

Topics : Solution of Triangle, Application of Derivatives, Straight Line

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q.1,2,3,4

(3 marks, 3 min.)

[12, 12]

Multiple choice objective (no negative marking) Q.5,6

(5 marks, 4 min.)

[10, 8]

Subjective Questions (no negative marking) Q.7,8

(4 marks, 5 min.)

[8, 10]

- In a $\triangle ABC$, $a = 5$, $b = 4$ and $\tan \frac{C}{2} = \sqrt{\frac{7}{9}}$, then the side c is equal to
(A) 2 (B) 3 (C) 6 (D) None of these
- In a triangle ABC , if $a^3 \cos(B - C) + b^3 \cos(C - A) + c^3 \cos(A - B) = \lambda abc$, then ' λ ' is equal to
(A) 1 (B) 2 (C) 3 (D) None of these
- With usual notations, in a $\triangle ABC$ $\frac{r_1}{(s-b)(s-c)} + \frac{r_2}{(s-c)(s-a)} + \frac{r_3}{(s-a)(s-b)}$ is equal to
(A) $\frac{1}{r}$ (B) $\frac{2}{r}$ (C) $\frac{3}{r}$ (D) $\frac{4}{r}$
- Let $f(x) = \begin{cases} \sin \frac{\pi x}{2}, & 0 \leq x < 1 \\ 3 - 2x, & x \geq 1 \end{cases}$ then :
(A) $f(x)$ has local maxima at $x = 1$
(B) $f(x)$ has local minima at $x = 1$
(C) $f(x)$ does not have any local extrema at $x = 1$
(D) $f(x)$ has a global minima at $x = 1$
- In a $\triangle ABC$, if $a + b = 3c$, then $\cos A + \cos B$ is equal to
(A) $3\cos C$ (B) $6\sin^2 \frac{C}{2}$ (C) $3\cos(A + B)$ (D) $3 + 3\cos(A + B)$
- If $H \equiv (3, 4)$ and $C \equiv (1, 2)$ are orthocentre and circumcentre of $\triangle PQR$ and equation of side PQ is $x - y + 7 = 0$, then
(A) equation of circum circle $(x - 1)^2 + (y - 2)^2 = 80$
(B) equation of circum circle $(x - 1)^2 + (y - 2)^2 = 70$
(C) centroid is $\left(\frac{5}{3}, \frac{8}{3}\right)$
(D) circumradius = $\sqrt{70}$
- The function $f(x) = \sqrt{ax^3 + bx^2 + cx + d}$ has its non zero local minimum and maximum values at $x = -2$ and $x = 2$ respectively. If a is a root of the equation $x^2 - x - 6 = 0$. Find all possible values of a , b , c , and d .
- Let $f(x) = \begin{cases} |x - 2| + a^2 - 9a - 9 & \text{if } x < 2 \\ 2x - 3 & \text{if } x \geq 2 \end{cases}$
Then find the value of ' a ' for which $f(x)$ has local minimum at $x = 2$

Answers Key

1. (C) 2. (C) 3. (C) 4. (A)
5. (B)(D) 6. (A)(C) 7. $a = -2, b = 0, c = 24, d > 32$
8. $(-\infty, -1] \cup [10, \infty)$