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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.

Name of the Examination :

☛ **B. Sc. (Sem. 3)**

Name of the Subject :

☛ **Mathematical Methods *(Elective Generic) (New)***

☛ Subject Code No. : **3 0 4 3** ☛ Section No. (1, 2,.....) : **4**

Seat No. :

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 $\Delta y_n =$ _____.

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

(B) None of these

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

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

2 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) 2

(B) 1

(C) 4

(D) 3

3 $x^{(-1)} =$ _____.

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

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

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

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

4 $\Delta \equiv$ _____.

(A) δE

(B) None of these

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

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

5 The first difference for the function e^x is

(A) $\dfrac{\Delta e^x}{e^{-h}-1}$

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

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

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

6 The general solution of the difference equation $2Y_{k+2}-5Y_{k+1}+2Y_k=0$ is

(A) $c_1e^{2k}+c_2e^{\frac{k}{2}}$

(B) $c_1e^{2k}-c_2e^{\frac{k}{2}}$

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

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

7 The general solution of the difference equation $f(x+2)-2f(x+1)+f(x)=0$ is

(A) $(c_1-c_2)x$

(B) c_1+c_2x

(C) c_1-c_2x

(D) $(c_1+c_2)x$

8 $\mu+\frac{\delta}{2}=$ _____.

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

(B) E^{-2}

(C) E^{2}

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

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

(A) 2

(B) 1

(C) 4

(D) 0

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

(A) 126

(B) 127

(C) 124

(D) 125

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

(A) 1

(B) None of these

(C) –1

(D) 0

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

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

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

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

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

13 $\Delta \log f(x) =$ _____.

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

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

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

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

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

(A) –90

(B) 91

(C) –91

(D) 90

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

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

(A) –6

(B) –12

(C) 12

(D) 6

17 The 6^{th} term of the series 8, 12, 19, 29, 42 is

(A) 58

(B) 57

(C) 60

(D) 59

18 $u_x - \binom{n}{1} u_{x-1} + \binom{n}{2} u_{x-2} - \ldots + (-1)^n u_{x-n} =$ _____

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

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

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

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