

SULIT

POLITEKNIK
Jabatan Pengajian Politeknik

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENGAJIAN POLITEKNIK
KEMENTERIAN PENGAJIAN TINGGI

JABATAN KEJURUTERAAN ELEKTRIK

PEPERIKSAAN AKHIR

SESI JUN 2013

EU704: PHYSIOLOGY FOR ENGINEERS 1

TARIKH : 24 OKTOBER 2013
TEMPOH : 2 JAM (8.30 AM - 10.30 AM)

Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.
Bahagian A : Objektif (20 soalan)
Bahagian B: Struktur (10 soalan)
Bahagian C: Esei (2 soalan)
Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

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EU704: PHYSIOLOGY FOR ENGINEERS 1

SECTION A : 20 MARKS
BAHAGIAN A : 20 MARKAH

INSTRUCTION:

This section consists of **TWENTY (20)** objective questions (10 multi choice; 10 fill in the blank). Mark your answers in the OMR form provided.

ARAHAN :

Bahagian ini mengandungi DUA PULUH (20) soalan objektif. Tandakan jawapan anda di dalam borang OMR yang disediakan.

CLO1
C1

1. Which of these things do BOTH plant and animal cells have?
Yang mana adalah terdapat pada kedua-dua sel tumbuhan dan sel haiwan

- | | |
|------------------------------------|------------------------------------|
| A. Cell wall
<i>Dinding sel</i> | C. chloroplasts
<i>krorofil</i> |
| B. cytoplasm
<i>sitoplasma</i> | D. vacuole
<i>vakuol</i> |

CLO1
C1

2. The movement of water through a semipermeable membrane is called:
Pergerakan air dalam membrane semipermeable adalah :

- | | |
|---|--|
| A. Facilitated diffusion
<i>Resapan terbantu</i> | C. active transport
<i>pengangkutan aktif</i> |
| B. Simple diffusion
<i>Resapan biasa</i> | D. osmosis
<i>osmosis</i> |

CLO1
C2

3. In sensory neurons, stimuli are received by the
Dalam saraf deria, ransangan diterima oleh

- | | |
|----------------------------------|----------------------------------|
| A. axons
<i>axon</i> | C. cell body
<i>sel badan</i> |
| B. dendrites
<i>dendrites</i> | D. myelin
<i>myelin</i> |

CLO1
C3

4. The myelin sheath is formed by _____, which wrap around the axons of some neurons
Salutan myelin terdiri daripada _____, ia menyaluti sekeliling axon pada neurons.

- | | |
|--|--|
| C. Node of ranvier
<i>Node of ranvier</i> | C. synapses
<i>synapses</i> |
| D. dendrites
<i>dendrites</i> | D. schwann cells
<i>sel schwann</i> |

CLO1
C2

5. _____ are chemical messengers that are produced in one body region but affect a different body region.
_____ adalah pengutus kimia yang dihasilkan pada satu bahagian badan tertentu tetapi ia memberi kesan kepada bahagian badan yang lain.

- A. Enzymes
Enzim
- B. Endocrines
Endocrines
- C. Neurotransmitters
neurotransmitters
- D. Hormones
Hormones.
- CLO1
C2 6. Which is **NOT** a function of the hypothalamus?
Mana yang BUKAN fungsi bagi hypothalamus?
- A. Affect heart rate
Kesan kepada denyutan jantung
- B. Control temperature
Kawalan suhu
- C. Affect water balance
Kesan kepada keseimbangan air
- D. secrete FSH
rembes FSH
- CLO1
C3 7. Which of the following proteins is **NOT** found in blood?
Mana di antara proteins di bawah yang tidak terdapat di dalam darah?
- A. prothrombin
prothrombin
- B. albumin
albumin
- C. creatin
keratin
- D. fibrinogen
fibrinogen
- CLO1
C3 8. What determines the blood type of a person?
Apakah yang menentukan kumpulan darah seseorang individu?
- A. Antibodies in the plasma
Antibodies dalam plasma
- B. Antigens in the plasma
Antigens dalam plasma
- C. antigens on the red blood cell surface
antigens di atas permukaan sel darah merah
- D. antibodies on the red blood cell surface
antibodies di atas permukaan sel darah merah
- CLO1
C4 9. What provides nutrients and oxygen to the heart muscle?
Apakah yang membekalkan zat nutrients dan oksigen kepada otot jantung ?
- A. Cardiac circulation
Kitaran kardiak
- B. Capillaries from the mammary arteries
Kapilari daripada saluran arteri
- C. blood flowing through the heart
darah mengalir melalui jantung
- D. branches from the pulmonary veins.
cabang daripada pulmonary vena

- CLO1
C4 10. Which of these most correctly traces the path of blood from the heart to a kidney and back to the heart again?
Di mana antara yang paling betul pengaliran darah daripada jantung ke buah pinggan dan kembali ke jantung ?
- A. Right atrium, aorta, renal artery, kidney, renal vein, inferior vena cava, left atrium
atrium kanan, aorta, arteri renal, buah pinggan, vena renal, inferior vena cava, atrium kiri
- B. Left ventricle, renal artery, kidney, renal vein, inferior vena cava, right atrium
Ventricle kiri, arteri renal, buah pinggan, vena renal, inferior vena cava, atrium kanan
- C. Left ventricle, aorta, renal artery, kidney, renal vein, inferior vena cava, right atrium
Ventricle kiri, aorta, arteri renal, buah pinggan, vena renal, inferior vena cava, atrium kanan
- D. Left ventricle, inferior vena cava, renal vein, kidney, renal artery, aorta, right atrium
Ventricle kiri, inferior vena cava, vena renal, buah pinggan, arteri renal, aorta, atrium kanan

For the question 11 to 20, fill in the blank.

Untuk soalan 11 hingga 20, isikan tempat kosong.

- CLO1
C2 11. _____ are the major sites of ATP production, which cells use as an energy source.
_____ adalah tempat utama bagi penghasilan ATP, di mana sel menggunakannya sebagai sumber tenaga.
- CLO1
C2 12. The phase of mitosis in which the chromosomes line up at the equator of the cell is called _____.
Fasa mitosis di mana kromosome kromosome beratur sebaris di tengah-tengah cell ialah fasa _____
- CLO1
C3 13. _____ neurons conduct impulses out of the Central Neurons System to effector organs (muscles and glands).
_____ saraf membawa maklumat atau isyarat keluar daripada Central Nervous System kepada effector organ (otot dan kalenjar)
- CLO1
C2 14. The _____ of the brain controls many activities of the autonomic system.
_____ bahagian otak mengawal banyak aktiviti bagi sistem automatik.
- CLO1
C1 15. The master gland that controls many bodily functions is _____.
Kalenjar utama mengawal semua fungsi badan ialah kalenjar _____
- CLO1
C3 16. The hormone _____ causes the contractions of labor.
Hormone _____ menyebabkan berlakunya pengecutan samasa kelahiran.
- CLO1
C4 17. _____ are found on the surface of red blood cell.
_____ terdapat pada atas permukaan sel darah merah.

- CLO1
C4 18. The first heart sound is produced at the _____ of systole.
Bunyi pertama jantung dihasilkan pada _____ systole.
- CLO1
C4 19. The sound of Korotkoff are produced by the _____ flow of blood through an artery.
Bunyi Korotkoff dihasilkan daripada pengaliran _____ darah yang melalui arteri.
- CLO1
C3 20. The right ventricle receives blood from the right atrium and pumps this blood out into the _____ circulation.
Ventricle kanan menerima darah daripada atrium kanan dan pam darah keluar ke dalam kitaran _____

SECTION B : 40 MARKS
BAHAGIAN B : 40 MARKAH

INSTRUCTION:

This section consists of **TEN (10)** structured questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **SEPULUH (10)** soalan berstruktur. Jawab **SEMUA** soalan.*

CLO1
C1 **QUESTION 1**

Define the following terms

- i. mitochondrion
- ii. ribosome

SOALAN 1

Definisikan terminology berikut:

- i. miochondrion
- ii. ribosome

[4 marks]

[4 markah]

QUESTION 2

CLO1
C3 Describe what happen to the cell during Metaphase and Anaphase of mitosis.

SOALAN 2

Huraikan keadaan yang berlaku pada sel semasa ia dalam fasa Metafasa dan Anafasa bagi mitosis.

[4 marks]

[4 markah]

CLO1
C4

QUESTION 3

Illustrate the structure and functions of each part of a neuron.

SOALAN 3

Terangkan struktur dan fungsi bagi setiap bahagian pada neuron.

[4 marks]

[4 markah]

CLO1
C4

QUESTION 4

Differentiate between olfaction sensation and gustation sensation..

SOALAN 4

Bezakan antara olfaction sensation dan gustation sensation.

[4 marks]

[4 markah]

CLO1
C2

QUESTION 5

List **TWO (2)** types of hormones from posterior pituitary gland.

SOALAN 5

*Senaraikan **DUA (2)** jenis hormone yang dirembeskan oleh posterior kelenjar pituitary.*

[4 marks]

[4 markah]

CLO1
C4

QUESTION 6

Compares **TWO (2)** differences between endocrine system and nervous system.

SOALAN 6

*Bandingkan **DUA (2)** perbezaan antara sistem endocrine dan system saraf*

[4 marks]

[4 markah]

QUESTION 7

CLO1
C3 State **THREE (3)** main functions of the blood.

SOALAN 7

Nyatakan **TIGA (3)** fungsi utama bagi darah.

[3 marks]

[3 markah]

QUESTION 8

CLO1
C4 Subdivides the disorder blood cell below:

- Anemia
- Hemophilia
- Leukemia

SOALAN 8

Bezakan penyakit yang berkiatan dengan sel darah berikut:

- Anemia
- Hemophilia
- Leukemia

[3 marks]

[3 markah]

QUESTION 9

CLO1
C3 State the major blood vessels that enter and exit the right and left heart.

SOALAN 9

Nyatakan saluran darah utama yang masuk dan keluar daripada jantung kanan dan jantung kiri.

[4 marks]

[4 markah]

QUESTION 10

CLO1
C4 Sketch a standard ECG and explain the different segments in it.

SOALAN 10

Lakarkan ECG normal dan terangkan setiap segments yang berbeza.

[6 marks]

[6 markah]

SECTION C : 40 MARKS**BAHAGIAN C : 40 MARKAH****INSTRUCTION:**

This section consists of **TWO (2)** essay questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi **DUA (2)** soalan esei. Jawab semua soalan.

QUESTION 1**SOALAN 1**

CLO1
C4 (a) Differentiate the function of sensory neuron, motor neuron and interneuron in the nervous system.

Bezakan fungsi antara neuron sensory, neuron motor dan interneuron di dalam system saraf.

[6 marks]

[6 markah]

CLO1
C4 (b) Explain the resting membrane potential and how an action potential is generated. Terangkan resting membrane potential dan bagaimana action potential dihasilkan.

[6 marks]

[6 markah]

CLO1
C4 (c) Compares among the types of brain wave as below:
i) Alpha
ii) Beta
iii) Theta
iv) Delta

Bandingkan antara jenis gelombang otak di bawah:

- i) *Alpha*
- ii) *Beta*
- iii) *Theta*
- iv) *Delta*

[8 marks]

[8 markah]

QUESTION 2**SOALAN 2**CLO1
C3

- (a) Explain the factors that affect blood pressure and vascular resistance.
Terangkan faktor-faktor yang memberi kesan kepada tekanan darah dan rintangan vascular.

[6 marks]

[6 markah]

CLO1
C4

- (b) Orders the path of electrical conduction of the heart, starting with the SA node.
Susunkan perjalanan bagi action potential dalam system konduksi jantung.

[6 marks]

[6 markah]

CLO1
C4

- (c) Composes the path of the blood through the heart and the function of the atrioventricular and semilunar valves.
Aturkan perjalanan darah dalam jantung and setiap fungsi bagi injap atrioventricular dan semilunar.

[8 marks]

[8 markah]

END OF QUESTIONS**SOALAN TAMAT**