SNJB KBJ COLLEGE OF ENGG. CHANDWAD.

MCQ's on Taylor's n Maclaurin Thm,Indeterminate Forms --Vijay Hirap

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Multiple choice questions

Type I: Maclaurin's Theorem & Expansion Of Functions:

1. Expansion Of f (x) in ascending powers of x by Maclaurin's Theorem is

   $(A)\ f(x)+xf'(x)+\frac{x^2}{2!}f''(x)+....$ $\quad (B)\ 1+x+\frac{x^2}{2!}+......$

   (C) $f(0)+xf'(0)+\frac{x^2}{2!}f''(0)+....$ $\quad (A)\ f(x)-xf'(x)+\frac{x^2}{2!}f''(x)-\frac{x^3}{3!}f''(x)....$

2. Expansion Of sin x in ascending powers of x is

   $(A)\ x+\frac{x^3}{3!}+\frac{x^5}{5!}+......$ $\quad (B)\ x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$

   (C) $x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+......$ $(D)\ 1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+.......$

3. Expansion of cos x in ascending powers of x is……….

   $(A)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ $\quad (B)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+.....$

   $(C)\ x+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ **(D)** $1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}.+......$

4. Expansion of tan x in ascending powers of x is……

   $(A)\ 1+x+\frac{1}{3}x^3+\frac{2}{15}x^5+......$ $\quad (B)\ x-\frac{1}{3}x^3+\frac{2}{15}x^5-.....$

   $(C)\ x+\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^6}{6!}+......$ **(D)** $x+\frac{1}{3}x^3+\frac{2}{15}x^5+......$

5. Expansion of e^x in ascending of x is.

   (A) $1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$ $\quad (B)\ 1-x+\frac{x^2}{2!}-\frac{x^3}{3!}+.....$

   $(C)\ 1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+......$ $(D)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+......$

6. Expansion of e^{-x} in ascending powers of x is…..

   $(A)\ 1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$ $\quad$ **(B)** $1-x+\frac{x^2}{2!}-\frac{x^3}{3!}+.....$

   $(C)\ 1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+......$ $(D)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+......$

7. Expansion of sinh x in ascending powers of x is

$(A)\ 1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$ $(B)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7}+.....$

$(C)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ **(D)** $x+\frac{x^3}{3!}+\frac{x^5}{5!}+\frac{x^7}{7!}+......$

8. Expansion of cosh x in ascending powers of x is

$(A)\ 1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$ $(B)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+.....$

(C) $1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ $(D)\ x+\frac{x^3}{3!}+\frac{x^5}{5!}+\frac{x^7}{7!}+......$

9. Expansion of tanh x in ascending powers of x is

$(A)\ 1+x+\frac{1}{3}x^3+\frac{2}{15}x^5+......$ **(B)** $x-\frac{1}{3}x^3+\frac{2}{15}x^5-.....$

$(C)\ x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+......$ $(D)\ x+\frac{1}{3}x^3+\frac{2}{15}x^5+......$

10. Expansion of log (1+x) in ascending powers of x is

(A) $x-\frac{x^2}{2}+\frac{x^3}{3}-\frac{x^4}{4}+......$ $(B)-x-\frac{x^2}{2}-\frac{x^3}{3}-\frac{x^4}{4}+.....$

$(C)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ $(D)\ x+\frac{x^3}{3!}+\frac{x^5}{5!}+\frac{x^7}{7!}+......$

11. Expansion of log (1-x) in ascending powers of x is

(A) $-x-\frac{x^2}{2}--\frac{x^3}{3}-\frac{x^4}{4}-......$ $(B)-x-\frac{x^2}{2}-\frac{x^3}{3}-\frac{x^4}{4}+.....$

$(C)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ $(D)\ x+\frac{x^3}{3!}+\frac{x^5}{5!}+\frac{x^7}{7!}+......$

12. Expansion of $\frac{1}{(1-x)}$ in ascending powers of x is

$(A)\ -1-x-x^2-x^3-......$ $(B)\ 1-x+x^2-x^3+.....$

$(C)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ **(D)** $1+x+x^2+x^3+.........$

13. Expansion of $\frac{1}{(1+x)}$ divided by (1+x) in ascending powers of x is

$(A)\ -1-x-x^2-x^3-......$ **(B)** $1-x+x^2-x^3+.....$

$(C)\ 1+\frac{x^2}{2!}+\frac{x^4}{4!}+\frac{x^6}{6!}+......$ $(D)\ 1+x+x^2+x^3+.........$

14.Expansion of $(1+x)^n$ in ascending powers of x is

$(A)\ 1-nx+\frac{n(n-1)}{2!}-x^2-\frac{n(n-1)(n-2)}{3!}x^3+......$ $(B)\ 1-nx+\frac{n(n+1)(n+2)}{3!}x^3+.....$

$(C)\ 1+nx+\frac{n(n+1)}{2!}x^2+\frac{n(n+1)(n+2)}{3!}x^3+......$ **(D)** $1+nx+\frac{n(n-1)}{2!}x^2+\frac{n(n-1)(n-2)}{3!}x^3+.........$

15.The limit of series $x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+\cdots$as x approaches to π/2 is ....

(A) 0 (B) π/2 **(C)** 1 (D)-1

16.First two terms in expansion of log $(1+e^x)$ by Maclaurins theorem is

(A) $\log 2+\frac{1}{2}x+......$ $(B)\ \log 2-\frac{1}{2}x+.....$

$(C)\ x-\frac{x^2}{2}+......$ $(D)\ x+\frac{x^2}{2}+......$

17.First two terms in expansion of sec x by Maclaurins theorem is

$(A)\ 1-\frac{x^2}{2!}+......$ $(B)\ x-\frac{x^3}{3!}x+.....$

(C) $1+\frac{x^2}{2!}+....$ $(D)\ x+\frac{x^3}{3!}+......$

18. .First two terms in expansion of e^x sec x by Maclaurins theorem is

$(A)\ x+x^2+......$ $(B)\ x-x^2+.....$

(C) $1+x+.....$ $(D)\ 1-x+......$

19.First two terms in expansion of tan^{-1} (1+x) by Maclaurins theorem is

(A) $\frac{\pi}{4}+\frac{x}{2}-......$ $(B)\ \frac{\pi}{4}-\frac{x}{2}.....$

$(C)\ x-\frac{x^3}{3!}+......$ $(D)\ x+\frac{x^3}{3!}+......$

20 Expansion of sin($\frac{x}{2}$)+ cos($\frac{x}{2}$) in ascending powers of x is

$(A)\ 1-\frac{x}{2}+\frac{x^2}{8}+\frac{x^3}{48}-\frac{x^4}{384}+......$ **(B)** $1+\frac{x}{2}-\frac{x^2}{8}-\frac{x^3}{48}+\frac{x^4}{384}+.....$

$(C)\ 1+\frac{x}{2}-\frac{x^2}{8}-\frac{x^3}{24}+\frac{x^4}{120}+......$ $(D)\ \frac{x^2}{8}-\frac{x^3}{48}+\frac{x^4}{384}+......$

21.Expansion of log(1-x^4)-log(1-x) in ascending powers of x is

$(A)\ -x-\frac{x^2}{2}-\frac{x^3}{3}-\frac{3}{4}x^4+......$ **(B)** $x+\frac{x^2}{2}+\frac{x^3}{3}-\frac{3}{4}x^4+.....$

$(C)\ x+\frac{x^2}{2!}+\frac{x^3}{3!}-\frac{3}{4!}x^4+......$ $(D)\ -x-\frac{x^2}{2!}-\frac{x^3}{3!}-\frac{3}{4!}x^4+......$

22 Expansion of log(1+x)$^{1/x}$ in ascending powers of x is

(A) $1-\frac{x}{2}+\frac{x^2}{3}-\frac{x^3}{4}+......$ $(B)\ -1-\frac{x}{2}-\frac{x^2}{3}-\frac{x^3}{4}-.....$

$(C)\ 1-\frac{x}{2!}+\frac{x^2}{3!}-\frac{x^3}{4!}+......$ $(D)\ -1-\frac{x}{2!}-\frac{x^2}{3!}-\frac{x^3}{4!}-......$

23 Expansion of log(1+x)^{x} in ascending powers of x is

$(A)\ x^2+\frac{x^3}{2}+\frac{x^4}{3}+\frac{x^5}{4}+......$ $(B)\ x^2-\frac{x^3}{2!}+\frac{x^4}{3!}-\frac{x^5}{4}+.....$

$(C)\ 1+x+x\frac{x^2}{2}-\frac{x^3}{3}+\frac{x^4}{4}-\frac{x^5}{5}+......$ **(D)** $x^2-\frac{x^3}{2}+\frac{x^4}{3}-\frac{x^5}{4}+......$

24 Expansion of cos^2 x in ascending powers of x is

(A) $\frac{1}{2}\left\{1+\left(1-\frac{2^2x^2}{2!}+\frac{2^4x^4}{4!}-......\right)\right\}$ $(B)\ \frac{1}{2}\left\{1-\left(1-\frac{2^2x^2}{2!}+\frac{2^4x^4}{4!}-......\right)\right\}$

$(C)\ \frac{1}{2}\left\{1+\left(2x-\frac{2^3x^3}{3!}+\frac{2^5x^5}{5!}-......\right)\right\}$ $(D)\ \frac{1}{2}\left\{2x-\left(1-\frac{2^3x^3}{3!}+\frac{2^5x^5}{5!}-......\right)\right\}$

25.Expansion of sin x cos x in ascending powers of x is

$(A)\ \frac{1}{2}\left(1-\frac{2^2x^2}{2!}+\frac{2^4x^4}{4!}-......\right)$ $(B)\ \frac{1}{2}\left(1-\frac{2^2x^2}{2!}+\frac{2^4x^4}{4!}-......\right)$

(C) $\frac{1}{2}\left(2x-\frac{2^3x^3}{3!}+\frac{2^5x^5}{5!}-......\right)$ $(D)\ \frac{1}{2}\left(x-\frac{2^3x^3}{3!}+\frac{2^5x^5}{5!}-......\right)$

26 Expansion of sin 2x cos 3x in ascending powers of x is

(A) $\frac{1}{2}\left[\left(5x-\frac{5^3x^3}{5!}+\frac{5^5x^5}{5!}-......\right)-\left(x-\frac{x^3}{3!}+\frac{x^5}{5!}-......\right)\right]$

(B) $\frac{1}{2}\left[\left(5x-\frac{5^3x^3}{3!}+\frac{5^5x^5}{5!}-......\right)+\left(x-\frac{x^3}{3!}+\frac{x^5}{5!}-......\right)\right]$

(C) $\frac{1}{2}\left[\left(1-\frac{5^2x^2}{2!}+\frac{5^4x^4}{4!}-......\right)-\left(1-\frac{x^2}{2!}+\frac{x^4}{4!}-......\right)\right]$

(D) $\frac{1}{2}\left[\left(1-\frac{5^2x^2}{2!}+\frac{5^4x^4}{4!}-......\right)+\left(1-\frac{x^2}{2!}+\frac{x^4}{4!}-......\right)\right]$

27. Expansion of $\tan^{-1}x$ in ascending powers of x is

$(A) x+\frac{x^3}{3!}+\frac{x^5}{5!}+......$ $\quad (B) x-\frac{x^3}{3!}+\frac{x^5}{5!}-.....$

(C) $x-\frac{x^3}{3}+\frac{x^5}{5}-......(D) x+\frac{x^3}{3}+\frac{x^5}{5}+......$

28.Simplified expression of $1 + \left(x^2-\frac{x^3}{2}+\frac{x^4}{3}-\frac{x^5}{4}+..\right).+\frac{1}{2}\left(x^2-\frac{x^3}{2}+\frac{x^4}{3}-\frac{x^5}{4}+..\right)^2+....$ on neglecting x^5 and higher powers of x is

(A) $1+x^2+\frac{x^3}{2}+\frac{5x^4}{6}+......$ $\quad (B)$ $1+x^2-\frac{x^3}{2}-\frac{x^4}{6}-.....$

(C) $x-\frac{x^3}{3}+\frac{x^5}{5}-......$ $\quad$ **(D)** $1+x^2-\frac{x^3}{2}+\frac{5x^4}{6}-......$

29.By using substitution x=tanθ , simplified form of $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ is

(A) $\tan^{-1}x$ $\quad (B)$ $2\cot^{-1}x$

(C) $2\tan^{-1}x$ $\quad (D)$ *none of these*

30.By using substitution x=tan θ , simplified form of $\cos^{-1}\left(\frac{x+x^{-1}}{x+x^{-1}}\right)$ is

(A) $\frac{\pi}{2}+2\tan^{-1}x$ $\quad$ **(B)** $\pi-2\tan^{-1}x$

(C) $2\tan^{-1}x$ $\quad (D)$ *none of these*

31.If x=log (1+y),then expansion of y in ascending powers of x is

(A) $x+\frac{x^2}{2!}+\frac{x^3}{3!}+......$ (B) $x-\frac{x^2}{2!}+\frac{x^3}{3!}-.....$

(C) $x+\frac{x^2}{2}-\frac{x^3}{3}+......$ (D) $-x-\frac{x^2}{2!}-\frac{x^3}{3!}-......$

TYPE-II: Taylor’s Theorem and Expansion of Functions:

32.The Taylor’s series expansion of f(x + h) in ascending powers of h is

(A) $f(x)+hf'(x)+\frac{h^2}{2!}f''(x)+......$ (B) $-f(x)-hf'(x)-\frac{h^2}{2!}f''(x)-.....$

(C) $f(0)+hf'(0)+\frac{h^2}{2!}f''(0)+......$ (D) $f(x)-hf'(x)+\frac{h^2}{2!}f''(x)-\frac{h^3}{3!}f'''(x)+......$

33.The Taylor’s series expansion of f(x + h) in ascending powers of x is

(A) $f(h)-xf'(h)+\frac{h^2}{2!}f''(h)-\frac{x^3}{3!}f'''(h)+......$ (B) $f(x)+hf'(x)+\frac{h^2}{2!}f''(x)+.....$

(C) $f(0)+xf'(0)+\frac{x^2}{2!}f''(0)+......$ **(D)** $f(h)+xf'(h)+\frac{x^2}{2!}f''(h)+......$

34.The Taylor’s series expansion of f(a + h) in ascending powers of h is

(A) $f(a)+hf'(a)+\frac{h^2}{2!}f''(a)+......$ (B) $f(h)+af'(h)+\frac{a^2}{2!}f''(h)+.....$

(C) $f(0)+hf'(0)+\frac{h^2}{2!}f''(0)+......$ (D) $f(a)-hf'(a)+\frac{h^2}{2!}f''(a)-\frac{h^3}{3!}f'''(a)+......$

35.Expansion of f(x) in ascending powers of (x-a) by Taylors theorem is

(A) $f(x)+af'(x)+\frac{a^2}{2!}f''(x)+......$

(B) $f(a)+(x-a)f'(a)+\frac{(x-a)^2}{2!}f''(a)+.....$

(C) $f(0)-(x-a)f'(0)+\frac{(x-a)^2}{2!}f''(0)-\frac{(x-a)^3}{3!}f'''(0)+......$

(D) $f(a)-(x-a)f'(a)+\frac{(x-a)^2}{2!}f''(a)-\frac{(x-a)^3}{3!}f'''(a)+......$

36.First two terms in expansion of log sec x by Taylor’s Theorem in ascending powers of (x-π/4) is

$(A)\ \frac{1}{2}\log 2-\left(x-\frac{\pi}{4}\right)+......$ $(B)\ \frac{1}{2}\log 2+\left(x-\frac{\pi}{4}\right)\frac{1}{2}......$

(C) $\frac{1}{2}\log 2+\left(x-\frac{\pi}{4}\right)......$ $(D)\ \frac{1}{2}\log 2-\left(x-\frac{\pi}{4}\right)\frac{1}{2}......$

37.First two terms in expansion of $\sqrt{x+h}$ by Taylor's Theorem in ascending powers of h is

$(A)\ \sqrt{x}+h\frac{1}{\sqrt{2}}-x+......$ $(B)\ \sqrt{x}-\frac{h}{2}\frac{1}{\sqrt{x}}+.....$

$(C)\ \frac{1}{\sqrt{x}}+\frac{h}{2}\frac{1}{\sqrt{x}}+......$ **(D)** $\sqrt{x}+\frac{h}{2}\frac{1}{\sqrt{x}}+......$

38.First two terms in expansion of log cos $\left(x+\frac{\pi}{4}\right)$ by Taylor's Theorem in ascending p

owers of x is

(A) $\log\frac{1}{\sqrt{2}}-x+......$ $(B)\ \log\frac{1}{\sqrt{2}}+x+.....$

$(C)\ \log\frac{\sqrt{3}}{2}-x+.....$.$(D)\ \log\frac{\sqrt{3}}{2}+x+......$

39.First two terms in expansion of $(x+2)^5$ +3$(x+2)^4$ by Taylor's Theorem in ascending powers of x is

$(A)\ 48+98x+......$ **(B)** $80+176x+.....$

$(C)\ 80+98x+......$ $(D)\ 48+176x+......$

40.First two terms in expansion of$(x-1)^5$ + 2$(x-1)^4$ by Taylor's Theorem in ascending powers of x is

$(A)\ 3-13x+......$ $(B)\ 1+13x+.....$

(C) $1-3x+......$ $(D)\ 3-3x+......$

41.First two terms in expansion of sinh (x+a) by Taylor's Theorem in ascending powers of x is

(A) $\sinh a+x\cosh a+......$ $(B)\ \sinh a-x\cosh a+.....$

$(C)\ \cosh a+x\sinh a+......$ (D) *none of these......*

42.First two terms in expansion f(x+2)+3$(x+2)^3$ + $(x+2)^4$ by Taylor's Theorem in ascending powers of x is

(A) $42+168x+......$ (B) $42+66x+.....$

(C) $42+69x+......$ (D) $40+69x+......$

43.First two terms in expansion of e^x by Taylor's Theorem in ascending

powers of (x-2) is

(A) $e^{-2}-e^2(x-2)+......$ (B) $e^{-2}+e^{-2}(x-2)+.....$

(C) $e^2-e^2(x-2)+......$ **(D)** $e^2+e^2(x-2)+......$

44.First two terms in expansion of tan^{-1} x by Taylor's Theorem in ascending powers of (x-1) is

(A) $\frac{\pi}{4}-\frac{1}{2}(x-1)+......$ **(B)** $\frac{\pi}{4}+\frac{1}{2}(x-1)+.....$

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

45.First two terms in expansion of sin x by Taylor's Theorem in ascending powers of $\left(x-\frac{\pi}{2}\right)$ is

(A) $\left(x-\frac{\pi}{2}\right)-\frac{1}{3!}\left(x-\frac{\pi}{2}\right)^3+......$ (B) $1+\frac{1}{2!}\left((x-\frac{\pi}{2})\right)^2+.....$

(C) $\left(x-\frac{\pi}{2}\right)+\frac{1}{3!}\left(x-\frac{\pi}{2}\right)^3+.....$ **(D)** $1-\frac{1}{2!}\left(x-\frac{\pi}{2}\right)^2+......$

46.First two terms in expansion of log cos x by Taylor's Theorem in ascending powers of $\left(x-\frac{\pi}{4}\right)$ is

(A) $\log\frac{1}{2}-\left(x-\frac{\pi}{4}\right)+......$ (B) $\log\frac{1}{\sqrt{2}}+\left(x-\frac{\pi}{4}\right)+......$

(C) $\log\frac{1}{\sqrt{2}}-\left(x-\frac{\pi}{4}\right)+......$ (D) $\log\frac{1}{2}+\left(x-\frac{\pi}{4}\right)+......$

47.First two terms in expansion of sin^{-1} x by Taylor's Theorem in ascending powers of $\left(x-\frac{1}{2}\right)$ is

(A) $\frac{\pi}{6}+\left(x-\frac{1}{2}\right)\frac{2}{\sqrt{3}}+......$ (B) $\frac{\pi}{6}-\left(x-\frac{1}{2}\right)\frac{2}{\sqrt{3}}+......$

(C) $\frac{\pi}{6}+\left(x-\frac{1}{2}\right)\frac{1}{\sqrt{2}}+......$ (D) $\frac{\pi}{6}-\left(x-\frac{1}{2}\right)\frac{1}{\sqrt{2}}+......$

48.First two terms in expansion of $x^{1/3}$ by Taylor's Theorem in ascending powers of (x-8) is

(A) $2-(x-8)\frac{1}{12}+......$ **(B)** $2+(x-8)\frac{1}{12}+.....$

(C) $2+(x-8)\frac{1}{24}+.....$ (D) $2-(x-8)\frac{1}{24}+......$

49.First two terms in expansion of $\sqrt{x+2}$ by Taylor's Theorem in ascending powers of (x-2) is

(A) $2+(x-2)\frac{1}{4}+......$ (B) $2-(x-2)\frac{1}{4}+.....$

(C) $2+(x-2)\frac{1}{8}+......$ (D) $2-(x-2)\frac{1}{8}+......$

50.In the Taylor's series expansion of e^x +sin x about the point x=π the coefficient of $(x-\pi)^2$ is

(A) e^{π} (B) $e^{\pi}+1$

(C) $e^{\pi}-1$ **(D)** $\frac{1}{2}e^{\pi}$

51. Which of the following functions will have only odd powers of x in its Taylor's series expansion about the point x=0 ?

(A) $\sin(x^2)$ **(B)** $\sin(x^3)$

(C) $\cos(x^2)$ (D) $\cos(x^3)$

INDETERMIONATE FORMS

TYPE-I :Indeterminate Forms $\left(\frac{0}{0}\ ,\frac{\infty}{\infty}\ ,0\times\infty\ ,\ \infty-\infty\right)$

52 If f(x) and g(x) be functions such that f(a)=0 and g(a) = 0 then $\lim_{x\to a}\frac{f(x)}{g(x)}$ is

is equal to ....

(A) $\lim_{x\to a}\frac{f'(x)}{g'(x)}$ (B) $\lim_{x\to a}\frac{g'(x)}{f'(x)}$ (C) $\frac{f(a)}{g(a)}$ (D)none of these

53 If f(x) and g(x) be functions such that f(a)=0,g(a)=0 and f'(a) = 0 then $\lim_{x\to a}\frac{f(x)}{g(x)}$ is equal to ....

(A) $\frac{f'(a)}{g'(a)}$ (B) $\lim_{x\to a}\frac{g'(x)}{f'(x)}$ **(C)** $\lim_{x\to a}\frac{f''(a)}{g''(x)}$ (D)none of these

54 If f(x) and g(x) be functions such that f(a)=∞ and g(a)=∞ then $\lim_{x\to a}\frac{f(x)}{g(x)}$ is equal to......

(A) $\lim_{x\to a}\frac{f'(x)}{g'(x)}$ (B) $\lim_{x\to a}\frac{g'(x)}{f'(x)}$ (C) $\frac{f(a)}{g(a)}$ (D)none of these

(55) $\lim_{x\to\pi/2}\ \frac{1-sinx}{cosx}$ *is equal to* ....

(A) 1 **(B)** 0 (C) $\frac{1}{2}$ (D) -1

(56) $\lim_{x\to 0}\frac{sinx}{x}$ is equal to

(A) 2 (B) 0 (C) -1 **(D)** 1

(57) $\lim_{x\to 0}\frac{tan}{x}$ is equal to

(A) 2 **(B)** -1 (C) $\frac{\pi}{2}$ (D) $\frac{3}{2}$

(58) $\lim_{x\to 0} \frac{sin^{-1}x}{x}$ is equal to

(A) 1 (B) -1 (C) $\frac{1}{2}$ (D) $\frac{\pi}{2}$

(59) $\lim_{x\to 0}$ (1+x)$^{1/x}$ is equal to

(A) 1 (B) e^2 (C) $\frac{1}{e}$ **(D)** e

(60) $\lim_{x\to 0}(1+\frac{1}{x})^{x}$ is equal to

(A) 1 **(B)** e (C) $\frac{1}{e}$ (D) e^2

(61) $\lim_{x\to 0}\frac{e^{x}-1}{x}$ is equal to

(A) 2 (B) $\frac{1}{2}$ **(C)** 1 (D) none of these

(62) $\lim_{x\to 0}\frac{a^{x}-1}{x}$ is equal to

(A) a (B) -log a **(C)** log a (D) 1

(63) $\lim_{\theta\to 0}\frac{\sin(\frac{\theta}{2})}{\theta}$ is equal to

(A) 1 ***(B)*** *2* *(C)* $\frac{1}{2}$ (D) not defined

(64) $\lim_{x\to 0}\frac{\sin \text{^}2x}{x}$ is equal to

(A) -1 (B)1 **(C)** 0 (D) not defined

(65) $\lim_{x\to 0}\frac{1-\cos x}{x}$ is equal to

(A) 0 (B) 1 (C)-1 (D) 2

(66) $\lim_{x\to 3}\frac{2x^2-7x+3}{5x^2-12x-9}$ is equal to

(A) $-\frac{1}{3}$ (B) $\frac{2}{5}$ **(C)** $\frac{5}{18}$ (D) 0

(67) $\lim_{x\to 0}\frac{a^{x}-b^{x}}{x}$ is equal to

(A) 0 (B)1 (C) $log\,\frac{b}{a}$ **(D)** $\log\,\frac{a}{b}$

(68) $\lim_{x\to 0}\ \frac{\sin^2 x}{xcosx}$ is equal to

(A) 0 (B) 1 (C) -1 (D) 2

(69) $\lim_{x\to 0}\ \frac{e^{ax}-e^{-ax}}{\log(1+bx)}$ is equal to

(A) $\frac{a}{2b}$ (B) 0 (C) $\frac{b}{2a}$ **(D)** $\frac{2a}{b}$

(70) $\lim_{x\to 0}\ \frac{(1+x^n)-1}{\mathrm{x}}$ is equal to

(A) n (B) 1 (C) e (D) 0

(71) $\lim_{x\to 0}\ \frac{2^x-1}{\sqrt{(1+\mathrm{x})}-1}$ is equal to

(A) log 2 (B) $\frac{1}{2}\,log2$ (C) 0 **(D)** 2 log 2

(72) if $\lim_{x\to 0}\ \frac{\sqrt{(1+x)}-\sqrt{(1-x)}}{x}$ is equal to

(A) 0 (B) -1 **(C)** 1 (D) 2

(73) if $\lim_{x\to 0}\ \frac{sin2x+psinx}{x^3}$ is finite then value of a is equal to

(A) -2 (B) 2 (C) 1 (D) -1

(74) if $\lim_{x\to 0}\ \frac{asinhx-5sinx}{x^3}$ is finite then value of a is equal to

(A)-5 **(B)** 5 (C) 0 (D) 10

(75) if $\lim_{x\to 0}\ \frac{asin2x+tanx}{x^3}$ is finite then value of a is equal to

(A)-2 (B) 2 **(C)** -1/2 (D) 1/2

(76) if $\lim_{x \to 0} \frac{2cosx-2+bx^2}{x^4}$ is finite then value of b is equal to

(A)2 (B) 0 **(C)** 1 (D) -1

(77) if $\lim_{x \to \pi/4} \frac{1-tanx}{1-\sqrt{2}\,sinx}$ is equal to

(A)2 (B) 0 (C) 1 (D) -2

(78) if $\lim_{x \to \infty} \frac{logx}{x^n}$ is equal to

(A)2 (B) -2 (C) 1 **(D)** 0

(79) if $\lim_{x \to \infty} \frac{\log(1+e^{3x})}{x}$ is equal to

(A)9 **(B)** 3 (C) 1/3 (D) 0

(80) if $\lim_{x \to 0}$ xlogx is equal to

(A)2 (B) -1 (C) 1 **(D)** 0

(81) if $\lim_{x \to \infty}$ $\mathrm{xsin}\frac{1}{x}$ x is equal to

(A)2 (B) 0 **(C)** 1 (D) -1

(82) $\lim_{x \to 1} (1-\mathrm{x})\tan\frac{\pi x}{2}$ is equal to

(A) $\frac{2}{\pi}$ (B) $0\,\frac{\pi}{2}$ (C) π (D) 0

(83) $\lim_{x \to \pi/2} (1-\mathrm{sinx})\tan x$ is equal to

(A) 1 (B) -1 (C) π **(D)** 0

(84) $\lim_{x \to \pi/2} (\mathrm{secx}-\mathrm{tanx})$is equal to

(A) 1 (B) -1 (C) π **(D)** 0

(85) $\lim\limits_{x \to \pi/2} \left(\text{xtanx} - \frac{\pi}{2} secx\right)$ is equal to

(A) 1 **(B)** -1 (C) π (D) 0

(86) $\lim\limits_{x \to \infty} \left(\text{x} - \text{x}^2 \log(1 + \frac{1}{x}\right)$ is equal to

(A) 1 (B) $-\frac{1}{2}$ **(C)** $\frac{1}{2}$ (D) 0

(87) $\lim\limits_{x \to 0} \left(\frac{1}{x} - \frac{1}{x^2} \log(1 + x)\right)$ is equal to

(A) 1 (B) $-\frac{1}{2}$ **(C)** $\frac{1}{2}$ (D) 0

(88) $\lim\limits_{x \to 0} \left(\frac{1}{x} - \frac{1}{sinx}\right)$ is equal to

(A) 1 (B) $-\frac{1}{2}$ (C) $\frac{1}{2}$ **(D)** 0

(89)$\lim\limits_{x \to 0} \left(\frac{1}{x} - \frac{1}{e^x - 1}\right)$ is equal to

(A) 1 (B) $-\frac{1}{2}$ **(C)** $\frac{1}{2}$ (D) 0

(90) $\lim\limits_{x \to \pi/2} \left(tanx - \frac{2x\, secx}{\pi}\right)$ is equal to

(A) $\frac{2}{\pi}$ (B) $-\frac{2}{\pi}$ (C) $\frac{\pi}{2}$ (D) 0

(91) $\lim\limits_{x \to 1} \left(\frac{x}{logx} - \frac{1}{logx}\right)$ is equal to

(A) -1 **(B)** 1 (C) $\frac{1}{2}$ (D) 0

TYPE -2

INDETERMINATE FORMS (0^0, ∞^0 , 1^∞):

(92) $\lim_{x\to\infty}\left(\frac{1}{x}\right)^{1/x}$ is equal to

(A) e (B)$-\frac{1}{2}$ (C) $\frac{1}{2}$ **(D)** 1

(93) $\lim_{x\to\pi/0}(\sin x)^{\tan x}$ is equal to

(A) 1 (B) e (C)-1 (D) $\frac{1}{e}$

(94) $\lim_{x\to\pi/2}(\cos x)^{\cos x}$ is equal to

(A) -1 (B) e **(C)** 1 (D) $\frac{1}{e}$

(95) $\lim_{x\to 0}(x)^{x}$ is equal to

(A) e **(B)** 1 (C) -1 (D) none of these

(96) $\lim_{x\to\infty}(x)^{1/x}$is equal to

(A) e (B)-1 **(C)** 1 (D) none of these

(97) $\lim_{x\to\pi/2}(\sec x)^{\cot x}$ is equal to

(A) e **(B)** 1 (C) $\frac{1}{e}$ (D) none of these

(98) $\lim_{x\to\infty}\left(1+\frac{a}{x}\right)^{x}$ is equal to

(A) e^{-a} **(B)** e^{a} (C) 1 (D) none of these

(99) $\lim_{x\to 1}(x)^{\frac{1}{x-1}}$ is equal to

(A) e (B)1 (C)-1 (D) none of these

(100) $\lim_{x\to 0}(cosx)^{1/x}$ is equal to

(A) e **(B)** 1 (C) -1 (D) none of these

(101) $\lim_{x\to 0}(cosx)^{\cot x}$ is equal to

(A) 1 (B) e (C) -1 (D) none of these

(102) $\lim_{x\to 1}(1-x^2)^{\frac{1}{\log(1-x)}}$ is equal to

(A) e (B) $\frac{1}{e}$ (C) 1 (D) e^2

(103) $\lim_{x\to 0}\left(\frac{\mathrm{a+x}}{\mathrm{a-x}}\right)^{1/x}$ is equal to

(A) $e^{2/a}$ (B) $e^{1/2a}$ (C) 1 (D) $e^{a/2}$

(104) $\lim_{x\to 0}(1+\sin \mathrm{x})^{\cot x}$ is equal to

(A) $e^{1/2}$ (B) e^2 (C) 1 **(D)** e

(105) $\lim_{x\to \pi/2}(\mathrm{cosec\ x})^{\tan x}$ is equal to

(A) e^{-1} (B) e^2 **(C)** 1 (D) e

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