1. In ΔABC, if $\frac{(a+b)\cos C+(a+c)\cos B+(b+c)\cos A}{\sin A+\sin B+\sin C}=100$, then area of circumcircle of ΔABC is

(A) 2500π (B) 25000π (C) 1000π (D) 10000π

2. In ΔABC, if $\sin^2A + \sin^2B = \sin^2C$, then the triangle is -

(A) equilateral (B) isosceles (C) right angled (D) None of these

3. In ΔABC, $b = 4$, $c = 3$ & $\tan\left(\frac{B-C}{2}\right)=\frac{\sqrt{3}}{7}$, then area of ΔABC is

(A) $\sqrt{3}$ (B) $2\sqrt{3}$ (C) $3\sqrt{3}$ (D) $4\sqrt{3}$

4. In ΔABC with usual notations the value of $\sum(a-b)\cot\frac{C}{2}$ is

(A) 0 (B) $\sum\tan\frac{A}{2}$ (C) $(a^2+b^2+c^2)$ (D) 1

5. In any triangle ABC, $\frac{\tan\frac{A}{2}-\tan\frac{B}{2}}{\tan\frac{A}{2}+\tan\frac{B}{2}}=$

(A) $\frac{a-b}{a+b}$ (B) $\frac{a-b}{c}$ (C) $\frac{a-b}{a+b+c}$ (D) $\frac{c}{a+b}$

6. If the area of a triangle ABC is given by $\Delta = a^2 - (b - c)^2$, then $\tan\left(\frac{A}{2}\right)$ is equal to

(A) -1 (B) 0 (C) $\frac{1}{4}$ (D) $\frac{1}{2}$

7. If $\frac{\cos A}{a}=\frac{\cos B}{b}=\frac{\cos C}{c}$ and the side $a = 2$, then area of triangle is

(A) 1 (B) 2 (C) $\frac{\sqrt{3}}{2}$ (D) $\sqrt{3}$

8. The expression $\frac{(a+b+c)(b+c-a)(c+a-b)(a+b-c)}{4b^2c^2}$ is equal to

(A) $\cos^2 A$ (B) $\sin^2 A$ (C) cosA cosB cosC (D) None of these

9. If b + c = 3a, then the value of $\cot\left(\frac{B}{2}\right)$ $\cot\left(\frac{C}{2}\right)$ is equal to

(A) 1 (B) 2 (C) $\sqrt{3}$ (D) $\sqrt{2}$

10. If in a triangle ABC, cos A cos B + sin A sin B sin C = 1, then the side are proportional to

(A) $1:1:\sqrt{2}$ (B) $1:\sqrt{2}:1$ (C) $\sqrt{2}:1:1$ (D) None of these

11. Let A, B, C are three angles such that cosA + cosB + cosC = 0 and if cosA . cosB . cosC = λ (cos 3A + cos 3B + cos 3C), then λ is equal to

(A) 1/3 (B) 1/6 (C) 1/9 (D)1/12

12. In any ΔABC, if $\cot\frac{A}{2}$, $\cot\frac{B}{2}$, $\cot\frac{C}{2}$ are in A.P. then a, b, c are in

(A) A.P. (B) G.P. (C) H.P. (D) none of these

13. In ΔABC, a cos (B – C) + b cos (C – A) + c cos (A – B) (where a, b, c are sides of Δ) equals

(A) $\frac{abc}{R^2}$ (B) $\frac{abc}{4R^2}$ (C) $\frac{4abc}{R^2}$ (D) None

14. In a ΔABC if ∠A = 60°, $\frac{b}{c}=\frac{\sqrt{3}+1}{2}$ then ∠B – ∠C has value equal to

(A) 15° (B) 30° (C) 22.5° (D) 45°

15. In a triangle ABC, bc $\cos^2\frac{A}{2}$ + ca $\cos^2\frac{B}{2}$ + ab $\cos^2\frac{C}{2}$ =

(A) $(s-a)^2$ (B) $(s-b)^2$ (C) $(s-c)^2$ (D) s^2

[SUBJECTIVE TYPE]

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16. In ΔABC if $\frac{s-a}{2}=\frac{s-b}{3}=\frac{s-c}{4}$, then the value of (140)s$\left(\frac{\cos A}{a}+\frac{\cos B}{b}+\frac{\cos C}{c}\right)$ is

(where s is semi perimeter of ΔABC)

17. Let three sides of a triangle are three consecutive integers and largest angle is double of smallest angle, then length of largest side is equal to

18. With usual notations, if in a ΔABC we have $\frac{b+c}{11}=\frac{c+a}{12}=\frac{a+b}{13}$, then prove that $\frac{\cos A}{7}=\frac{\cos B}{19}=\frac{\cos C}{25}$.

19. In any ΔABC, prove that: $2\left(a\sin^2\frac{C}{2}+c\sin^2\frac{A}{2}\right)=a+c-b$

20. In any ΔABC, prove that: $4\left(bc\cos^2\frac{A}{2}+ca\cos^2\frac{B}{2}+ab\cos^2\frac{C}{2}\right)=(a+b+c)^2$

Answers

RACE # 38

1. (A) **2.** (C) **3.** (C) **4.** (A) **5.** (B) **6.** (C) **7.** (D) **8.** (B) **9.** (B) **10.** (A)
11. (D) **12.** (A) **13.** (A) **14.** (B) **15.** (D) **16.** 330 **17.** 6