Используя метод разделения переменных, найти решение однородного волнового уравнения $u_{tt} = a^2 u_{xx}$, $0 < x < l$, $t > 0$ при следующих граничных и начальных условиях:

1. $u(0,t) = u(l,t) = 0$,
   $u(x,0) = sin\frac{\pi}{l}x + sin\frac{3\pi}{l}x$, $u_t(x,0) = 0$.

2. $u_x(0,t) = u(l,t) = 0$,
   $u(x,0) = 0$, $u_t(x,0) = 1$.

3. $u(0,t) = u_x(l,t) = 0$,
   $u(x,0) = sin\frac{\pi}{2l}x + sin\frac{3\pi}{2l}x$, $u_t(x,0) = 0$.

4. $u_x(0,t) = u_x(l,t) = 0$,
   $u(x,0) = 1$, $u_t(x,0) = 1$.

5. $u(0,t) = u(l,t) = 0$,
   $u(x,0) = sin\frac{2\pi}{l}x$, $u_t(x,0) = 1$.

6. $u_x(0,t) = u_x(l,t) = 0$,
   $u(x,0) = 0$, $u_t(x,0) = 1 + cos\frac{\pi}{l}x + cos\frac{3\pi}{l}x$.

7. $u_x(0,t) = u(l,t) = 0$,
   $u(x,0) = 0$, $u_t(x,0) = cos\frac{\pi}{2l}x + cos\frac{5\pi}{2l}x$.

8. $u(0,t) = u_x(l,t) = 0$,
   $u(x,0) = sin\frac{5\pi}{2l}x$, $u_t(x,0) = 1$.

9. $u_x(0,t) = u_x(l,t) = 0$,
   $u(x,0) = U = const$, $u_t(x,0) = V = const$.

10. $u(0,t) = u(l,t) = 0$,
    $u(x,0) = 0$, $u_t(x,0) = 1$.

11. $u_x(0,t) = u(l,t) = 0$,
    $u(x,0) = cos\frac{3\pi}{2l}x$, $u_t(x,0) = 1$.

12. $u_x(0,t) = u_x(l,t) = 0$,
    $u(x,0) = 1$, $u_t(x,0) = 2 + cos\frac{\pi}{l}x$.

13. $u(0,t) = u(l,t) = 0$,
    $u(x,0) = sin\frac{\pi}{l}x$, $u_t(x,0) = sin\frac{\pi}{l}x + sin\frac{3\pi}{l}x$.

14. $u_x(0,t) = u(l,t) = 0$,
    $u(x,0) = cos\frac{\pi}{2l}x + cos\frac{3\pi}{2l}x$, $u_t(x,0) = cos\frac{3\pi}{2l}x$.

15. $u(0,t) = u_x(l,t) = 0$,
    $u(x,0) = sin\frac{\pi}{2l}x$, $u_t(x,0) = sin\frac{\pi}{2l}x + sin\frac{3\pi}{2l}x$.

16. $u_x(0,t) = u_x(l,t) = 0$,
    $u(x,0) = 2 + cos\frac{\pi}{l}x$, $u_t(x,0) = 1 + cos\frac{2\pi}{l}x$.

17. $u(0,t) = u(l,t) = 0$,
    $u(x,0) = sin\frac{2\pi}{l}x$, $u_t(x,0) = x$.

18. $u_x(0,t) = u(l,t) = 0$,
    $u(x,0) = 0$, $u_t(x,0) = cos\frac{3\pi}{2l}x + cos\frac{5\pi}{2l}x$.

19. $u_x(0,t) = u_x(l,t) = 0$,
    $u(x,0) = 1 + cos\frac{2\pi}{l}x$, $u_t(x,0) = cos\frac{\pi}{l}x + cos\frac{2\pi}{l}x$.

20. $u(0,t) = u(l,t) = 0$,
    $u(x,0) = sin\frac{2\pi}{l}x + sin\frac{3\pi}{l}x$, $u_t(x,0) = sin\frac{2\pi}{l}x$.