MASTER 2016

PART B **SHORT ANSWER SECTION**

Name _____ **30 MARKS**

*Tunica Intima (inner most)
*Tunica Media (middle layer)
*Tunica Externa (or adventitia) outmost.

21. Complete the Table below for each type of blood vessel stated, giving (a) one function it serves, and (b) one structural feature which helps it carry out the function.

MUST APPLY TO ALL – ARTERIES, CAPILLARIES, VEINS

Blood Vessel	Function	Structural Feature
1. Artery	(a) To carry blood away from the heart & circulate it throughout body	(b) • Thick walls (withstand pressure) • Thick layer of muscles (to control size/dia) • Elastic fibres - stretch + recoil, maintain pressure
2. Capillary	(a) To get blood supply to all tissues + cells to take O_2 to them & to take CO_2/waste away	(b) • Very thin walls (less distance to travel - diffusion) • Large surface area (again to max. diffusion) • no smooth muscle, single endothelium.
3. Vein	(a) To carry blood to the heart.	(b) • Wide internal lumen (tunica intima) • Presence of valves (to prevent blood flowing back)

narrow lumen — any of the 3.
wide lumen — any of the 2.
any of the 2

muscle/elastic fibre. (less than arteries)

(6 marks) 1 mark each

22. The process of respiration involves several processes and structures. Give the correct **biological term** described by the following.

MUST BE SPELT CORRECTLY

a) A flap of tissue which, when swallowing, closes off the trachea so that food and liquid cannot enter the lungs.
EPIGLOTTIS

b) The membrane which covers the lungs and lines the inside of the chest.
PLEURA / PLEURAL (MEMBRANE)

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c) Breathing in INSPIRATION / INHALATION (accept one or the other)

d) Muscles between the ribs which move the rib cage upwards and outwards to increase the volume of the lungs.
INTERCOSAL MUSCLES • EXTERNAL - inspiration lifts ribs
INTERNAL - expiration → refers to INSPIRATION

e) Gas which diffuses from the blood into the lungs.
CARBON DIOXIDE (CO_2)

error *

from pulmonary artery CO_2

f) Sudden paralysis of the body due to interruption of blood supply to brain
STROKE (APOPLEXY)

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g) Damage of heart muscle due to coronary artery being completely blocked
CORONARY THROMBOSIS (HEART ATTACK)

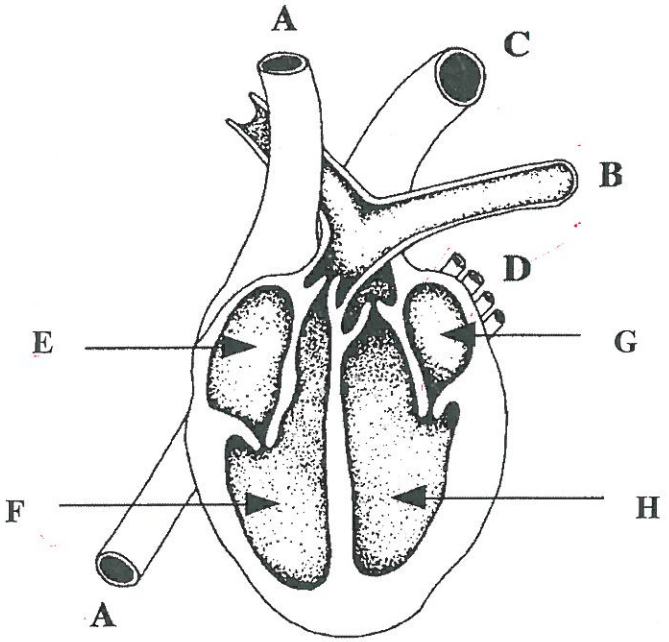
h) Constriction/inflammation of bronchioles is a symptom of which respiratory disease?
ASTHMA. / (BRONCHITIS - of the larger bronchi)
(EMPHYSEMA - damage to alveoli / bronchi)

½ mark each

(4 marks)

MARKS REDUCED in 2016 to 3

23. Use the diagram below to answer parts a) to e) of question 23.



(a) Using the letters indicated on the diagram state which vessels and which chambers contain **oxygenated** blood.

D, G, H, C

← 2 Ls.

½ mark each

(2 marks)

(b) Name the structures labeled

C AORTA

E RIGHT ATRIUM
(NOT ATRIA plural)

1 mark each

(2 marks)

LETTERS FROM HEART DIAGRAM

(c) Describe clearly what is meant by the pulmonary circulation.

DEOXYGENATED BLOOD VIA THE VENA CAVAS (A), RIGHT (E) ATRIUM, RIGHT VENTRICLE (F) & PULMONARY ARTERY (B) / TRUNK - TRAVEL TO THE LUNGS (1) TO GET OXYGENATED (EXCHANGE CO_2/WASTE FOR O_2) (1) & RETURNED TO THE HEART VIA PULMONARY VEINS (1)

(c.f. SYSTEMIC CIRCULATION — AROUND BODY)

(2 marks)

(d) Explain why the walls of the chambers of the heart are of different thickness.

THE ATRIA ARE CHAMBERS THE "FILL UP" & RECEIVE BLOOD NOT UNDER A LOT OF PRESSURE — WALLS LESS MUSCULAR (1)

THE VENTRICLES ARE CHAMBERS THAT "PUMP" BLOOD EITHER TO THE LUNGS (RIGHT VENTRICLE) & THE REST OF THE BODY (LEFT VENTRICLE — WALLS MORE MUSCULAR - ESPECIALLY THE LEFT VENTRICLE (1)

(2 marks)

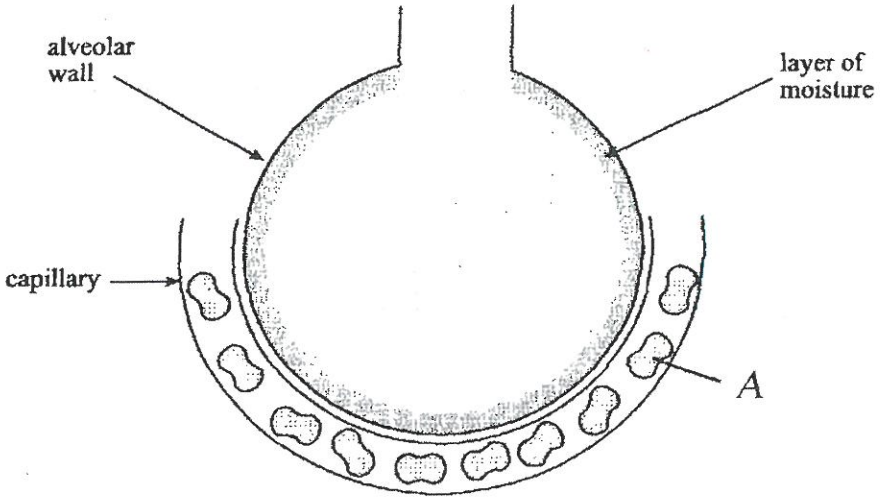
(e) If a person required first aid for a badly cut arm, how would you know whether an artery was bleeding or a vein was bleeding?

- CUT ARTERY — SQUIRTS IN UNISON WITH HEART BEATS & APPEARS BRIGHT RED (OXYGENATED) (1)
- CUT VEIN — FLOW OF BLOOD MORE CONSTANT & APPEARS DARK RED (DEOXYGENATED) (1)

(2 marks)

— ANSWERS MAY NOT BE "BALANCED" BUT MAY CONTAIN SIGNIFICANT DETAIL.

24. The diagram below refers to parts (a) to (d) of Question 24.



(a) State **ONE** function of the layer of moisture that lines the alveolar wall.

ENABLES DIFFUSION TO OCCUR MORE EASILY (+ protection of surface) GASES DISSOLVED FIRST IN FLUID BEFORE DIFFUSION (1 mark)

2016: prevents alveoli from collapsing - due to cohesive forces of H_2O

accept.

can not use the above.

(b) Name **ONE** other structural feature of the alveolar wall tissue and describe the how it facilitates efficient gas exchange.

- THIN WALLS — ENABLES DIFFUSION OF SUBSTANCES (SMALL DISTANCE) 1 CELL THICK.
- LARGE SURFACE AREA — ENABLES MORE DIFFUSION TO TAKE PLACE (+ less energy required) accept (2 marks)

ANY OF THE 2

(c) What is structure A, and what role does it perform in the gas exchange in the lungs?

- ERYTHROCYTE (RBC) (1)
- CAN CARRY OXYGEN ON ITS HAEMOGLOBIN (OXYHAEMOGLOBIN) (1) FOR CELLULAR RESPIRATION (1) TO PRODUCE ENERGY
- CAN CARRY CARBON DIOXIDE ON ITS HAEMOGLOBIN (CARBAMINOHAEMOGLOBIN) AS CELLULAR WASTE

(3 marks)

25. Expired air and inspired air differ in composition. The following table gives an approximate comparison.

	INSPIRED AIR (Total volume)	EXPIRED AIR (Total volume)
Oxygen	21%	17%
Carbon Dioxide	0.04%	4%
Nitrogen and inert gases	78%	78%
Water vapour	Varies	Saturated
Temperature	Atmospheric	Body (37° C)

Explain the differences or the lack of difference between the inspired and expired values shown in the table.

- OXYGEN MORE INSPIRED – IMPORTANT COMPONENT OF CELLULAR RESPIRATION (TO PRODUCE ENERGY) (1)
- CARBON DIOXIDE MORE EXPIRED (x100) – WASTE PRODUCT OF CELLULAR RESPIRATION (1)
- NITROGEN (+ INERT GASES) – NOT ESSENTIAL; NITROGEN
- WATER VAPOUR MORE EXPIRED – DUE TO INTERNAL SURFACES OF RESPIRATORY SYSTEM & PART CELLULAR RESPIRATION AS A WASTE PRODUCT (1)
- TEMPERATURE – EXTERNAL VARIES; HOWEVER, INTERNAL SAME (37°C) → OPTIMUM TEMPERATURE FOR THE FUNCTION OF ESSENTIAL PROTEINS & STEROIDS E.G. ENZYMES, HORMONES (1)

ANY 4

(4 marks)

W 2016 ADDITION OF ONE EXTRA MARK – TO 5

ALL ABOUT CELLULAR RESPIRATION