

Soalan Subjektif

10.1

Ciri-ciri Gelombang Bunyi Characteristics of Sound Waves

Buku Teks: m.s. 224 – 228

1. Nyatakan ciri-ciri gelombang bunyi. **1P** (1)
State the characteristics of sound waves.

- _____ be reflected by objects
- Move _____ in solids, followed by liquids and gases
- _____ be absorbed by objects
- Move _____ than light
- _____ move through vacuum
- _____ move through solids, liquids and gases.

Pemindahan Bunyi
Transfer of Sound

2. Nyatakan sama ada pernyataan di bawah **BENAR** atau **PALSU**. **TP 2**
State whether the statements below are TRUE or FALSE.

- (a) Bunyi tidak boleh didengar dalam persekitaran vakum.
Sound cannot be heard in a vacuum surrounding.
- (b) Kelajuan pemindahan bunyi dalam cecair lebih tinggi berbanding dalam gas.
The speed of sound in liquids is higher than in gases.
- (c) Bunyi dipindahkan dengan cepat melalui pepejal kerana zarah-zarahnya yang tersusun rapat.
Sound is transferred faster in solids because the particles are close to each other.
- (d) Kepingan asbestos memantulkan bunyi dengan baik.
Asbestos board is a good reflector of sound.
- (e) Bunyi merambat lebih cepat daripada cahaya.
Sound propagates faster than light.

3. Jadual 1 menunjukkan kelajuan bunyi dalam medium yang berbeza.
Table 1 shows the speed of sound in different medium.

Jadual 1 / Table 1

Medium	Kelajuan bunyi / Speed of sound ($m s^{-1}$)
Udara / Air	330
Air / Water	1 400
Kaca / Glass	3 900
Besi / Iron	5 000

(a) Apakah inferens yang boleh anda buat daripada data yang diberikan? **TP 5**
What are the inference that you can made from the given data?

KBAT Menilai

Sound is transferred the fastest in , followed by in and

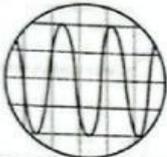
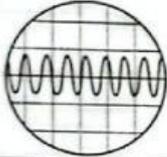
(b) Huraikan jawapan anda di 3(a). **TP 4**
Elaborate your answer in 3(a).

KBAT Menganalisis

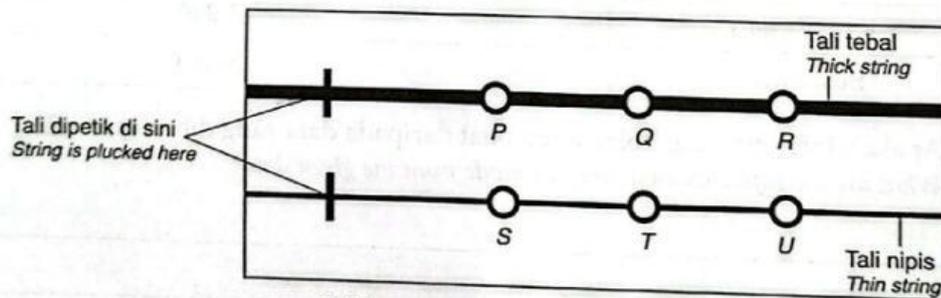
The closer the particles are to each other and the tighter their bonds, the time taken to transfer the to each other. Since the particles in solid are together and more tightly bonded, then the sound transfer with speed through solids than through liquids and gases.

less closer high waves sound

1. Bandingkan kedua-dua gelombang bunyi di bawah dan lengkapkan jadual yang diberikan. **TP 3**
 Compare the two sound waves below and complete the table given.

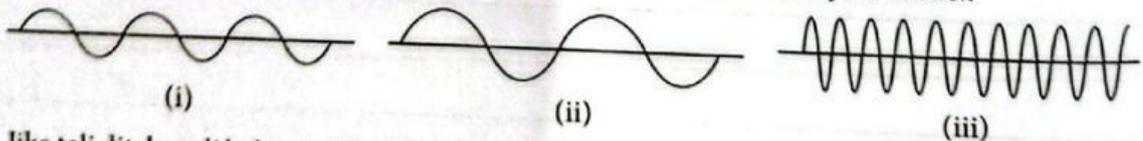
	Frekuensi gelombang bunyi <i>Frequency of sound wave</i>	Kelangsingan bunyi <i>Pitch of sound</i>	Amplitud gelombang bunyi <i>Amplitude of sound wave</i>	Kenyaringan bunyi <i>Loudness of sound</i>
	(a)	(b)	(c)	(d)
	(e)	(f)	(g)	(h)

2. Rajah 1 menunjukkan ilustrasi tali gitar. Tali pendek dan nipis menghasilkan bunyi yang kuat dan berkelangsingan tinggi. Tali panjang dan tebal menghasilkan bunyi yang perlahan dan berkelangsingan rendah. Berdasarkan informasi tersebut, jawab soalan di bawah.
 Diagram 1 shows an illustration of guitar strings. A short and thin string produces strong and high pitched sounds. The long and thick string produces slow and low pitched sounds. Based on the information, answer the question below.

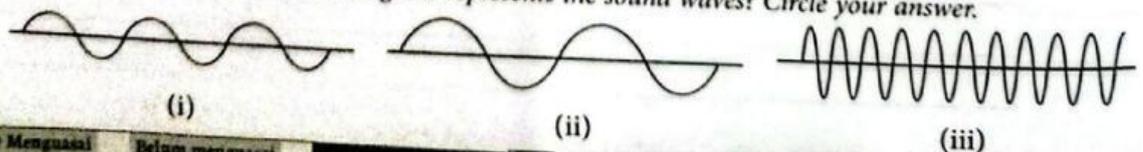


Rajah 1 / Diagram 1

- (a) Jika tali ditekan di bahagian R, rajah yang manakah mewakili bunyi yang dihasilkan? Bulatkan jawapan anda. **TP 4**
 If the string is hold at R, which diagram represents the sound wave? Circle your answer.



- (b) Jika tali ditekan di bahagian S, rajah yang manakah mewakili bunyi yang dihasilkan? Bulatkan jawapan anda.
 If the string is hold at S, which diagram represents the sound waves? Circle your answer.



Kesan Doppler
Doppler Effect

3. Dean sedang berdiri di perhentian bas apabila sebuah kereta polis lalu sambil membunyikan siren. Dean menyedari perubahan kelangsingan bunyi yang ketara daripada siren tersebut.
Dean was standing at a bus stop when a police car drove by with the siren on. Dean noticed an obvious change in the pitch of the siren sound.

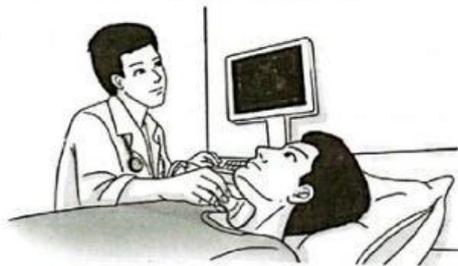
(a) Nyatakan fenomena yang dialami Dean. (TP 2)
State the phenomena experienced by Dean.

(b) Jelaskan perubahan bunyi yang didengar oleh Dean. (TP 2)
Explain the changes in sound that was heard by Dean.

When the police car was getting near Dean, the sound of the siren had a [] pitch.
But as the car drove away, the sound of siren had a [] pitch.

4. Rajah 2 menunjukkan mesin pengimbas ultrabunyi. Transduser berfungsi menghasilkan bunyi berfrekuensi tinggi yang dihantar ke dalam tubuh dan merekod pantulan. Selain mengimbas organ, mesin ini juga boleh mengesan kesan Doppler. Ini membantu membezakan salur darah dan saraf.

Diagram 2 shows an ultrasound machine. The transducer produces the high frequency sound that is transmitted into the body and records the resulting echoes. Besides scanning organs, this machine can also detect Doppler effect. This helps to differentiate between blood vessels and nerves.



Rajah 2 / Diagram 2

Pada pendapat anda, bagaimanakah perubahan pada frekuensi yang direkodkan oleh transduser apabila gelombang ultrabunyi menghentam salur darah? (TP 4)

In your opinion, how are the changes in the frequency recorded by the transducer when the ultrasound waves hit the blood vessels?

KBAT Menganalisis

Blood vessels are full of rapidly moving blood. The Dopple effect causes the frequency of the waves reflected from a moving [] to be different from the frequency of the waves sent out by the []. If the blood is moving [] the transducer, the reflected frequency will increase. If the blood moving away from the transducer, the reflected frequency will decrease.

[] transducer

[] towards

[] blood

TP2 Menguasai

Belum menguasai

TP4 Menguasai

Belum menguasai