國立中興大學107學年度碩士班招生考試試題

科目：獸醫病理學　　系所：獸醫病理生物學研究所甲組

本科目不得使用計算機　　本科目試題共 1 頁

一、請說明細胞若開始發生死亡，於 H&E 染色下，細胞核(nucleus) 及細胞質 (cytoplasm)會出現那些病理變化? 請以文字分類描述，並繪圖輔助說明死亡細胞特徵(15%)

二、一般組織病理變化之形態學診斷(morphological diagnosis)常依病變分佈(distribution)、程度(degree)及病程(duration)等過程進行組織病變描述，請分別說明上述三種各常用病理名詞? (15%)。

三、請說明 inflammation 有哪些主要機制共同或系統性協同參與? 並請敘述導致炎症區域產生 edema 的主要原因與各種分子調控機制? (15%)

四、請說明 Rabies virus 由 Ferret Badger 一旦藉由接觸或直接咬傷而傳染給犬、貓時，請敘述 Rabies virus 的感染機制? 而被感染動物可能會呈現哪些病理變化? 獸醫師又如何進行診斷與應注意哪些事項? (15%)

五、請寫出下列各種疾病的主要組織病理學特徵。(30%)

1. Pseudorabies (Pr) in Pigs
2. Tuberculosis (TB) in cattle
3. Feline infectious peritonitis (FIP) in cats
4. Q fever (*Coxiella burnetii*) in goats
5. Porcine epidemic diarrhea (PED) in piglets
6. Highly pathogenic avian influenza (HPAI) in chickens

六、請說明心臟的三種解剖方法分別適用於哪些心臟病變的檢查。(10%)

本科目不得使用計算機　　本科目試題共 2 頁

一、請翻譯本篇短文。（10%）

Seasonal influenza viruses infect 5–15% of the human population each year, resulting in ~500,000 deaths worldwide. The annual recurrence of seasonal epidemics is attributed to the continued evolution of seasonal influenza viruses, which enables them to escape the immunity that is induced by prior infections or vaccination, and to the ability of those viruses to be transmitted efficiently from human-to-human via respiratory droplets, direct contact and fomites. Influenza virus vaccines are effective in preventing the spread of seasonal influenza virus epidemics, but they must be updated regularly to keep pace with the evolution of the circulating viruses. The virus surface glycoprotein haemagglutinin is the primary target of the host immune response, and evolutionary selection pressure drives it to acquire mutations to escape immune recognition without eliminating its receptor binding function (Adapted and modified from Nature Reviews Microbiology 16, 47–60 (2018))

二、請敘述造成 RNA 病毒基因產生變異的可能原因有哪些？（4%）

三、請各舉出二種偵測（1）RNA 病毒核酸，（2）DNA 病毒核酸以及（3）病毒蛋白質之方法。(6%)

四、（A）Orthomyxovirus（B）Coronavirus（C）Picornavirus（D）Flavivirus

（1）請由上述之病毒當中，選擇一個病毒，繪圖並詳細敘述該病毒如何感染細胞、如何在細胞內複製以及如何釋出細胞外之過程。（6%）

（2）請各舉出一個由上述病毒所造成之疾病。（4%）

五、請翻譯本篇短文。（10%）

The mammalian gastrointestinal tract, the site of digestion and nutrient absorption, harbors trillions of beneficial commensal microbes from all three domains of life. Commensal bacteria, in particular, are key participants in the digestion of food, and are responsible for the extraction and synthesis of nutrients and other metabolites that are essential for the maintenance of mammalian health. Many of these nutrients and metabolites derived from commensal bacteria have been implicated in the development, homeostasis and function of the immune system, suggesting that commensal bacteria may influence host immunity via nutrient- and metabolite-dependent mechanisms. Here we review the current knowledge of how commensal bacteria regulate the production and bioavailability of immunomodulatory, diet-dependent nutrients and metabolites and discuss how these commensal bacteria–derived products may regulate the development and function of the mammalian immune system. (Adapted from *Nat Immunol.* 2013;14(7):676-684).

六、輔助 T 細胞（Th）是調節免疫反應之重要關鍵，請說明 Th1、Th2 和 Treg（調節型 T 細胞）等次族群之功能及如何調節相關之免疫反應。（10%）

七、請說明抗原呈現細胞如何活化細胞（媒介）免疫反應?（7%）

八、請說明細菌之內毒素與外毒素的相同及相異之處?（8%）

九、請說明什麼是敗血症，以及常見造成敗血症的原因。（15%）

十、請說明免疫系統如何對抗細菌。（20%）

請於答案卷上作答，否則不予計分　本科目不得使用計算機　本科目試題共 2 頁

一、 請說明細胞週期。根據細胞再生的能力，細胞可分為三大類，請說明這三大類細胞的特性以及所屬細胞週期，三大類細胞各舉一兩例。 (20%)

二、 請說明腫瘤細胞特性。(10%)

三、 請翻譯以下短文。(11%)

Breast cancer is a disease affecting many women worldwide, and in Asian countries the incidence of breast cancer has been increasing over the past decades. While breast cancer incidence is lower in developing Asian countries, the breast cancer associated mortality in the developing countries is higher compared to high-income developed western countries. Another disparity between breast cancers in the West and Asia is the age of onset, with Asians being diagnosed at a younger age of 40–50 and Westerners at 60–70. The causes accounting for these differences are diverse, including genetic predispositions, lifestyle and other environmental factors. (Adapted and modified from *Cancer Treatment Review*, 62, 29–38 (2017). *DOI: http://dx.doi.org/10.1016/j.ctrv.2017.10.014*)

四、 翻譯以下短文。(7%)

Naturally occurring cancers in pet dogs and humans share many features, including histological appearance, tumour genetics, molecular targets, biological behaviour and response to conventional therapies. Studying dogs with cancer is likely to provide a valuable perspective that is distinct from that generated by the study of human or rodent cancers alone. The value of this opportunity has been increasingly recognized in the field of cancer research for the identification of cancer-associated genes, the study of environmental risk factors, understanding tumour biology and progression, and, perhaps most importantly, the evaluation and development of novel cancer therapeutics. (Adapted from *Nature Reviews Cancer* 8, 147–156 (2008)).

五、 請從下方選擇合適的回答填入以下空格 (每格 2 分) (8%)

心臟節律傳導路徑主要引發心跳及控制頻率為_____，然後經由_____和_____傳入心室。最後經_____傳遍左、右心室。

(Purkinje fibers; Sinoatrial node; Coronary sinus; Atrioventricular node; Bundle of His; semilunar valve)

六、 解釋下列名詞: 請由下列題目**選擇 5 題**回答，每題 4 分。 (20%)

a. receptor
b. homeostasis
c. endoderm
d. mitochondrion
e. meiosis
f. gas exchange
g. endocrine
h. epigenetic regulation
i. Genomic imprinting

七、 解釋下列名詞：請由下列問題選擇8題回答，每題2分。(16%)

a. reverse transcriptase
b. intron
c. primase
d. mRNA
e. tRNA
f. rRNA
g. poly(A) tail
h. ribosome
i. TATA box
j. DNA polymerase
k. restriction enzyme
l. telomerase

八、 選擇題（請選擇一最適當之答案）(8%)

1. 人類的肝細胞、肌細胞和神經細胞明顯不同，主要是因為
(A) 存在於每一種細胞內之基因的種類有所不同。
(B) 它們表現不同的基因。
(C) 它們使用不同的遺傳密碼 (genetic code)。
(D) 它們所含有的基因數目各不相同。
(E) 它們各自具有獨特的核醣體。

2. 蛋白質分子之訊息肽 (signal peptide)的主要功能在於
(A) 導引蛋白質至細胞中的某些特定位置。
(B) 影響蛋白質的半生期 (half-life)。
(C) 增加蛋白質與 DNA 的親和力 (binding affinity)。
(D) 遞送蛋白質抵達身體內的各種組織 (tissue)。
(E) 指導蛋白質摺疊成正確的三級結構 (tertiary structure)。

3. 人體所攝入的大部分葡萄糖 (glucose)在何處被吸收?
(A) stomach。　(B) colon。
(C) salivary glands。　(D) small intestine。
(E) esophagus。

4. 脈搏 (pulse)是在直接測量什麼?
(A) 血壓 (blood pressure)。　(B) 心輸出量 (cardiac output)。
(C) 心搏出量 (stroke volume)。　(D) 呼吸速率 (breathing rate)。
(E) 心跳速率 (heart rate)。