



**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"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<input type="text" value="B. Sc. (Sem. 3)"/>	<input type="text" value="Student's Signature"/>
Name of the Subject :	
<input type="text" value="Mathematical Methods (Elective Generic) (New)"/>	
Subject Code No. : <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="4"/> <input type="text" value="3"/>	Section No. (1, 2,.....): <input type="text" value="4"/>

- (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 છે.***  
***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  $\Delta \equiv$  \_\_\_\_\_.

(A)  $\delta E^{1/2}$

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

(C)  $\delta E$

(D) None of these

2  $\Delta y_n =$  \_\_\_\_\_.

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

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

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

(D) None of these

3 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) 4

(B) 3

(C) 2

(D) 1

4  $x^{(-1)} =$  \_\_\_\_\_.

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

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

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

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

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

(A)  $E^2$

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

(C)  $E \frac{1}{2}$

(D)  $E^{-2}$

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

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

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

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

8 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)  $(c_1 - c_2)x$

(D)  $c_1 + c_2 x$

9  $\Delta \log f(x) = \underline{\hspace{2cm}}$ .

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

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

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

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

10 When the equal increment is unity, then  $\Delta^3 \{(1+x)(1-3x)(1+5x)\} = \underline{\hspace{2cm}}$ .

(A) -91

(B) 90

(C) -90

(D) 91

11 If  $u_0 = 1, u_1 = 11, u_2 = 21, u_3 = 28, u_4 = 29$ , then  $\Delta^4 u_0 = \underline{\hspace{2cm}}$ .

(A) 4

(B) 0

(C) 2

(D) 1

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

$$f(6) = \underline{\hspace{2cm}}.$$

(A) 124

(B) 125

(C) 126

(D) 127

13 If  $f(x) = C_1 + C_2 3^x$ , then  $f(x+2) - 7f(x+1) + 6f(x) = \underline{\hspace{2cm}}$ .

(A) -1

(B) 0

(C) 1

(D) None of these

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

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

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

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

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

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

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

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

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

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

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

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

(A) 12

(B) 6

(C) -6

(D) -12

18 The 6<sup>th</sup> term of the series 8, 12, 19, 29, 42 is

(A) 60

(B) 59

(C) 58

(D) 57