Sixth Form Entrance 2018

GENERAL PAPER

1 hour 20 minutes

Total: 80 marks

Please complete Sections A and B on the question paper. Answers to Sections C and D should be completed on lined paper, using a fresh sheet for each section, and ensuring you clearly name each piece of paper used.

Name (Capital Letters): ....

Present School: ..………………………………...

Section A [20 marks]

Read the questions and circle the correct letters below:

1.	A	B	C	D	E	**6.**	A	B	C	D	E
2.	A	B	C	D	E	**7.**	A	B	C	D	E
3.	A	B	C	D	E	**8.**	A	B	C	D	E
4.	A	B	C	D	E	**9.**	A	B	C	D	E
5.	A	B	C	D	E	**10**.	A	B	C	D	E

1. More than 60 per cent of highly able, highly skilled graduates are unemployed in the first year after leaving university. We need to make employers more aware of the wealth of talent available and give practical advice as to how they can go about recruiting these talented youngsters.

Which of the following, if true, would most weaken the argument?

A Organisations are already aware of the talent available to them

B Most graduates do not want a job in the first year after leaving university

C There is a general lack of jobs in the current economic climate

D It is often difficult to give practical advice on how to recruit

E Most graduates are not a burden on society when unemployed

2. Children in Britain spend too much time indoors playing computer games and watching television these days and, as a result, become less sociable, have less exposure to the outside world and, significantly, have less sporting talent than they perhaps should.

Children in Australia and New Zealand, for example, spend a lot of time outdoors and consequently the sporting talent of youngsters in these countries outstrips that of British children. Due to this, and because of the other advantages derived from being outdoors, the Government should discourage the use of computer games and television for youngsters.

Which of the following best summarises the conclusion of the argument above?

A Children should spend more time outdoors

B Parents need to encourage their children to engage in more sporting activities than they do currently

C Our Government should model itself on that of Australia or New Zealand

D   Playing outdoors brings about many other positive changes than simply increasing sporting talent

E   The Government needs to intervene to change the habits of youngsters

3.   There was a time when the economic situation demanded that the Government either had to support the currency directly in the foreign exchange markets or it had to raise interest rates. But at that time to increase interest rates was political suicide. The Government therefore had to support the pound, costly though it turned out to be.

Which one of the following most closely parallels the reasoning used above?

A   If he had followed the doctor's advice and stayed at home he would have recovered completely by now. But he could not take the time off, so is still unwell.

B   You either have an allergy or have picked up a virus. If it is a virus there is no treatment that will help so you might as well treat it as an allergy

C   She needed a painkiller and we had both paracetamol and aspirin. But she was allergic to paracetamol so had to take the aspirin.

D   This treatment is available from a doctor's prescription or from a pharmacy but it is cheaper on prescription so I need to see my doctor.

E   There are two doctors at the clinic, a man and a woman. The female is always agreeable but the male is unpleasant so I hope I see the woman doctor.

4.   The King's School old clock is rather curious. It shows the correct time every hour on the hour but owing to gravity the minute hand travels three times as fast going down to the 6 as it does back up to the 12. Within each half of its revolution the speed is constant.

What is the correct time when the clock shows 10.45am?

A   7.5 minutes to 11   **D**   22.5 minutes to 11

B   10 minutes to 11   **E**   25 minutes to 11

C   20 minutes to 11

5. Surveys of public opinion reveal that many people object to the idea of selling bodily organs for transplant. Some object on religious grounds claiming that the body is a sacred and holy thing that must not be violated. Others object on aesthetic grounds simply finding the idea of selling human livers for transplant somehow unpleasant or distasteful. But the sale of bodily organs can not be morally wrong. Everyone has the right to do what they want with their private property and each person owns their own organs.

Which is the best expression of the conclusion of this argument?

A The body is a sacred and holy thing which must not be violated.

B Everyone has the right to do what they want to with their private property.

C Public opinion is strongly opposed to the sale of bodily organs for transplant.

D The sale of bodily organs can never be wrong.

E Surveys of public opinion reveal many people are opposed to the sale of bodily organs for transplant.

6. The battery life of laptop computers means that they cannot be used for the duration of a long haul flight without needing to be recharged from an onboard power point. Not all planes have this facility. Therefore laptop computers should not be allowed as carry-on items on long haul flights without power points, regardless of whether they are intended for personal or business use, as they will be of limited use to their owners and take up a disproportionate amount of space in the cabin.

Which is the best statement of the flaw in this argument?

A Different models have different battery capacities

B Some companies ask their employees to work on long flights

C A laptop may run out of batter on a short haul flight, too.

D The passenger cannot choose whether or not they book a flight with an onboard power point.

E Passengers could make some use of their laptop even if the battery does run out.

7. Father Christmas needs to arrange his eight reindeer in four rows of two. However, he needs to observe the following rules about the reindeer:

Blitzen must always be on the left-hand side but not in the rear row

Comet and Cupid must be in either of the first two rows, but not necessarily in the same row

Dancer must always be directly behind Donner

Prancer must always be ahead of Dasher but never on the same side, and never next to Comet or Cupid

Vixen must be as far away from Blitzen as possible and not on the same side

From left to right, which two reindeer make up the rear row?

A	Prancer and Vixen		**D**	Dancer and Dasher
B	Dasher and Vixen		**E**	Vixen and Dasher
C	Dancer and Vixen			

8. Midas bought a golden jug at auction for £80. A year later the price of old gold had risen and he decided to sell it at auction, receiving £100. He immediately regretted his decision and approached the buyer who sold it back to him for £110. The next year, he needed some money so he sold the jug to a dealer for £120.

How much profit did Midas make on the jug overall?

A	£10		**D**	£40
B	£20		**E**	£50
C	£30			

9.   In the UK 45% of the workforce is female but the percentage of women in senior positions is significantly lower than this. This is unfair to women and bad for the economy, in that those who are promoted to senior positions may not be the most able.

Women may be discouraged from seeking promotion because employers require senior employees to work long and inflexible hours. Women may also be perceived as being unwilling to subordinate the demands of family life to the demands of the job. So employers must be urged to offer flexibility in working hours and to seek to move away from the UK culture of long working hours.

Which of the following is an assumption underlying this argument?

A   Most women are not currently interested in seeking promotion.

B   Men do not object to the promotion of more women.

C   Women would be better leaders than men if given the opportunity.

D   Women are no less likely than men to have the abilities needed for senior positions.

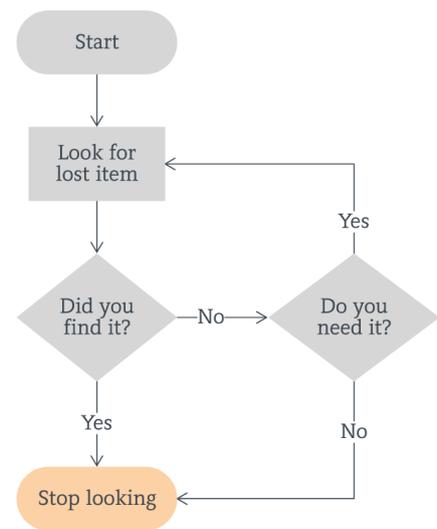**E**   Working hours would become more flexible if employers promoted women to senior positions.

10.   Many drivers deliberately break traffic laws, both because they are convinced that there is little chance of being caught and because if they are caught the penalties do not act as a sufficient deterrent. For example, people who would never think of stealing money even when they needed it, think nothing of exceeding a 30mph limit even in a street where children are playing. It is clear, then, that a substantial reduction in road accidents can be achieved only by catching more motorists who break the law and by increasing the penalties for such law-breakers.

Which of the following is an assumption of the above argument?

A   The number of road accidents is increasing because motorists are ignoring the traffic laws.

B   Drivers who have been convicted of a traffic offence think nothing of continuing to break the law.

C   People who break the traffic laws are a significant cause of road accidents.

D   If the penalties for stealing were less severe, people would think nothing of stealing money when they needed it

E   If the penalties for traffic offences were increased, drivers would not break the law so frequently
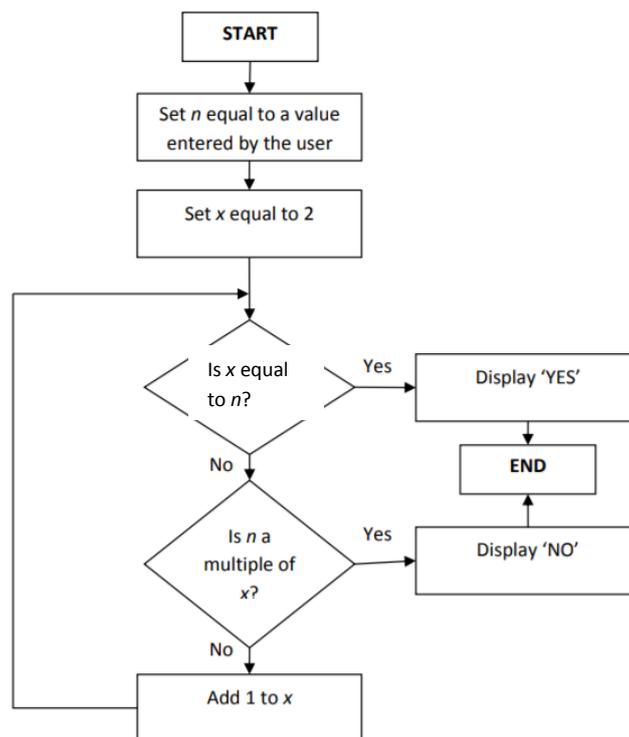
Section B [20 marks] – Algorithms

Computer programs work by executing a set of instructions called an algorithm. Although computers read their instructions in specific programming languages, the algorithms that they use may be represented using flow diagrams. An example of such an algorithm is shown. It models a computer (or logical person) looking for lost items. The computer executes the instructions in the rectangular boxes and then moves on to the next stage according to the direction of the arrows. Sometimes the computer is required to make a decision; this is represented by a diamond-shaped box. After making the decision, the computer proceeds according to the outcome of the decision.

Note that every box must have at least one arrow entering it and one arrow leaving it. The only exceptions are the START and STOP/END boxes.

(a) Study the algorithm below. It is designed to display either YES or NO depending on the value of a number n entered by a user. You may assume that the user enters a positive whole number.

7

(i) Write down the outcomes displayed by the computer when it executes the algorithm for n = 2, n = 3 and n = 4. [3]

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(ii) This algorithm displays YES if n possesses a particular mathematical property. What is this property? [1]

……

(iii) This algorithm is not very good. It is inefficient and also contains a flaw: if a particular positive whole number is entered as n the program will not work properly. What is the flaw, and which value of n will trigger it? [2]

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Algorithms are not restricted to the context of computing.

(b) Some animal decision-making can be described with simple algorithms. Using the three instructions and one decision given below, design a flow diagram for the decision-making algorithm of a gazelle in the African bush. [4]

START   Flee for 2 minutes   Graze for 5 minutes   Is there a lion present?

(c) Many modern cars have 'cruise control', designed for making driving easier at high speeds. When cruise control is switched on at a speed selected by the driver, the driver can take his feet off the pedals and the car's computer keeps the car travelling at the selected speed. The computer continually checks to make sure that the car is going at the correct speed and if not, the computer adjusts the speed accordingly. If the driver presses the brake pedal, then the cruise control is immediately switched off.

(i) Design a flow-diagram for the cruise control algorithm. It should satisfy the following requirements:

• When the cruise control is switched on, the algorithm must immediately check the current speed and turn the cruise control off immediately if it is less than 25 mph.

• It should check the current speed at every 4 seconds and adjust the speed either up or down as appropriate.

• It should switch itself off if the driver presses the brake or accelerator pedals.

You may use the following instructions in your rectangular boxes in the flow diagrams. You will need to decide for yourself what should be contained in any decision boxes that you use. [8]

START **END** **Increase speed by 5mph** **Decrease speed by 5mph**
Set s equal to current speed **Wait 4 seconds**

(ii) Even a well-written algorithm for a cruise control would lead to an uncomfortable ride for the occupants of the car if it were limited to the instructions in the previous part of the question. Why is this? [2]

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Answer the following sections on lined paper.

Section C [20 marks] – A Just War

Read the passage and then answer the questions which follow.

For a war to be just three conditions are necessary. The first concerns the authority of the ruler within whose competence it lies to declare war. A private individual may not declare war; for he can have recourse to the judgement of a superior to safeguard his rights. Nor has he the right to mobilise the people, which is necessary in war. But since the responsibility for public affairs is entrusted to rulers, it is they who are charged with the defence of the city, realm, or province subject to them. And just as in the punishment of criminals they rightly defend the state against all internal disturbance with the civil arm, so they also have the duty of defending the state, with the weapons of war against external enemies. As Augustine says The natural order of men, to be peacefully disposed, requires that the power and decision to declare war should lie with the rulers'. Secondly there is required a just cause: that is that those who are attacked for some offence merit such treatment. Those wars are generally defined as just which avenge some wrong, when a nation or a state is to be punished for having failed to make amends for the wrong done, or to restore what has been taken unjustly. Thirdly, there is required a right intention on the part of the belligerents: either of achieving a good object or of avoiding some evil. As Augustine says: For the true followers of God even wars are peaceful, not being made for greed or out of cruelty, but from desire of peace, to restrain the evil and to assist the good'. So it can happen that even when war is declared by legitimate authority, and there is a just cause, it is, nevertheless, made unjust through evil intention.

Thomas Aquinas (c. 1225 – 1274)

(a) Summarise the passage in forty to fifty words. [6]

(b) Which one of the four conditions mentioned above do you consider the most important? Explain your answer fully. [14]

Section D [20 marks]

Write your answer to this section on a separate sheet of writing paper.

Choose one of the titles below and write an essay addressing the question.

1.   Should the richest part of a country have the right to secede (become independent)?

2.   Is science a religion?

3.   What makes a good building? Discuss with respect to one public building you know.

4.   Should the judiciary be representative of the society it serves?

5.   How do apologies work?

6.   How is it different to know something and to be certain of it?

7.   Are there differences between the appearance and the reality of things?