Instructions

Q1. Which of the following statements is true for the function $f(x) = \begin{cases} x+3, & x \neq 0 \\ 1, & x = 0 \end{cases}$? **1 Mark**

A f(x) is continuous and differentiable $\forall\, x \in \mathbb{R}$
B f(x) is continuous $\forall\, x \in \mathbb{R}$
C f(x) is continuous and differentiable $\forall\, x \in \mathbb{R} - (0)$
D f(x) is discontinuous at infinitely many points

Q2. The value of k for which $f(x) = \begin{cases} 3x+5, & x \geq 2 \\ kx^2, & x < 2 \end{cases}$ is a continuous function, is: **1 Mark**

A $-\frac{11}{4}$ **B** $\frac{4}{11}$ **C** 11 **D** $\frac{11}{4}$

Q3. The number of points of discontinuity of f defined by $f(x)|x| - |x-1|$ is _____.

Q4. The function f(x) = |x| - x is:

A Continuous but not differentiable at x = 0.
B Continuous and differentiable at x = 0.
C Neither continuous nor differentiable at x = 0.
D Differentiable but not continuous at x = 0.

Q5. For what value of k may the function $\begin{cases} k(3x^2 - 5x), & x \leq 0 \\ \cos x, & x > 0 \end{cases}$ become continuous?

A 0 **B** 1 **C** $-\frac{1}{2}$ **D** No value

Q6. The value of k so that f defined by $f(x) = \begin{cases} x^2 \sin\left(\frac{1}{x}\right) & \text{if } x \neq 0 \\ k & \text{if } x = 0 \end{cases}$ is continuous at x = 0 is

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

Q7. The greatest integer function defined by f(x) = [x], 0 < x < 2 is not differentiable at x = _____.

Q8. The value of λ so that the function f defined by $f(x) = \begin{cases} \lambda x, & \text{if } x \leq \pi \\ \cos x & \text{if } x > \pi \end{cases}$ is continuous at $x = \pi$ is _____.

Q9. The function $f(x) = \frac{x-1}{x(x^2-1)}$ is discontinuous at

A Exactly one point. **B** Exactly two points. **C** Exactly three points. **D** No point.

Q10. The function f: R → R given by f(x) = – |x – 1| is:

A Continuous as well as differentiable at x = 1.
B Not continuous but differentiable at x = 1.
C Continuous but not differentiable at x = 1.
D Neither continuous nor differentiable at x = 1.

Q11. Let f(x) = |x| and g(x) = $|x^3|$, then: **1 Mark**

A f(x) and g(x) both are continuous at x = 0
B f(x) and g(x) both are differentiable at x = 0
C f(x) is differentiable but g(x) is not differentiable at x = 0
D f(x) and g(x) both are not differentiable at x = 0

Q12. The value of a for which the function $f(x) = \begin{cases} 5x - 4, & \text{if } 0 < x \leq 1 \\ 4x^2 + 3ax, & \text{if } < x < 2 \end{cases}$ is continuous at every point of its domain, is: **1 Mark**

A $\frac{13}{3}$ **B** 1 **C** 0 **D** -1

Q13. $f(x) = \begin{cases} \frac{\sqrt{1+px} - \sqrt{1-px}}{x}, & \text{if } 0 \leq x < 0 \\ \frac{2x+1}{x-2}, & \text{if } 0 \leq x \leq 1 \end{cases}$ is continuous in the interval [-1, 1], then p is equal to: **1 Mark**

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

Q14. **1 Mark**

The function $f\{x\}\begin{cases}1, & |x|\geq 1\\ \frac{1}{n^2}, & \frac{1}{n}<|x|<\frac{1}{n-1}, n=2,3,\ldots\end{cases}$

A Is discontinuous at finitely many points.
B Is continuous everywher.
C Is discontinuous only at $x=\pm\frac{1}{n}, n\in z-\{0\}$ and x = 0
D None of these.

Q15. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion: $f(x)=\begin{cases}x^2\sin\left(\frac{1}{x}\right), & x=0\\ 0, & x=0\end{cases}$ is continuous at x = 0.

Reason: Both $h(x)=x^2, g(x)=\begin{cases}x^2\sin\left(\frac{1}{x}\right), & x=0\\ 0, & x=0\end{cases}$ are continuous at x = 0.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true and R is not the correct explanation of A.
C A is true but R is false.
D R is true but A is false.

Q16. If $f(x)=\sqrt{1-\sqrt{1-x^2}}$, then f(x) is:

A Continuous on [-1, 1] and differentiable on (-1, 1)
B Continuous on [-1, 1] and differentiable on $(-1,0)\cup(0,1)$
C Continuous and differentiable on [-1, 1]
D None of these.

Q17. The function $f(x)=\begin{cases}\frac{e^{\frac{1}{x}}-1}{e^{\frac{1}{x}}+1}, & x\neq 0\\ 0, & x=0\end{cases}$

A Is continuous at x = 0
B Is not continuous at x = 0
C Is not continuous at x = 0, but can be made continuous at x = 0
D None of these.

Q18. Choose the correct answers from the given four options:

If $f(x)=\begin{cases}mx+1, & \text{if } x\leq\frac{\pi}{2}\\ \sin x+n, & \text{if } x>\frac{\pi}{2}\end{cases}$, is continuous at $x=\frac{\pi}{2}$, then:

A $m=1, n=0$
B $m=\frac{n\pi}{2}+1$
C $n=\frac{m\pi}{2}$
D $m=n=\frac{\pi}{2}$

Q19. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion(A): $f(x)=\sin x$ is continuous x = 0.

Reason(R): $\sin x$ is differentiable at x = 0.

A Both A and R are true and R is the correct explanation of A
B Both A and R are true but R is NOT the correct explanation of A
C A is true but R is false.
D A is false but R is true.

Q20. If $f(x)=\begin{cases}\frac{1}{1+e^{\frac{1}{x}}}, & x\neq 0\\ 0, & x=0\end{cases}$ then f(x) is:

A Continuous as well as differentiable at x = 0
B Continuous but not differentiable at x = 0
C Differentiable but not continuous at x = 0
D None of these.

Q21. The function $f(x)=\begin{cases}\frac{\sin 3x}{x}, & x\neq 0\\ \frac{k}{2}, & x=0\end{cases}$ is continuous at x = 0, then k = **1 Mark**

A 3 **B** 6 **C** 9 **D** 12

Q22. If $f(x)=\begin{cases}\frac{|x+2|}{\tan^{-1}(x+2)}, & x\neq -2\\ 2, & x=-2\end{cases}$, then f(x) is: **1 Mark**

A Continuous at x = -2
B Not continuous at x = -2
C Diffrentiable at x = -2
D Continuous but nit derivable at x = -2

Q23. If $f(x)=\begin{cases}\frac{1-\sin x}{(\pi-2x^2)}\times\frac{\log\sin x}{\log(1+\pi^2-4\pi x+4x^2)}, & x\neq\frac{\pi}{2}\\ k, & x=\frac{\pi}{2}\end{cases}$ is continuous at $x=\frac{\pi}{2}$, then k = **1 Mark**

A $-\frac{1}{16}$ **B** $-\frac{1}{32}$ **C** $-\frac{1}{64}$ **D** $-\frac{1}{28}$

Q24. Choose the correct answers from the given four options: **1 Mark**

The function $f(x) = \cot x$ is discontinuous on the set

A $\{x = n\pi : n \in Z\}$ **B** $\{x = 2n\pi : n \in Z\}$

C $\left\{x = (2n+1)\frac{\pi}{2}; n \in Z\right\}$ **D** $\left\{x = \frac{n\pi}{2}; n \in Z\right\}$

Q25. If $f(x) = \begin{cases} \frac{1-\cos x}{x \sin x}, & x \neq 0 \\ \frac{1}{2} & x = 0 \end{cases}$ then at x = 0, f(x) is: **1 Mark**

A Continuous and differentiable. **B** Differentiable but not continuous.

C Continuous but not differentiable. **D** Neither continuous not differentiale.

Q26. The value of f(0), so that the function $f(x) = \frac{2-(256-7x)^{\frac{1}{8}}}{(5x+32)^{\frac{1}{5}}-2}$, $x \neq 0$ is continuous everywhere, is given by: **1 Mark**

A -1 **B** 1 **C** 26 **D** None of these

Q27. The value of b for which the function $f(x) = \begin{cases} 5x-4, & 0 < x \leq 1 \\ 4x^2+3bx, & 1 < x < 2 \end{cases}$ is continuous at every point of its domain, is:

A -1 **B** 0 **C** $\frac{13}{3}$ **D** 1

Q28. If $f(x) = |\log_e |x||$, then:

A f(x) is continuous and differentiable for all x in its domain. **B** f(x) is continuous for all for all × in its domain but not differentiable at $x = \pm 1$

C f(x) is neither continuous nor differentiable at $x = \pm 1$ **D** None of these.

Q29. If $f(x) = \begin{cases} \frac{1-\cos 10x}{x^2}, & x < 0 \\ a, & x = 0 \\ \frac{\sqrt{x}}{\sqrt{625+\sqrt{x}}-25}, & x > 0 \end{cases}$ then the value of so that f(x) may be continuous at x = 0 is:

A 25 **B** 50 **C** -25 **D** None of these

Q30. Choose the correct answers from the given four options:

If f(x) = 2x and $g(x) = \frac{x^2}{2} + 1$, then which of the following can be a discontinuous function:

A $f(x) + g(x)$ **B** $f(x) - g(x)$

C $f(x) \cdot g(x)$ **D** $\frac{g(x)}{f(x)}$

Q31. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion(A): $f(x) = \tan^2 x$ is continuous at $x = \frac{\pi}{2}$

Reason(R): x^2 is continuous at $x = \frac{\pi}{2}$

A Both A and R are true and R is the correct explanation of A **B** Both A and R are true but R is NOT the correct explanation of A

C A is true but R is false. **D** A is false but R is true.

Q32. The function $f(x) = \tan x$ is discontinuous on the set: **1 Mark**

A $\{n\pi : n \in z\}$ **B** $\{2n\pi : n \in z\}$

C $\{(2n+1)\frac{\pi}{2} : n \in z\}$ **D** $\left\{\frac{n\pi}{2} : n \in z\right\}$

Q33. If f(x) = |3 − x| + (3 + x), where (x) denotes the least integer greater than or equal to x, then f(x) is: **1 Mark**

A Continuous and differentiable at x = 3 **B** Continuous but not differentiable at x = 3

C Differentiable nut not continuous at x = 3 **D** Neither differentiable nor continuous at x = 3

Q34. Choose the correct answers from the given four options: **1 Mark**

If $f(x) = x^2 \sin \frac{1}{x}$, where $x \neq 0$, then the value of the function f at x = 0, so that the function is continuous at x = 0, is:

A 0 **B** -1 **C** 1 **D** None of these

Q35. The function f(x) = x − [x], where [·] denotes the greatest integer function is: **1 Mark**

A Continuous everywhere.
B Continuous at integer points only.
C Continuous at non-integer points only.
D Differentiable everywhere.

Q36. If $f(x) = |\log_{10} x| fx = \log_{10} x$, then at x = 1: **1 Mark**

A f(x) is continuous and $f'(1^+) = \log_{10} e$
B f(x) is continuous and $f'(1^+) = \log_{10} e$
C f(x) is continuous and $f'(1^-) = -\log_{10} e$
D f(x) is continuous and $f'(1^-) = -\log_{10} e$

Q37. If $f(x) = \begin{cases} \frac{1-\sin^2 x}{3\cos^2 x}, & \text{if } x < \frac{\pi}{2} \\ a, & \text{if } x = \frac{\pi}{2} \\ \frac{b(1-\sin x)}{(\pi-2x)^2}, & \text{if } x > \frac{\pi}{2} \end{cases}$ Then f(x) is continuous at $x = \frac{\pi}{2}$, if: **1 Mark**

A $a = \frac{1}{3},\ b = 2$
B $a = \frac{1}{3},\ b = \frac{8}{3}$
C $a = \frac{2}{3},\ b = \frac{8}{3}$
D None of these

Q38. Let f(x) = (x + |x|) |x|. Then, for all x: **1 Mark**

A f is continuous.
B f is differentiable for some x
C f' is continuous.
D f'' is continuous.

Q39. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:
Assertion(A): Acontinuous funection is always differentiable.
Reason(R): Adifferentiable function is always continuous.

A Both A and R are true and R is the correct explanation of A
B Both A and R are true but R is NOT the correct explanation of A
C A is true but R is false.
D A is false but R is true.

Q40. If $f(x) = x \sin \frac{1}{x},\ x \neq 0$, then the value of the function at x = 0, so that the function is continuous at x = 0, is:

A 0 **B** -1 **C** 1 **D** Indeterminate

Q41. The function$f(x) = 1 + |\cos x|$ is:

A Continuous no where.
B Continuous everywhere.
C Not differentiable at x = 0
D Not differentiable at $x = n\pi, n \in Z$.

Q42. If f(x) defind by $f(x) = \begin{cases} \frac{|x^2-x|}{x^2-x}, & x \neq 0, 1 \\ 1, & x = 0 \\ -1, & x = 1 \end{cases}$ then f(x) is continuse for all:

A x
B x except at x = 0
C x except at x = 1
D x except at x = 0 and x = 1

Q43. Choose the correct answers from the given four options:
The function $f(x) = e^{|x|}$ is:

A Continuous everywhere but not differentiable at x = 0.
B Continuous and differentiable everywhere.
C Not continuous at x = 0.
D None of these.

Q44. The function $f(x) = \frac{x^3+x^2-16x+20}{x-2}$ is not defind for x = 2. in order to make f(x) continuous at x = 2, here f(2) should be defined as: **1 Mark**

A 0 **B** 1 **C** 2 **D** 3

Q45. Let $f(x) = \begin{cases} 1, & x \leq -1 \\ |x|, & -1 < x < 1 \\ 0, & x \geq 1 \end{cases}$ then, f is: **1 Mark**

A Continuous at x = -1
B Differentible at x = -1
C Everywhere continuous.
D Everywhere diffrentiable.

Q46. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion (A) The value of the constant 'k' so that $f(x) = \begin{cases} kx^2, \text{if } x \leq 2 \\ 3, \text{if } x > 2 \end{cases}$ is continuous at x = 2 is $k = \frac{4}{3}$

Reason(R) A function f(x) is continuous at a point x= a of its domain if $\lim_{x\to 0} f(x) = f(x)$

A Both A and R are true and R is the correct explanation of A

B Both A and R are true but R is NOT the correct explanation of A.

C A is true but R is false

D A is false but R is true

Q47. The value of k which makes $f(x) = \begin{cases} \sin\frac{1}{x}, & x \neq 0 \\ k, & x = 0 \end{cases}$ continuous at x = 0, is: **1 Mark**

A 8 **B** 1 **C** -1 **D** None of these

Q48. If $f(x) = (x+1)^{\cot x}$ be continuous at x = 0, then f(0) is equal to: **1 Mark**

A 0 **B** $\frac{1}{e}$ **C** e **D** None of these.

Q49. If $f(x) = \begin{cases} x\sin\frac{\pi}{2}(x+1), & x \leq 0 \\ \frac{\tan x - \sin x}{x^3}, & x > 0 \end{cases}$ is continuous at x = 0, then a equals: **1 Mark**

A $\frac{1}{2}$ **B** $\frac{1}{3}$ **C** $\frac{1}{4}$ **D** $\frac{1}{6}$

Q50. If the function f(x) defined by $f(x) = \begin{cases} \frac{\log(1+3x)-\log(1-2x)}{x}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at x = 0, then k =

A 1 **B** 5 **C** -1 **D** None of these.

Q51. Let f(x) = |x| + |x - 1|, then:

A f(x) is continuous at x = 0, as well as at x = 1

B f(x) is continuous at x = 0, but not at x = 1

C f(x) is continuous at x = 0, but not at x = 1

D None of these

Q52. The function $f(x) = \begin{cases} \frac{x^2}{a}, & 0 \leq x < 1 \\ a, & 1 \leq x < \sqrt{2} \\ \frac{2b^2-4b}{x^2}, & \sqrt{2} \leq x < \infty \end{cases}$ is continuous for $0 \leq x < \infty$, then the most suitable values of a and b are:

A $a = 1,\ b = -1$

B $a = -1,\ b = 1+\sqrt{2}$

C $a = -1,\ b = 1$

D None os these.

Q53. If the fucnction $f(x) = \begin{cases} (\cos x)^{\frac{1}{x}}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuouse at x = 0, then the value of k is:

A 0 **B** 1 **C** -1 **D** e

Q54. Let $f(x) = \begin{cases} \frac{x-4}{|x-4|} + a, & \text{if } x < 4 \\ a + b, & \text{if } x = 4 \\ \frac{x-4}{|x-4|} + b, & \text{if } x > 4 \end{cases}$ Then, f(x) is continus at x = 4 when:

A a = 0, b = 0 **B** a = 1, b = 1 **C** a = -1, b = 1 **D** a = 1, b = -1

Q55. If $f(x) = \begin{cases} ax^2 + b, & 0 \leq x < 1 \\ 4, & x = 1 \\ x + 3, & 1 < x \leq 2 \end{cases}$ then the value of (a, b) for which f(x) cannot be continuous at x = 1, is:

A (2, 2) **B** (3, 1) **C** (4, 0) **D** (5, 2)

Q56. The values of the constants a, b and for which the function $f(x) = \begin{cases} (1+ax)^{\frac{1}{x}}, & x > 0 \\ b, & x = 0 \\ \frac{(x+c)^{\frac{1}{2}}-1}{(x+1)^{\frac{1}{2}}-1}, & x > 0 \end{cases}$ may be continuous at x = 0, are: **1 Mark**

A $a = \log_e\left(\frac{2}{3}\right),\ b = -\frac{2}{3},\ c = 1$

B $a = \log_e\left(\frac{2}{3}\right),\ b = \frac{2}{3},\ c = -1$

C $a = \log_e\left(\frac{2}{3}\right),\ b = \left(\frac{2}{3}\right),\ c = 1$

D None of these

Q57. If $f(x) = |x - a|\ \phi(x)$, where $\phi(x)$ is continuous function, then: **1 Mark**

A $f'(a^+) = \phi(a)$

B $f'(a^-) = -\phi(a)$

C $f'(a^+) = f'(a^-)$

D None of these

Q58. Let $f(x) = |\cos x|$. Then, **1 Mark**

A f(x) is everywhere differentiable.

B f(x) is everywhere continuous but not differentiable at $x = n\pi, n \in Z$

C f(x) is everywhere continuous but not differentiable at $x = (2n+1)\frac{\pi}{2}, n \in Z.$

D None of these.

Q59. The value of f(0), so that the function $f(x) = \frac{\sqrt{a^2+ax+x^2}-\sqrt{a^2+ax+x^2}}{\sqrt{a+x}-\sqrt{a-x}}$ becomes continuous for all x, given by: **1 Mark**

A $a^{\frac{3}{2}}$

B $a^{\frac{1}{2}}$

C $-a^{\frac{1}{2}}$

D $-a^{\frac{3}{2}}$

Q60. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following: **1 Mark**

Assertion (A): $f(x) = \sin x$ is continuous for all $x \epsilon R$

Reason (R): $\sin x$ and x are continuous at on R.

A Both A and R are true and R is the correct explanation of A

B Both A and R are true but R is NOT the correct explanation of A

C A is true but R is false.

D A is false but R is true.

Q61. The function $f(x) = \sin^{-1}(\cos x)$ is:

A Discontinuous at x = 0

B Continuous at x = 0

C Differentiable at x = 0

D None of these.

Q62. If $f(x) = \begin{cases} \frac{\log(1+ax)-\log(1-bx)}{x}, & x \neq 0 \\ k, & x = 0 \end{cases}$ and f(x) is continous at x = 0, then the value of k is:

A a - b

B a + b

C $\log a + \log b$

D None of these.

Q63. If $f(x) = \frac{1}{1-x}$, then the set of points discontinuity of the function f(f(f(x))) is:

A {1}

B {0,1}

C {-1, 1}

D None of these

Q64. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion (A) f(x) = x - 1 + x - 2 is continuous but not differentiable at x = 1, 2.

Reason(R) Every differentiable function is continuous

A Both A and R are true and R is the correct explanation of A

B Both A and R are true but R is NOT the correct explanation of A.

C A is true but R is false

D A is false but R is true

Q65. The function f(x) = [x], where [x] denotes the greatest integer function, is continuous at:

A 4

B -2

C 1

D 1.5

Q66. If $f(x) = x^2 + \frac{x^2}{1+x^2} + \frac{x^2}{(1+x^2)} + \ldots + \frac{x^2}{(1+x^2)} + \ldots$, then at x = 0, f(x):

A Has not limit.

B Is discontinuous.

C Is continuous but not differentiable.

D Is differentiable.

Q67. If $f(x) = \begin{cases} \frac{\sin(\cos x)-\cos x}{(\pi-2x)^2}, & x \neq \frac{\pi}{2} \\ k, & x = \frac{\pi}{2} \end{cases}$ is continuous at $x = \frac{\pi}{2}$, then k is equal to: **1 Mark**

A 0

B $\frac{1}{2}$

C 1

D -1

Q68. The points of discontinuity of the function $f(x) = \begin{cases} \frac{1}{5}(2x^2+3), & x \leq 1 \\ 6-5x, & 1 < x < 3 \\ x-3, & x \geq 3 \end{cases}$ is (are): **1 Mark**

A x = 1

B x = 3

C x = 1, 3

D None of these

Q69. The value of a for which the function $f(x) = \begin{cases} \frac{(4^x-1)^3}{\sin\left(\frac{x}{a}\right)\log\left\{\left(1+\frac{x^2}{3}\right)\right\}}, & x \neq 0 \\ 12(\log 4)^3, & x = 0 \end{cases}$ may be continuous at x = 0 is: **1 Mark**

A 1 **B** 2 **C** 3 **D** None of these.

Q70. The function $f(x) = \frac{4-x^2}{4x-x^3}$ **1 Mark**

A Discontinuous at only one point.
B Discontinuous exactly at two points.
C Discontinuous exactly at three points.
D None of these.

Q71. If $f(x) = \begin{cases} \frac{\sin(a+1)}{x}, & x < 0 \\ c, & x = 0 \\ \frac{\sqrt{x+bx^2}-\sqrt{x}}{bx\sqrt{x}}, & x > 0 \end{cases}$ is continuouse at x = 0, then: **1 Mark**

A $a = -\frac{3}{2}, b = 0, c = \frac{1}{2}$
B $a = -\frac{3}{2}, b = 1, c = -\frac{1}{2}$
C $a = -\frac{3}{2}, b \in R - \{0\}, c = \frac{1}{2}$
D None of these.

Q72. The value of f(0), so that the function $f(x) = \frac{(27-2x)^{\frac{1}{3}}-3}{9-3(243+5x)^{\frac{1}{5}}}$ is continuous, is given by: **1 Mark**

A $\frac{2}{3}$ **B** 6 **C** 2 **D** 4

Q73. The function $f(x) = |\cos x|$ is:

A Everywhere continuous and differentiable.
B Everywhere continuous but not differentiable at $(2n+1)\frac{\pi}{2}, n \in Z$
C Neither continuous nor differentiable at $(2n+1)\frac{\pi}{2}, n \in Z$
D None of these.

Q74. If $f(x) = \begin{cases} \frac{36^x-9^x-4x+1}{\sqrt{2}-\sqrt{1+\cos x}}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at x = 0, these k equals:

A $16\sqrt{2}\log 2 \log 3$
B $16\sqrt{2}$ in 6
C $16\sqrt{2}$ in 6 in 3
D None of these

Q75. Choose the correct answers from the given four options:
The function $f(x) = \frac{4-x^2}{4x-x^3}$ is:

A Discontinuous at only one point.
B Discontinuous at exactly two points.
C Discontinuous at exactly three points.
D None of these.

Q76. If $f(x) = \frac{1-\sin x}{(\pi-2x)^2}$, when $x \neq \frac{\pi}{2} = \lambda$ then f(x) will be continuous function at $x = \frac{\pi}{2}$, where $\lambda =$

A $\frac{1}{8}$ **B** $\frac{1}{4}$ **C** $\frac{1}{2}$ **D** None of these

Q77. Function $f(x) = \cos x - 2\lambda x$ is monotonic decreasing when:

A $\lambda > \frac{1}{2}$
B $\lambda < \frac{1}{2}$
C $\lambda < 2$
D $\lambda > 2$

Q78. If $f(x) = \begin{cases} mx + 1, & x \leq \frac{\pi}{2} \\ \sin x + n, & n > \frac{\pi}{2} \end{cases}$ is continuous at $x = \frac{\pi}{2}$, then:

A $m = 1,\ n = 0$
B $m = \frac{n\pi}{2} + 1$
C $n = \frac{m\pi}{2}$
D $m = n = \frac{\pi}{2}$

Q79. The function $f(x) = |\cos x|$ is: **1 Mark**

A Differentiable at$x = (2n+1)\frac{\pi}{2}, n \in Z$
B Continuous but not differentiable at $x = (2n+1)\frac{\pi}{2}, n \in Z$
C Neither differentiable nor continuous at $x = n \in Z$
D None of these.

Q80. If the function $f(x) = \frac{2x-\sin^{-1}x}{2x+\tan^{-1}x}$ is continuous at each point of its domain, then the value of f(0) is:

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