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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 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) 1

(B) 4

(C) 3

(D) 2

2 $x^{(-1)} =$ _____.

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

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

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

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

3 $\Delta \equiv$ _____.

(A) None of these

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

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

(D) δE

4 $\Delta y_n =$ _____.

(A) None of these

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

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

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

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

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

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

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

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

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

(A) $c_1 + c_2 x$

(B) $c_1 - c_2 x$

(C) $(c_1 + c_2)x$

(D) $(c_1 - c_2)x$

7 $\mu + \frac{\delta}{2} =$ _____.

(A) E^{-2}

(B) E^{2}

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

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

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

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

(A) 127

(B) 124

(C) 125

(D) 126

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

(A) None of these

(B) -1

(C) 0

(D) 1

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

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

12 $\Delta \log f(x) =$ _____.

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

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

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

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

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

(A) 91

(B) –91

(C) 90

(D) –90

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

(A) 1

(B) 4

(C) 0

(D) 2

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

(A) -12

(B) 12

(C) 6

(D) -6

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

(A) 57

(B) 60

(C) 59

(D) 58

17 $u_x - \binom{n}{1} u_{x-1} + \binom{n}{2} u_{x-2} - \ldots + (-1)^n u_{x-n} =$ _____

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

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

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

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

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