MASTER of COMPUTER APPLICATION
SECOND SEMESTER
COMPUTER ORIENTED NUMERICAL METHODS & STATISTICS
MCA - 205

(Use Separate Answer Scripts for Objective & Descriptive)

Duration : 3 hrs. **Full Marks : 70**

(PART-A : Objective)

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: ***1×20=20***

1. The general quadrature formula in numerical integration is of ___ ordinates
   a. Different
   b. Hypothetical
   c. Unequal
   d. None of these

2. In general quadrature formula for deriving Simpsons one-third rule we put the value of n as
   a. 1
   b. 2
   c. 3
   d. 5

3. In general quadrature formula for deriving Simpsons three -eighth rule we put the value of n as
   a. 2
   b. 4
   c. 3
   d. None of these

4. What is the degree of the interpolated polynomial (1,5), (2,18),(3,37), (4,62) and (5,93) ?
   a. 3
   b. 4
   c. 5
   d. 2

5. What is the degree of the interpolated polynomial (1,5), (2,18),(3,37), (4,62) and (5,93) ?
   a. 3
   b. 4
   c. 5
   d. 2

6. If f(x) be a polynomial of nth degree in x , then the nth difference of f(x) is constant and _____
   a. $\Delta^{(n+1)} f(x) = 0$
   b. $\Delta^n f(x) = 0$
   c. $f(x) = 0$
   d. None of these.

7. The relation between differential operator D and difference operator Δ is
   a. $D = \frac{1}{h}[\Delta + \frac{\Delta^2}{2} + ..]$
   b. $D = \frac{1}{h}[\Delta - \frac{\Delta^2}{2} + \frac{\Delta^3}{3} - ...]$
   c. $D = \Delta$
   d. D=0

8. Which one of the following is not a method of interpolation ?
   a. Graphic method
   b. Algebraic method
   c. Cauchy method
   d. None of these

9. The value of any divided difference is _____ of the order of the arguments.
   a. Dependent b. Optional
   c. Independent d. None of these

10. If the number of observations n is odd, then the median is ---------- observation
   a. $(\frac{n}{2})$ th b. $(\frac{n+1}{2})$ th
   c. 0 d. None of these

11. If the number of observations n is even, then the median is ---------- observation.
   a. $(\frac{n}{2})$ th b. $(\frac{n}{2})$ th and $(\frac{n}{2}+1)$ th
   c. $(\frac{n+1}{2})$ th and 0 d. None of these

12. In Probability, Simple event contains ---------- elements.
   a. Many b.Two c.Sigle d.Zero

13. The value of the integral $\int_4^{5.2} logx\,dx$ by Simpson's $\frac{1}{3}$rd rule is
   a. 1.82 b.3.46 c.7.32 d. 5.27

14. The formula $I = h[ny_0 + \frac{n^2}{2}\Delta y_0 + \left(\frac{n^3}{3} - \frac{n^2}{2}\right)\frac{\Delta^2 y_0}{2!} + \cdots]$ is a form of
   a. Newton Raphson method b. Regula Falsi method
   c. General Quadrature method d. None of these

15. The formula
$\int_{x_0}^{x_0+nh} ydx = \frac{h}{6}[2(y_0 + y_n) + 8(y_1 + y_3 + \cdots + y_{n-1}) + 4(y_2 + y_4 + \cdots + y_{n-2})$ is a form of
   a. Trapezoidal rule b. Simpson's 1/3 rd Rule
   c. Simpson's 3/8th Rule d. Weddle's Rule

16. When two events A and B are mutually exclusive, then $A \cap B$ is ----------
   a. ∅ b.0 c. 1 d. 2

17. When two events are exhaustive events, then AUB is
   a. 1 b.S c. S-1 d.None of these

18. The value of P(A)+P(B) – P(A∩B) is equal to
   a. P(AUB). b. P(A∩B)
   c. P(A) d. P(B)

19. Let E be an event and $\bar{E}$ be its complementary, then the value of the probability of $\bar{E}$ i.e P($\bar{E}$) is
   a. 1+P(E) b. P(E)
   c. 1-P(E) d. zero

20. The value of E in calculus of finite difference is
   a. $I \div \Delta$ b. $I - \Delta$
   c. $I \times \Delta$ d. $I + \Delta$

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Contd...

(PART-B : Descriptive)

Time : 2 hrs. 40 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Calculate the value of the integral $\int_4^{5.2} logx\,dx$ by Trapezoidal rule, Simpson's one -third rule and Simpson's three- eighth rule 10

2. Find the Mean Deviation from the Median for the following Data (Use Cumulative frequency) 10

x_i :	15	21	27	30	35
f_i :	3	5	6	7	8

3. A dice is thrown . Find the probability P as follows: P(a prime number) (b) P(a number ≥3) (c) P(a number ≤1) (d) P(a number> 6) (e) P(a number < 6) 2+2+2+2+2 =10

4. Find the solution of the system: 83x+11y-4z=95
   7x+52y+ 13 z= 104
   3x+8y+29z = 71
   using Jacobi and Gauss iterative method. 10

5. A bag contains 20 balls, in which 9 are red, 7 are white and 4 are black balls. A ball is drawn at random. What is the probability that the ball drawn will be (i) white (ii) black (iii) red or black (iv) not black 2+2+3+3 =10

6. State fundamental theorem of difference calculus. A third degree polynomial passes through the points (0,-1), (1,1),(2,1) and (3,-2). Find the polynomial. 2+8=10

7. Given 10
   $log_{10}654 = 2.8156$, $log_{10}658 = 2.8182$, $log_{10}659 = 2.8189$, $log_{10}661 = 2.8$, find $log_{10}656$. By means of Lagrange's formula prove that $y_1 = y_3 - .3(y_5 - y_{-3}) + .2(y_{-3} - y_{-5})$

8. Evaluate $\int_{0.5}^{0.7} x^{\frac{1}{2}}e^{-x}\,dx$ using Simpson's 1/3 rd rule dividing the range of integration into 4 equal parts. 10

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