

**UNIVERSITY OF EDUCATION**  
**"UEXAM" Semester-IV, 2019**  
**M.Sc Mathematics Session:2017-19**  
**Course Code: MATH4118**  
**Subject: Numerical Analysis-II**

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No \_\_\_\_\_

Roll No. (in fig.) \_\_\_\_\_

Roll No. (in words) \_\_\_\_\_

Candidate's Signature. \_\_\_\_\_

Signature of Addl. Supdt. \_\_\_\_\_

**SECTION: I (MCQ's)**

Time Allowed: 20 Minutes

Max. Marks: 18

NOTE: Encircle the correct/ best answer in each of the followings. Each Question carries 1 mark. Use of remover carries zero mark. Cutting and Overwriting is not allowed.

**Q1.**

- In Simpson 1/3 rule coefficient of  $y_0$  will be  
 a). h                        b).  $h/2$                         c).  $h/3$                         d). None
- In Simpson 3/8 rule coefficient of  $y_0$  will be  
 a).  $3h$                         b).  $3h/8$                         c).  $h/3$                             d). None
- In Simpson 3/8 rule coefficient of  $y_5$  will be  
 a).  $2h$                         b).  $3h/8$                         c).  $9h/8$                         d). None
- In Weddle rule coefficient of  $y_6$  will be  
 a). h                            b).  $3h/5$                         c).  $3h/5$                         d). None
- The order of difference equation  $y_{x+1}^2 + y_{x+2}^3 + y_{x+1}y_x - y_x^2 = x$  is  
 a). 1                            b). 2                            c). 3                            d). None
- The degree of difference equation  $y_{x+1}^2 + y_{x+2}^3 + y_{x+1}y_x - y_x^2 = x$  is  
 a). 5                            b). 2                            c). 3                            d). None
- Difference equation to  $y_n = A3^n + B5^n$  is  
 a).  $y_{n+2} - 8y_{n+1} + 15y_n = 0$     b).  $y_{n+2} + 8y_{n+1} + 15y_n = 0$     c).  $y_{n+2} + 8y_{n+1} - 15y_n = 0$     d). None
- $\lim \left( \frac{e^{ix}}{e^i - 1} \right)$  is  
 a).  $\frac{\sin(x-1) - \sin x}{2(1-\cos(1))}$                     b).  $\frac{\sin(x-1) - \sin x}{2(1+\cos(1))}$                     c).  $\frac{\sin(x-1) + \sin x}{2(1-\cos(1))}$                     d). None
- Which method give more accurate approximation  
 a). Simpson 3/8                    b). Simpson 1/3                    c). Trapezoidal                    d). None
- In Fibonacci difference equation  $C_2 =$   
 a).  $\frac{5-\sqrt{5}}{10}$                         b).  $\frac{-5+\sqrt{5}}{10}$                         c).  $\frac{5+\sqrt{5}}{10}$                             d). None
- In three point Gaussian formula  $C_3$  is  
 a).  $9/8$                             b).  $8/9$                             c).  $9/5$                                 d).  $5/9$
- In three point Gaussian formula  $C_2$  is  
 a).  $9/8$                             b).  $8/9$                             c).  $9/5$                                 d).  $5/9$
- In two pints Gaussian formula if  $t_2 = 1/\sqrt{3}$  then  $t_1 =$   
 a).  $-1/\sqrt{3}$                         b).  $1/\sqrt{3}$                         c). 0                                d). None
- If 'a' and 'b' are two distinct real roots of a difference equation then  $c_1 a^x + c_2 b^x$  is  
 a).  $Y_p$                                 b).  $Y_c$                                 c). General solution                    d). None
- In a difference equation when  $f(x) = a^x$  then  $\frac{1}{\phi(x)} a^x = \frac{1}{\phi(a)} a^x$  if  
 a).  $\phi(a) \neq 0$                         b).  $\phi(E) \neq 0$                         c).  $\phi(x) \neq 0$                         d). None
- In three point Gaussian formula  $C_1 =$   
 a).  $9/8$                                 b).  $9/5$                                 c).  $C_3$                                 d). None
- In Trapezoidal rule coefficient of  $y_4$  will be  
 a). h                                    b).  $h/2$                                 c).  $h/3$                                 d). None
- In Trapezoidal rule coefficient of  $y_0$  will be  
 a). h                                    b).  $h/2$                                 c).  $h/3$                                 d). None

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Subject: Numerical Analysis-II  
Time Allowed: 100 Minutes.**

**Max. Marks: 42**

**Section II (Short Answer)**

**Q.2- Write short answers of the following.**

**$3 \times 6 = 18$**

- I). Define numerical integration.
- II). Give formulas for Simpson 1/3 rule.
- III). Define general solution of a homogeneous difference equation.
- IV). Solve the DE  $y_{x+3} - 6y_{x+2} + 11y_{x+1} - 6y_x = 0$ .
- V). Give formulae for Weddle Rule.
- VI). What do we mean by Numerical Differentiation.

**Section III (Essay Type)**

**Answer the following Questions**

**$6 \times 4 = 24$**

**Q.3. Solve and drive Fibonacci difference equation.**

**Q.4. Drive Simpson's 3/8 rule from Newton cotes formula.**

**Q.5. Find error in Simpson 1/3 rule.**

**Q.6. Solve  $\int_0^{1.2} e^{x^3} dx$  by Weddle rule by taking  $n = 12$**