GRADE 10 HEART & SKELETON PRACTICAL
MARKS: 50
TIME: 2 PERIODS

QUESTION 1: TRANSPORT SYSTEMS IN ANIMALS

Materials:

1. One pig heart.
2. Plastic gloves
3. A sharp scalpel or blade
4. Scissors
5. Cutting board
6. Newspaper

Safety tips: Be careful when working with the scissors, scalpel and blade to prevent injury to yourself or the person next to you. Wash all the dissection apparatus, working surfaces and your hands with soap and water when the dissection is complete.

EXTERNAL STRUCTURE

1.1 A large number of branched blood vessels is visible over the surface of the heart.

    (a) What are they called?   (1)

    _____

    (b) What is the function of these blood vessels?   (2)

    _____

    _____

Place the heart on your cutting board with its point directed downwards. Ensure that the groove is angled from top right to bottom left. CUT your heart LONGITUDINALLY. Cut as slowly and centrally as possible. Look at the structures as you are cutting. Do not completely cut the heart in two. Only cut it deep enough so that you can flip the heart open, but the blood vessels are not damaged.

INTERNAL STRUCTURE

1.2. How do the atria and ventricles differ in size and shape? Explain why.   (4)

    _____

    _____

    _____

1.3. Look at the large blood vessels attached to the heart. Identify which of them are arteries and which are veins.

(a) How did you identify the arteries? Give **TWO** visible structural characteristics.   (2)
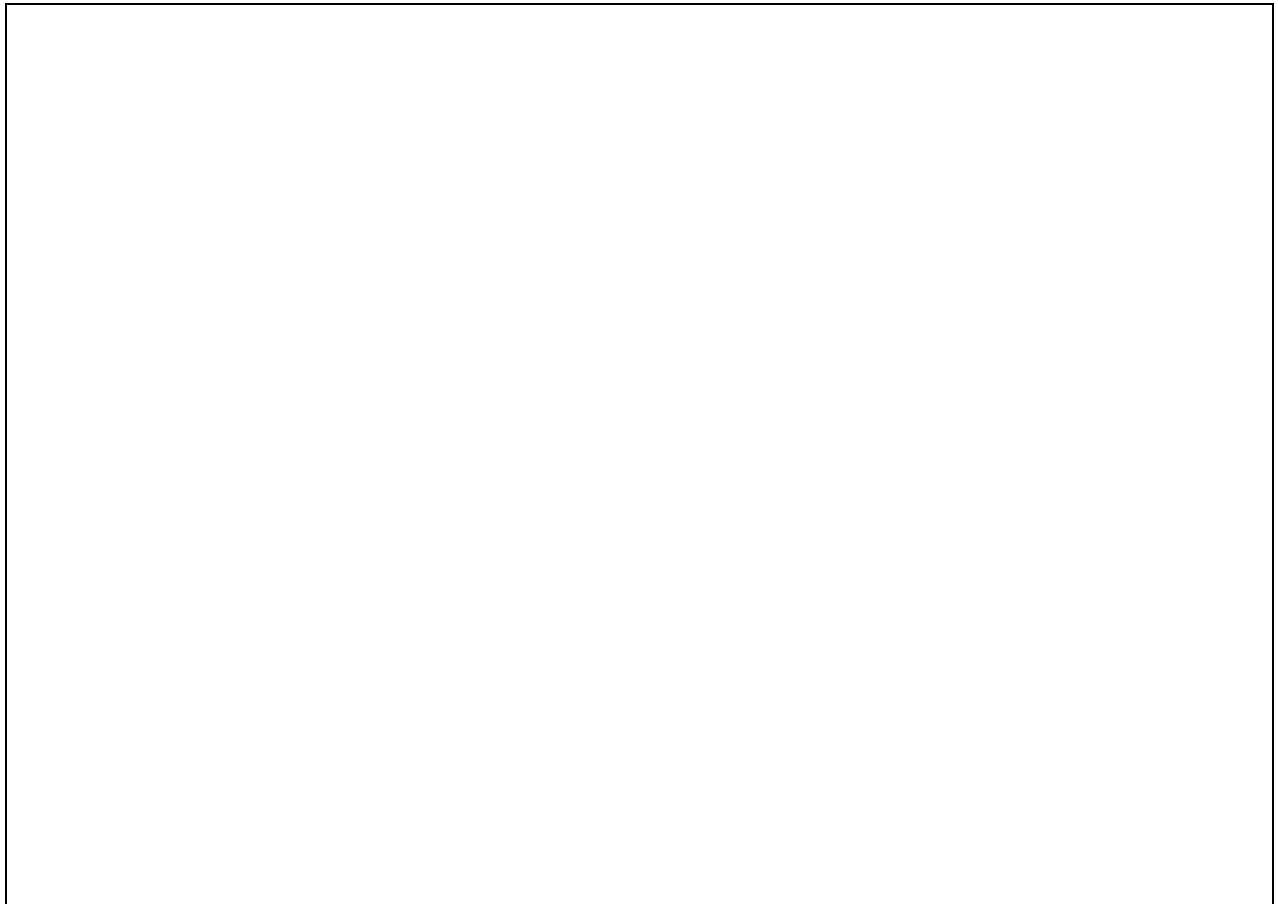
_____

1.4. Identify the atrio-ventricular valves.

(a) Describe their colour: _____   (1)

(b) What attaches the valves to the heart walls? _____   (1)

1.5. Make a neat, scientific pencil sketch of the **right side** of the heart dissection. It must include a part of an *atrium* and *ventricle* and *three other known parts*.
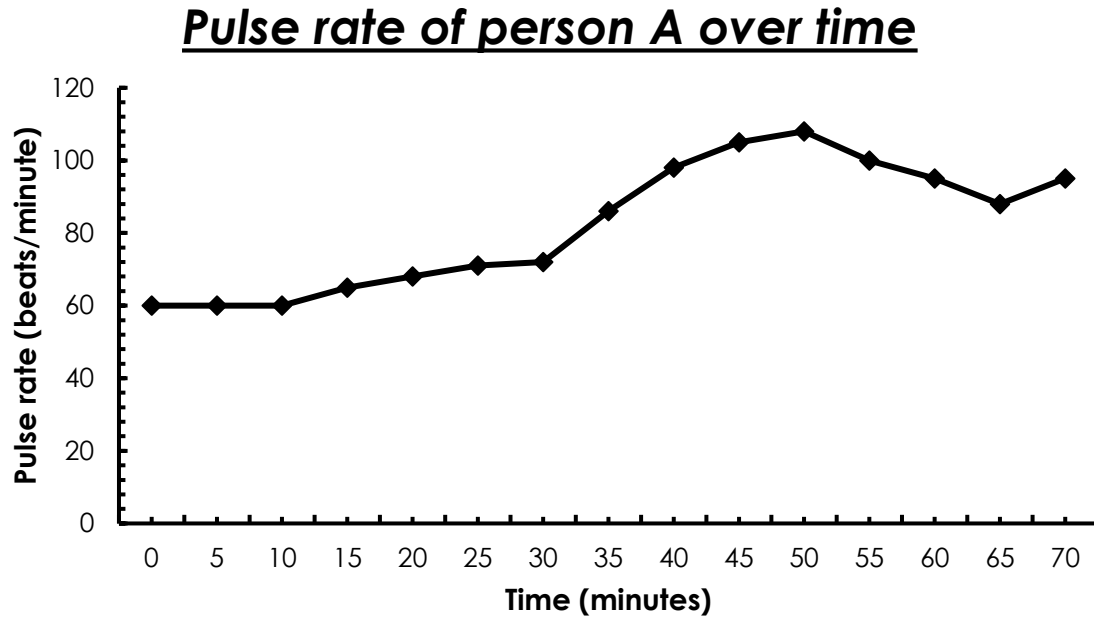
(7)

1.6. Your teacher will call you to the front to identify any **THREE** structures on the dissected heart. Wait for you turn.

3 out of 3	2 out of 3	1 out of 3	0 out of 3

(3)

1.7. Study the graph on pulse rate given below and answer the questions that follow:

Pulse rate of person A over time

Use the graph to determine between **which times** person A was:

(a) running: _____

(b) sleeping: _____

(c) walking: _____

(d) frightened by a loud noise: _____ (4)

TOTAL QUESTION 1: [25]

QUESTION 2: SUPPORT SYSTEMS IN ANIMALS

{Give the scientific name for the bone in each case}

2.1. The X-rays below show broken bones in the human body. Study the X-rays and answer the questions that follow.
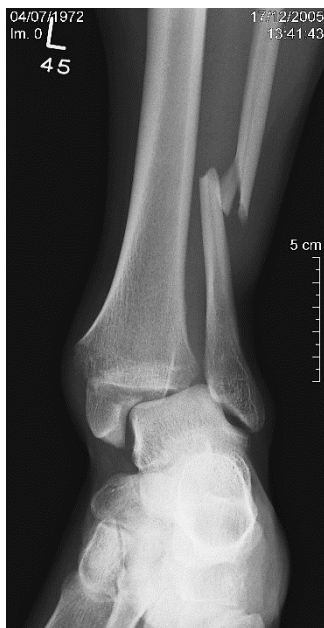

(a) Give the name of the broken bone:

_____

(b) Give two possible causes for this bone fracture:

_____

_____

(3)

(a) Give the name of this broken bone:

_____

(b) Where in the human body is this bone located?

_____

(2)

(a) Give the name of the broken bone:

_____

_____

(b) Give one possible cause for this bone fracture:

_____

(2)

3

2.2. Five vertebrae marked A to E are laid out on the table. Study the vertebrae and complete the table below:

Bone	Identify the vertebrate	Visible, distinguishable reason
A		
B		
C		
D		

(8)

2.3. Five bones are laid on the table. Identify each bone:

1 : _____

2 : _____

3 : _____

4 : _____

5 : _____ **(5)**

2.4. Two stickers are visible on bone number 1.

(a) Which **colour** sticker represents the head of the bone? _____ (1)

(b) With which bone does the head of bone 1 articulate? _____ (1)

(c) Which type of joint is created by the head of bone 1 and the bone you mentioned in **(b)** above? _____ (1)

(d) Give the number of the bone that articulates with the clavicle. _____ (1)

(e) *Underline the correct word in brackets:*
The bone numbered 5 forms part of the (AXIAL SKELETON / APPENDICULAR SKELETON). (1)

(5)
TOTAL QUESTION 2: [25]
SUM TOTAL: [50]

GRADE 10 HEART AND SKELETON PRACTICAL MEMORANDUM
MARKS: 50
TIME: 2 PERIODS

_____

QUESTION 1: TRANSPORT SYSTEMS IN ANIMALS

EXTERNAL STRUCTURE

1.1 (a) Coronary arteries / coronary blood vessels✓   (1)
   (b) Provide oxygen and nutrients✓ to the heart muscle AND removes CO_2 and waste
   products✓ from the heart tissues   (2)

INTERNAL STRUCTURE

1.2. Atria are smaller✓ than ventricles. They are also thinner✓ than the ventricles. This is
      because the ventricles must pump blood over a longer distance✓ and have to be
      stronger and larger✓   (4)

1.3. **ANY TWO** of the following:
     They are whiter in colour✓
     Their walls are thicker✓
     They have a smaller lumen   (2)

1.4. (a) White-pink / pink   (1)
     (b) Heart tendons / Chordae tendinae✓   (1)

1.5. ✓ Pencil sketch
     ✓ Labels in pen
     ✓ Heading: "*Longitudinal section through the right side of a pig heart*"
     ✓✓ ✓ ✓ Four correct labels   (7)

1.6. Teacher gives learner a mark out of 3 for identifying any THREE of the following
     structures:

- Apex   - Right / left ventricle
- Aorta   - Septum
- Pulmonary artery   - papillary muscles
- Pulmonary vein   - Heart tendons
- Vena cava   - Bicuspid valve
- Right / left atrium   - Tricuspid valve
                                                                                                        (3)
1.7. (a) 30 – 50 minutes
      (b) 0 – 10 minutes
      (c) 10 – 30 minutes
      (d) 65 – 70 minutes   (4)

TOTAL QUESTION 1: [25]

QUESTION 2: SUPPORT SYSTEMS IN ANIMALS

2.1.

(a) Radius ✓

(b) Landed on their arm falling (from a great
    height) ✓
    Sports injury✓
    Car accident
    Was in a fight
    Any relevant reason for the injury✓
    (NOT OSTEOPOROSIS)

(3)

(a) Fibula ✓

(b) Lower limb / leg ✓

(2)

(a) Metacarpal ✓

(b) Fighting / fist fight✓
    Sports injury
    Falling and landing on the hand
    (NOT OSTEOPOROSIS)

(2)

2.2.

BONE	IDENTIFY THE VERTEBRA	REASON (MARK FIRST ONE ONLY)
A	Atlas ✓	No spinal process / large articulation facets for skull / no vertebral body/centrum / largest vertebral canal ✓
B	Lumbar ✓	Long spinal process / largest vertebral body/centrum / very large vertebra ✓
C	Axis ✓	Split spinal process / odontoid process / Large vertebral canal / large surfaces for articulation with atlas ✓
D	Cervical ✓	Split spinal process / short transverse processes / small vertebral body/centrum ✓

(8)

2.3.

1 : Femur ✓

2 : Humerus ✓

3 : Scapula ✓

4 : Tibia ✓

5 : Sacrum ✓   **(5)**

2.4.

(a) Green ✓   (1)

(b) Pelvis / Ileum of the pelvis / pelvic girdle✓   (1)

(c) Ball-and-socket joint ✓   (1)

(d) 3 ✓   (1)

(e) Axial skeleton ✓   (1)

(5)

TOTAL QUESTION 2: [25]

SUM TOTAL: [50]