

# ENTRANCE EXAM SLOT - Z

Academic year: 2021/2022

Time allowed:

<b>Application number (name &amp; surname):</b>	
<b>Signature:</b>	

### Instructions to candidates:

- ANSWER ALL QUESTIONS IN DETAIL, SHOWING ALL YOUR WORK ON THE SAME PAGE AS THE QUESTION.
- PLEASE USE A PEN, DO NOT USE A PENCIL.
- THE ANSWERS PROVIDED IN THE DRAFT PAGE OR IN SEPARATE SHEETS WILL NOT BE CONSIDERED.
- NO BOOKS, NOTES, CALCULATORS OR ANY SORT OF ASSISTING MATERIAL ARE ALLOWED.
- **IF NECESSARY, YOU CAN ASK FOR A BLANC PAPER.**
- **ANSWERS WITHOUT THE CORRECT AND FULL SOLUTIONS WILL NOT BE MARKED.**

**PLEASE DO NOT TURN OVER THIS PAGE UNTIL TOLD TO DO SO**

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**PART 1: MATHEMATICS - 50%**

10 questions by 10 marks. Total: 100 points

**PART 2: ENGLISH - 50%**

50 questions by 2 marks. Total: 100 points

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
<b>Total</b>	
Staff name and signature:	

Use of English (30 marks)	
Reading (20 marks)	
<b>Total</b>	
Staff name and signature:	

**ANSWER WITHOUT THE CORRECT AND FULL SOLUTIONS WILL NOT BE MARKED. PROVIDE THE DETAILED SOLUTION AND GIVE THE CORRECT ANSWER ON THE PROVIDED SPACE BELOW. THERE IS NO MARK FOR PARTIAL ANSWERS.**

**Question 1.**

Of those surveyed in a poll, 60 % were members of “Student Union” youth organization. If 75 % of the “Student Union” members polled were males and 55 % of non- “Student Union” people polled were males, what percent of those polled were males?

**Write your answer here: .....**

**Question 2.**

If Elon and Jeff work together, they can finish the work in 3 hours. If Jeff works together with Bruce, they can make this work done in 6 hours. Elon and Bruce can finish this work in 4 hours. How much time would it take to finish the work if all three worked together?

**Write your answer here: .....**

**Question 3.**

Solve the simultaneous non-linear equations:

$$\begin{cases} \frac{x}{y} - \frac{y}{x} = \frac{5}{6} \\ x^2 - y^2 = 5 \end{cases}$$

**Write your answer here: .....**

**Question 4.**

Two farmers bought a total of 230 cows and a year later found out that the first farmer had 10% more cows than in the beginning, whereas the second had 20% increase. The total number of cows at the end of the observed period was 263. How many cows did each have in the beginning?

**Write your answer here: .....**

**Question 5.**

The length of a rectangle is increased by 60% and the width is decreased by 40%. How does the area of the rectangle change?

Write your answer here: .....

**Question 6.**

Find the first term and ratio of geometric progression:

$$\begin{cases} b_3 + b_6 = 1260 \\ b_4 - b_5 + b_6 = 945 \end{cases}$$

Write your answer here: .....

**Question 7.**

Simplify fully a)  $\frac{2\sqrt{39}+16}{\sqrt{3}+\sqrt{13}}$ . and b)  $\frac{b^{20}c^{20}+b^8c^{48}}{b^{13}c+bc^{29}}$ .

**Write your answer here: .....**

**Question 8.**

Find the equation of the line that passes through: (2, - 3) and is perpendicular to  $- 2x + 5y = - 10$

**Write your answer here: .....**

**Question 9.**

Find the sum of all two-digit numbers that are multiples of 3 but not of 4.

**Write your answer here: .....**

**Question 10.**

Paint needs to be thinned to a ratio of 2 parts paint to 1.5 parts water. The painter has by mistake added water so that he has 6 liters of paint which is half water and half paint. What must he add to make the proportions of the mixture correct?

**Write your answer here: .....**

USE THIS SPACE AS DRAFT

**Use of English (30 marks)****Choose the correct answer by circling the appropriate letter.**

Christmas cards are a big tradition in the English-speaking world. In 2017, people in Britain sent (1) ... received about 900 million cards. That's an average of about twelve cards for every person, from tiny babies to the oldest grandparents.

The number of cards that are sent around Britain (2) ... an annual headache for the postal service. Each year, the postal service has to take on (3) ... staff to help with the extra mail, and postal sorting offices are stretched to their maximum capacity and sometimes beyond it.

In 1994, the service handled about 1.6 billion cards! – about 25 cards per person in Great Britain, including children!) In spite of advertisements telling people to "Post Early for Christmas", (4) ... people get round to sending off their cards before December 10th; and from that point on, the postal service slows down.

Until the age of faxes, emails and social media, the pre-Christmas period caused a lot of problems for firms and (5) ... industry, as "urgent" letters and documents took several days to (6) ... their destination by post, slowed down by the mass of Christmas mail!

- |              |              |                |              |
|--------------|--------------|----------------|--------------|
| 1. A) or     | B) and       | C) but         | D) also      |
| 2. A) causes | B) is caused | C) have caused | D) causing   |
| 3. A) season | B) seasoned  | C) seasonal    | D) seasoning |
| 4. A) often  | B) rare      | C) fast        | D) seldom    |
| 5. A) ---    | B) that      | C) a           | D) the       |
| 6. A) reach  | B) achieve   | C) obtain      | D) follow    |

**Choose the correct answer by circling the appropriate letter.**

In the large flat regions in the middle of North America, the (7) ... popular winter sports are snowmobiling, snow-shoeing and cross-country skiing. Ice-skating is popular too; lakes and rivers freeze, and many towns and cities have free open-air skating rinks. In many places, (8) ... are flood-lit after dark, so that people can enjoy skating in the evening.

However, for many people, real "winter sports" means downhill skiing; and in the USA, there are two main (9) ... for this; the Adirondack Mountains in the Northeast, and the Rockies in the west.

The Rockies are probably the best place in the world for skiing. North America's "continental" climate that (10) ... the snow that falls here is usually very dry, very powdery. It provides perfect skiing conditions in the most famous skiing resorts, which are mostly situated at a height of over 2000 metres.

The best resorts are in Colorado and Utah, where the air is usually (11) ... clear through the winter months. Colorado has America's most famous skiing resorts, Vail and Aspen, (12) ... the stars and the rich go for their winter holidays.

- |                  |           |             |                |
|------------------|-----------|-------------|----------------|
| 7. A) more       | B) most   | C) much     | D) many        |
| 8. A) these      | B) this   | C) that     | D) the         |
| 9. A) area       | B) area's | C) areas    | D) areas'      |
| 10. A) mean      | B) means  | C) meaning  | D) meant       |
| 11. A) beautiful | B) beauty | C) beautify | D) beautifully |
| 12. A) where     | B) when   | C) what     | D) who         |

**Choose the correct answer by circling the appropriate letter.**

Youth crime and vandalism in the Patchway district of Bristol have fallen by 20% in just a few months. Why? Because young people have stopped (13) ... each other to do stupid and antisocial things and are now making sure that they keep out of trouble. And it is all the result of a new football league!

"Peer pressure" is a strong force, especially among young people. Almost (14) ... can remember a moment when they have felt compelled to do something because their friends were doing it, or to buy something because their friends had bought it.

In the age of social media, peer pressure (15) ... stronger than ever. Without it, fashion would not be the same, and advertising would be much harder. There would also be fewer of today's big (16) ... problems: drugs, crime and so on. Yet although peer pressure is usually seen as a bad influence, it can also produce positive results.



Jon Owen and David Morgan, two Bristol policemen, have organised a six-a-side football league (17) ... teenagers in Patchway, one of the poorest parts of the city. Police in several parts of Britain organise similar football leagues or competitions, but usually the aim is just to keep (18) ... teens occupied and build confidence between teenagers and the police.

- |                  |               |                 |                |
|------------------|---------------|-----------------|----------------|
| 13. A) encourage | B) encouraged | C) to encourage | D) encouraging |
| 14. A) everyone  | B) noone      | C) everything   | D) nobody      |
| 15. A) has       | B) is         | C) had          | D) was         |
| 16. A) sociable  | B) socially   | C) socialize    | D) social      |
| 17. A) for       | B) about      | C) by           | D) among       |
| 18. A) the       | B) a          | C) ---          | D) that        |

**Choose the correct answer by circling the appropriate letter.**

The legend of Robin Hood is an incredibly old one. According to one story, Robin was really an Anglo-Saxon nobleman, (19) ... called Robin of Huntingdon, or Robin Fitz-Ooth, and he was a rebel against England's Norman rulers.

After William the Conqueror conquered England in 1066, England (20) ... by Norman kings and Norman barons. Most of the ordinary Anglo Saxon people accepted their (21) ... masters; but some did not. They became outlaws, enemies of the Norman barons and the people who worked for them.

In modern language, we could perhaps call this Robin a "resistance fighter" - though some people might call him a "terrorist". The legend tells (22) ... that he took money from the rich and gave it to the poor. In fact, he probably took money from the Normans, (23) ... were relatively rich, and gave it to poor Anglo Saxons. This is why he soon became a legendary hero among Anglo Saxons.

Other stories claim that Robin was not an Anglo-Saxon nobleman, but a common fugitive; they say that his real name was "Robert Hod", and that he only fought (24) ... his personal enemies, in particular the Sheriff of Nottingham, not against the Normans.

- |                  |            |               |              |
|------------------|------------|---------------|--------------|
| 19. A) almost    | B) perhaps | C) hardly     | D) likely    |
| 20. A) was ruled | B) ruled   | C) was ruling | D) had ruled |
| 21. A) newest    | B) newly   | C) newer      | D) new       |
| 22. A) them      | B) us      | C) me         | D) him       |
| 23. A) what      | B) where   | C) who        | D) whose     |
| 24. A) for       | B) by      | C) next to    | D) against   |

**Choose the correct answer by circling the appropriate letter.**

Dolphins aren't just cute—they're incredibly clever animals. But just *how* (25) ... dolphins are might surprise you.

Some of the facts about dolphins laid out in a new TEDEd video lesson by Dr. Lori Marino show that they exhibit (26) ... similarities to human intelligence.

The animated short film describes how dolphins can mimic human speech patterns, (27) ... an understanding of symbols and syntax (two of the main elements of (28) ... language), and are one of the few animals that can recognize (29) ... in a mirror. Like humans, dolphins demonstrate empathy and altruism, and they even mourn their dead. And it's not just emotional or intellectual traits (30)... prove how intelligent they are—their brains are also quite large.

- |               |            |               |                 |
|---------------|------------|---------------|-----------------|
| 25. A) smart  | B) smarter | C) smartest   | D) the smartest |
| 26. A) much   | B) no      | C) some       | D) little       |
| 27. A) divide | B) develop | C) decide     | D) divert       |
| 28. A) human  | B) humanly | C) humanity   | D) humanism     |
| 29. A) itself | B) himself | C) yourselves | D) themselves   |
| 30. A) than   | B) that    | C) though     | D) they         |

**Reading (20 marks)**

**Read the text. First decide whether the statements are true (T) or false (F) and put a tick (✓) in the correct box. Then identify the sentence in the text which supports your decision. Write the FIRST four-five words of this sentence in the space provided. There may be more than one correct answer; write down only one. The first one (0) has been done for you.**

Napoleon Bonaparte (15 August 1769 – 5 May 1821) was a military and political leader of France. He was also "Emperor of the French" as Napoleon I. His actions shaped European politics in the early 19th century. Bonaparte was born in Corsica. His parents were of noble Italian birth. He trained as an officer in mainland France. Napoleon became important under the First French Republic. He led successful campaigns against Coalitions of enemies of the Revolution. In 1799, he staged a coup d'état to make himself First Consul. Five years later the French Senate declared him Emperor. In the first ten years of the nineteenth century, the French Empire under Napoleon waged the Napoleonic Wars. Every European great power joined in these wars. After a number of victories, France became very important in continental Europe. Napoleon increased his power by making many alliances.

The French invasion of Russia in 1812 became Napoleon's first big defeat. His army was badly damaged and never fully recovered. In 1813, another Coalition defeated his forces at Leipzig. The year after that, they attacked France. The Coalition exiled Napoleon to the island of Elba. Less than a year later, he escaped Elba and briefly became powerful again. However, he was defeated at the Battle of Waterloo in June 1815. Napoleon spent the last six years of his life on the island of Saint Helena.

Napoleon's campaigns are studied at military schools all over the world.

0 The political activity of Napoleon formed the politics of the whole continent.

31. Napoleon rose to power during the First French Republic.

32. He became the Emperor in 1799.

33. Some smaller European states joined military campaigns led by France.

34. After 1812 Napoleon's armed forces were never as strong as they had been before.

35. Napoleon's greatest victory was in the Battle of Waterloo in 1815.

	<b>T</b>	<b>F</b>	<b>First four-five words</b>
<b>0</b>	✓		<i>His actions shaped European politics</i>

**Read the text and complete the sentences below. Use NO MORE than three words.**

Elephants display complex social and emotional behaviour and are said to value their families more than most animals.

Elephant families have a matriarchal head, meaning that an older, knowledgeable lady elephant leads the herd. A family usually consist of a mother, her sisters, daughters their babies (calves). Occasionally, non-related elephants join to form families. Female family units range from three to twenty-five elephants.

Sometimes herds of female elephants combine with groups of bull elephants to form larger clans.

Female elephants help each look after each other's babies. Babysitting other female's calves is important for elephant development; young females learn how to look after the young, and the calves are shown how it's done. The survival rate of a calf greatly increases when more females are present and willing take care of it. Elephants walk in single file when they are on the move, for instance while in search of food and water. The calves will sometimes hold on to their mother's tails with their trunks.

Adult male elephants live a predominantly solitary life. When a male elephant (bull) reaches puberty, around 12 to 15 years of age, he will gradually become more independent of his family until he breaks away completely, to either roam alone or find a group of male elephants to join.

Although they tend to be close, an elephant family can split. This decision is influenced by ecological factors, such as the availability of food and water in the area.

36. It is an experienced lady elephant who is always the \_\_\_\_\_ the herd.
37. Sometimes elephants which are not connected by birth make \_\_\_\_\_.
38. Young female elephants learn to look after \_\_\_\_\_.
39. When elephants walk in the hunt for \_\_\_\_\_, the calves keep close to their mothers.
40. When \_\_\_\_\_ grow up, they separate from their families.
41. Elephant families \_\_\_\_\_ when food or water is not available.

**Read the text and choose the correct answer by circling the appropriate letter.**

Stonehenge is a circular group of huge stone blocks in southern England. It is located near the city of Salisbury. Ancient people built Stonehenge in stages between 5,000 and 3,500 years ago. No one knows for sure why Stonehenge was built. Many scholars think that it was a place of religious worship.

The largest stones were arranged in two groups. One was a circle of flat stones that rested on other stones that stood upright. The other group was inside the circle. It was a horseshoe-shaped group of five pairs of upright stones, with a flat stone on top of each pair. These stones weighed as much as 50 tons each.

Stonehenge also included smaller stones that weighed up to four tons each. Some of these stones had to be moved 385 kilometers from the place where they were mined. No one knows how this was done.

A straight path called the Avenue led away from the circles. An upright stone called the Heel Stone still stands near the center of the Avenue. On the longest day of the year (usually June 21), a person standing in the center of the stone circle can see the Sun rise directly above the Heel Stone. This has led some archaeologists to guess that Stonehenge was built by people who worshipped the Sun. In 1986 Stonehenge was designated a World Heritage site by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

42. Which of the following is true according to the text?
- A) The people who built Stonehenge were probably sunworshippers.
  - B) People spent about a thousand years arranging stones in circles.
  - C) Southern England is the area where huge stones were excavated.
  - D) There are small stones in the middle of the path called Avenue.

43. According to the text the Heel Stone is  
 A) a flat stone.  
 B) an upright stone.  
 C) good to visit in June.  
 D) in the centre of the inner circle.
44. How many stones are there in the horseshoe-shaped group?  
 A) four B) fifty C) five pairs D) 385

**Read the text and match the beginnings of the sentences (45-50) and the endings (A-H). There are more endings than you need.**

Summer is the best season to engage kids in a variety of sports. It is important to find activities that will hold children's attention longer than a video game or a computer screen.

**BASKETBALL** is a very popular activity for kids of all ages. This summer sport can be played individually, with a small group of friends, or through a friendly competition with many children participating. Basketball is a great sport for developing physical skills, while also strengthening essential values such as teamwork and intuition.

**LACROSSE** is played with a long stick headed by a basket, which is used to catch, carry and shoot the ball into the goal. This is an easy sport to learn. Lacrosse is a dynamic sport that develops a child's strength. The lacrosse rules are designed to minimize injuries, making this a relatively safe contact sport for kids to play.

**FOOTBALL** is a very popular sport among kids of all ages. This sport brings out a competitive spirit in a child. Football also teaches kids about valuable lessons in life including teamwork, discipline, and how to handle success or failure.

**VOLLEYBALL** is another popular summer sport for kids. This sport is traditionally played with a net, as the children volley the ball back and forth to each side. Volleyball is a relaxing summer sport for beginners to learn. This is one of the best summer sports to develop kids' motor skills.

**TENNIS** provides a perfect opportunity for kids to enjoy the hot summer sun. Playing tennis helps to build coordination, strength and endurance, making it one of the best sports activities for kids. Tennis matches tend to be fun and kids will have an enjoyable time while playing with their friends.

**MULTI-SPORTS**

Adolescence is the best time for kids to try out different types of summer sports. A multi-sports camp gives children the opportunity to explore many athletic activities. Through them, a child may discover a natural inclination towards a particular sport, which can be developed more closely in the future.

45. Basketball	A) is a pleasurable activity in hot weather.
46. Lacrosse	B) is the game where the stick touches the goal.
47. Football	C) help to understand which kind of sport is best for a kid.
48. Volleyball	D) helps to develop movement skills.
49. Tennis	E) can be played without a partner.
50. Multi-sports	F) has rules that make it quite harmless.
	G) has strict competition rules.
	H) teaches kids behave properly when they win or lose.