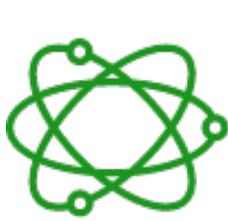




**PREMIER GENIE**

— FORMULA FOR SUCCESS —



**DUBAI STEM OLYMPIAD**

**2021**

**INTERMEDIATE CATEGORY**

**SAMPLE PAPER**

DSO 2021 | Intermediate Category | Sample Paper

Question 1:

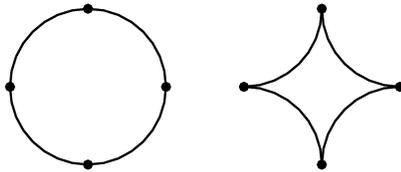
Of the 500 balls in a large bag, 80% are red and the rest are blue. How many of the red balls must be removed so that 75% of the remaining balls are red?

Options:

(A) 25    (B) 50    (C) 75    (D) 100

Question 2:

A circle of radius 2 is cut into four congruent arcs. The four arcs are joined to form the star figure shown. What is the ratio of the area of the star figure to the area of the original circle?



Options:

(A)  $\frac{4 - \pi}{\pi}$     (B)  $\frac{1}{\pi}$     (C)  $\frac{\sqrt{2}}{\pi}$     (D)  $\frac{\pi - 1}{\pi}$

Question 3:

In the country of Monaco, statisticians estimate there is a baby born every 8 hours and a death every day. To the nearest hundred, how many people are added to the population of Monaco each year?

Options:

- (A) 600    (B) 700    (C) 800    (D) 900

Question: 4

Matthew's family ordered a 12-slice pizza for dinner. Matthew ate one slice and shared another slice equally with his brother Paul. What fraction of the pizza did Matthew eat?

Options:

- (A)  $\frac{1}{24}$     (B)  $\frac{1}{12}$     (C)  $\frac{1}{8}$     (D)  $\frac{1}{6}$

Question: 5

Justine must take four 100-point tests in her math class. Her goal is to achieve an average grade of 95 on the tests. Her first two test scores were 97 and 91. After seeing her score on the third test, she realized she can still reach her goal. What is the lowest possible score she could have made on the third test?

Options:

- (A) 90    (B) 92    (C) 95    (D) 96

Question: 6

Jessie has a large white cube that has an edge of 10 feet. She also has enough green paint to cover 300 square feet. Jessie uses all the paint to create a white square centered on each face, surrounded by a green border. What is the area of one of the white squares, in square feet?

Options:

- (A)  $5\sqrt{2}$     (B) 10    (C)  $10\sqrt{2}$     (D) 50

Question: 7

In a jar of red, green, and blue marbles, all but 6 are red marbles, all but 8 are green, and all but 4 are blue. How many marbles are in the jar?

Options:

- (A) 6    (B) 8    (C) 9    (D) 10

Question: 8

What is the smallest positive integer that is neither prime nor square and that has no prime factor less than 50?

Options:

- (A) 3127    (B) 3133    (C) 3137    (D) 3139

Question: 9

The smallest number greater than 2 that leaves a remainder of 2 when divided by 3, 4, 5, or 6 lies between what numbers?

Options:

- (A) 40 and 50    (B) 51 and 55    (C) 56 and 60    (D) 61 and 65

Question: 10

In the BIG N, a middle school football conference, each team plays every other team exactly once. If a total of 21 conference games were played during the 2012 season, how many teams were members of the BIG N conference?

Options:

- (A) 6    (B) 7    (C) 8    (D) 9

Question: 11

What is the unit's digit of  $13^{2012}$ ?

Options:

- (A) 1    (B) 3    (C) 5    (D) 7

Question: 12

How many 4-digit numbers greater than 1000 are there that use the four digits of 2012?

Options:

- (A) 6    (B) 7    (C) 8    (D) 9

Question: 13

The National Zoo has a number of two-legged birds and a number of four-legged mammals. On one visit to the zoo, Margie counted 200 heads and 522 legs. How many of the animals that Margie counted were two-legged birds?

Options:

- (A) 61    (B) 122    (C) 139    (D) 150

Question: 14

At Elite English School the Mathematics teachers are Mrs. Germain, Mr. Newton, and Mrs. Young. There are 11 students in Mrs. Germain's class, 8 students in Mr. Newton's class, and 9 students in Mrs. Young's class taking the STEM Olympiad this year. How many mathematics students at Elite English School are taking the contest?

Options:

- (A) 26    (B) 27    (C) 28    (D) 29

Question: 15

What is the correct ordering of the three numbers,  $10^8$ ,  $5^{12}$ , and  $2^{24}$ ?

Options:

- (A)  $2^{24} < 10^8 < 5^{12}$   
(B)  $2^{24} < 5^{12} < 10^8$   
(C)  $5^{12} < 2^{24} < 10^8$   
(D)  $10^8 < 5^{12} < 2^{24}$

Question: 16

What is the sum of the mean, median, and mode of the numbers 2, 3, 0, 3, 1, 4, 0, 3?

Options:

- (A) 6.5    (B) 7    (C) 7.5    (D) 8.5

Question: 17

In a room,  $\frac{2}{5}$  of the people are wearing gloves, and  $\frac{3}{4}$  of the people are wearing hats. What is the minimum number of people in the room wearing both a hat and a glove?

Options:

- (A) 3    (B) 5    (C) 8    (D) 15

Question: 18

Melanie needs to replace a light bulb located 10 centimeters below the ceiling in her kitchen. The ceiling is 2.4 meters above the floor. Melanie is 1.5 meters tall and can reach 46 centimeters above the top of her head. Standing on a stool, she can just reach the light bulb. What is the height of the stool, in centimeters?

Options:

- (A) 32    (B) 34    (C) 36    (D) 38

Question: 19

A square and a circle have the same area. What is the ratio of the side length of the square to the radius of the circle?

Options:

- (A)  $\frac{\sqrt{\pi}}{2}$     (B)  $\sqrt{\pi}$     (C)  $\pi$     (D)  $2\pi$

Question: 20

What is the sum of the prime factors of 2010?

Options:

- (A) 67    (B) 75    (C) 77    (D) 201

**Answer Key**

1. D
2. A
3. B
4. C
5. B
6. D
7. C
8. A
9. D
10. B
11. A
12. D
13. C
14. C
15. A
16. C
17. A
18. B
19. B
20. C



# **PREMIER GENIE**

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# **DUBAI STEM OLYMPIAD**

**2022**

**Intermediate Category**

**Computer Science - Sample Paper**

- 1) What type of device is a CPU?
  - a. Input
  - b. Output
  - c. Storage
  - d. All of the above
  
- 2) Which of these is another name for the CPU?
  - a. Processor
  - b. Plotter
  - c. Scanner
  
- 3) Which of these is not a type of computer monitor?
  - a. LCD
  - b. CRT
  - c. CAM
  
- 4) The device primarily used to provide hardcopy is the:
  - a. CRT
  - b. Computer Console
  - c. Printer
  - d. Card
  
- 5) What type devices are computer speakers or headphones?
  - a. Input
  - b. Input/output
  - c. Software
  - d. Output
  
- 6) USB refers to:
  - a. Storage device
  - b. Processor
  - c. Port type
  - d. Serial bus standard
  
- 7) Which of the following groups consists of only input devices?
  - a. Mouse, Keyboard, Monitor
  - b. Mouse, Keyboard, Printer
  - c. Mouse, Keyboard, Plotter
  - d. Mouse, Keyboard, Scanner
  
- 8) Which of the following is not an example of hardware?
  - a. Scanner
  - b. Printer
  - c. Monitor
  - d. Interpreter

- 9) Devices that allow you to put information into the computer?
- Input
  - Output
  - Type
  - Print
- 10) Devices that let the computer communicate with you?
- Input
  - Output
  - Type
  - Print
- 11) Which are the two major types of computer chips?
- External memory chip
  - Primary memory chip
  - Microprocessor chip
  - Both b and c
- 12) RAM is used as a short memory because it is
- Volatile
  - Has a small capacity
  - Is very expensive
  - Is programmable
- 13) A \_\_\_\_\_ stores a piece of data, and gives it a specific name, For example: a=5
- storage
  - value
  - variable
  - none of the above
- 14) Loop which does not executed at all if it is tested at beginning is classified as
- DO loop
  - WHILE loop
  - REPEAT loop
  - GO REPEAT loop
- 15) A \_\_\_\_\_ is like a light switch. It can only have two values. Just like a light switch can only be on or off, a \_\_\_\_\_ can only be True or False
- Boolean
  - If statement
  - Loop
  - Comment
- 16) \_\_\_\_\_ simply displays your code in the console.
- Display
  - Show
  - Print

- d. Command
- 17) The \_\_\_\_ and returns True when the expressions on both sides of and are true.
- a. String operator
  - b. Boolean operator
  - c. Conditional operator
  - d. If statement
- 18) a \_\_\_\_ takes an input and returns an output.
- a. Loop
  - b. Function
  - c. Command
  - d. Conditional statement
- 19) A \_\_\_\_ error does not prevent the program from running, but causes it to produce incorrect results
- a. Syntax
  - b. Run-time
  - c. Logic
  - d. Simple
- 20) Int and float types can hold the exact same values.
- a. True
  - b. false

Answer Keys:

1) C

2) A

3) C

4) C

5) D

6) A

7) D

8) D

9) A

10) B

11) D

12) A

13) C

14) B

15) A

16) C

17) B

18) B

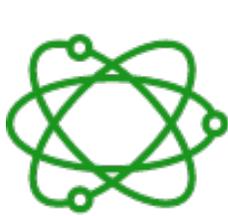
19) C

20) B



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## DUBAI STEM OLYMPIAD

# 2022

# **INTERMEDIATE CATEGORY SAMPLE PAPER**

DSO 2021 | Intermediate Category | Sample  
Paper

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Question 1 - Science

Question A The strength of a Force is expressed by its

Options:

- a. SI unit
- b. Magnitude
- c. Weight
- d. Both a and b

Question 2 - Science

Question A The Force between two charged bodies is called

Options:

- a. Electrostatic Force
- b. Magnetic Force
- c. Frictional Force
- d. Gravitational Force

Question 3 - Science

Question When two Forces acts in opposite directions, then the net force acting on two forces is

Options:

- a. sum of two forces
- b. difference of two forces
- c. both a and b
- d. none of these

Question 4 - Science

Question Force acts on an object may change

Options:

- a. direction
- b. shape
- c. speed
- d. all the above

Question 5 - Science

Question Force acting on per unit area is called

Options:

- a. normal reaction
- b. weight
- c. pressure
- d. upthrust

Question 6 - Science

Question 1 Kilogram weight is equal to

Options:

- a. 1 Newton
- b. 9.8 Newton
- c. 98 Newton
- d. 0.098 Newton

Question 7 - Science

Question Elastic potential energy found in

Options:

- a. Fossil fuels
- b. Batteries
- c. Coiled Springs
- d. muscles

Question 8 -Science

Question If an appliance converts most of the energy going in into the energy we want coming out, we say it is

Options:

- a. Useful
- b. Effective
- c. Energetic
- d. Efficient

Question 9 -Science

Question: What sort of energy is stored in petrol

Options:

- a. Light energy
- b. Elastic potential energy
- c. Chemical potential energy
- d. Gravitational potential energy

Question 10 - Science

Question Sound energy is:

Options:

- a. Energy stored in objects that are raised
- b. Energy released by vibrating objects
- c. Energy stored in the nuclei of atoms
- d. Energy in moving objects

Question 11 - Science

Question Which of the following converts light energy into electrical energy

Options:

- a. Electrical Generator
- b. Electric Cell
- c. Photocell
- d. Electric Bulb

Question 12 - Science

Question (  $\frac{\text{A required form of output}}{\text{Total input energy}} \times 100$ )

Options:

- a. % Power
- b. % Efficiency
- c. % Stress
- d. % Strain

Question 13 - Science

Question Calculate the efficiency of cyclist when he does 12J of useful work from every 100J of food energy he takes is

Options:

- a. 0.13
- b. 0.12
- c. 0.14
- d. 0.15

Question 14 - Science

Question Mechanical advantage is

Options:

- a. Effort/Load
- b. Load/Effort
- c. Load+Effort
- d. Load-Effort

Question 15 - Science

Question In case of first class lever , the sequence is

Options:

- a. Fulcrum,Load,Effort
- b. Effort,Fulcrum,Load
- c. Load,Fulcrum,Effort
- d. Load,Effort,Fulcrum

Question 16 -Science

Question For second class lever mechanical advantage is

Options:

- a. always less than 1
- b. always greater than 1
- c. always equal to 1
- d. can't predict, depends on load and effort

Question 17 - Science

Question What is the fixed point upon which a lever rotates

Options:

- a. Fulton
- b. Fulcrum
- c. Wedges
- d. Screw

Question 18 - Science

Question How many edges does a Sphere have

Options:

- a. two
- b. three
- c. four
- d. zero

Question 19 - Science

Question: If a polyhedron has 6 vertices and 12 edges. What is the number of faces it has

Options:

- a. 8
- b. 6
- c. 12
- d. 18

Question 20 - Science

Question For a polyhedron F stands for the number of faces, V stands for the number of vertices and E stands for the number of edges. then which of the following relation is named as Euler's formula

Options:

- a.  $F+V = E+2$
- b.  $F+E = V+2$
- c.  $V+E = F+2$
- d.  $F+V = E-2$

## Answer Key

1. B
2. A
3. B
4. D
5. C
6. B
7. C
8. D
9. C
10. B
11. C
12. B
13. B
14. B
15. C
16. B
17. B
18. D
19. A
20. A