

Differential Calculus-2
Model Exam Question paper - 2

11th Standard

Business Maths

Reg.No. :

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I. Answer all the questions

Time : 00:45:00 Hrs

Total Marks : 35

Part-A

7 x 1 = 7

- 1) $\lim_{x \rightarrow \pi/2} \frac{\sin x}{x} =$
(a) π (b) $\frac{\pi}{2}$ (c) $\frac{2}{\pi}$ (d) None of these
- 2) If $f(x) = \frac{x^2 - 36}{x - 6}$, then $f(x)$ is defined for all real values of x except when x is equal to
(a) 36 (b) 6 (c) 0 (d) None of these
- 3) The point of discontinuity for the function $\frac{2x^2 - 8}{x - 2}$ is
(a) 0 (b) 8 (c) 2 (d) 4
- 4) A function $f(x)$ is said to be continuous at $x = a$ if $\lim_{x \rightarrow a} f(x) =$
(a) $f(a)$ (b) $f(-a)$ (c) $2f(a)$ (d) $f(1/a)$
- 5) $\frac{d}{dx}(\tan^{-1} 2x)$ is
(a) $\frac{1}{1+x^2}$ (b) $\frac{2}{1+4x^2}$ (c) $\frac{2x^2}{1+4x^2}$ (d) $\frac{1}{1+4x^2}$
- 6) The derivative of $\sqrt[2]{x}$ with respect to x is
(a) $\sqrt{x}$ (b) $1/2\sqrt{x}$ (c) $1/\sqrt{x}$ (d) $1/4\sqrt{x}$
- 7) If $y = 2^x$, then $\frac{dy}{dx}$ is equal to
(a) $2^x \log 2$ (b) 2^x (c) $\log 2^x$ (d) $x \log 2$

Part-B

6 x 2 = 12

- 8) Evaluate the following limits
(viii) $\lim_{x \rightarrow 0} \frac{\sin 5x}{3x}$
- 9) Evaluate the following limits
(ix) $\lim_{x \rightarrow \infty} \frac{x-1}{x+1}$
- 10) Evaluate the following limits
(x) $\lim_{x \rightarrow 0} \frac{\tan 8x}{\sin 2x}$
- 11) Evaluate the following limits
(xii) $\lim_{x \rightarrow \infty} \frac{5x^2 + 3x - 6}{2x^2 - 5x + 1}$
- 12) Differentiate the following with respect to x .
(i) $3x^4 - 2x^3 + x + 8$
- 13) Differentiate the following with respect to x .
(ii) $\frac{5}{x^4} - \frac{2}{x^3} + \frac{5}{x}$

Part-C

2 x 3 = 6

- 14) Differentiate the following functions with respect to x .
(viii) $\cos(3x - 2)$
- 15) Differentiate the following functions with respect to x .
(x) $\log \cos x^2$

Part-D

2 x 5 = 10

- 16) Evaluate $\lim_{x \rightarrow \infty} \frac{6 - 5x^2}{4x + 15x^2}$
- 17) Show that $\lim_{n \rightarrow \infty} \frac{1^2 + 2^2 + 3^2 + \dots + n^2}{n^3} = \frac{1}{3}$
