Cambridge Assessment
Admissions Testing

BioMedical Admissions Test

Sample A   **60 minutes**

SECTION 1   **Thinking Skills**

INSTRUCTIONS TO CANDIDATES

Please read this page carefully, but do not open the question paper until you are told that you may do so.

This paper is Section 1 of 3. Your supervisor will collect this question paper and answer sheet before giving out Section 2.

A separate answer sheet is provided for this section. Please check you have one. You also require a soft pencil and an eraser.

Please complete the answer sheet with your:

- BMAT candidate number
- Centre number
- Date of birth
- Name

Speed as well as accuracy is important in this section. ***Work quickly, or you might not finish the paper.*** There are no penalties for incorrect responses, only marks for correct answers, so you should attempt **all** 32 questions. Each question is worth one mark.

Answer on the sheet provided. Questions ask you to show your choice between options by shading one circle. If you make a mistake, erase thoroughly and try again.

You **must** complete the answer sheet within the time limit.

You can use the question paper for rough working or notes, but **no extra paper** is allowed.

Calculators are NOT permitted.

Please wait to be told you may begin before turning this page.

This question paper consists of 19 printed pages and 5 blank pages.

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1 Fear of death prompted us to develop technology that helps people live longer. But those same technological advances have condemned us to fear of infirmity and dementia, since so many of us will live to an advanced age. So as to eliminate this new fear, once we have reached old age we should be assisted to die if we choose death over a sad decline. According to current estimates, dementia affects almost 50 per cent of people by the age of 85, and bodily infirmity is guaranteed to develop further the older we get. There is no cure for old age.

Which one of the following best expresses the main conclusion of the above argument?

A Technology has advanced to the point where we can now choose when to die.

B Euthanasia should be readily available to people who have reached a certain age.

C The fear of infirmity and dementia is worse than the fear of death.

D We must develop technology to cure dementia and infirmity.

E We should focus on the health of the young instead of that of the old.

2 A café owner makes 50 mini pizzas and 50 flapjacks for sale during the day. The pizzas are sold for $2.00 each and the flapjacks are sold for $1.00 each. However, by the end of lunchtime there are 10 mini pizzas still unsold and 15 flapjacks unsold, so the price of each is halved for the afternoon. At the end of the day there are still 2 mini pizzas and 1 flapjack left which are given away free to the last customer.

If the original 50 mini pizzas and 50 flapjacks had a combined production cost of $30.00, how much profit is made on the sale of the mini pizzas and flapjacks for the day?

A $100.00

B $102.50

C $115.00

D $120.00

E $130.00

3   Thousands of parents have recently been prosecuted by local education authorities for taking their children out of school to go on holiday during term time. I took my daughter out of primary school for a two-week holiday every year. The headmistress made no objection and said it would give the other kids time to catch up with her! She was able to learn a foreign language and spend some rewarding time with her French pen-pal. She eventually achieved top grades at school and a degree in mathematics, so it obviously did her no harm! Parents, not governments, know best how to raise children. This law is quite unnecessary.

Which one of the following is the best statement of the flaw in the above argument?

A   It is an appeal to tradition because it suggests that taking children on holiday in term time used to be acceptable.

B   It is based on authority as it uses the headmistress's lack of objection in support.

C   It assumes that because the daughter's good grades were achieved after her foreign holidays, they were the result of the holidays.

D   It is based entirely on the one example of the daughter and generalises from that.

E   It assumes that learning some French adequately compensated for the work the daughter missed.

4   Mobile phone use and driving under the influence of alcohol are not the only examples of irresponsible driver behaviour. Tiredness when driving a vehicle is said to be responsible for 300 deaths per year. Astonishingly, almost half of male drivers and 22% of female drivers admit to having fallen asleep at the wheel. If we assume (and it seems reasonable to do so) that even more people are injured than killed as a result of accidents caused by tiredness, it is clear that tiredness while driving is a major road safety issue – and entirely preventable. If we wish to preserve our own lives and those of others we should not drive a car knowing that we have had insufficient sleep or rest to drive safely.

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

A   Women are more careful than men about driving when they are tired.

B   Drivers are able to recognise when they are dangerously tired.

C   Falling asleep when driving is more dangerous than using a mobile phone while driving.

D   People whose jobs involve long distance driving can always avoid driving while tired.

E   Tiredness has been insufficiently highlighted in road safety campaigns.

5 The world is now producing more farmed fish than beef. In 2012, fish production reached a record 66 million tonnes; cattle-farm output levelled out at 63 million tonnes. This ought to be good news for the environment. Cattle farming is one of the biggest contributors to global warming, while fish farming – as well as being sustainable – produces little pollution. Fish such as the silver carp can be reared on existing rice paddies, and they feed on grass, plankton and detritus. Species such as salmon, however, are carnivorous and are fed on smaller fish like anchovies caught in the wild. As a result, salmon can only be farmed by further depleting wild fish stocks.

Which one of the following can most reliably be drawn as a conclusion from the above passage?

A Fish farmers who produce carnivorous fish should switch to producing non-carnivorous fish.

B Fish farming is likely to become increasingly more widespread in comparison to beef farming.

C Fish farming will always be better for the environment than cattle farming.

D It would be better for the environment if a greater proportion of farmed fish was non-carnivorous.

E Where possible, farmers should opt for more environmentally friendly forms of farming.

6 A picture 40 cm high by 30 cm wide is to be framed. There will be a mount between the edge of the picture and the frame. This mount will be 6 cm wide at the top and sides, and 9 cm wide at the bottom. The width of the wood used for the frame is 2 cm.

What is the overall height of the framed picture?

A 46 cm

B 49 cm

C 56 cm

D 59 cm

E 62 cm

7 The following table summarises the results of all the matches played last season in a football league. (The home team's score is always given first.) Each team plays every other team in the league twice; once at home and once away.

| away team										
home team		Amazon	Danube	Ganges	Hudson	Nile	Orinoco	Rhine	Tigris	Volga	Yangtze
	Amazon		2–2	2–1	4–0	1–1	2–1	1–3	2–0	1–2	1–1
	Danube	1–3		1–4	2–1	2–3	0–1	2–1	0–0	2–5	0–1
	Ganges	2–2	3–1		2–0	1–2	2–3	1–3	1–2	3–1	2–0
	Hudson	1–2	0–1	2–1		0–1	1–3	2–1	1–0	1–4	0–0
	Nile	2–0	3–0	1–2	3–1		1–0	3–3	2–3	2–0	1–2
	Orinoco	4–1	0–0	3–1	2–0	3–2		2–2	3–1	1–2	2–0
	Rhine	2–3	2–1	1–1	3–0	1–2	2–0		3–0	2–2	3–1
	Tigris	1–1	2–2	1–3	1–0	2–0	0–2	0–3		2–4	1–0
	Volga	3–2	3–0	2–1	4–1	2–2	1–0	1–2	4–0		1–1
	Yangtze	0–2	1–2	2–0	2–1	3–1	0–3	0–2	2–0	1–3	

Which was the only team that scored at least one goal in every match they played last season?

A Amazon

B Ganges

C Nile

D Rhine

E Volga

6

8 After the financial crash there were fewer new car registrations in the UK in 2012 than there were in 2007. The monthly figures for new car registrations for both years are given in the table below.

Jan 2012	124.1	Jan 2007	161.2
Feb 2012	61.4	Feb 2007	71.5
Mar 2012	367.9	Mar 2007	445.3
Apr 2012	138.0	Apr 2007	167.9
May 2012	159.0	May 2007	184.8
Jun 2012	185.5	Jun 2007	220.6
Jul 2012	141.7	Jul 2007	175.3
Aug 2012	57.5	Aug 2007	76.2
Sep 2012	359.0	Sep 2007	419.1
Oct 2012	149.7	Oct 2007	168.0
Nov 2012	150.3	Nov 2007	160.5
Dec 2012	123.1	Dec 2007	139.8

Which one of the following charts best represents the monthly differences between new car registrations for these two years?

A

B

C

D

E
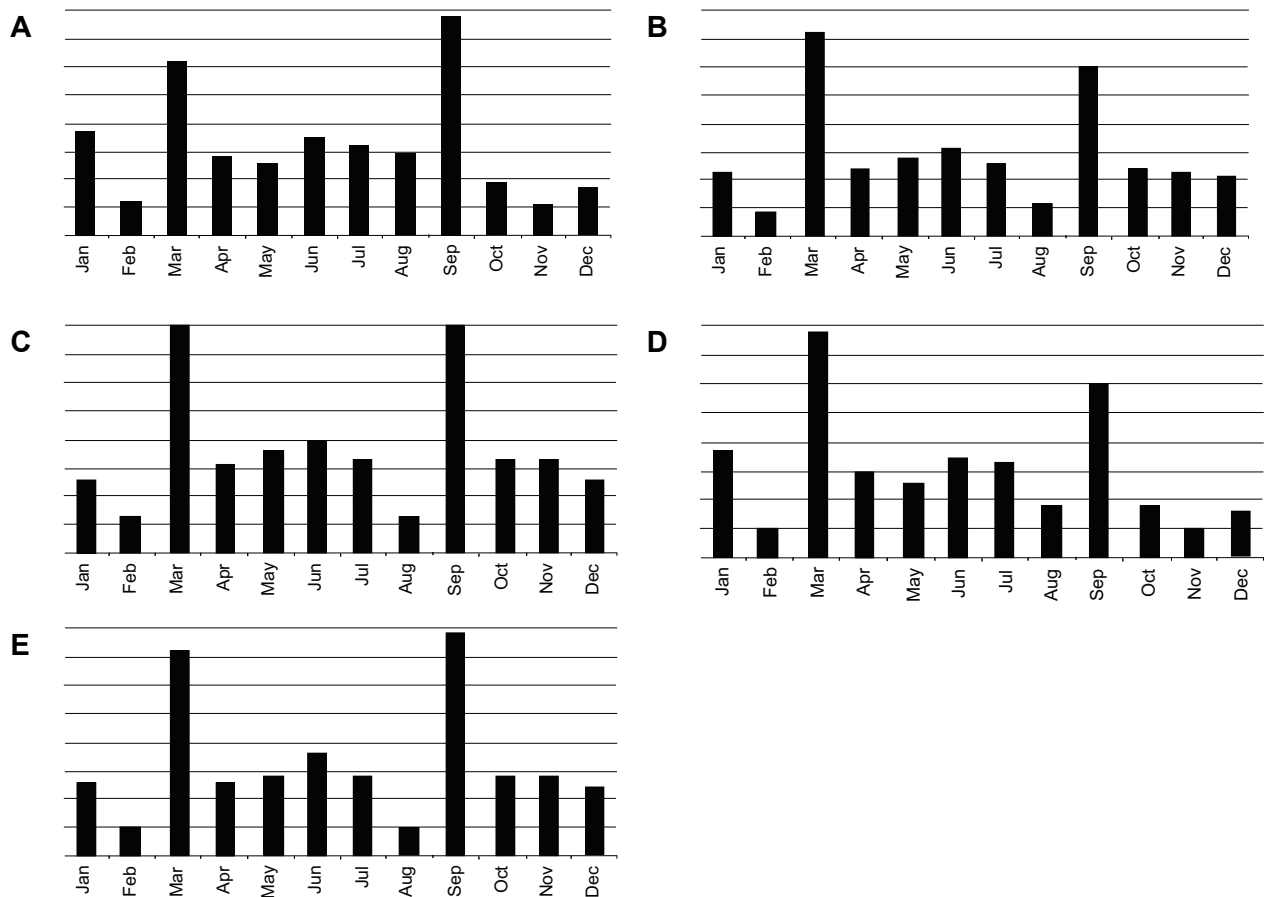
9   We live in an information-rich world where communication is quicker and easier than ever before. We don't have to wait for journalists and photographers to report news to us. Anyone can talk about or take photographs of significant events and share them immediately. Traditional ways of reporting meant that news could be effectively censored, but this is no longer the case. Similarly, incorrect information cannot be removed from the public domain without great difficulty. Governments and the traditional media will therefore need to find new ways to cope with these challenges and adapt to new technology.

Which one of the following, if true, most strengthens the above argument?

A   Some governments have successfully restricted the information available on the internet in their countries.

B   Journalists occasionally film material on their mobile phones.

C   Information can be posted anonymously on the internet, thus avoiding possible prosecution.

D   Legal proceedings have been brought against those publishing false and incriminating material on the internet.

E   In the past, individuals often took photographs that they then sold to the press.

10   The decline in voter turnout at elections is chiefly explained by the decline in voting by younger people. Older people are much more likely to vote. If this trend continues, we will reach a point at which no government can be said to have a mandate to govern as the number of voters will be too small to indicate the wishes of the majority. We need, therefore, to find an alternative to conventional elections so that the wishes of the people can be heard.

Which one of the following best expresses the flaw in the above argument?

A   There may be problems in using alternatives such as internet and postal voting.

B   Young people may be more likely to join a pressure group than to vote in an election.

C   All European countries have seen a decline in voter turnout.

D   Elections are used in all democratic countries as a way of choosing a government.

E   People who are young now may become more likely to vote as they get older.

11 A new supermarket scheme awards money-off vouchers to customers who spend £40 a week on their grocery shopping. As your weekly shop only costs £15, you are not eligible for vouchers.

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

A A discount is given to gym members who introduce new customers. You brought two friends who joined up, so you will get a discount.

B Dessert is given to all those who have completed their main course. You have not eaten your main course so you will not be given dessert.

C Anyone between the ages of 18–30 inclusive gets admission into the nightclub half-price. You are 30 so you will not pay full price.

D A bursary is given to those on incomes below £10 000. You earn £9000 so you will receive a bursary.

E Only experienced wine drinkers can appreciate a good wine. You prefer poor quality wine as you have only recently started drinking wine.

12 A laboratory technician has made up a stock mixture of two chemicals, X and Y, ready for use by all of the groups in Year 9 at a High School. He has mixed 6.0 kg which is $\frac{1}{4}$ of X and $\frac{3}{4}$ of Y. He realises that he has used the wrong mix and, rather than waste the chemicals he has used so far, he is going to add some more of chemical X so that the mix consists of 40% of X and 60% of Y.

What mass of chemical X must he add?

A 1.0 kg

B 1.5 kg

C 2.0 kg

D 2.5 kg

E 3.0 kg

13 The heptathlon is a seven-event athletics competition. In each event the time or distance recorded is converted into a points score. This is the scoring table that is used for the high jump:

performance	points	performance	points	performance	points	performance	points
2.19	1498	1.89	1093	1.59	724	1.29	399
2.18	1484	1.88	1080	1.58	712	1.28	389
2.17	1470	1.87	1067	1.57	701	1.27	379
2.16	1456	1.86	1054	1.56	689	1.26	369
2.15	1442	1.85	1041	1.55	678	1.25	359
2.14	1428	1.84	1029	1.54	666	1.24	350
2.13	1414	1.83	1016	1.53	655	1.23	340
2.12	1400	1.82	1003	1.52	644	1.22	331
2.11	1386	1.81	991	1.51	632	1.21	321
2.10	1373	1.80	978	1.50	621	1.20	312
2.09	1359	1.79	966	1.49	610	1.19	302
2.08	1345	1.78	953	1.48	599	1.18	293
2.07	1332	1.77	941	1.47	588	1.17	284
2.06	1318	1.76	928	1.46	577	1.16	275
2.05	1305	1.75	916	1.45	566	1.15	266
2.04	1291	1.74	903	1.44	555	1.14	257
2.03	1278	1.73	891	1.43	544	1.13	248
2.02	1264	1.72	879	1.42	534	1.12	239
2.01	1251	1.71	867	1.41	523	1.11	231
2.00	1237	1.70	855	1.40	512	1.10	222
1.99	1224	1.69	842	1.39	502	1.09	214
1.98	1211	1.68	830	1.38	491	1.08	205
1.97	1198	1.67	818	1.37	481	1.07	197
1.96	1184	1.66	806	1.36	470	1.06	188
1.95	1171	1.65	795	1.35	460	1.05	180
1.94	1158	1.64	783	1.34	449	1.04	172
1.93	1145	1.63	771	1.33	439	1.03	164
1.92	1132	1.62	759	1.32	429	1.02	156
1.91	1119	1.61	747	1.31	419	1.01	149
1.90	1106	1.60	736	1.30	409	1.00	141

Daphne is competing in a heptathlon competition and has just beaten her previous best high jump performance by 18 cm. This has increased her best points score in the high jump by 214.

What is Daphne's new personal-best high jump performance?

A   1.09 metres

B   1.44 metres

C   1.74 metres

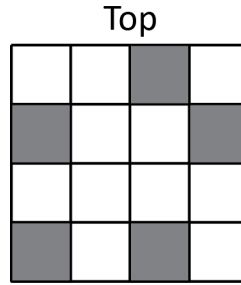**D**   1.89 metres

E   2.09 metres

14 Instructions were given to shade 5 particular squares on a grid of 16 squares. One student shaded in the squares as instructed, but the other four got exactly 1 square wrong.

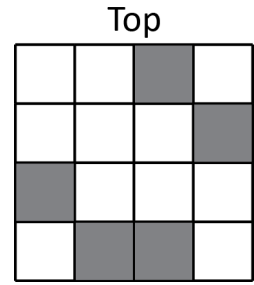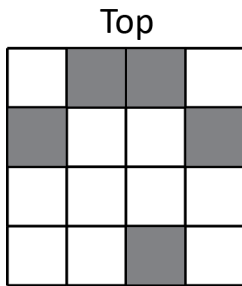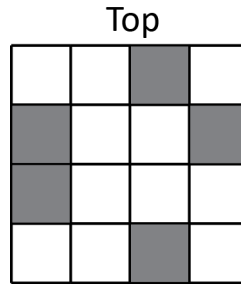Which one of the five grids below shows the correct shading?

A

Top

B

Top

C

Top

D

Top

E

Top
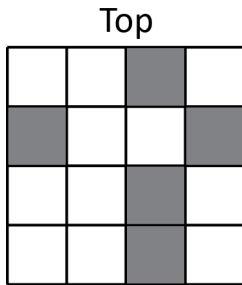
15 Long-term unemployment is a big problem for the UK, both for the government and for the individual. The solution is unlikely to be one the government wishes to consider: invest money in improving the skills of job centre staff. Some people argue that providing welfare benefits makes unemployed people less motivated to find work. Other people, mostly outside the government, think that not enough is done to provide the help needed to get people into work. Neither side is right. Unemployed people are all different: some really want to work and would do so if they had help; others are content to live on benefits. We have to steer away from one-size-fits-all solutions and tailor the approach to the individual. But this needs much higher levels of skilled staff than job centres currently have.

Which one of the following best expresses the main conclusion of the above argument?

A Long-term unemployment is one of the biggest problems facing the UK.

B Unemployed people vary in their motivation to work.

C One-size-fits-all solutions tend to be cheaper than tailored approaches.

D The way to reduce unemployment is to spend on skilled staff in job centres.

E Welfare benefits provide a disincentive to work.

16 Government advice on alcohol drinking limits is based on studies carried out twenty-five years ago. It has often been expressed in terms of a maximum number of units per day. But advising people about a daily rate implies that drinking alcohol every day is acceptable, when up-to-date research suggests that the body needs more 'recovery time' than one day. Health promotion advice should avoid being so simple that it inadvertently encourages unhealthy behaviour. Better to have more complex messages than simple messages which promote unhealthy behaviour.

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

A The research carried out twenty-five years ago is no longer valid.

B Drinking alcohol every day is common practice.

C People always follow the advice of health promotion messages.

D The government should regularly revise its advice on all health issues.

E Complex health promotion messages will be read and understood.

17 It has emerged that prisoners have helped to maintain one of Britain's busiest railway lines. Inmates from an open prison have worked night-shifts on the main line from London to Glasgow. This is the same line where a train left the tracks earlier this year, killing one person and injuring several others. It is all very well to have offenders being rehabilitated through work, but what appears to be happening here is that rail contractors are cynically using prisoners as cheap labour. This is unacceptable, not just for safety reasons – important as they are – but because ultimately it is an infringement of workers' rights. If these prisoners are being paid less, or treated differently from regular workers, the practice must stop once and for all.

Which one of the following expresses the general principle that underlies the above argument?

A Labour is labour and should have the same value whoever is performing it.

B Public safety issues must always be given priority over economic advantages.

C Rehabilitation should be for the prisoner's benefit, not the employer's.

D Prisoners who are given work should not take jobs away from other workers.

E Maintenance of public services should be in the hands of skilled professionals only.

18 I am planning to repaint the walls and the ceiling of my dining room. The room has the shape of a rectangular box and is 8 m long, 4 m wide and 3 m high. I do not need to paint the door and the three windows, the combined surface area of which is $10\,m^2$. Paint is sold in 8-litre tins and 1 litre of paint is sufficient for a surface area of $12\,m^2$.

How many tins of paint do I need to buy?

A   1

B   2

C   6

D   8

E   17

19 The following ingredient and nutrition information (rounded to the nearest 0.1 g or 1 kcal) appears on a 300 g packet of oatcakes.

Each oatcake provides:

energy	53 kcal
fat	2.2 g
saturated fat	0.6 g
salt	0.2 g
sugars	0.3 g

Ingredients: oatmeal (77%), vegetable oils, wheat flour, sugar, salt, raising agent: sodium hydrogen carbonate.

Typical values per 100 g: energy 1792 kJ, 427 kcal; protein 10.7 g; carbohydrate 56.45 g of which sugars 2.4 g, starch 53.7 g; fat 17.6 g of which saturates 5.0 g, mono-unsaturates 7.9 g, polyunsaturates 4.5 g; fibre 8.9 g; salt 1.4 g of which sodium 0.6 g.

How many oatcakes are there in a packet?

A   7

B   8

C   21

D   24

E   27

20 The following net is folded up to make a cube.
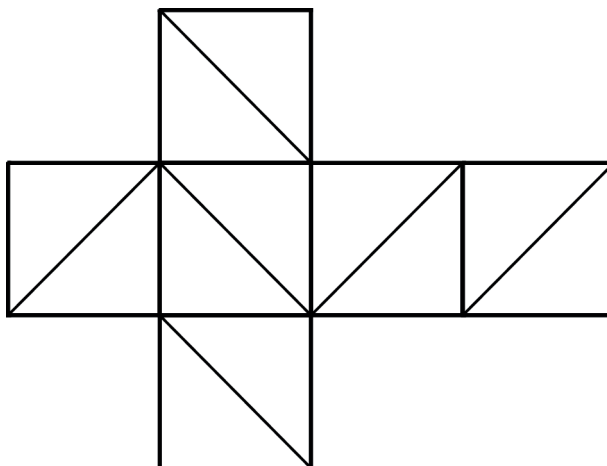
At how many corners of the cube do exactly two of the diagonal lines on the faces meet?

A 2

B 3

C 4

D 5

E 6

21 Modern aeroplanes are for the most part 'flown' by autoflight computers. These computers can take over when the plane is just 30 metres off the ground, maintain whatever speed and height is tapped into the flight management system, and land the aircraft automatically. But when autoflight computers experience situations they haven't been programmed to handle – sudden structural damage to the aircraft, or extreme weather – they can throw back responsibility to the pilot, who may become confused over the level of control they have. The confusion is made worse by flight deck computers overloading pilots with a blizzard of alerts. This is when crashes are most likely to happen.

Which one of the following is a conclusion that can be drawn from the above passage?

A Developing autoflight computers further to allow pilotless planes is likely to be safer than the current arrangement.

B Automated systems can be refined to the extent that air crashes will not happen.

C The combination of computer and human control over an aircraft is unsafe in most situations.

D Autoflight computers can be controlled as easily from the ground as from inside the plane.

E Human error in entering data into autoflight computers will always pose a risk.

22   Anyone who lends money to anyone else without a licence is committing an offence under UK law. Some unlicensed money lenders charge excessive rates of interest, and many use threats and violence to enforce payment. It is important to protect poor and vulnerable people from being exploited in this way. So anyone convicted of this offence should be sent to prison.

Which one of the following is the best statement of the flaw in the above argument?

A   It appeals to the reader's emotions by describing some people as 'poor and vulnerable'.

B   It draws a conclusion about all unlicensed money lenders on the basis of evidence about some of them.

C   It makes a personal attack on the unlicensed money lenders.

D   It restricts the options between licensed and unlicensed money lenders.

E   It wrongly assumes that licensed money lenders do not charge excessive rates of interest.

23   Studies of fossilised remains indicate that, every 20 to 30 million years, life on Earth experiences a sudden and mass extinction of all or most of its dominant species. Yet, in each case, within some 5 to 10 million years the diversity of species on the planet is as great, if not greater, than it had been previously, since the demise of the dominant species allows more minority species to flourish. Whatever disasters we may wreak on the planet, life in the long term will not only survive but actually increase in richness and diversity.

Which one of the following, if true, most weakens the above argument?

A   The consequences of a global nuclear holocaust are not known.

B   It can be difficult to draw precise conclusions about dates from fossil records.

C   Human technology will soon be advanced enough to prevent most natural catastrophes.

D   Some species are able to withstand the most extreme forms of environmental change.

E   Some species have died out due to dramatic changes in climate.

24 Fergus Castle is a tourist attraction on a small island off the coast of the mainland. A ferry service runs between the mainland and the island, and takes 40 minutes to make a single journey in either direction. There is a turnaround time of 5 minutes at the end of each single journey. Each day, ferries leave the mainland every 20 minutes, at 5, 25 and 45 minutes past each hour, starting at 09:05. Ferries leave the island at 15, 35 and 55 minutes past each hour, starting at 09:15.

What is the minimum number of boats needed?

A　3

B　4

C　5

D　6

E　7

25 The table below shows the numbers of pupils and teachers in all UK schools in 2003:

	pupils (thousands)	teachers (thousands)
England North	2,418	132
England Midlands	1,613	88
England East	900	50
England London	1,173	66
England South	2,160	121
Wales	497	26
Scotland	893	59
Northern Ireland	341	21

Which region had the lowest ratio of pupils per teacher?

A　England Midlands

B　England South

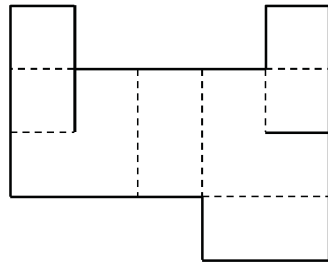**C**　Wales

D　Scotland

E　Northern Ireland

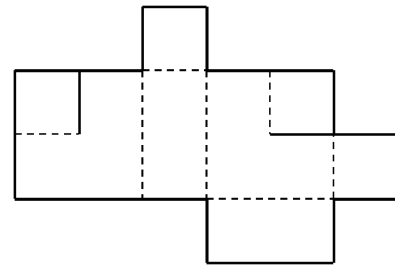**26**   The drawing below shows an 'L' shaped box.
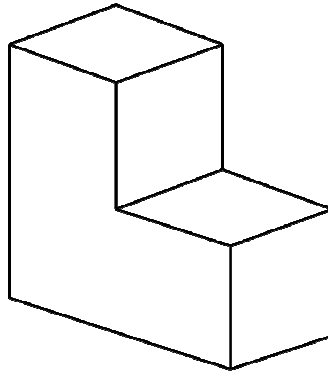
Which one of the nets below **cannot** be folded up to form the 'L' shaped box? (A dotted line indicates a fold and a solid line indicates a cut.)
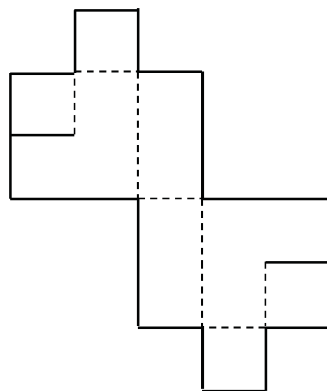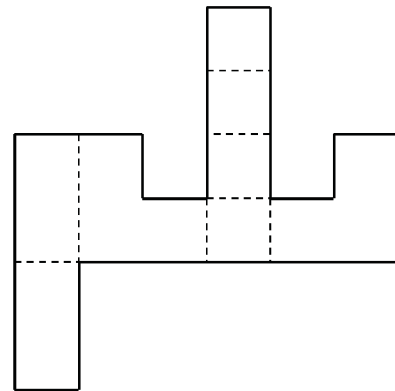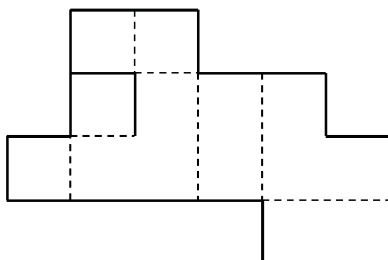
A

B

C

D

E

27 When either freedom of speech or freedom of assembly is present in society, democratic government inevitably results. If you live under a dictatorship, you must therefore lack both of these key liberties.

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

A If a house lacks both window locks and a burglar alarm, the insurance application will inevitably be turned down. Since your claim has been rejected, your house must have neither window locks nor burglar alarm.

B If heat or light is emitted by a body, then its energy decreases. It follows that, if a body's energy remains constant, it has emitted neither heat nor light.

C Anybody over 21 who holds a university degree or equivalent is eligible for selection. Since Greg is 19 and still an undergraduate, he cannot be eligible.

D Either the fans are very loyal or they don't mind the team losing week after week. No fans like to watch their team being beaten, so they must be very loyal.

E With water and sunlight this plant will thrive, since both water and sunlight are necessary for a plant's survival.

28 Joan has a cat called Tibber.

Every day Tibber is fed 2 sachets of wet food and 25 grams of dry food.

For some time, Joan has bought the cat food from the local pet shop where one box of 12 sachets costs £12.00 and one 400 gram packet of dry food costs £4.00.

Joan has now decided to buy all of the cat food from an online distributor.

Four boxes, each of 24 sachets of wet food, will cost £62.40, and one 2 kilogram packet of dry food will cost £16.00.

How much money will Joan save each day on cat food when she buys it from the online distributor rather than the local pet shop?

A 40p

B 75p

C 93p

D £1.50

E £2.25

29 The current advice from the NHS in the UK is to eat five portions of fruit and vegetables a day. However, a recent study suggested that at least seven portions are needed to maximise health. Given that less than a third of adults in the UK, and even fewer children, currently meet the five-a-day target, there is little to be gained from changing the NHS advice to a higher number. A higher target might even be counter-productive, as evidence shows that a change in diet is best sustained when the change is made slowly and incrementally.

Which one of the following best expresses the main conclusion of the above argument?

A Eating seven portions of fruit and vegetables a day is needed to stay healthy.

B At least two thirds of the UK adult population ignore current guidelines.

C Current guidance on fruit and vegetable intake should be maintained.

D Setting high targets for a change in diet is unrealistic.

E Current advice on fruit and vegetable intake has not taken account of recent research.

30 A particular computer game involves the capturing of three types of mythical creatures: Arps, Orps and Urps.

Arps have 6 legs, 3 horns and a tail.
Orps have 4 legs and 2 horns, but no tail.
Urps have 3 legs and a tail, but no horns.

The last time Billy played this game he captured 45 creatures with a total of 222 legs, 99 horns and 33 tails.

How many of the 45 creatures that Billy captured were Urps?

A 8

B 12

C 15

D 20

E 25

31 The award of a Nobel Prize in economics, but not in psychology, sociology or anthropology, seems to imply that economics is not a social science, but an exact one, like chemistry or physics. Underpinning this idea is the thought that the human world operates like the physical world. Economists themselves perpetuate this impression by dealing in hard quantitative data, as opposed to observation and qualitative analysis. The defining feature of the natural sciences is their consistent success in making predictions, but almost all economists failed to predict the 2008 financial crisis. The striking collapse of LTCM, a hedge fund set up by two economists who were later awarded the Nobel Prize, further underscores the limits of economics to make accurate forecasts.

Which one of the following can be drawn as a conclusion from the above passage?

A The Nobel Prize should not be awarded for economics.

B The human world is not part of the physical world.

C Economics is not a science like chemistry or physics.

D Economists cannot predict the behaviour of markets.

E Hard quantitative data has no role in economics.

32 Each word in a word game is scored by adding up the values of its letters. Each letter has the same value whenever it appears but different letters have different values. I know the word values for TEAR, RITE, TREE and RAT, but none of the letter values.

How many of the letter values can I now calculate?

A 0

B 1

C 2

D 3

E 4

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