Applied Mathematics MCQ

1. If f(-x)= -f(x) then function is ------.

a) even **b)odd** c)implicit d)parametric

2. If f(-x)= f(x) then function is ------.

a. even

b.odd

c.implicit

d.parametric

3.If f(x) = log(sinx) then f(π/2)=----.

a.0

b.1

c.2

d.3

4. If f(x)= x^2+6x+10 then f(-2) + f(2) =------.

a. 24

b.26

c.28

d.30

5.If f(x)= $3x^2$-5x+7 then f(-1) is -------.

a. f(1)

b.2f(1)

c.3f(1)

d.4f(1)

6).The function

$$f'(x) = \lim_{h \to ?} \frac{f(x+h) - f(x)}{h}$$

is called derivative with respect to x, if the limit h

A. $h \to 0$

B. $h \to -\infty$

C. $h \to \infty$

D. $h \to \mathbb{Z}$; where $\mathbb{Z}$ is an integer

Ans- a

5. If $y = \sqrt{x+1}$, then $y' = ?$

A. $2\sqrt{x+1}$

B. $\frac{2}{\sqrt{x+1}}$

C. $\frac{1}{\sqrt{x+1}}$

D. $\frac{1}{2\sqrt{x+1}}$

Ans-d

8).The derivative of $sec(2x)$ is ?

(a) $sec(x)tan(x)$

(b) $sec(2x)tan(2x)$

(c) $2sec(2x)tan(2x)$

(d) $4sec(2x)tan(2x)$

Ans- c

8. If $y = \sin(2\pi)$, then $\frac{dy}{dx} = ?$

A. 0

B. π

C. 2π

D. $\cos(2\pi)$

ANS-A

10). The derivative of which function is itself?

a.e^x

b.x

c.sinx

d.tanx

11).The natural logarithm of 10^x simplifies to _____.

a.10 ln x

b.x ln x

c.10 ln 10

d. x ln 10

12) $f(x) = \log x$ is

a. trigonometric function

b. logarithmic function

c. exponential function

d. algebric function

13) Find dy/dx if $y= e^{\log x}$

a.0

b.1

c.2

d.3

14).If y= log(secx + tanx) then dy/dx is

a. tanx

b.secx

c. secx .tanx

d. secx-tanx

15). If y= $\sin^{-1}$(cosx) then dy/dx = -------.

a.1

b.-1

c. 2

d. 0

16). $\cot^{-1}$ x=---------.

a. $\sin^{-1}$x

b $\sin^{-1}$(1/x)

c.$\tan^{-1}$x

d. $\tan^{-1}$(1/x)

17. Find dy/dx if $x^2 + y^2 = 25$

a. x.y

b. x/y

c.-x/y

d. y/x

18) If x= a.cosq, y=a.sinq then dy/dx= ------

a.-x/y

b.x/y

c. -x.y

d. x.y

19) If y= $a^x + x^a + a^a + \sqrt{x}$ then dy /dx = ----------

a) $a^x + ax^{a-1} + a^a + 1/\sqrt{x}$ b) $a^x + ax^{a-1} + 0 + 1/\sqrt{x}$

c) $a^x \log x + ax^{a-1} + 0 + 1/2\sqrt{x}$ d) $xa^x + ax^{a-1} + a^a + 1/\sqrt{x}$

20)The derivative of the function: y=f(x) = tan x is ----------

a) **f'(x) = $\sec^2 x$** b) f'(x) = $\sec^2 x \tan x$ c) f'(x) = sec x tan x d) f'(x) = cosec x

21) If $x^2 + y^2 = 25$ then dy /dx = ----------

a) 2x = -2y b) 2x = 2y c) 2x .2y =0 **d) -2x /2y**

22) If $\sqrt{x} + \sqrt{y} = \sqrt{a}$ then dy /dx = ----------

a) $2\sqrt{x} = -2\sqrt{y}$ **b) $-2\sqrt{y}/2\sqrt{x}$** c) $-2\sqrt{x}/2\sqrt{y}$ d) $2\sqrt{x} .2 \sqrt{y}$

23)The Slope of **tangent** to the curve y=f(x) at $p(x_1,y_1)$ is m = ……..

a) $\frac{d^2y}{dx^2}$ **b) $\frac{dy}{dx}$** c) $\frac{-1}{\frac{dy}{dx}}$ d) $\frac{-1}{\frac{d^2y}{dx^2}}$

24)The Slope of **normal** to the curve y=f(x) at $p(x_1,y_1)$ is m = ……..

a) $\frac{d^2y}{dx^2}$ b) $\frac{dy}{dx}$ **c) $\frac{-1}{\frac{dy}{dx}}$** d) $\frac{-1}{\frac{d^2y}{dx^2}}$

25) The slope of the to the curve $y = 3x - x^2$ at point $(4, -4)$ is

a)1/5 b) -5 c) 0 d)1

26) If the slope of tangent to the curve $4x^2 + 9y^2 = 40$ at point (1,2) is m= -2/9 then equation of tangent is----------

a)9x – 2y=5 **b) 2x +9y = 20** c)2x +20y+9 = 0 d)9x +2y =5

27) The condition for **minima** at point $x = a$ is

a) $\frac{dy}{dx} = 0$ & $\frac{d^2y}{dx^2} < 0$ **b)** $\mathbf{\frac{dy}{dx} = 0}$ & $\mathbf{\frac{d^2y}{dx^2} > 0}$

c) $\frac{dy}{dx} = 0$ & $\frac{d^2y}{dx^2} = 0$ d) $\frac{d^2y}{dx^2} = 0$

28) Divide100 into two parts such that their product is **maximum.**

a)one number = -50,other number= 50 b) one number = 50,other number=25

c)one number =25,other number= - 50 **d)one number =50,other number= 50**

29) **Radius of curvature** for any curve is calculated by the formula

a) $\boldsymbol{\rho = \frac{\left[1+(\frac{dy}{dx})^2\right]^{3/2}}{\frac{d^2y}{dx^2}}}$ b) $\rho = \frac{\left[1-(\frac{dy}{dx})^2\right]^{3/2}}{\frac{d^2y}{dx^2}}$

c) $\rho = \left[\frac{1+(\frac{dy}{dx})^2}{\frac{d^2y}{dx^2}}\right]^{3/2}$ d) $\rho = \frac{\left[1-(\frac{dy}{dx})^2\right]^{5/2}}{\frac{d^2y}{dx^2}}$

30) The **radius of curvature** is always ----------

a) Zero **b) positive** c) one d) both

31) The **radius of curvature** of the curve $y = e^x$ at point $(0,1)$ *is*

a) $\mathbf{2^{3/2}}$ b) $2^{2/3}$ c) 0 d) 1

32) The **radius of curvature** of the curve $y = x^3$ at point $(1,1)$ *is* $---$.

a) $\frac{(10)^{3/2}}{6}$ b) $\frac{(145)^{3/2}}{12}$ c) $\frac{(7)^{3/2}}{6}$ d) $\frac{(145)^{3/2}}{6}$

33) If $\frac{d(\cos x)}{dx} = -\sin x$, then $\int sinxdx = -------$

a) cosx +c b) cosecx +c **c) –cosx +c** d) - sinx +c

34) If $\frac{d(\log x)}{dx} = 1/x$, then $\int 1/xdx = --------$.

a) tanx + c b) cotx + c **c) logx + c** d) secx + c

35) $\int(\frac{1}{\sqrt{1-x^2}} - cosx)dx =$ ----------

a) $\mathbf{\sin^{-1}x - \sin x + c}$ b) $\sin^{-1}x + \sin x + c$

c) $\cos^{-1}x + sinx + c$ d) $\cos^{-1}x - cosx + c$

36) $\int(e^x + a^x - x^2)dx =$

a) $xe^x + \frac{a^x}{\log a} - \frac{x^3}{3} + c$ b) $e^x + a^x + 2x + c$

c) $e^x + a^x \log a - \frac{x^3}{3} + c$ **d)** $\boldsymbol{e^x + \frac{a^x}{\log a} - \frac{x^3}{3} + c}$

37) $\int \frac{1}{\sqrt{a^2-x^2}}\, dx =$

a) $\boldsymbol{\sin^{-1}\left(\frac{x}{a}\right) + c}$ b) $\cos^{-1}\left(\frac{x}{a}\right) + c$

c) $\frac{1}{a}\sin^{-1}\left(\frac{x}{a}\right) + c$ d) $\frac{1}{a}\tan^{-1}\left(\frac{x}{a}\right) + c$

38) $\int \frac{x^2+x+1}{x} dx =$

a) $x^2 + 1 + x + c$ **b)** $\boldsymbol{\frac{x^2}{2} + x + \log x + c}$

c) $\frac{x^2}{2} + x + 1 + c$ d) $x^2 + 1 - x + c$

39) $\int e^{3x}\, dx =$

a) $\boldsymbol{\frac{e^{3x}}{3} + c}$ b) $e^{3x} + c$

c) $3\, e^{2x} + c$ d) $3.e^x + c$

40) $\int \frac{1}{x^2+a2} dx =$

a)$tan^{-1}\left(\frac{x}{a}\right) + c$ **b)** $\boldsymbol{\frac{1}{a}tan^{-1}\left(\frac{x}{a}\right) + c}$

c) $\frac{1}{a}cot^{-1}\left(\frac{x}{a}\right) + c$ d) $\frac{1}{a}tan^{-1}(x) + c$

41) $\int \frac{\sin(\log x)dx}{x}$ =----------

a) $xsin(\log x) + c$ b) $sin(\log x) + c$

c) - cos(log x) + c d) $-xsin(\log x) + c$

42) $\int \sqrt{a^2 - x^2}\, dx =$

a) $\frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2} sin^{-1}\left(\frac{x}{a}\right) + c$ b) $\frac{x}{2}\sqrt{a^2 - x^2} - \frac{a^2}{2}\sin^{-1}\left(\frac{x}{a}\right) + c$

c) $\frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2}\tan^{-1}\left(\frac{x}{a}\right) + c$ d) $\frac{a}{2}\sqrt{a^2 - x^2} - \frac{x^2}{2}\sin^{-1}\left(\frac{x}{a}\right) + c$)

43) In by part integration $\int uv\, dx =$

a) $v\int u\ dx + \int \left[\frac{du}{dx}\int v\, dx\right] dx$ b) $u\int v\ dx + \int \left[\frac{du}{dx}\int v\, dx\right] dx$

c) $v\int u\ dx - \int \left[\frac{du}{dx}\int v\, dx\right] dx$ **d)** $\mathbf{u\int v\ dx - \int \left[\frac{du}{dx}\int v\, dx\right] dx}$

44) $\int \cos 2x\, dx$ =-----

a) $-\frac{\cos 2x}{2}$ +c **b)** $\mathbf{\frac{\sin 2x}{2}}$ **+c** c) sinx+c d) cosx +c

45) Integration of $\int \frac{dx}{x.\log x}$ = …….

a) logx +C **b) log (logx)+c** c) logx .logx +c d) $\frac{1}{x}$ +c

46) Integration of $\int \sin^3 x .\cos x\, dx$ =……..

a) $\frac{(\sin x)^3}{3}$+C b) $\frac{(\cos x)^4}{4}$ +c **c)** $\mathbf{\frac{(\sin x)^4}{4}}$ **+c** d) $\frac{(\cos x)^3}{3}$ +c

47) Integration of $\int \frac{dx}{x+a}$ = …….

a) log(x -a)+c **b) log(x +a)+c** c) $\log\frac{(x+a)}{a}$+c d) $\log\frac{(x-a)}{a}$+c

48) Integration of $\int \frac{\sin\sqrt{x}}{\sqrt{x}}\, dx$ =……

a) - sin√x + c b) cos√x + c c) sin√x + c **d) -cos√x + c**

49) For Integration by parts which sequence is correct to find first , second function

a) LATEI b) IATEL **c) LIATE** d) ELIAT

50) In Integration by partial fration values of A=1 B=-1 ,then $\int \frac{dx}{x.(x+1)}$ = …….

a) $\log \frac{(x+1)}{x}$ +c **b) $\log \frac{x}{x+1}$ + c** c) $\log \frac{1}{x}$ +c d) log x +c

51) Integration of $\int_a^b$ k.f(x) dx = …….

a) $\int_a^b$ - k.f(x) dx +c **b) $k\int_a^b f(x)\,dx$ +c** c) $-k\int_a^b f(x)\,dx$ +c d) $\int_a^b f(x)$

52) Integration of $\int_1^3 x^2\,dx$ = …….

a) $\frac{25}{3}$ b) $\frac{22}{3}$ c) $\frac{23}{3}$ **d) $\frac{26}{3}$**

53)Integration of $\int_1^2 \frac{dx}{3x-2}$ = …….

a) $\frac{1}{3}\log 4$ b) log4 c) $\log \frac{4}{3}$ d) log4

54) Integration of $\int_0^1 e^x\,dx$ = …….

a) e+1 **b) e-1** c) 1-e d) 1+e

55) Integration of $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$ =……

a) ¶/3 b)¶ c) ¶/4 **d) ¶/2**

56) Integration of $\int_e$ logx dx = …….

a) -1 b) e^1 **c) <u>1</u>** d) 0

57) Definite Integral $\int_0^a f(x)\,dx$ = …….

a) $\int_a^b f(a-x)\,dx$ b) $\int_b^a f(a-x)\,dx$ **c) $\int_0^a f(a-x)\,dx$** d) $\int_0^a f(x)\,dx$

58) Definite Integral $\int_a^b f(x)\,dx$ = …….

a) $\int_a^b f(a+b-x)\,dx$ b) $\int_b^a f(a+b-x)dx$ c) $\int_0^a f(a+b-x)dx$ d) $\int_0^a f(x)dx$

59) Integration of $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\cos x + \sin x}\,dx$

a)π b)π/2 **c) <u>π/4</u>** d) π/8

60) Integration of $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{1}{1+\sqrt[n]{\tan x}}\,dx$

a) π b) π/2 **c) <u>π/12</u>** d) π/6

61) Area under the curve y= sinx from x=0 to x= π and x-axis is ----------

a) 2 b)1 c) 0 d) π

62) Area bounded by curve $y=x^3$ from x=1 to x=3 and x-axis is ----------

a)27 b)10 c)15 **d)<u>20</u>**

63) The volume of the solid generated by revolving the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$ $about\ x-axis\ is$ $--$ ---------

a) 25πcubic units **b) <u>16 πcubic units</u>** c) 12π cubic units d) 9πcubic units

64) The area enclosed by the curve y=x and $y=x^2$ is ------

a) <u>1/6</u> b)1/3 c)1/2 d)1/9

65) Area between two parabolas $y^2=4x$ and $x^2=4y$ is ------

a) 4/3 b) 32/3 **c)<u>16/3</u>** d)1/6

66) An equation involving derivatives is called

a) Simultaneous equation b) Linear differential equation
c) <u>Differential equation</u> d) Quadratic equation

67) Order of D.E is--------.

a) <u>Highest order derivatives appearing in D.E</u>
b) Lowest order derivatives appearing in D.E
c) Any order derivative appearing in D.E
d) power of derivative

68) If the no. of arbitrary constants in equation is two then order of D.E is

a) One **b) <u>Two</u>** c) Zero d) Three

69) If y=A cos3x+Bsin3x How many arbitrary are

a)4 b)3 **c) <u>2</u>** d) 5

70)The **Order and Degree** of differential equation $\frac{d^2y}{dx^2}+\sqrt{1+\frac{dy}{dx}}=0$ is

a) order =2, degree=1 b) order =1 , degree=2
c) order =1, degree=1 **d) <u>order =2, degree= 2</u>**

71) **Formation** of D.E $Y=ax^2$ is

a) $\frac{dy}{dx}=2ax$ **<u>b)</u>** $\mathbf{x\frac{dy}{dx}=2y}$ c) $\frac{dy}{dx}=2y/x$ d) $\frac{dy}{dx}-2ax=0$

72) Formation of D.E Y= A sin x+ B cos x is-------

a) $\frac{d^2y}{dx^2} + y = 0$ b) $\frac{d^2y}{dx^2} + 6y = 0$

c) $\frac{d^2y}{dx^2} - y = 0$ d) $\frac{d^2y}{dx^2} + 5y = 0$

73) The D.E. $\frac{dy}{dx} + py = Q$ is of the form

a) ***linearform*** b) *exact* form

c) *homogeneous* form d) *variable seprable form*

74) In linear D.E. $\frac{dy}{dx} + y = x^3$ value of P and Q are

a)P= 1/x, Q=x^3 b)p=x^3, Q=1/x **c) p=1,Q= x^3** d) p=x^3, Q=1

75)The Integrating factor of L.D.E. equation $\frac{dy}{dx} + y\,cotx = cos^2x$ is

a)tanx **b) secx** c)cosecx d)log(secx)

76) Integrating factor of D.E $x\frac{dy}{dx} + y = x^3$ is x then solution of D.E is

a) xy= $\frac{x^4}{4}$+c b) a) y= x^4+c c) a) xy= x^4+c d) x=y^2+c

77) Integrating factor of D.E $\frac{dy}{dx} + ycotx = cosecx$ is

a) cos x b)cosec x c)cot x **d) sin x**

78) The solution of D.E $\frac{dy}{dx} = e^{3x-2y} + x^2e^{-2y}$ is

a) $\frac{e^{2y}}{2} = \frac{e^{3x}}{3} + \frac{x^3}{3} + c$ b) $\frac{e^{3y}}{2} = \frac{e^{3x}}{3} - \frac{x^3}{3} + c$

c) $\frac{e^{2y}}{2} = \frac{e^{2x}}{3} + \frac{x^3}{3} + c$ d) $\frac{e^{2y}}{2} = \frac{e^{4x}}{3} - \frac{x^2}{3} + c$

79)If a= 2 & b= 3 then the root of $x^3 - 2x - 5 = 0$ using Bisection Method. up to 2 iteration is ------

a) 2.5
b) **2.25**
c) 2.125
d) 1.896

80) If function is defined as $f(x) = x^2 - 2x - 1$. between the interval [-1,0] then the root of the function by Bisection Method is(two iteration) is----------.

a) - 0.25
b) +0.25
c) + 0.5

d)- 0.5

81) The formula used for solving the equation using Regula Falsi method

a) $x = \frac{b\,f(a) - a\,f(b)}{f(a) - f(b)}$ b) $x = \frac{b - a}{2}$ c) $x = \frac{a - b}{2}$ **d)** $\mathbf{x = \frac{a\,f(b) - b\,f(a)}{f(b) - f(a)}}$

82) The root of the equation $x \log x = 1.2$ lies between 2 & 3 using Regula Falsi method upto two iterations is ----------.

a) 2.7400
b) 2.4760
c) 2.5760
d) 2.4706

83) The Iterative formula for Newton Raphson method is given by _____

a) $\mathbf{x_1 = x_0 - f(x_0)/f'(x_0)}$
b) $x_0 = x_1 - f(x_0)/f'(x_0)$
c) $x_0 = x_1 + f(x_0)/f'(x_0)$
d) $x_1 = x_0 + f(x_0)/f'(x_0)$

84).Use Newton Raphson method the approximate value $3\sqrt{20}$ is x= ---------

a) **2.715** b) 1.715 c) 3.715 d) 0.715

85) If f(x) =0 has a root between a & b then f(a) & f(b) are of _____ signs.

a) same b) negative **c) Opposite** d) Positive

86) The rate of convergence of Gauss Seidel Method is _____ that of Jacobi Method

1) once **2) twice** 3) thrice 4) reciprocal

Happy Learning!