

KINGDOM OF BAHRAIN

NATIONAL AUTHORITY for QUALIFICATIONS  
and QUALITY ASSURANCE of EDUCATION  
and TRAINING

Directorate of National Examinations

Grade 12 National Examinations

مملكة البحرين

الهيئة الوطنية للمؤهلات و ضمان جودة

التعليم و التدريب

إدارة الامتحانات الوطنية

الامتحانات الوطنية للصف الثاني عشر

March 2016

امتحان مارس 2016

PROBLEM SOLVING

حل المشكلات

Paper 1 Problem Solving

الورقة 1 حل المشكلات

Duration: 90 minutes

مدة الامتحان: 90 دقيقة

Write your answer on the question paper.

اكتب الإجابة في ورقة الأسئلة.

Additional materials: ruler, pencil, eraser,  
calculator.

الأدوات الإضافية: مسطرة، قلم رصاص، ممحاة،  
آلة حاسبة.

Read these instructions first:

Use a blue pen only.

Attach your CPR label here

Do not write in the margin.

Answer **all** questions.

The use of calculators is permitted.

There are four options to each question. Select **one**  
correct answer from the options by circling the letter  
as follows:

**B**

**Note:**

Each correct answer will score one mark. Marks will  
**not** be deducted for incorrect answers.

The total number of marks for this paper is 30.

This document consists of **32** printed pages

- 1 Isa followed a training programme to lose weight. At the end of every week he recorded the weight he had lost or gained since the end of the previous week. The following table shows the results:

First week	2 kg lost
Second week	1 kg lost
Third week	1.5 kg gained
Fourth week	Same weight
Fifth week	2 kg lost
Sixth week	1 kg lost
Seventh week	2 kg lost
Eighth week	2 kg gained

At the end of the eighth week Isa weighed 80 kg.

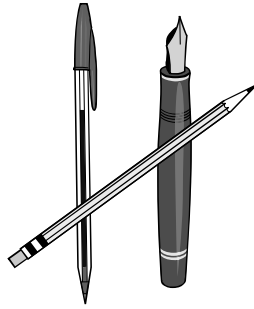
How much did he weigh at the end of the fourth week?

- A 80 kg
- B 81.5 kg
- C 83 kg
- D 84.5 kg



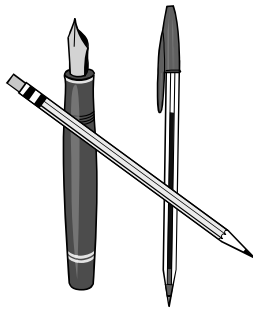
- 2 The image below shows some writing implements that are on a desk.

For  
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Use

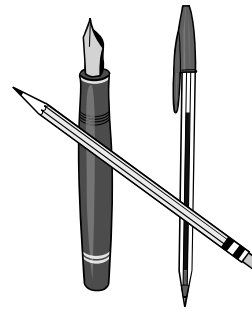


Which one of the following images is the correct reflection of this image if you put a plane mirror to the right?

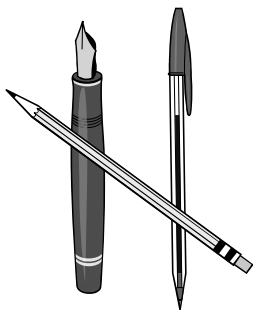
**A**



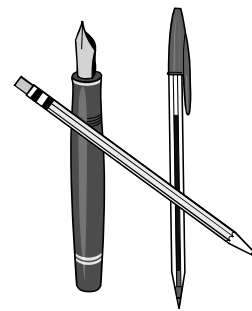
**B**



**C**



**D**

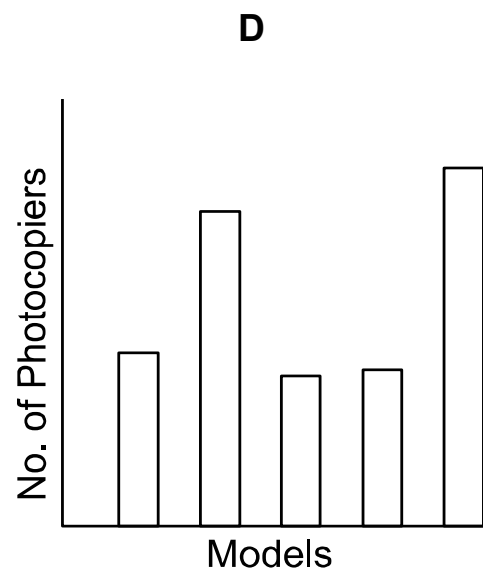
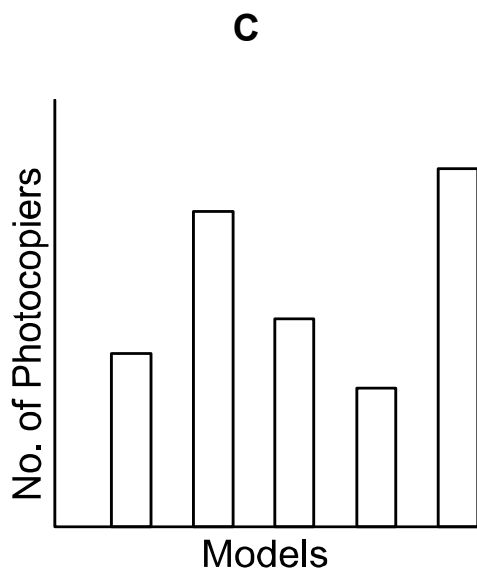
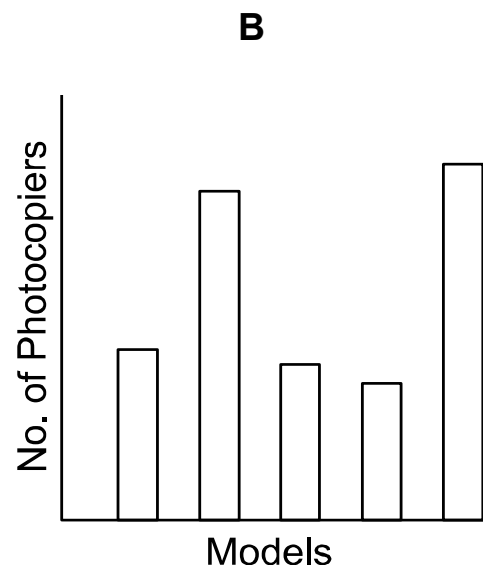
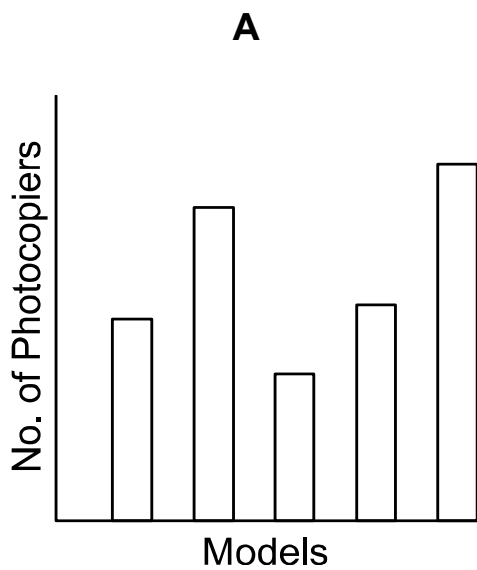


- 3 Smart Print records the number of photocopiers sold by the company every year. The following table shows the data for last year:

For  
Examiner's  
Use

Model	Mono 1	Mono 2	Mono 3	Colour 1	Colour 2
<b>Number of Photocopiers</b>	240	450	294	190	510

Which of the following charts, suitably labelled, could represent the data above?



- 4** A family decided to travel to the Levant by car. They drove 500 km a day for 5 days. The fuel price was 100 fils per litre.

*For  
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Use*

Which one of the following pieces of information is sufficient by itself to calculate the total cost of the fuel used during the trip?

- A** The number of litres that the fuel tank holds
- B** The number of times that the fuel tank is filled during the trip
- C** The distance travelled by the car per hour
- D** The distance the car travels per litre



- 5** The University of Bahrain's student shuttle buses depart from the Muharraq every hour at 10 minutes past the hour and take Sheikh Khalifa bin Salman Street to the University of Bahrain. The buses leave the University of Bahrain every hour at 40 minutes past the hour, taking the same route back to Muharraq. In both directions, the trip takes between 60 and 70 minutes depending on the traffic.

If you take the student shuttle bus from the University to Muharraq, what is the maximum number of student shuttle buses that will pass you in the other direction during your journey?

- A** 1
- B** 2
- C** 3
- D** 4



- 6 The following table shows the rates for shipping packages via express mail:

<b>Express Mail Shipping</b>		
<b>Country</b>	<b>Weight (kg)</b>	<b>Rate (BD)</b>
<b>GCC countries</b>	First 0.5 kg	4.5
	Every additional 0.5 kg	1
<b>Other Arab countries</b>	First 0.5 kg	5
	Every additional 0.5 kg	1
<b>Europe – India – Sri Lanka – Pakistan – Southeast Asia</b>	First 0.5 kg	5
	Every additional 0.5 kg	2
<b>Canada – North America – South America</b>	First 0.5 kg	7
	Every additional 0.5 kg	2

A person wants to send two packages: one weighing 2.5 kg, to Kuwait, and one weighing 3 kg, to India.

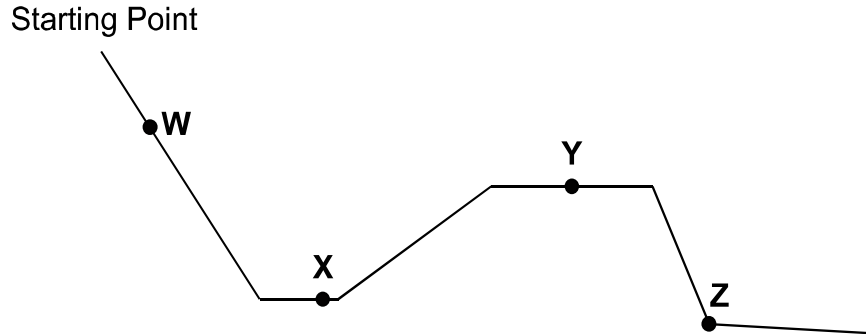
What will be the total cost for sending the two packages?

- A** BD 9.5
- B** BD 12.5
- C** BD 23.5
- D** BD 26.5

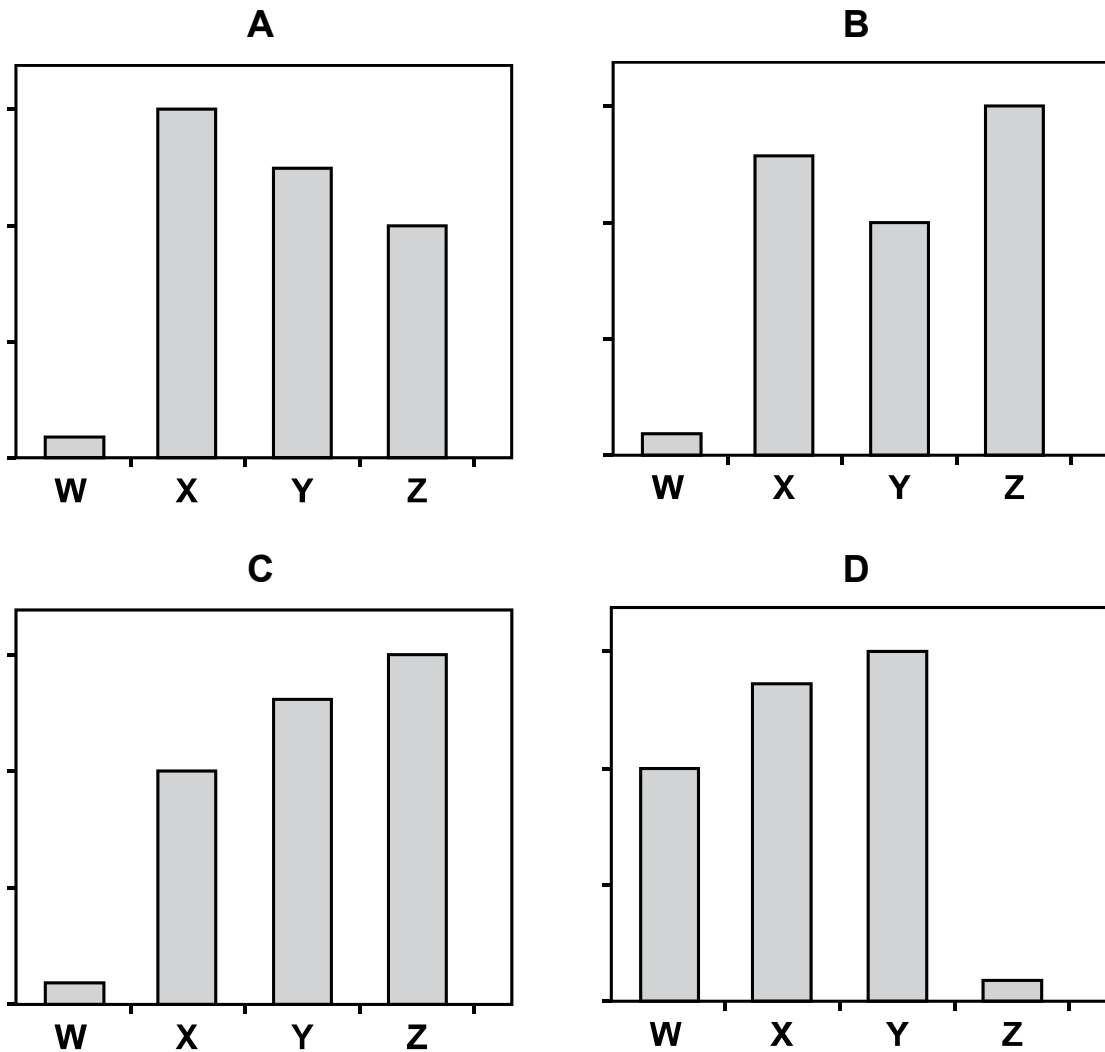


- 7 The figure below shows Osama's local skateboard track. On one occasion, just before setting off from the starting point, Osama dropped his skateboard and it went down the track without him. The points W, X, Y and Z represent the skateboard at different heights on the track.

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Use



Which of the following graphs represents the skateboard's speed at the different heights?





- 8 A burger restaurant owner, adding up a day's takings, finds that the total is BD 110.500. He knows that 100 pieces of burger have been served.

For  
Examiner's  
Use

The table below shows the prices of the different types of meals sold at the restaurant.

Meal	Price (BD)
Kids meal (1 small burger + 1 fries + 1 juice)	1.500
Meal for one (1 burger + 1 fries + 1 juice)	1.700
Meal for two (2 burgers + 2 fries + 2 juice)	2.600
Meal for four (5 burgers + 5 fries + 5 juice)	5.400
Meal for eight (10 burgers + 10 fries + 10 juice)	11.000

Which of the following would describe all the meals that were sold during that day?

- A 50 meals for two
- B 10 meals for eight
- C 5 meals for two, 13 meals for four, 9 meals for one and 8 kids meals
- D 15 meals for four, 2 meals for eight and 5 kids meals



9

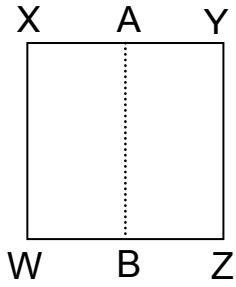


Figure 1

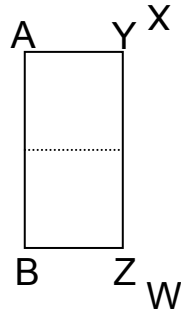


Figure 2

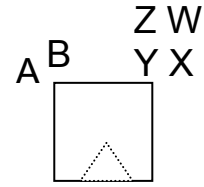
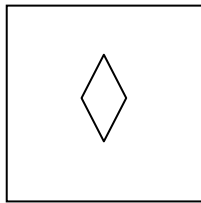


Figure 3

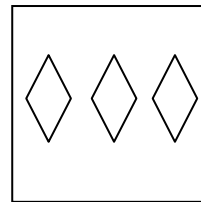
The square piece of paper in figure 1 is folded along the dotted line AB so that X is on the top of Y and W is on the top of Z (figure 2). The paper is then folded again so that B is on the top of A and ZW on the top of YX (figure 3). The dotted shape in figure 3 is cut out and the paper is unfolded.

Which of the following is the result?

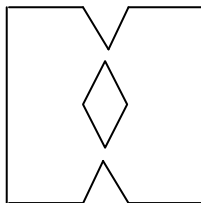
**A**



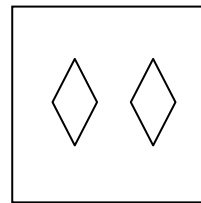
**B**



**C**



**D**



- 10** Ahmad noticed that his colleague, Rashid, is quick at typing numbers, so he asked him to type all the whole numbers from 1 to 100, inserting a space each time between the numbers. Rashid did it in less than a minute without making any mistakes.

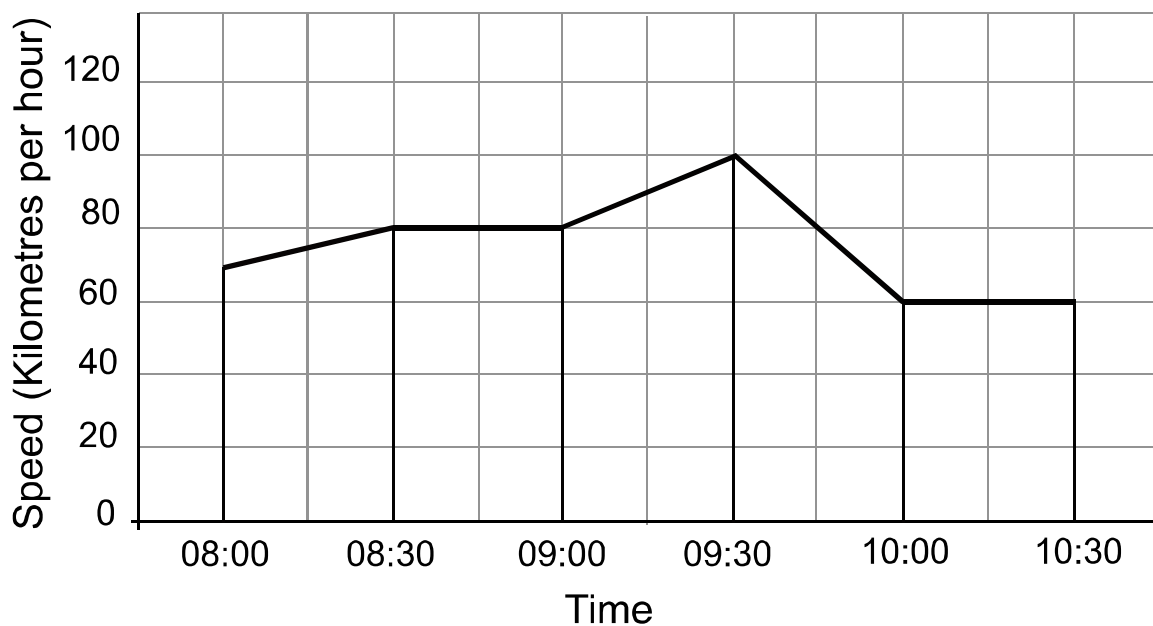
*For  
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Use*

How many times did Rashid press on the keyboard keys?

- A** 192
- B** 201
- C** 287
- D** 291



11

For  
Examiner's  
Use

The graph above shows the speeds at which Mariam drove her car during a journey.

For what percentage of the time was Mariam driving at 80 kilometres per hour or faster during her journey?

- A 20%
- B 30%
- C 40%
- D 50%



- 12** Everyday, your father leaves home at exactly the same time to take you to school. If your father drives his car at a speed of 40 km/h, you will arrive 10 minutes late, after the bell rings. If your father drives his car at a speed of 60 km/h, you will arrive early, before the bell rings.

Which one of the following pieces of information would allow you to be able to tell your father the speed he should drive at for you to get to school on time, as the bell rings?

- A** The time you leave home
- B** The time required to arrive at school if your father drives at a speed of 60 km/h
- C** The time required to arrive at school if your father drives at a speed of 40 km/h
- D** How early you will arrive before the bell rings if your father drives at a speed of 60 km/h

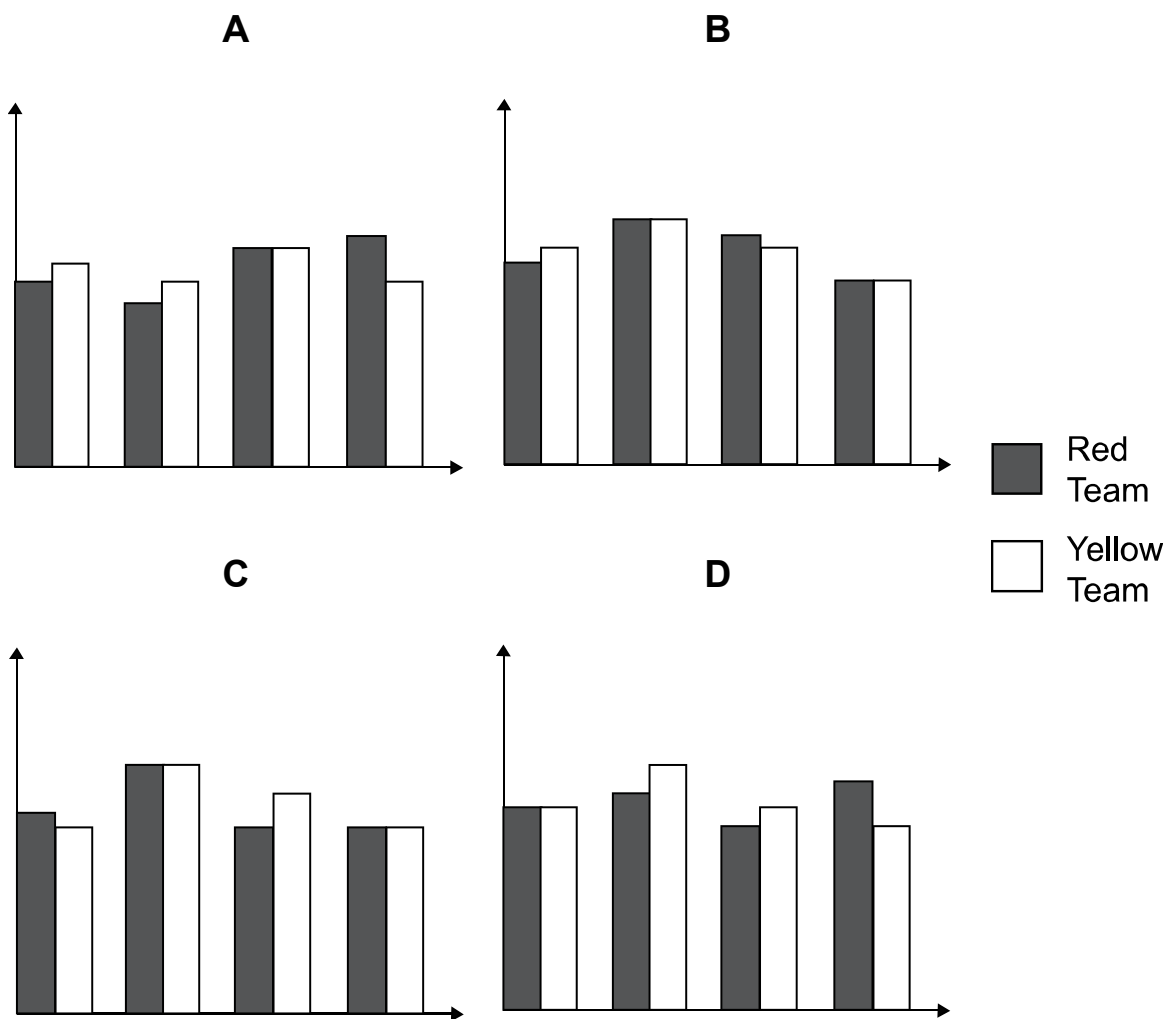


- 13** Basketball is a team game. The winning team is the one who scores the most points in four quarters.

For  
Examiner's  
Use

The Reds played a game against the Yellows. The Yellows won the game. Ahmed drew a graph showing the points scored by both teams in each of the four quarters.

Which one of the following graphs **could** be the graph that Ahmed drew?



- 14** Hassan found some sweets in a bowl. He ate half of them. Later, his mother added twelve more sweets to the bowl. Once again Hassan ate half of the sweets in the bowl. There was now the same number of sweets in the bowl as there was at the beginning.

How many sweets did Hassan eat in total?

- A** 8
- B** 10
- C** 12
- D** 20

*For  
Examiner's  
Use*



- 15** The administration of a sports club needs to transport a total of 350 people, made up of competitors and fans, to the stadium where a tournament is being held. The club owns 6 big buses, which can reach the stadium in 1 hour, and 5 minibuses, each of which can hold 10 passengers and can reach the stadium in 30 minutes. Using all the buses, they are confident that they will get everybody to the stadium within 2 hours.

For  
Examiner's  
Use

Which one of the following pieces of further information allows the administration to be confident that they will get everybody to the stadium within 2 hours?

- A** The maximum speed of the minibuses is 100 km/h
- B** The distance between the club and the stadium is 25 km
- C** 60 of the 350 people are the competitors
- D** The big buses each have 42 seats





- 16** Manar plans to make sandwiches for a picnic. She has three types of bread (brown, multigrain, white), four types of meat (salami, bologna, turkey, pastrami) and three types of cheese (swiss, cheddar, mozzarella).

*For  
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Use*

Manar will make each sandwich with one of the types of bread and one type of meat **or** one type of cheese **or** one type of meat and one type of cheese.

How many different kinds of sandwiches can Manar make?

- A** 19
- B** 22
- C** 36
- D** 57

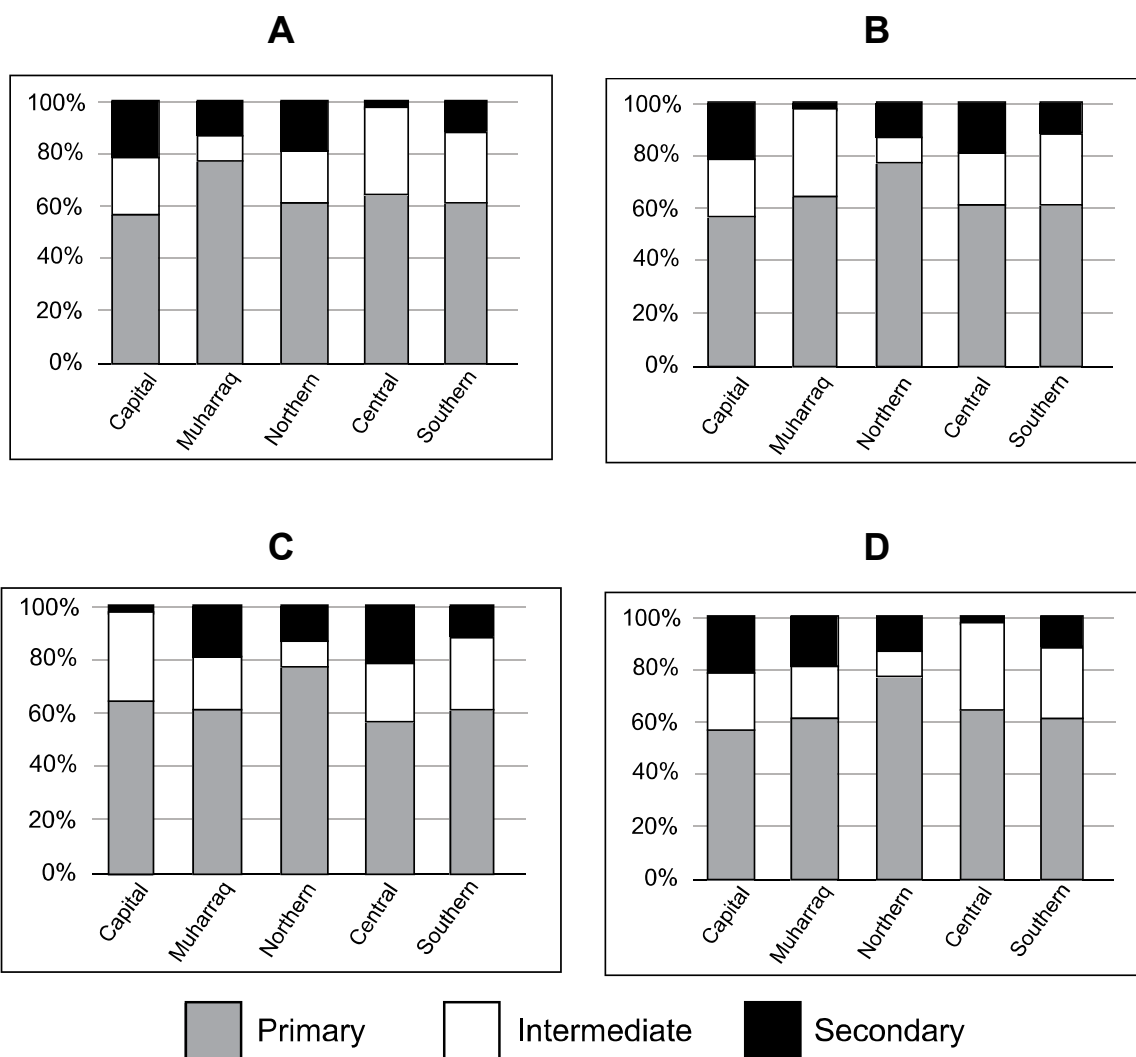


- 17 The following table shows the number of government schools according to educational level and governorates that there were in the academic year 2012/2013 in the Kingdom of Bahrain:

For  
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Use

Educational Level	Governorates				
	Capital	Muharraq	Northern	Central	Southern
Primary	18	20	35	22	5
Intermediate	7	6	4	11	2
Secondary	7	6	6	1	1

Which one of the following graphs shows the percentages of each educational level within the five governorates?



- 18**  $\frac{3}{4}$  of the members of the Whiteknight chess club are boys.  $\frac{2}{5}$  of the boys entered a tournament, of which  $\frac{2}{3}$  of them won their first round matches.

If 48 of the boys from the Whiteknight club won their first round matches in the tournament, how many girls are there in the Whiteknight club?

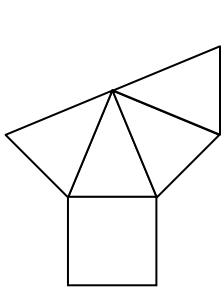
- A** 45
- B** 60
- C** 180
- D** 240

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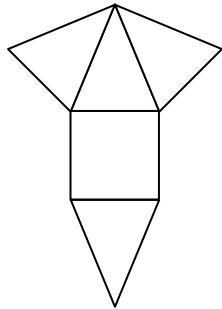


- 19 Hesham drew the following four nets that he thought would fold to form a pyramid:

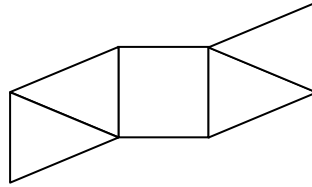
For  
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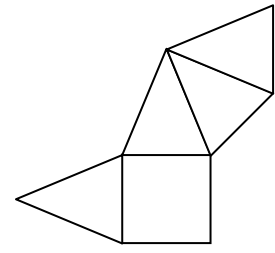
Net 1



Net 2



Net 3



Net 4

Which one of the nets he was **not** able to form a pyramid with?

- A Net 1
- B Net 2
- C Net 3
- D Net 4



- 20** Yousif is going to the UK for his holidays. He wants to hire a car for 10 days. He knows that he will drive at least 600 miles. He has seen these two adverts on the internet for the same model of car.

<u>Golden Car</u>	<u>Best Cars</u>
<ul style="list-style-type: none"><li>• GBP 80 each day</li><li>• No mileage charge</li><li>• Price includes tax</li><li>• <b>Special offer: 35% off</b></li></ul>	<ul style="list-style-type: none"><li>• GBP 36 each day + GBP 0.15 per mile</li><li>• Price excludes tax</li><li>• Value added tax 20%</li></ul>

If Yousif chooses one of these two companies, what is the least amount that he will pay to hire the car he wants?

- A** 280  
**B** 450  
**C** 520  
**D** 540



- 21** Hanan has found a recipe that makes a cake for 24 people. The table below shows the ingredients and quantities required, together with the cost.

<b>Ingredient</b>	<b>Quantity required</b>	<b>Cost</b>
Golden sugar	1.2 kg	GBP 1.50 per kilogram bag
Flour	1.4 kg	GBP 1.20 per kilogram bag
Eggs	20	GBP 2.70 per box of 12
Milk	160 ml	GBP 0.90 per litre bottle
Vanilla	30 ml	GBP 1.20 per 50 ml bottle

She wants to bake a cake like this one, big enough for the 36 people that will be at her party. She has none of these ingredients in her cupboard and can only buy them in the amounts shown in the cost column in the table above.

How much will she have to pay to buy the ingredients she needs for the cake she wants to bake?

- A** GBP 11.25
- B** GBP 15.60
- C** GBP 16.80
- D** GBP 18.30



- 22** In 2012 the rates of tax on people's incomes in the UK were as follows:

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Use*

<b>Amount Earned</b>	<b>Tax Rate</b>
First GBP 7475	0%
Next GBP 35000	20%
Further income	40%

If David paid a total of GBP 8610 income tax in 2012, how much had he earned?

- A** GBP 39025
- B** GBP 43050
- C** GBP 46500
- D** GBP 50525



- 23** Jasim wants to join a gym for 6 months. There are 4 gyms: Victory, Strength, Compete and Perfection. These gyms offer a discount on their monthly fees. The following table shows the discount offered by each gym:

<b>Gym</b>	<b>Type of Discount</b>
<b>Victory</b>	BD 4.5 discount off the monthly fees
<b>Strength</b>	20% discount off the monthly fees
<b>Compete</b>	Pay full price for 2 months and get 60% discount off a third month
<b>Perfection</b>	Pay full price for 1 month and get 50% discount off a second month

The full monthly fee for each of the four gyms is BD 20.

Which gym would be cheapest for Jasim to join for 6 months?

- A** Victory
- B** Strength
- C** Compete
- D** Perfection





**24** A tailor has bought a 95 m length of fabric for BD 114.

The table below shows the time to make one thoub for different age groups, together with the lengths of fabric required and the selling prices per thoub.

Age group	Time require to make	Length of fabric required	Selling Price
6 -10 years	2 hr	2 m	BD 8
11 -17 years	5 hr	2.5 m	BD 10
18 years or more	7 hr	3 m	BD 14

The cost of sewing each thoub is BD 1 per hour for all age groups.

He is going to use the 95 m length of fabric to make the following:

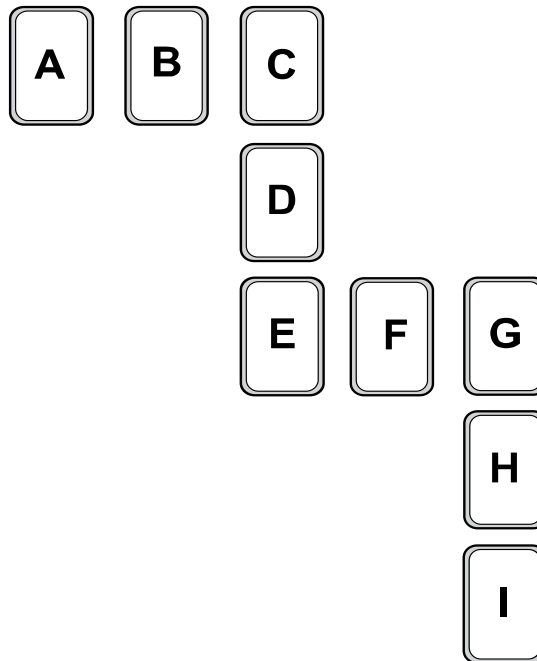
- 20 thoub for the 18 years or more age group
- 10 thoub for 11 -17 years age group
- and 5 thoub for 6 -10 years age group

What will be his total profit?

- A** BD 106  
**B** BD 220  
**C** BD 306  
**D** BD 506



- 25** Hani created a game for his nephew's birthday party. He wrote each of the digits 1, 2, 3, 4, 5, 6, 7, 8 and 9 on a different piece of card and placed the cards on the floor. He covered each piece of card with a block with a letter on it. The guests in the party saw the arrangement shown in the figure below.



The nine children at the party were told that each line of three digits under the letters added up to 13, e.g.  $C + D + E$ . Each child took out a card with a different letter on it from a box, without looking. The winner of the game was the child who was first to guess correctly the number on the card under the block with his number on it.

Salman won the game, correctly guessing the number under block E.

What number was under block E?

- A** 1
- B** 2
- C** 3
- D** 4



- 26** Al-Resala Primary School teaches up to 6<sup>th</sup> grade and it receives students from three other schools, namely, Al-Nahdha Primary School, Al-Najah Primary School and Al-Rehab Primary School, when they finish the highest grade that their school teaches.

At the end of the academic year 2012/2013, the numbers in the two highest grades were as follows:

School Name	Al-Nahdha Primary		Al-Najah Primary		Al-Rehab Primary		Al-Resala Primary	
	3 <sup>rd</sup>	4 <sup>th</sup>	4 <sup>th</sup>	5 <sup>th</sup>	4 <sup>th</sup>	5 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>
<b>Number of repeaters</b>	0	12	8	10	11	10	10	21
<b>Total number of students</b>	110	120	100	150	120	130	120	200

The total number of students includes the number of repeaters, who will remain in the same grade next year.

Additionally, some students transfer to other schools from Al-Resala and some students transfer from other schools to Al-Resala after the start of the new academic year. The numbers of these students that transferred during the first week of the academic year 2013/2014 were as follows:

Grade	5 <sup>th</sup>	6 <sup>th</sup>
<b>Number of transfers from Al-Resala Primary School</b>	25	52
<b>Number of transfers to Al-Resala Primary School</b>	30	45

How many students were in the 6<sup>th</sup> grade at Al-Resala Primary School at beginning of the second week of the academic year 2013/2014?

- A** 363
- B** 384
- C** 414
- D** 492



- 27** An insurance company has 7500 clients. Each client has a client number between 0001 and 7500.

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Use*

The company has decided to give prizes to some of the clients. A client has won one of the prizes if his client number satisfies the following conditions:

- All four digits of the number are different
- The sum of the four digits is 25
- The last digit is 1 higher than the first digit

How many clients have won a prize?

- A** 5  
**B** 8  
**C** 10  
**D** 19



- 28** Waleed's telephone service provider offers two different tariffs, as follows:

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Use

<b>Packages</b>	<b>Monthly subscription (BD)</b>	<b>Per-minute rate for calls (BD)</b>
<b>Gold package</b>	15.000	0.075
<b>Silver package</b>	2.500	0.200

The service provider sends a bill to Waleed every month and guarantees that it will always use the tariff that makes his bill lower.

Waleed's bill for October was BD 21.300, whilst the bill for November was BD 23.700.

Which one of the following statements explains these two bills?

- A** The service provider used the Gold package for both months
- B** The service provider used the Gold package for October's bill and the Silver package for November's bill
- C** The service provider used the Silver package for October's bill and the Gold package for November's bill
- D** The service provider used the Silver package for both months



- 29** Salman and Hussain ran for student council in their high school. All 11<sup>th</sup> and 12<sup>th</sup> graders voted in the elections. Salman got 225 votes and Hussain got 480 votes. According to the Election Committee's statistics, 40% of the 11<sup>th</sup> graders voted for Salman and 75% of the 12<sup>th</sup> graders voted for Hussain.

How many more students are there in Grade 12 than in Grade 11?

- A** 35
- B** 55
- C** 90
- D** 100

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Examiner's  
Use*



- 30** Amal left a bowl of toffees on the dining table intending them to be shared out equally between her three daughters, Rawan, Abeer and Fatima.

Rawan arrived home first and she ate her share, and then left again. Abeer arrived home next. She thought she was the first one home, so she ate what she thought was her fair share, before she too left again. Finally Fatima arrived home. She also thought she was the first one home and ate what she thought was her fair share.

Later, they realised what had happened, and Amal distributed the remaining 8 toffees fairly.

How many toffees did Amal give to Fatima?

- A** 3
- B** 4
- C** 5
- D** 6



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PS12/01E

March 2016

PROBLEM SOLVING

Paper 1 Problem Solving

امتحان مارس 2016

حل المشكلات

الورقة 1 حل المشكلات

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