Saitech Unit Test - Trigonometric Formulas

Section A: Multiple Choice Questions (1 mark each)

1. If $\sin A = \frac{3}{5}$, then $\sin 2A$ is:
   a) $\frac{12}{25}$
   b) $\frac{24}{25}$
   c) $\frac{6}{25}$
   d) $\frac{9}{25}$
2. If $\cos A = \frac{4}{5}$, then $\cos 2A$ is:
   a) $\frac{7}{25}$
   b) $\frac{16}{25}$
   c) $\frac{9}{25}$
   d) $\frac{12}{25}$
3. The value of $\tan 2A$ when $\tan A = 2$ is:
   a) $\frac{4}{3}$
   b) $\frac{5}{3}$
   c) $\frac{6}{3}$
   d) $\frac{8}{3}$
4. If $\sin A = \frac{1}{3}$, then $\sin 3A$ is:
   a) $\frac{1}{9}$
   b) $\frac{3\sqrt{8}}{27}$
   c) $\frac{8}{27}$
   d) $\frac{7}{27}$
5. If $\cos A = \frac{1}{2}$, then $\cos 3A$ is:
   a) $\frac{1}{8}$
   b) $\frac{1}{4}$
   c) $\frac{1}{2}$
   d) $\frac{3}{8}$
6. The value of $\tan 3A$ when $\tan A = 1$ is:
   a) $\frac{1}{3}$
   b) $\frac{3}{2}$
   c) 3
   d) $\frac{3}{4}$
7. The formula for $\sin 2A$ is:
   a) $2 \sin A \cos A$

b) $\sin^2 A - \cos^2 A$
c) $1 - 2\cos^2 A$
d) $2\sin A - \cos A$

8. The formula for $\cos 2A$ is:
a) $2\cos^2 A - 1$
b) $\cos^2 A - \sin^2 A$
c) $1 - 2\sin^2 A$
d) All of the above

9. The formula for $\tan 2A$ is:
a) $\frac{2\tan A}{1-\tan^2 A}$
b) $\frac{\tan A}{1-\tan^2 A}$
c) $\frac{2\tan A}{1+\tan^2 A}$
d) $\frac{\tan A}{1+\tan^2 A}$

10. If $\sin A = \frac{4}{5}$, then $\sin \frac{A}{2}$ is:
a) $\frac{1}{2}$
b) $\frac{2}{3}$
c) $\frac{\sqrt{5-\sqrt{21}}}{2}$
d) $\frac{\sqrt{5+\sqrt{21}}}{2}$

11. If $\cos A = \frac{3}{5}$, then $\cos \frac{A}{2}$ is:
a) $\frac{2}{3}$
b) $\frac{3}{4}$
c) $\frac{\sqrt{5+\sqrt{11}}}{2}$
d) $\frac{\sqrt{5-\sqrt{11}}}{2}$

12. The value of $\tan \frac{A}{2}$ when $\tan A = 3$ is:
a) $\frac{1}{2}$
b) $\sqrt{2}$
c) $\frac{3}{2}$
d) 2

13. The formula for $\sin 3A$ is:
a) $3\sin A - 4\sin^3 A$
b) $4\sin^3 A - 3\sin A$
c) $3\sin^2 A - 4\sin^3 A$
d) $\sin^3 A - 3\sin A$

14. The formula for $\cos 3A$ is:
a) $4\cos^3 A - 3\cos A$
b) $3\cos A - 4\cos^3 A$
c) $3\cos^2 A - 4\cos^3 A$
d) $\cos^3 A - 3\cos A$

15. The formula for $\tan 3A$ is:
a) $\frac{3\tan A - \tan^3 A}{1-3\tan^2 A}$
b) $\frac{3\tan A + \tan^3 A}{1-\tan^2 A}$
c) $\frac{3\tan A - \tan^3 A}{1-\tan^3 A}$
d) $\frac{\tan A - 3\tan^3 A}{1-3\tan^2 A}$

16. If $\sin A = \frac{5}{13}$, then $\cos 2A$ is:
    a) $\frac{119}{169}$
    b) $\frac{120}{169}$
    c) $\frac{121}{169}$
    d) $\frac{122}{169}$
17. If $\cos A = \frac{12}{13}$, then $\sin 2A$ is:
    a) $\frac{120}{169}$
    b) $\frac{119}{169}$
    c) $\frac{121}{169}$
    d) $\frac{122}{169}$
18. The value of $\tan 2A$ when $\tan A = \frac{5}{12}$ is:
    a) $\frac{5}{12}$
    b) $\frac{10}{12}$
    c) $\frac{10}{24}$
    d) $\frac{10}{7}$
19. If $\sin A = \frac{7}{25}$, then $\sin 3A$ is:
    a) $\frac{3}{125}$
    b) $\frac{63}{125}$
    c) $\frac{27}{125}$
    d) $\frac{8}{125}$
20. If $\cos A = \frac{9}{25}$, then $\cos 3A$ is:
    a) $\frac{97}{125}$
    b) $\frac{98}{125}$
    c) $\frac{99}{125}$
    d) $\frac{100}{125}$
21. The value of $\tan 3A$ when $\tan A = \frac{7}{24}$ is:
    a) $\frac{7}{8}$
    b) $\frac{21}{24}$
    c) $\frac{21}{72}$
    d) $\frac{21}{23}$
22. The value of $\sin \frac{A}{2}$ when $\sin A = \frac{12}{13}$ is:
    a) $\frac{5}{6}$
    b) $\frac{6}{5}$
    c) $\frac{\sqrt{13+12}}{2}$
    d) $\frac{\sqrt{13-12}}{2}$
23. The value of $\cos \frac{A}{2}$ when $\cos A = \frac{15}{17}$ is:
    a) $\frac{7}{8}$
    b) $\frac{8}{7}$
    c) $\frac{\sqrt{17+15}}{2}$
    d) $\frac{\sqrt{17-15}}{2}$
24. The value of $\tan \frac{A}{2}$ when $\tan A = \frac{15}{8}$ is: