Final Examination
2018/2019 Academic Session

June 2019

JIB225 – Animal Physiology
(Fisiologi Haiwan)

Duration : 3 hours
(Masa : 3 jam)

Please check that this examination paper consists of **SIXTEEN (16)** pages of printed material before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi **ENAM BELAS (16)** muka surat yang bercetak sebelum anda memulakan peperiksaan ini].*

Instructions : Answer **ALL** questions from **Section A** in the **OMR** sheet provided. Answer **THREE (3)** questions from **Section B** in the answer booklet provided. Mark for each sub question in **Section B** is given at the end of that sub question. You may answer **either** in Bahasa Malaysia or English.

*[**Arahan** : Jawab **SEMUA** soalan **Seksyen A** dalam borang **OMR** yang diberikan. Jawab **TIGA (3)** soalan daripada **Seksyen B** dalam buku jawapan yang disediakan. Markah untuk setiap subsoalan dalam **Seksyen B** diperlihatkan di penghujung subsoalan itu. Anda dibenarkan menjawab soalan **sama ada** dalam Bahasa Malaysia atau Bahasa Inggeris].*

In the event of any discrepancies, the English version shall be used.

[Sekiranya terdapat sebarang percanggahan pada soalan peperiksaan, versi Bahasa Inggeris hendaklah digunapakai].

THE WHOLE QUESTION BOOKLET MUST BE RETURNED TO THE INVIGILATORS.

[KESELURUHAN KERTAS SOALAN INI MESTI DISERAHKAN KEMBALI KEPADA PENGAWAS PEPERIKSAAN].

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SECTION A/SEKSYEN A
(40 marks/*markah*)

Answer **ALL** questions.
*Jawab **SEMUA** soalan.*

1. Muscle fibre can be changed in response to

   A. activity levels
   B. temperature
   C. thyroid hormone levels
   D. All of the above

   Gentian otot boleh berubah dalam gerak balas terhadap

   A. aras aktiviti
   B. suhu
   C. aras hormon tiroid
   D. Semua di atas

2. Which of the following types of movement may **NOT** require use of a motor protein?

   A. Muscle contraction
   B. Amoeboid movement
   C. Vesicle transport
   D. Flagella movement

   *Manakah antara jenis pergerakan berikut **TIDAK** memerlukan protein motor?*

   A. Pengecutan otot
   B. Pergerakan ameboid
   C. Pengangkutan vesikel
   D. Pergerakan flagela

3. ATP is broken down to provide energy for movement of the myosin _____

   A. tail
   B. neck
   C. head
   D. body

   ATP diuraikan untuk membekal tenaga bagi pergerakan_____miosin

   A. ekor
   B. leher
   C. kepala

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D. badan

4. A single skeletal muscle cell is referred to as a

A. cardiomyocyte
B. sarcomyocyte
C. myofibril
D. myofibre

Sel otot rangka tunggal dirujuk sebagai

A. kardiomiosit
B. sarkomiosit
C. miofibril
D. miofiber

5. Which of the following is **NOT TRUE?**

i. Parasympathetic nerves stimulate salivation
ii. Sympathetic nerves inhibit salivation
iii. Parasympathetic nerves inhibit salivation
iv. Sympathetic nerves stimulate salivation

A. i and iv
B. ii and iv
C. iii and iv
D. All the above

*Manakah antara berikut **TIDAK BENAR**?*

i. Saraf parasimpatetik meransang peliuran
ii. Saraf simpatetik merencat peliuran
iii. Saraf parasimpatetik merencat peliuran
iv. Saraf simpatetik meransang peliuran

A. i dan iv
B. ii dan iv
C. iii dan iv
D. Semua di atas

Table 1 : Hormonal control of digestion

Source	Regulatory factor	Inhibit
XX	Glucagon	Pancreatic and intestinal secretion
YY	Pancreatic Polipeptide	Gastric acid secretion

6. XX is

A. Jejunum
B. Duodenum
C. Pituitary
D. Pancreas

7. YY is

A. Jejunum
B. Duodenum
C. Pituitary
D. Pancreas

Jadual 1 : Kawalan hormon pencernaan

Sumber	***Faktor kawal atur***	***Merencat***
XX	*Glukagon*	*Pankreatik dan rembesan usus*
YY	*Polipeptida Pankreas*	*Rembesan asid gaster*

6. XX adalah

A. Jejunum
B. Duodenum
C. Pituitari
D. Pankreas

7. XX adalah

A. Jejunum
B. Duodenum
C. Pituitari
D. Pankreas

8. During long-term starvation,

   A. glycogen stores become depleted
   B. skeletal muscle experiences protein degradation
   C. fatty acids and amino acids are converted into ketone bodies
   D. All of the above

   Semasa kebuluran jangka panjang,

   A. simpanan glikogen berkurangan
   B. otot rangka mengalami penyusutan protein
   C. asid lemak dan asid amino ditukarkan kepada jasad keton
   D. Semua di atas

9. Which of the following is **TRUE**?

   A. Reptiles excrete nitrogen in the form of ammonia
   B. Insects excrete nitrogen in the form of urea
   C. Aquatic animals excret nitrogen in the form of ammonia
   D. Mammals excrete nitrogen in the form of ammonia

   *Manakah antara berikut **BENAR**?*

   A. Reptilia mengumuhkan nitrogen dalam bentuk ammonia
   B. Serangga mengumuhkan nitrogen sebagai ammonia
   C. Haiwan akuatik mengumuhkan nitrogen sebagai ammonia
   D. Mamalia mengumuhkan nitrogen sebagai ammonia

10. Name **t**he functional unit of excretory organ in insects

    A. Pronephros tubule
    B. Protonephridia tubule
    C. *Malphigian tubule*
    D. Metanephridia tubule

    Namakan unit berfungsi bagi ginjal serangga

    A. *Tubul pronefros*
    B. Tubul protonefridia
    C. Tubul malfigia
    D. Tubul metanefridia

11. Which of the following is the pathway of fluid through a juxtamedullary nephron?

    A. Proximal convoluted tubule, descending loop of Henle, ascending loop of Henle, distal convoluted tubule
    B. Proximal convoluted tubule, distal convoluted tubule, descending loop of Henle
    C. Proximal convoluted tubule, descending loop of Henle, distal convoluted tubule, ascending loop of Henle
    D. Distal convoluted tubule, descending loop of Henle, ascending loop of Henle, proximal convoluted tubule

    Manakah antara berikut adalah laluan cecair melalui nefron jukstamedulari?

    A. Tubul melingkar proksimal, gelung Henle menurun, gelung Henle menaik, tubul melingkar distal
    B. Tubul melingkar proksimal, tubul melingkar distal, gelung Henle menurun, gelung Henle menaik
    C. Tubul melingkar proksimal, gelung Henle menurun, tubul melingkar distal, gelung Henle menaik
    D. Tubul melingkar distal, gelung Henle menurun, gelung Henle menaik, tubul melingkar proksimal

12. Ammonia is the end product of _____ catabolism.
    Urea is synthesised in the _____

    A. carbohydrate, spleen
    B. protein, liver
    C. lipid, kidney
    D. nitrogen, urinary bladder

    Ammonia merupakan produk terakhir katabolisme _____.
    Urea disintesis dalam _____

    A. karbohidrat, limpa
    B. protein, hati
    C. lipid, ginjal
    D. nitrogen, pundi kencing

13. In the mammalian heart, the opening and closure of valves are

    A. under neural control
    B. under myogenic control
    C. due to changes in chamber pressure
    D. All of the above

Pada jantung mamalia, pembukaan dan penutupan injap

A. dikawal oleh saraf
B. dikawal oleh otot
C. disebabkan perubahan tekanan
D. Semua di atas

14. A crocodile has a heart with _____ chamber/s?

A. 1
B. 3
C. 4
D. 5

Seekor buaya mempunyai jantung dengan _____ruang?

A. 1
B. 3
C. 4
D. 5

15. An octopus has a heart with _____ chamber/s?

A. 1
B. 2
C. 3
D. 4

Seekor sotong kurita mempunyai jantung dengan _____ruang?

A. 1
B. 2
C. 3
D. 4

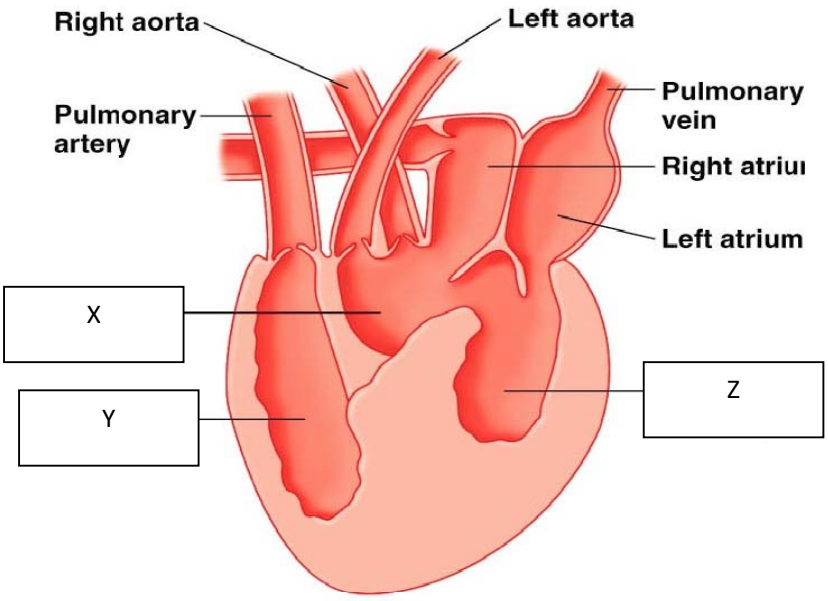

Figure 1: Cardiac anatomy of non- crocodalian reptile
Rajah 1 : Anatomi kardiak reptilia bukan buaya

16. Label X, Y and Z in Figure 1

A. Cavum venosum, Cavum pulmonale and Cavum arteriosum
B. Cavum pulmonale, Cavum venosum and Cavum arteriosum
C. Cavum arteriosum, Cavum pulmonale and Cavum venosum
D. Cavum venosum, Cavum arteriosum and Cavum pulmonale

Label X, Y and Z dalam Rajah 1

A. Cavum venosum, Cavum pulmonale dan Cavum arteriosum
B. Cavum pulmonale, Cavum venosum dan Cavum arteriosum
C. Cavum arteriosum, Cavum pulmonale dan Cavum venosum
D. Cavum venosum, Cavum arteriosum dan Cavum pulmonale

17. In crustacean respiration, ventilation happens when water moves out of the

A. appendages
B. branchial chamber
C. scaphognathite
D. carapace

Pada respirasi krustasia, ventilasi terjadi apabila air keluar daripada

A. appendej
B. ruang brankia
C. skafognatit

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D. karapas

18. Bird lungs are efficient because of

A. large size
B. unidirectional and continuous air flow
C. countercurrent blood flow
D. non countercurrent blood flow

Paru-paru burung adalah cekap kerana

A. saiz besar
B. ekaarah dan aliran udara selanjar
C. aliran darah lawan arus
D. aliran darah bukan lawan arus

19. Air enters the tracheae of insects through the

A. spiracles
B. ostia
C. madreporite
D. buccal cavity

Udara memasuki trakea serangga melalui

A. spirakel
B. ostia
C. madreporit
D. rongga bukal

20. In birds, fresh air from the environment moves primarily into the

A. lungs
B. posterior air sacs
C. anterior air sacs
D. buccal cavity

Pada burung, udara segar daripada persekitaran bergerak terutamanya ke dalam

A. paru-paru
B. pundi udara posterior
C. pundi udara anterior
D. rongga bukal

Question 21 - 25 refer to the Table 2.

Table 2 : Mammalian reproductive hormones

Hormone	Tissue of origin
Gonadotropin-releasing hormone (GnRH)	21.
Luteinizing Hormone (LH)	22.
Follicle-Stimulating Hormone (FSH)	23.
Estrogen	24.
Progesterone	25.

Match the hormone and their tissue origin in mammalian reproductive

A. Anterior pituitary
B. Hypothalamus
C. Corpus luteum
D. Ovarian follicle

Soalan 21 - 25 rujuk kepada Jadual 2.

Jadual 2 : Hormon pembiakan mamalia

Hormon	***Tisu asal***
Hormon pelepas gonadotropin (GnRH)	*21.*
Hormon Peluteinan (LH)	*22.*
Hormon perangsang folikel (FSH)	*23.*
Estrogen	*24.*
Progesteron	*25.*

Padankan hormon dan tisu asal dalam pembiakan mamalia

A. Pituitari anterior
B. Hipotalamus
C. Korpus luteum
D. Folikel ovari

26. Which is not a gonadotropin?

A. Chorionic Gonadotrophin Hormone (CGH)
B. Follicle-Stimulating Hormone (FSH)
C. Gonadotropin-releasing hormone (GnRH)

D. Luteinizing Hormone (LH)

Manakah bukan gonadotropin?

A. Hormon gonadotrofin korion(CG)
B. Hormon perangsang folikel (FSH)
C. Hormon pelepas gonadotropin (GnRH)
D. Hormon peluteinan (LH)

Question 27-31 refer to Table 3.

Table 3 : Mammalian reproductive hormones in pregnancy and parturition

Hormone	Main actions
Chorionic Gonadotropin	27.
Estrogen	28.
Oxytocin	29.
Prostaglandin	30.
Prolactin	31.

Match the hormone and their main actions during pregnancy and parturition

A. Stimulate uterine smooth muscle in uterus
B. Promotes growth and colustrum syntesis in mammary gland
C. Promotes smooth muscle contraction in uterus
D. Stimulates release of estrogen in uterus

Soalan 27-31 rujuk kepada Jadual 2.

Jadual 3 : Hormon pembiakan semasa kehamilan dan kelahiran

Hormon	Tindakan utama
Korionik Gonadotropin	27.
Estrogen	28.
Oksitosin	29.
Prostaglandin	30.
Prolaktin	31.

Padankan hormon dan tindakan utama semasa kehamilan dan kelahiran

A. Merangsang otot licin uterus dalam uterus
B. Merangsang tumbesaran dan sintesis kolostrum dalam kelenjar mamari
C. Merangsang pengecutan otot licin dalam uterus

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D. Meransang perembesan estrogen dalam uterus

32. Which hormone is not placenta in origin?

A. Gonadotropin
B. Estrogen
C. Progesteron
D. Prolactin

Hormon manakah bukan berasal daripada plasenta?

A. Gonadotropin
B. Estrogen
C. Progesteron
D. Prolaktin

Question 33 - 35 refer to the Table 4.

Table 4 : Mammalian male reproductive hormones

Hormone	***Main actions***
Andogen	33.
Luteinizing Hormone (LH)	34.
Follicle-Stimulating Hormone (FSH)	35.

Match the hormone and main action in mammalian male reproductive

A. Stimulates androgen syntesis in Leydig cells
B. Stimulate spermatogenesis and secondary sex characteristic in Sertoli sel
C. Stimulate spermatogenesis in Leyding cells
D. Stimulate spermatogenesis in Sertoli sel

Soalan 33-35 rujuk kepada Jadual 4.

Jadual 4 : Hormon pembiakan jantan mamalia

Hormon	***Tindakan utama***
Andogen	*33.*
Hormon Peluteinan (LH)	*34.*
Hormon perangsang folikel (FSH)	*35.*

Padankan hormon dan tindakan utama dalam pembiakan mamalia jantan

A. meransang sentesis androgen dalam sel Leydig
B. meransang spermatogenesis dan ciri sekunder seks dalam sel Sertoli
C. meransang spermatogenesis dalam sel Leydig

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D. meransang spermatogenesis dalam sel Leydig

36. Which hormone is not involve in spermatogenesis?

A. Luteinising Hormone (LH)
B. Follicle-Stimulating Hormone (FSH)
C. Estrogen
D. Prostaglandins

Hormon manakah tidak terlibat dalam spermatogenesis?

A. Hormon Peluteinan (LH)
B. Hormon perangsang folikel (FSH)
C. Estrogen
D. Prostaglandin

37. Which of the following is **INCORRECTLY** matched to it function's?

A. Bulbourethral gland - secretion of nutrient and enzymes
B. Epididymis - sperm concentration and storage
C. Fallopian tube - site of fertilization
D. Prostate - secretion of citrate

*Manakah berikut **SALAH** padanan berdasarkan fungsi?*

A. *Kelenjar bulbouretra - perembesan nutrient dan enzim*
B. *Epididimis - pemekatan dan penyimpanan sperma*
C. *Tiub falopian - tapak persenyawaan*
D. *Prostate - perembesan sitrat*

38. The alkaline fluid produced by _____neutralises the acidic conditions in female reproductive tract to allow the sperm to swim

A. bulbourethral gland
B. epididymis
C. seminal vesicles
D. prostate gland

Cecair alkali yang di hasilkan oleh _____ neutralkan kondisi berasid pada saluran pembiakan betina untuk membenarkan sperma berenang

A. kelenjar bulbouretra
B. epididimis
C. seminal vesikel
D. kelenjar prostate

39. Sperm storage organ in insect is known as

A. accessory gland
B. Dufour's gland
C. Gametosome
D. spermatheca

Organ penyimpanan sperma pada serangga dikenali sebagai

A. kelenjar aksesori
B. kelenjar Dufour's
C. gametosom
D. *spermatheca*

40. In the crocodilians and marine turtles, the sex of the young is determined by

A. homogamy vs. heterogamy
B. aromatase activity
C. nest temperature
D. rates of vitellogenesis

Pada buaya dan penyu laut, jantina haiwan muda ditentukan dengan

A. homogami vs. heterogami
B. aktiviti aromatase
C. suhu sarang
D. kadar vitelogenesis

SECTION B/*SEKSYEN B*
(60 marks/*markah*)

Answer THREE question only.
Jawab TIGA soalan sahaja.

1. (a). Draw a labelled diagram and discuss,
   (i). Sliding Filament Model
   (ii). Sarcomeres structure

   Lukis gambar rajah berlabel dan bincangkan,
   (i). Model Filamen Menggelongsor
   (ii). Struktur sarkomer

   (10 marks/*markah*)

   (b). By using a diagram, draw and explain nitrogen excretion in different animal groups.
   Dengan menggunakan gambar rajah, lukis dan jelaskan perkumuhan nitrogen dalam kumpulan berbeza.

   (10 marks/*markah*)

2. (a). With the aid of labelled diagrams, describe ruminant digestive system.
   Dengan bantuan gambarajah berlabel, perihalkan sistem pencernaan ruminan.

   (10 marks/*markah*)

   (b). List hormones and neurotransmitters in controlling appetite.
   Senaraikan hormon dan neurotransmiter dalam pengawalan selera.

   (10 marks/*markah*)

3. Explain:

   (a). Mammalian Cardiac Cycle.
   (b). Shunting in Reptile Hearts.

   Jelaskan:

   (a). Kitaran kardiak pada mamalia.
   (b). Pemirauan dalam jantung reptilia.

   (20 marks/*markah*)

4. Discuss teleost fishes and birds ventilation
   Bincangkan ventilasi pada ikan teleost dan burung.

   (20 marks/markah)

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