**1. Quality of Written Communication**  
The parts to many of the answers to this question require continuous prose. To gain one mark for Quality of Written Communication these answers should be presented in clear, scientific English. Technical terminology should have been used effectively and should usually be accurate

(a) For clearly expressed understanding of principles maximum 3 marks  
Sequence started by the pacemaker / sinoatrial node;  
Electrical activity spreads over atria;  
which produces muscle contraction;

For details to a maximum of 5 marks  
Sinoatrial node myogenic (beats spontaneously);  
Role of atrioventricular node in allowing transmission to ventricles;  
and in delaying spread of electrical activity to ventricles;  
Role of bundle of His in conduction to ventricles 5

(b) For clearly expressed understanding of principle maximum 2 marks  
Link between receptors, brain and heart;  
via nerve impulses;

For details to a maximum of 4 marks  
Increase in amount of exercise leads to an increase in carbon dioxide;  
Detected by receptors in (walls of) arteries leaving heart;  
Impulse to medulla  
Impulse to sinoatrial node;  
via acceleratory / sympathetic nerve 4

(c) Carbon dioxide and water in aerobic;  
Lactic acid (only) in anaerobic;  
Energy release much higher in aerobic 3

(d) Increase in lactate;  
and / fall in blood pH 2

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**2.** (a) A = sinoatrial node / SAN;  
B = atrioventricular node / AVN; 2

(b) Emits wave of depolarisation / impulses / pacemaker / initiates beat;  
Causing contraction of atria; 2

(c) (i) 60 ÷ 0.72 – 0.76;  
79 – 83; (*Correct answer = 2 marks*) 2

(ii) Ventricular pressure increases above pressure in atrium ; 1

(d) Left ventricle has thicker / more muscle; 1

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