Chapter → Taylor's and Maclaurin's Series

*** Multipte Choice Questions :-

Q→1 The coefficient of x^3 in the expansion of $\sin x$ is ;

a) 0
b) $-\frac{1}{3!}$
c) $\frac{1}{3!}$
d) 1

Q→2 Maclaurin's series of $f(x)$ is ;

a) $f(x) + \frac{x \cdot f'(x)}{1!} + \frac{x^2 f''(x)}{2!} + \cdots$
b) $f(0) + \frac{x \cdot f'(0)}{1!} + \frac{x^2 \cdot f''(0)}{2!} + \cdots$
c) $1 + \frac{x \cdot f'(x)}{1!} + \frac{x^2}{2!} \cdot f''(x) + \cdots$
d) $1 + \frac{x}{1!} \cdot f'(1) + \frac{x^2}{2!} \cdot f''(1) + \cdots$

Q→3 The n^{th} term in Maclaurin's series expansion is ;

a) $f^n(x)/n!$
b) $f^n(0)/n!$
c) $f(x)/$
d) $f(0)/n!$

Q→4 Taylor's series expansion of $y = 1/x$ about $x = 1$ is ;

a) $1 - (x-1) + (x-1)^2 - (x-1)^3 + \cdots$
b) $1 + (x-1) + (x-1)^2 + (x-1)^3 + \cdots$
c) $1 - (x-1) + (x-1)^2/2! - (x-1)^3/3! + \cdots$
d) $1 + (x-1) + (x-1)^2/2! + (x-1)^3/3! + \cdots$

Q→5 Which of the Following is the coefficient of $x^{(iv)}$ in the expansion of e^x ?

a) $4!$
b) $-4!$
c) $1/4!$
d) $-1/4!$

Q→6 The coefficient of x^5 in the expansion of $\cos x$ is ;

a) 0
b) $\frac{1}{5!}$
c) $-\frac{1}{5!}$
d) $1/5$

Q→7 The coefficient of x^{100} in the Expansion of $\log(1-x)^2$ is ;

a) $1/100$
b) $-1/100$
c) $-1/50$
d) $1/50$

Q→8 The coefficient of x^2 in the expansion of $e^x \cdot \cos x$ is ;

a) 1/2 b) −1

c) 0 d) −1/2

Q-9 The expansion of $x^4 - 3x^2 + 2x^2 - x + 1$ about 3 is ;

a) $16 + 38(x+3) + 29(x+3)^2 - - -$ b) $16 + 38x + 29x^2 - - - -$

c) $16 + 38(x-3) + 29(x-3)^2 - - -$ d) $16 - 38(x+3) + 29(x+3)^2 - - -$

Q→10 The series $x + \frac{x^3}{3!} + \frac{x^5}{5!} + - - -$ represent expansion of ;

a) $\sin x$ b) $\sinh x$

c) $\cos x$ d) $\cosh x$

Q→11 The series $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + - - -$ represent expansion of ;

a) $\log(1+x)$ b) $\log(1-x)$

c) e^{-x} d) $\sin x$

Q→12 The coefficient of x^5 in the expansion of e^x is ;

a) 1/5 b) 1/4!

c) 5 d) 1/5!

Q→13 The maclaurin's series of $\sin x$ is ;

a) $\sum_{n=0}^{\infty} \frac{x^{(2n+1)}}{(2n+1)!}$ b) $\sum_{n=0}^{\infty} \frac{(-1)^n \cdot x^{(2n+1)}}{(2n+1)!}$

c) $\sum_{n=0}^{\infty} \frac{x^{(2n)}}{(2n)!}$ d) $\sum_{n=0}^{\infty} \frac{(-1)^n \cdot x^{(2n)}}{(2n)!}$

Q→14 The maclaurin's series of e^{-x} is ;

a) $\sum_{n=0}^{\infty} \frac{x^n}{n!}$

b) $\sum_{n=0}^{\infty} \frac{(-1)^n (x)^n}{n!}$

c) $\sum_{n=1}^{\infty} \frac{x^n}{n!}$

d) $\sum_{n=1}^{\infty} \frac{(-1)^n (x)^n}{n!}$

Q→15 Using taylor's theorem, during evaluating $\sqrt{8.12}$ what will be the value of a ;

(a) 9

b) −9

c) 0.88

d) −0.88

Q→16 Using taylor's theorem, during evaluting $\sqrt[3]{30}$ what will be the value of h ;

(a) 27

b) 3

c) −3

d) −27

Q→17 In the expansion of $\tan(x+\pi/4)$, what will be the value of a ;

(a) 45°

b) $\pi/4$

c) $-\pi/4$

d) −45°

Q→18 In the expansion of $(x+2)^4 + 5(x+2)^3 + 6(x+2)^2 + 7(x+2) + 8$ in the power of $(x-1)$, what will be the value of a ;

a) −1

b) −2

c) +2

d) 1

Q→19 What will be expansion of $(1+x)^m$ using maclaurin's series;

a) $1 - mx + \frac{m(m-1)}{2!}x^2 - \frac{(m)(m-1)(m-2)}{3!}x^3 + ----$

b) $1 + mx + \frac{m(m-1)}{2}x^2 + \frac{(m)(m-1)(m-2)}{3}x^3 + ---$

c) $1 + mx + \frac{m(m-1)}{2!}x^2 + \frac{(m)(m-1)(m-2)}{3!}x^3 + ---$

d) $1 + mx + \frac{m(m+1)}{2!}x^2 + \frac{m(m+1)(m+2)}{3!}x^3 + ---$

Q→20 find the expansion of $\log_e\left(\frac{1+x}{1-x}\right)$;

a) $2\left(1 + \frac{x^2}{2} + \frac{x^4}{4} + \frac{x^6}{6} + ----\right)$

b) $2\left(x + \frac{x^3}{3} + \frac{x^5}{5} + \frac{x^7}{7} + ---\right)$

c) $2\left(1 - \frac{x^2}{2} + \frac{x^4}{4} - \frac{x^6}{6} + ---\right)$

d) $2\left(x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + ----\right)$

** Answers :- { Taylor's and Maclaurin's Series }

1) - (b)
2) - (b)
3) - (b)
4) - (a)
5) - (c)
6) - (a)
7) - (c)
8) - (c)
9) - (c)
10) - (b)
11) - (a)
12) - (d)
13) - (b)
14) - (b)
15) - (a)
16) - (b)
17) - (b)
18) - (d)
19) - (c)
20) - (b)