$

(D) $c_1 - c_2x$

6 $\mu + \frac{\delta}{2} = \underline{\hspace{2cm}}$.

(A) $E^{-\frac{1}{2}}$

(B) $E^{\frac{1}{2}}$

(C) E^{-2}

(D) E^2

7 The first difference for the function e^x is

(A) $\frac{\Delta e^x}{e^h + 1}$

(B) $\frac{\Delta e^x}{e^{-h} - 1}$

(C) $\frac{\Delta e^x}{e^h - 1}$

(D) $\frac{\Delta e^x}{e^{-h} + 1}$

8 The general solution of the difference equation

$$2Y_{k+2} - 5Y_{k+1} + 2Y_k = 0 \text{ is}$$

(A) $c_1 2^k - c_2 \left(\frac{1}{2}\right)^k$

(B) $c_1 e^{2k} + c_2 e^{\frac{k}{2}}$

(C) $c_1 e^{2k} - c_2 e^{\frac{k}{2}}$

(D) $c_1 2^k + c_2 \left(\frac{1}{2}\right)^k$

9 If $f(x) = C_1 + C_2 3^x$, then $f(x+2) - 7f(x+1) + 6f(x) =$ _____.

(A) 0

(B) 1

(C) None of these

(D) -1

10 The solution of $y_{k+2} - 6y_{k+1} + 8y_k = 0$ is

(A) $C_1(-2)^k + C_2 2^k$

(B) $C_1 2^k + C_2(-4)^k$

(C) $C_1 2^k - C_2 4^k$

(D) $C_1 2^k + C_2 4^k$

11 $\Delta \log f(x) =$ _____.

(A) $\log\left(1 - \frac{\Delta f(x)}{f(x)}\right)$

(B) $\log\left(1 + \frac{f(x)}{\Delta f(x)}\right)$

(C) $\log\left(1 - \frac{f(x)}{\Delta f(x)}\right)$

(D) $\log\left(1 + \frac{\Delta f(x)}{f(x)}\right)$

12 When the equal increment is unity, then $\Delta^3 \{(1+x)(1-3x)(1+5x)\} =$
_____.

(A) 90

(B) -90

(C) 91

(D) -91

13 If $u_0 = 1, u_1 = 11, u_2 = 21, u_3 = 28, u_4 = 29$, then $\Delta^4 u_0 =$ _____.

(A) 0

(B) 2

(C) 1

(D) 4

14 If $f(0) = -3, f(1) = 6, f(2) = 8$ and $f(3) = 12$, then
 $f(6) =$ _____.

(A) 125

(B) 126

(C) 127

(D) 124

15 The 6th term of the series 8, 12, 19, 29, 42 is

(A) 59

(B) 58

(C) 57

(D) 60

16 $u_x - \binom{n}{1}u_{x-1} + \binom{n}{2}u_{x-2} - \dots + (-1)^n u_{x-n} = \underline{\hspace{2cm}}$

(A) $\Delta^{n+1}u_{x-n}$

(B) $\Delta^{n+1}u_{x+n}$

(C) $\Delta^n u_{x-n}$

(D) $\Delta^n u_{x+n}$

17 If $f(x) = C5^x + x5^{x-1}$, then the difference equation is

(A) $f(x+1) - 5f(x) = 5^x$

(B) $f(x+1) - 5f(x) = -5^x$

(C) $f(x+1) + 5f(x) = -5^x$

(D) $f(x+1) + 5f(x) = 5^x$

18 If $f(x) = x^3 + 3x^2 + 5x + 12$, then $\Delta^3 f(x)$ is

(A) 6

(B) -6

(C) -12

(D) 12