



ALADWAA

Gem



Science

الصف 2 الإعدادى

إجابات نماذج امتحانات الأضواء النهائية

الفصل الدراسى الثانى

2024 - 2025

Model (1)

24
Marks

1 (A) Correct the underlined words:

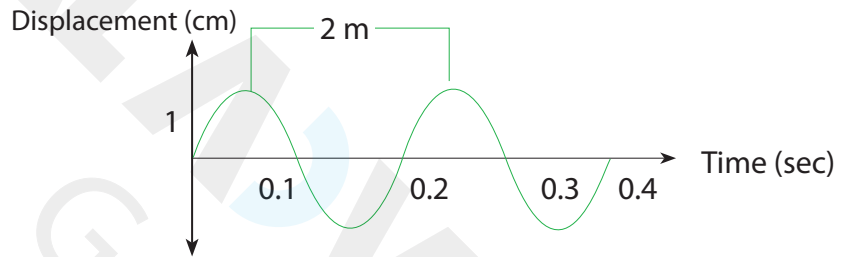
- The nucleus of a mature egg in humans contains double the genetic material. (half)
- The sound intensity is a property that allows the ear to distinguish between sharp and harsh sounds. (sound pitch)

(B) First: Give reasons for:

- We see lightning before hearing thunder, although they occur at the same time.
Because the speed of light waves (electromagnetic waves) is faster than the speed of sound waves (mechanical waves).
- The pollination in barely is auto-pollination.
- Because its flowers never bloom until the completion of fertilization process.

Second: Look at the opposite figure, then calculate:

- Amplitude = 1 m
- Wavelength = 2 m
- Periodic Time = 0.2 sec
- Frequency = $\frac{\text{Number of complete oscillations}}{\text{Time (sec)}} = \frac{2}{0.4} = 5 \text{ Hz}$



2 (A) Complete the following sentences:

- A simple pendulum oscillates 30 complete oscillations in 6 seconds, its frequency equals 5 hertz and its periodic time is 0.2 seconds.
- After the fertilization process in a plant is completed, the ovule turns into a seed, while the ovary turns into a fruit.

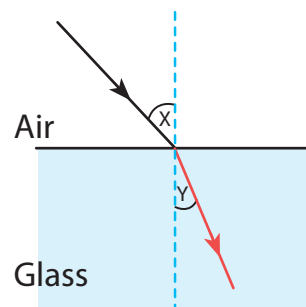
(B) First: Look at the following figures, then answer:

Fig. (1)



The flower's sex is male.

Fig. (2)



Complete the figure.

Second: Problem:

- Calculate the absolute refractive index of diamond, knowing that the velocity of light through it is 1.25×10^8 m/s.

$$\text{- Absolute refractive index}_{(\text{diamond})} = \frac{\text{Velocity of light through air}}{\text{Velocity of light through diamond}} = \frac{3 \times 10^8}{1.25 \times 10^8} = 2.4$$

3 (A) Write the scientific term:

- 1 The reflection of light rays when they meet a smooth and glistening reflecting surface, where the incident rays are reflected in one direction. (**Regular light reflection**)
- 2 The intensity of light is inversely proportional to the square of the distance between the surface and the source of light. (**Inverse square law of light**)

(B) What happens when ...?

- 1 A part of an orange plant is tied to a branch of a naring plant.
- The orange plant (scion) feeds on the juice of the naring plant (stock) and grows forming orange fruits (reproduction by grafting).
- 2 The two fallopian tubes were cut.
- The ripped ovum can't be received and directed towards the uterus.
- 3 The thickness of a transparent medium increases. (In terms of passing light).
- The quantity of light that passes through it decreases.
- 4 A light ray falls perpendicular to the interface between two different media.
- The light ray passes without refraction.

4 (A) Choose the correct answer:

- 1 The amplitude of a wave is of a complete wave. (double –fifth – half – **quarter**)
- 2 The measuring unit of noise intensity is (Hertz – meter – **decibel** – nanometer)

(B) First: What is meant by ...?

- 1 The wavelength of a sound wave = 2 m.
- This means that the distance between the centers of two successive compressions or two successive rarefactions is 2 meters.
- 2 Vegetative reproduction.
- It is the process of producing new individuals from different parts of the plant, such as roots, stems, or leaves without the flower having a role in this process.

Second: Compare between ...:

P.O.C	Testes	Ovary
Location	Outside the male's body in scrotal sac hanged between male's thighs.	Inside the female's body in the lower part of the abdominal cavity at the back.
Function	Production of sperms and testosterone hormone.	Production of ova and female sex hormones (estrogen and progesterone).

Model (2)

24
Marks

1 (A) Choose the correct answer:

1 The speed of sound is the highest in

- a) vacuum **b) solids** c) liquids d) gases

2 The hormone is essential for the continuation of pregnancy.

- a) estrogen b) testosterone **c) progesterone** d) thyroxine

(B) First: What happens when ...?

1 A vibrating body passes through its equilibrium position (in terms of its speed).

- **Its speed increases.**

2 A recent labored mother is subjected to cold air currents.

- **She will be affected by puerperal sepsis disease.**

Second: Savart's wheel rotates with a rate of 30 cycles per minute. A sound of frequency 100 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of the teeth of the gear.

Time (t) = 1 × 60 = 60 seconds

$$\text{No. of gear teeth (n)} = \frac{\text{Time in seconds (t)} \times \text{Frequency (F)}}{\text{No. of cycles (d)}} = \frac{60 \times 100}{30} = 200 \text{ Teeth}$$

2 (A) Put (✓) or (X) in front of each sentence:

1 In a longitudinal wave, the particles of the medium vibrate perpendicularly to the direction of wave propagation. (X)

2 The energy of a photon is inversely proportional to its frequency. (X)

(B) First: Look at the following figures, then answer:

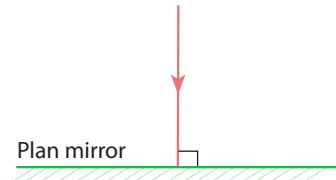
Fig. (1)



The sound of the lion is harsh. Why?

Because it has low frequency and low pitch.

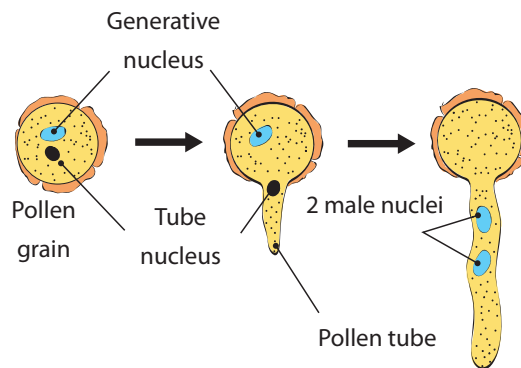
Fig. (2)



What is the value of the angle of reflection?

Zero.

Second: Illustrate by a labelled diagram the stages of a pollen grain germination.



3 (A) Write the number that indicates each of the following:

- 1 The product of multiplying the frequency by the periodic time. (1)
- 2 Number of floral whorls where a typical flower has. (4)

(B) Give reasons for:

- 1 The energy of red photon is less than the that of orange photon.
- Because the frequency of the red photon is less than that of the orange photon.
- 2 The inner wall of the fallopian tubes is lined with cilia.
- To direct the ripe ovum towards the uterus.
- 3 The strings of a musical lute are fixed on a hollow wooden box.
- To increase the vibrating surface area which leads to an increase in the sound intensity.
- 4 We can't hear the sound of solar explosions, but we can see the light coming out of them.
- Because the sound is a mechanical wave, area which can't propagate through vacuum between the Sun and Earth, while the light is an electromagnetic wave, which can propagate through vacuum.

4 (A) Write the scientific term:

- 1 The area in longitudinal waves where the medium particles have the lowest density and pressure. **(Rarefaction)**
- 2 A hollow muscular organ that protects the fetus until birth. **(Uterus)**

(B) First: What is meant by ...?

- 1 Tissue culture.
- It is the process of multiplying a small part of a plant (such as, carrot) to get many identical parts.
- 2 Light refraction.
- It is the change of light path when it travels from a transparent medium to another transparent medium of different density.

Second: Calculate the time taken by a simple pendulum to reach the maximum displacement away from its rest position knowing that its frequency is 5 Hertz.

$$\text{Periodic time (T)} = \frac{1}{\text{Frequency (F)}} = \frac{1}{5} = 0.2 \text{ sec}$$

$$\text{Time of amplitude} = \frac{\text{Periodic time (T)}}{4} = \frac{0.2}{4} = 0.05 \text{ sec}$$

Model (3)

24
Marks

1 (A) Choose the correct answer:

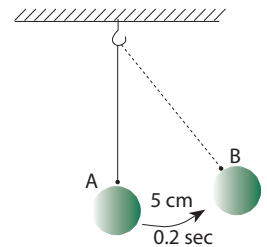
- If the distance between the center of the third compression and the center of the fifth compression in a longitudinal wave is 20 cm, then the wavelength of this wave is cm.
a) 5 **b) 10** c) 20 d) 40
- The human egg cell is similar to the sperm cell in that it
a) is static b) is mobile
c) is large in size **d) contains 23 chromosomes**

(B) First: Give a reason for:

- The human ear can distinguish between sounds of different sources even if they are equal in intensity and pitch.
- Due to the difference in the harmonic tones that associate the fundamental tone produced from the source of sound.
- Self-pollination does not occur in sunflower flowers, even though they are bisexual.
- Because the anthers and stigmas do not mature at the same time.

Second: Look at the opposite figure, then answer:

- Amplitude = **5 cm**
- Periodic time = **$4 \times 0.2 = 0.8 \text{ sec}$**



2 (A) Complete the following sentences:

- Sharp** sounds have a high frequency, while **harsh** sounds have a low frequency.
- In humans, the right ovary produces only one ripe ovum every **56** days.

(B) First: What is meant by ...?

- The angle of refraction of a light ray is 40° .
- This means that the angle between the refracted light ray and the normal at the point of incidence on the interface is 40° .
- The frequency of an oscillating body is 50 Hertz.
- This means that number of complete oscillations produced by the oscillating body in one second is 50 oscillations.

Second: Compare between ...:

1

P.O.C	Transparent medium	Opaque medium
Transmission of light	It permits most light to pass through.	It doesn't permit any light to pass through.
Examples	Air	Wood

2

P.O.C	Androecium	Gynoecium
Its leaves are known as	Stamens	Carpels
Function	It produces pollen grains.	It produces ovules.

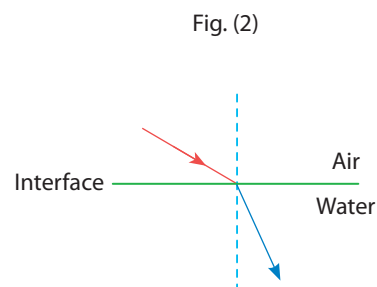
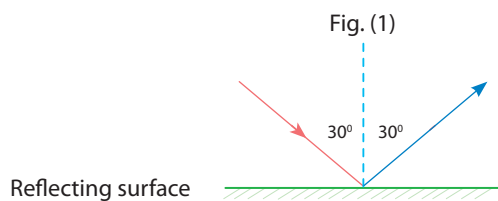
3 (A) Cross out the words, then write down the relation between the rest of words:

- 1 20 Kilohertz – 15 Hertz – 20 Hertz – 10 Kilohertz. (15 Hertz, the rest are sonic waves)
- 2 Head – Tail – Midpiece – Scrotum. (Scrotum, the rest are the structure of a sperm)

(B) First: Mention one function of or a use for each of the following:

- 1 Ultrasonic waves in the medical field.
- It is used in breaking down kidney and ureter stones without any surgical interventions.
- 2 Tubers of potatoes.
- They contain buds that are used for vegetative reproduction.

Second: Complete the following figures after redrawing them in your answer sheet:



4 (A) Match from column (A) what suits in column (B):

(A)	(B)
1 Irregular reflection	a. It is the measuring unit of noise intensity.
2 Decibel	b. It is the simplest oscillatory motion.
3 Corms	c. happens on rough reflecting surface.
4 Simple harmonic motion	d. Natural vegetative reproduction way.
	e. Measuring unit of frequency.

1. (c)

2. (a)

3. (d)

4. (b)

(B) First: Define ...:

1 Transverse wave.

- It is a disturbance in which the particles of the medium vibrate perpendicular to the direction of wave propagation.

2 Sound quality.

- It is the property by which the human ear can distinguish between different sounds according to the nature of the source even if they are equal in intensity and pitch.

Second: Calculate the wavelength of a sound wave that propagates in sea water with velocity 1500 m/s, knowing that its frequency is 10 kilohertz.

- Frequency = $10 \times 10^3 = 10^4$ Hz

$$\text{Wavelength } (\lambda) = \frac{\text{Wave velocity (V)}}{\text{Frequency (F)}} = \frac{1500}{10^4} = 0.15 \text{ m}$$

Model (4)

24
Marks

1 (A) Write the scientific term:

- 1 Short stem where leaves are developed and modified into genital organs. (Flower)
- 2 The highest point of the particles of the medium in the transverse waves. (Crest)

(B) First: Compare between ...:

1

P.O.C	Estrogen hormone	Testosterone hormone
Produced by	Ovaries	Two testes

2

P.O.C	Sonic waves	Infrasonic waves
Frequency	Ranges from 20 Hz to 20 KHz.	Frequencies are lower than 20 Hz

Second: A simple pendulum makes 3600 complete oscillations in 2 minutes. If each complete oscillation covers a distance of 36 cm, calculate:

- 1 Amplitude = $\frac{36}{4} = 9 \text{ cm}$
- 2 Frequency = $\frac{\text{Number of complete oscillations}}{\text{Time (sec)}} = \frac{3600}{120} = 30 \text{ Hz}$

2 (A) Complete the following sentences:

- 1 The corolla follows the **calyx** of the flower and its brightly colored **petals** attract insects to the flower.
- 2 Sound intensity **decreases** by decreasing the density of the medium.

(B) First: Give a reason for:

- 1 The absolute refractive index of any transparent medium is always greater than one.
 - Because the velocity of light through air is always greater than that through any transparent medium.
- 2 Peach fruit contains only one seed, while pea fruit contains more than one seed.
 - Because the ovary of peach contains only one ovule, while the ovary of the pea contains many ovules.

Second: What is meant by ...?

1 The wave velocity = 30 m/s.

- This means that the wave covers a distance of 30 meters in one second.

2 The pregnancy period.

- It is the period between the fertilization process and delivery which extends about 9 months in humans.

3 (A) Mention one example for...:

1 A unisex flower.

(Palm flowers)

2 Harsh low-pitched sound.

(Lion)

(B) First: What happens when ...?

1 A pendulum reaches its maximum displacement away from its rest position. (In terms of velocity)

- The velocity of the pendulum equals zero.

2 The mucus membrane lining the uterus has no blood capillaries.

- The placenta will not be formed, then the nourishment of the fetus will not happen, so the fetus dies.

Second: Calculate the frequency of a musical tone similar to the frequency of a produced by using Savart's wheel rotated with a velocity of 360 cycles in one minute, given that the number of teeth of the gear is 10 teeth.

- Time (t) = 1 × 60 = 60 seconds

$$\text{Frequency (F)} = \frac{\text{No. of cycles (d)} \times \text{No. of gear teeth (n)}}{\text{Time in seconds (t)}} = \frac{360 \times 10}{60} = 60 \text{ Hz}$$

4 (A) Choose the correct answer:

1 The intensity of a gunshot sound at the top of the mountain is its intensity at the foot of a mountain.

a) greater than **b) less than** c) equal to d) double

2 Flowers with large colored and scented petals are mainly pollinated by

a) water b) wind **c) insects** d) humans

(B) First: Mention one function or a use for each of the following:

1 Jacuzzi.

- It is used to treat sprains and cramps by using hot water, while treating nervous tension by using cold water.

2 Triangular glass prism.

- It analyzes the white light into seven spectrum colors.

Second: Answer the following questions:

1 What affects the light intensity?

- The distance between the light source and the surface.

2 Look at the following figures, then answer:

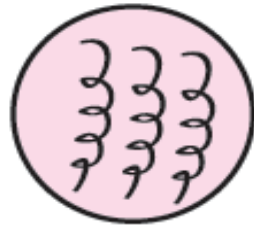


Fig. (1)

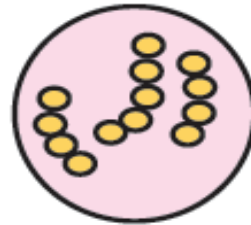


Fig. (2)

- Fig (1) represents **spiral-shaped** bacteria, and causes **syphilis** disease.

- Fig (2) represents **spherical-shaped** bacteria, and causes **puerperal sepsis** disease.

Model (5)

24
Marks

1 (A) Complete the following sentences:

- 1 If the vertical distance between the crest and trough of a wave is 10 cm, then the amplitude of this wave is **5** cm.
- 2 The male reproductive organ in the flower is the **stamen**, while the female reproductive organ is the **carpel**.

(B) First: What happens when ...?

- 1 The distance between a listener's ear and the sound source is doubled.
- **The sound intensity decreases to quarter.**
- 2 A light ray falls perpendicularly on the interface between two transparent media with different optical densities.
- **It passes through without any refraction.**

Second: Calculate the time in minutes taken by Savart's wheel to make 30 cycles, if the frequency of the produced sound with a gear of 60 teeth is 300 Hz.

$$\text{Time in minutes (t)} = \frac{\text{No. of cycles (d)} \times \text{No. of gear teeth (n)}}{\text{Frequency (F)}} = \frac{60 \times 30}{300} = 6 \text{ sec}$$

$$\text{Time in minutes (t)} = \frac{6}{60} = 0.1 \text{ min.}$$

2 (A) Put (✓) or (X) in front of each sentence:

- 1 Ultrasonic waves are used to discover landmines. (✓)
- 2 The motion of the rotary bee is considered as an oscillatory motion. (X)

(B) Give reasons for:

- 1 Sound can be heard from all the surrounding directions.
- **Because sound travels through air as spheres of compressions and rarefactions whose center is the sound source.**
- 2 The frequency of an oscillating body decreases by increasing its periodic time.
- **Because the frequency is inversely proportional with the periodic time.**
- 3 When a light ray falls perpendicular on a reflecting surface, it reflects on itself.
- **Because the angle of incidence and the angle of reflection equals zero.**
- 4 The stigma of some flowers is feathery like and sticky.
- **To catch pollen grains from air.**

4 (A) Cross out the words, then write down the relation between the rest of words:

1 Energy of a photon – Wavelength – Planck's constant – Photon frequency.

(Wavelength, the rest are the energy of a photon)

2 Carpel – Filament – Pollen grains – Anther. (Carpel, the rest are the structure of stamens)

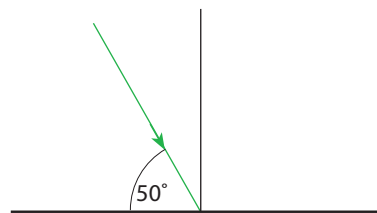
(B) First: Look at the following figures, then answer:

Fig. (1)



The flower's sex is
bisexual.

Fig. (2)



The angle of incidence
equals **40°.**

Second: What is meant by ...?

1 Female menopause.

- It is the age at which the two ovaries completely stop releasing ova.

2 The absolute refractive index of water is 1.33.

- This means that the ratio between the velocity of light through air to that through water is 1.33.