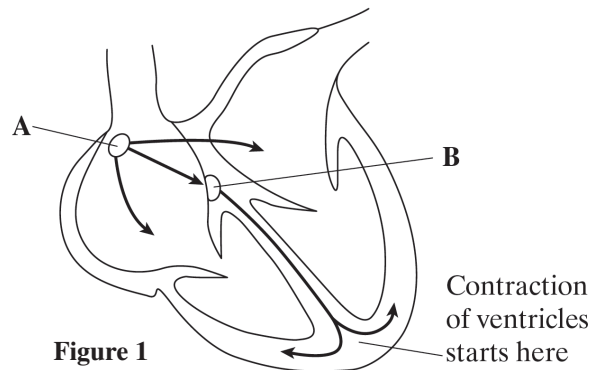


- 1 **Figure 1** shows the pathways in the heart for the conduction of electrical impulses during the cardiac cycle.



- (a) Name structure A. (1 mark)
- (b) Explain why each of the following is important in pumping blood through the heart.
- There is a short delay in the passage of impulses through part B. (2 marks)
 - The contraction of the ventricles starts at the base.
- (c) The table shows the blood pressure in the left atrium, the left ventricle and the aorta at different times during part of a cardiac cycle.

Time / s	Blood pressure / kPa		
	Left atrium	Left ventricle	Aorta
0.0	0.5	0.4	10.6
0.1	1.2	0.7	10.6
0.2	0.3	6.7	10.6
0.3	0.4	17.3	16.0
0.4	0.8	8.0	12.0

- At which time is blood flowing into the aorta? (2 marks)
 - Between which times are the atrioventricular valves closed? (2 marks)
- (d) The maximum pressure in the left ventricle is higher than the maximum pressure in the right ventricle. What causes this difference in pressure? (1 mark)

AQA, 2004

- 2 **Figure 2** shows the left side of the heart at two stages in a cardiac cycle.

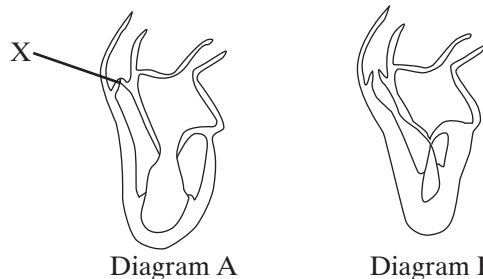


Figure 2

Diagram A

Diagram B

- Name the structure labelled X. (1 mark)
 - Describe **two** pieces of evidence in Diagram B which indicate that the ventricle is emptying. (2 marks)
- (c) During exercise the rate of blood flow to heart muscle increases from 270 cm³ per minute to 750 cm³ per minute.
- Calculate the percentage increase in rate of blood flow to heart muscle during exercise. Show your working.
 - Explain the advantage of the increase in the rate of blood flow to heart muscle during exercise. (4 marks)

AQA, 2001

- 3 (a) The times taken in the various stages of a complete cardiac cycle are shown in the table.

Stage of cardiac cycle	Time taken / s
Contraction of the atria	0.1
Contraction of the ventricles	0.3
Relaxation of both atria and ventricles	0.4

- (i) Use the information in the table to calculate the heart rate in beats per minute.
 (ii) If the same rate of heartbeat were maintained throughout a 12-hour period, for how many hours would the ventricular muscle be contracting? (2 marks)
- (b) Although the heart does have a nerve supply, the role of the nervous system is not to initiate the heartbeat but rather to modify the rate of contraction. The heart determines its own regular contraction.
 Describe how the regular contraction of the atria and ventricles is initiated and coordinated by the heart itself. (5 marks)
- (c) An interventricular septal defect is an opening in the wall (septum) that separates the left and right ventricles. Suggest and explain the effect of this defect on blood flow through the heart. (2 marks)

AQA, 2006

- 4 The table shows some information about the incidence of high blood pressure and heart attacks in the UK.

Sex	Condition	Percentage of people affected in each age group						
		16–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65–74 years	75–84 years
Male	high blood pressure	0.5	1.5	3.5	6.0	17.0	22.5	18.5
	heart attack			0.1	0.2	1.1	2.4	3.2
Female	high blood pressure	0.7	1.6	3.8	7.8	20.5	27.9	26.9
	heart attack			0.1	0.3	0.6	0.7	1.8

- (a) Use the pattern of data in the table to describe:
 (i) **two** similarities between males and females.
 (ii) **two** differences between males and females. (4 marks)
- (b) People have been advised to reduce their cholesterol intake as a part of a healthy lifestyle. **Figure 3** shows information about mean daily intake of cholesterol.

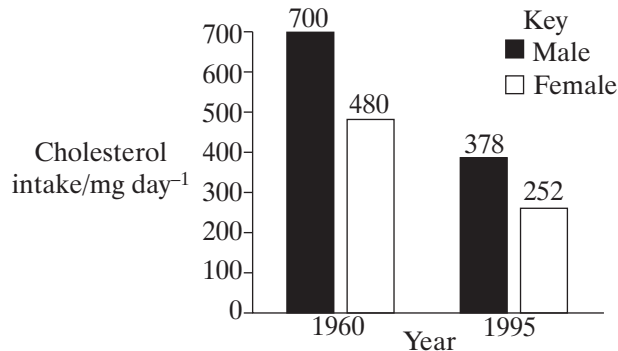


Figure 3

- Calculate which group, male or female, shows the greater percentage reduction in cholesterol intake between 1960 and 1995. Show your working. (2 marks)
- (c) Explain how smoking and a high blood cholesterol concentration increase the risk of developing coronary heart disease. (6 marks)

AQA, 2002