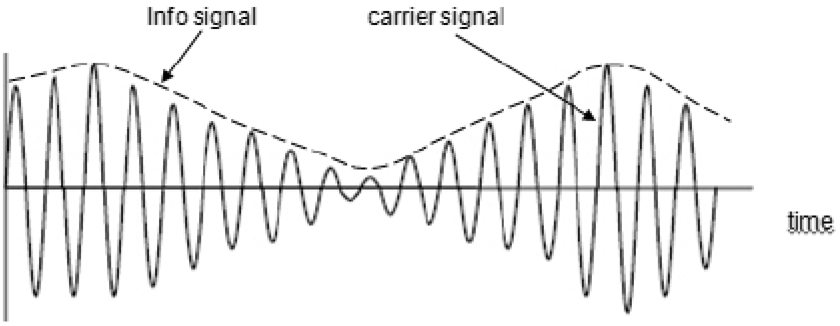
M1.(a) amplitude of carrier varies in phase with information / audio signal ✓
accept labelled diagram in support



1

(b) 2 x 2.2 kHz = 4.4 kHz ✓

1

(c) requires a large bandwidth so would limit the number of channels / stations if low frequency carriers were used✓

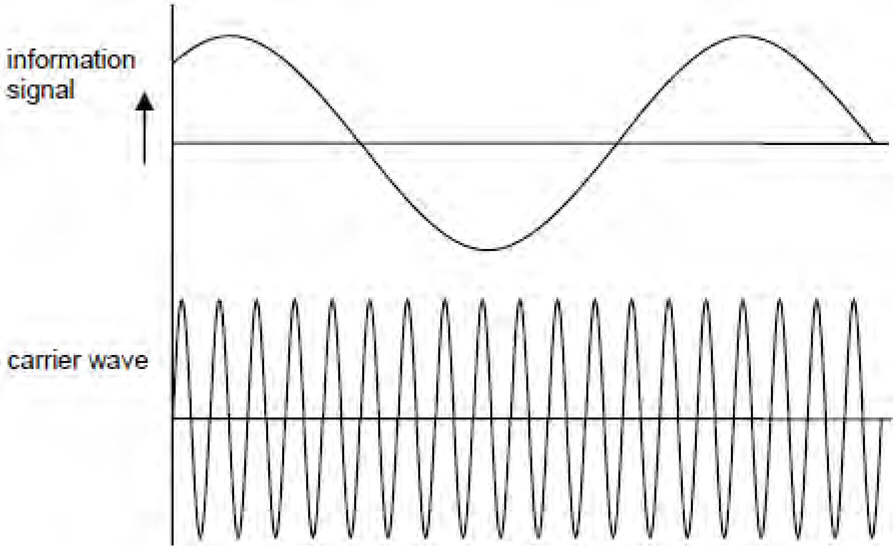
1

(d) Noise distorts the amplitude of signals which is difficult to reduce in am✓
In fm the original signal can be recovered as long as the frequencies in the BW are detectable since no information in the amplitude. ✓
In AM receivers signals and noise are amplified equally.
ANY TWO

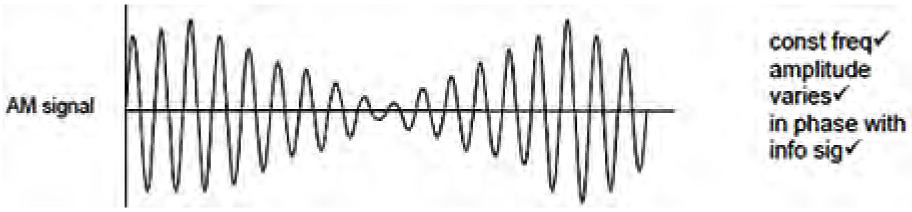
2

[5]

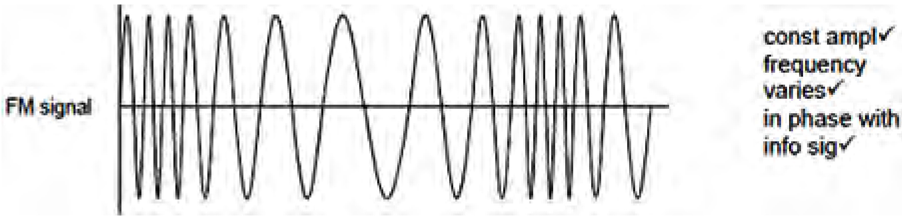
M2.(a)



(i)



(ii)



6

(b) (i) 2 × 3 kHz = 6kHz✓

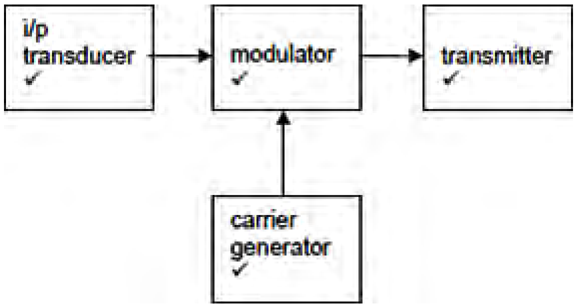
1

(ii) 2(3 + 5)✓ = 16kHz✓

2

[9]

M3.(a)



4

(b) (i) carrier generator✓ 1

(ii) use of $f = 1 \div 2\pi\sqrt{LC}$✓

$1 \div 2\pi\sqrt{10^{-7} \times 5 \times 10^{-12}}$ ✓

225 MHz✓ 3

(c) calc leading to λ = 1.32m✓

1.33 ÷ 2 = 0.66m✓ 2

[10]