
UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session 2008/2009

April/Mei 2009

BBT 213/4 – Plant Physiology and Development
[Fisiologi dan Perkembangan Tumbuhan]

Duration: 3 hours
[Masa : 3 jam]

Please ensure that this examination paper contains SEVEN printed pages before you begin the examination.

[Sila pastikan bahawa kertas peperiksaan ini mengandungi TUJUH muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]

Instructions: Answer **FIVE** (5) out of **SIX** (6) questions, in English or Bahasa Malaysia. Each question carries 20 marks.

[Arahan: Jawab **LIMA** (5) daripada **ENAM** (6) soalan yang diberikan dalam Bahasa Inggeris atau Bahasa Malaysia. Tiap-tiap soalan bernilai 20 markah.]

1. What contributes to the osmotic (ψ_S) and pressure potential (ψ_P) and thus water potential (ψ) in plant cell?

(20 marks)

2. Give an appropriate title to the table below and explain the data recorded in the table.

(20 marks)

Leaf	Atmosphere	$e_{\text{leaf}} - e_{\text{air}}$
(A)		
T = 10 °C	T = 10 °C	
e = 1.23 kPa	e = 0.61 kPa	0.61 kPa
RH = 100%	RH = 50%	
(B)		
T = 20 °C	T = 20 °C	
e = 2.34 kPa	e = 0.61 kPa	1.73 kPa
RH = 100%	RH = 26%	
(C)		
T = 30 °C	T = 20 °C	
e = 4.24 kPa	e = 0.61 kPa	3.63 kPa
RH = 100%	RH = 26%	

3. Based on the diagram below:

[a] Give an appropriate title to the diagram

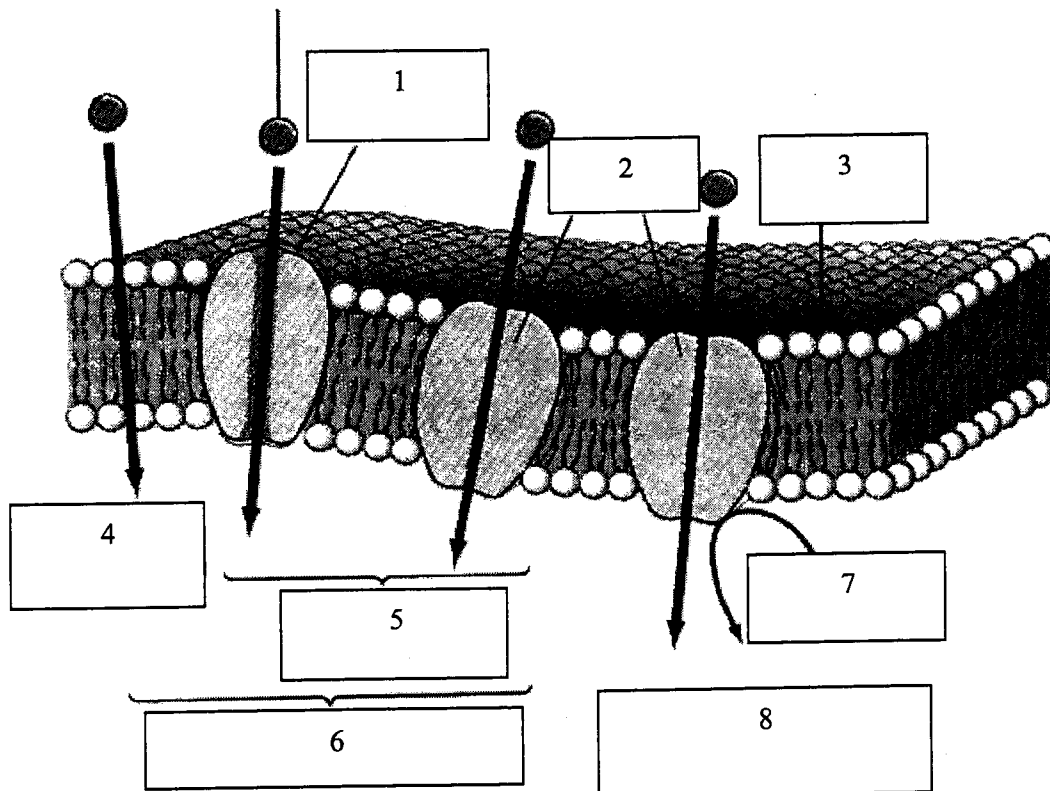
(2 marks)

[b] Name the structures or processes in blanks provided by the diagram.

(8 marks)

[c] Briefly explain the processes that occur in 4, 5, 6, and 7 in the diagram.

(10 marks)



4. How would you characterize the six (6) major classes of plant hormones on the basis of their primary action?
(20 marks)

5. Describe the concept of a photo system and how it is involved in converting light energy to chemical energy.
(20 marks)

6. One of the early effects of water deficit is reduced shoot growth and leaf expansion. What is the cellular basis for this observation?
(20 marks)

1. Apakah yang menyumbang kepada keupayaan osmotik (ψ_S) dan tekanan (ψ_P) dan dengan itu keupayaan air (ψ) dalam sel tumbuhan?

(20 markah)

2. Berikan tajuk yang sesuai kepada jadual di bawah dan terangkan data yang tercatat dalam jadual tersebut.

(20 markah)

Daun	Atmosfera	$e_{\text{daun}} - e_{\text{udara}}$
(A) T = 10 °C e = 1.23 kPa RH = 100%	T = 10 °C e = 0.61 kPa RH = 50%	0.61 kPa
(B) T = 20 °C e = 2.34 kPa RH = 100%	T = 20 °C e = 0.61 kPa RH = 26%	1.73 kPa
(C) T = 30 °C e = 4.24 kPa RH = 100%	T = 20 °C e = 0.61 kPa RH = 26%	3.63 kPa

3. Berdasarkan kepada gambar rajah berikut:

[a] Berikan satu tajuk yang sesuai kepada gambar rajah tersebut.

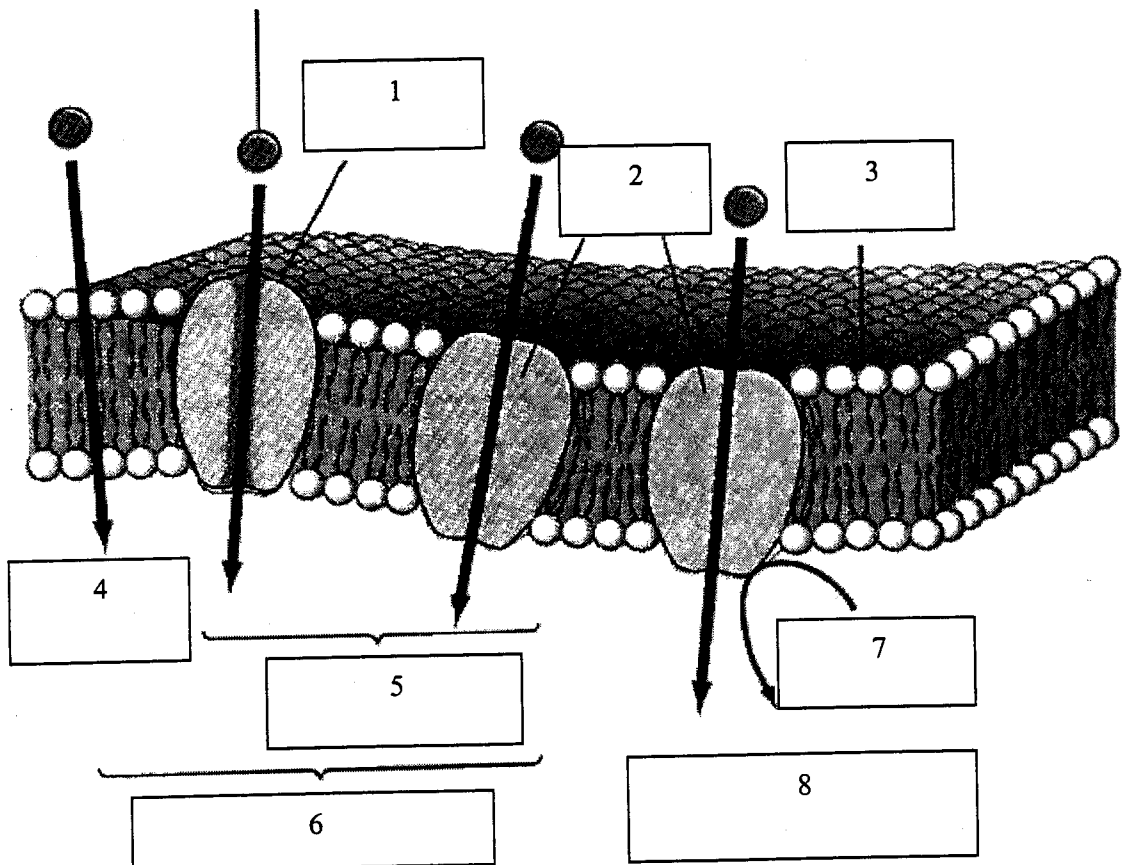
(2 markah)

[b] Namakan struktur atau proses dalam tempat kosong gambar rajah tersebut.

(8 markah)

[c] Terangkan dengan ringkas proses yang berlaku dalam 4, 5, 6 dan 7 gambar rajah tersebut.

(10 markah)



4. Bagaimanakah anda boleh mencirikan enam (6) kelas utama hormon tumbuhan berdasarkan tindak balas primer?

(20 markah)

5. Terangkan konsep fotosistem dan bagaimana ia terlibat dalam penukaran tenaga cahaya kepada tenaga kimia.

(20 markah)

6. Salah satu kesan awal akibat defisit air ialah mengurangkan pertumbuhan pucuk dan perkembangan daun. Apakah asas selular bagi pemerhatian ini?

(20 markah)