一. 单选题（共8题，60.8分）

1. (单选题)When did scientists report the first demonstration of the existence of mechanically activated ion channels?( )

A. 1981

**B. 1979**

C. 1977

D. 1982

2. (单选题)Which of the functions listed below is not a function of hair cells?( )

A. The outer hair cells amplify the auditory signal.

B. The outer hair cells transform the sound vibrations in the fluids of the cochlea into electrical signals.

C. The inner hair cells transform the sound vibrations in the fluids of the cochlea into electrical signals that are then relayed via the auditory nerve to the auditory brainstem and to the auditory cortex.

**D. The inner hair cells amplify sound waves and transduce auditory information to the brain Stem.**

3. (单选题)How many types of olfactory receptors do people have?( )

A. 150-200

B. 250-300

**C. 350-400**

D. 450-500

4. (单选题)Which of the criteria listed below is not a criterion used to select putative odorant receptors?( )

A. Odorant receptors would be selectively expressed in the olfactory epithelium, where olfactory sensory neurons are located.

**B. Odorant receptors would be ligand-gated ion channels directly activated by odorants.**

C. Odorant receptors would be proteins encoded by a family of varied, but related genes.

D. Odorant receptors would be at least distantly related to the relatively small set of G protein coupled receptors (GPCRs).

5. (单选题)Which of the stimuli listed below does not activate TRPV1?

A. Heat

B. Capsaicin

**C. Voltage**

D. Proton

6. (单选题)Which three TRP channels mediates acute noxious heat sensing?

A. TRPV1, TRPM8, and TRPA1

B. TRPV1, TRPV2, and TRPA1

C. TRPV1, TRPM2, and TRPA1

**D. TRPV1, TRPM3, and TRPA1**

7. (单选题)Which of the mechanoreceptors listed below is not a cutaneous mechanoreceptor?

A. Meissner's corpuscles

**B. Golgi tendon organs**

C. Pacinian corpuscles

D. Merkel's disks

8. (单选题)What is the principle protein sensor for touch?

A. PIEZO1

**B. PIEZO2**

C. TRPV1

D. TMC1

二. 简答题（共5题，39.2分）

9. (简答题)Cochlea:

耳蜗是内耳的一部分,其名称来源于其形状与蜗牛壳的相似性,耳蜗的英文名Cochlea,即是拉丁语中“蜗牛壳”的意思,是一个中空的螺旋形骨管,全长约30~32毫米,其内部充满液体。耳蜗是外周听觉系统的组成部分,连接着听神经。耳蜗的核心部分为柯蒂氏器,是听觉传导器官,负责将来自中耳的声音信号转换为相应的神经电信号,交送脑的中枢听觉系统接受进一步处理,最终实现听觉。

10. (简答题)Hair cells:

毛细胞是听觉系统的感觉受体,它们将机械声波信号转换成神经系统能够理解的电信号。其名称来源于其顶端长出的一束静纤毛(stereocilia),也就是“毛束” (hair bundle) 结构。毛细胞位于内耳耳蜗的柯蒂氏器官(organ of corti)中,位于基底膜和顶盖膜之间。

11. (简答题)Odorant receptors:

嗅觉受体是一类G蛋白偶联受体(G Protein-Coupled Receptors,GPCR),表达在嗅觉上皮的嗅觉感觉神经元中,可以被气味分子激活,引起细胞内的信号转导,将气味的化学信号转变成电化学信号。

12. (简答题)Somatosensory system:

躯体感觉系统是外周感觉神经系统的一部分,介导触觉、温度觉、痛觉和本体感觉。

13. (简答题)Nociceptors:

伤害性感受器是背根神经节和三叉神经节中负责感受来自皮肤、肌肉、关节和内脏器官的伤害性刺激并将信号传递给脊髓或大脑的初级感觉神经元。