

**M1.(a)** (i) Correct formula ✓,  
substitution ✓,  
calculation, 50 ✓, 3

(ii) Correct circuit (non-inverting) ✓,  
Variable element in a correct place ✓,  
Appropriate values (1kΩ - 10MΩ) (gain of 10 to ≈100) (must work as an  
amplifier) ✓ 3

(b) (i) Correct circuit (summing amp) ✓,  
Appropriate resistor values (1kΩ - 10MΩ) ✓,  
Appropriate gain (0.1 - 3) ✓ 3

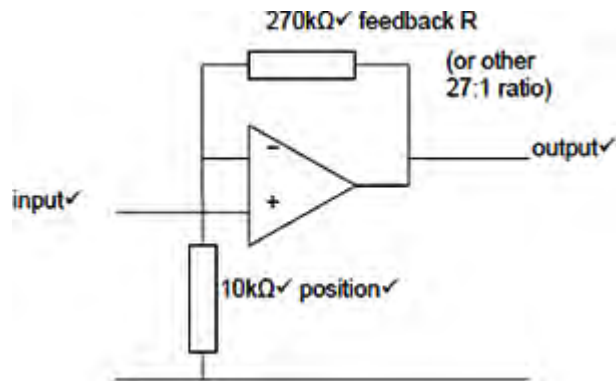
(ii) Signals out of phase, inverted ✓,  
so when added they cancel ✓ 2

[11]

**M2.(a)** (i) so it does not load the demodulator ✓ 1

(ii) non-inverting amplifier ✓ 1

(iii)



5

(iv)  $10\text{mV} \times +28 \checkmark = 280\text{mV} \checkmark$

2

(b)  $(1 \times 10^6) \div 28 = 35.7\text{kHz} \checkmark \checkmark$   
 suitable for audio sigs (max 20kHz)  $\checkmark$

3

- (c) push-pull source follower diagram  $\checkmark$   
 correct n channel symbol upper  $\checkmark$   
 correct p channel symbol lower  $\checkmark$   
 diode / resistor biasing  $\checkmark$

4

[16]