



ISTO

Sample Papers Intermediate



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GUIDELINES

- ▶ This booklet contains two sample papers.
- ▶ The sample paper 1 is unsolved and the sample paper 2 is solved.
- ▶ Each sample papers contains a total of 25 questions.
- ▶ The sample papers describe the type of questions that will be asked in the examination. The sample papers do not intend to describe the pattern of ISTO 2020 exam.

- 1) A company is designing a new laptop computer. The computer must not exceed a certain weight. Which of the following is the most likely reason to have a weight restriction for the computer?



- A. To make it easier to test the prototype.
B. To reduce the cost of making the computer.
C. To make it easier to transport the computer.
D. To reduce the cost of building the prototype.
- 2) A steam engine train is running at its maximum speed but suddenly the speed starts decreasing the locomotive driver told the workers to put more coal in heat generator for achieving more speed the workers pour more coal in heat exchanger but still the speed was decreasing then the driver checked every parts whether it was working or not, he found everything correct, What could be the possible reason of speed declination?



- A. Lack of water in boiler
- B. Electric Motor failure
- C. Lack of Coal
- D. Generator failure

- 3) There are different types of elevators, based on how they operate. The pneumatic-style elevator is very quiet, virtually maintenance free and is very common in private residential buildings. But they have one problem that prevents them from being used in skyscrapers. What is it?



- A. They are more prone to getting stuck between floors
 - B. They cannot give service more than four floors
 - C. They have a spotty safety record
 - D. They cost much more to operate
- 4) When a student listens to music, sound waves propagate from the speaker to the ear. Which of the following is a physical description of this process?



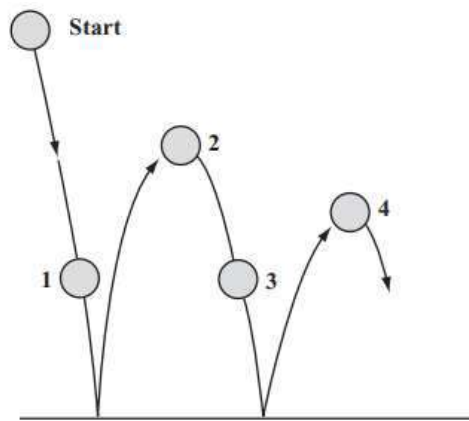
- A. Particles produced at the speaker move to the student's ear.
 - B. Energy is transported from the speaker to the student's ear.
 - C. Material is transferred from the speaker to the student's ear.
 - D. Clusters of air molecules are sent from the speaker to the student's ear
- 5) A college campus has so few parking spaces that cars are often lined up waiting to park during class hours. Which of the following describes how the college could best solve the need for more parking spaces using the universal systems model?
- A. The college could build an additional parking lot, gather parking data, and then receive input from community meetings.
 - B. The college could limit access to parking lots during busy hours, hire security officers to help restrict parking, and then gather parking data.
 - C. The college could gather parking data, receive input from community meetings, build an additional parking lot, and then gather more parking data.
 - D. The college could hire security officers to help restrict parking, gather parking data, receive input from community meetings, and then gather more data.

- 6) A light dimmer switch can be a useful appliance. You could be in the same room and change your lighting output to suit the activity you are doing - reading, having a romantic dinner or watching TV. Which of these components inside the circuit controls the brightness when you turn the dimmer knob?
- A. Capacitor
 - B. Diode
 - C. Inductor
 - D. Variable Resistor
- 7) Manufacturers typically indicate blender motor power in watts. The majority of household models fall within 500 to 750 watts. What does the wattage number on the blender motor measure?



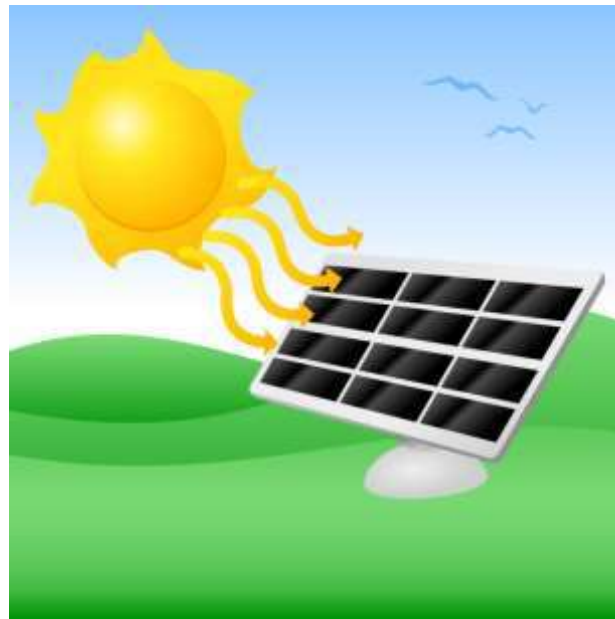
- A. Power generated by the blender motor
- B. Heat released by the blender motor
- C. Power felt by the user
- D. Power consumed by the blender motor

- 8) The diagram below shows the path of a ball bouncing on the ground. Four locations in the path are identified with numbers



At which location does the ball have the greatest amount of kinetic energy?

- A. location 1
 - B. location 2
 - C. location 3
 - D. location 4
- 9) Solar energy works by capturing the sun's energy and turning it into electricity for your home or offices. Which of the following is a factor affecting the power efficiency of a solar panel?
- 1. The direction where the solar panel is facing.
 - 2. The hours of rainy day per year.
 - 3. The level of air pollution in the area.



- A. 1 and 2 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

10) Which of the following activities would show that air is dissolved in water?



A. Press of piece of cotton wool into the bottom of a tumbler. Hold the tumbler upside down and insert it into a bowl of water, without tilting it.

- B. Press steel wool into the bottom of the gas jar. Invert the gas jar into the bowl of water on two small wooden blocks so that there is space between the gas jar and the bowl.
- C. Take some water in a pan. Heat it gently on a gas burner. Observe the water as it begins to heat.
- D. None of these.

11. Sumit is doing an Arduino activity in which he is using a temperature sensor to know the temperature of the room. He interfaced the temperature sensor with the Arduino and the reading of temperature sensor is displayed in the serial monitor. The Arduino correlates temperature reading with what value?



TEMPERATURE SENSOR

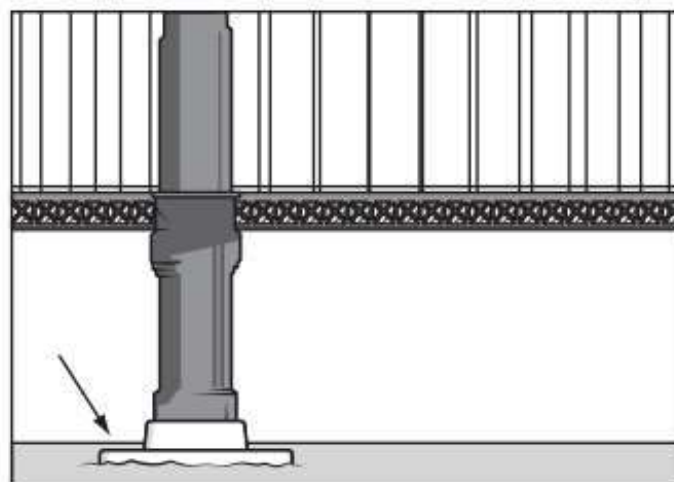
- A. Current
- B. Inductance
- C. Voltage
- D. Coulombs

12. Infrared radiation can act as -



- A. Thermal source
- B. Non-thermal source
- C. Thermal or non-thermal source
- D. None of mentioned

13. The arrow in the picture points to a part of the Golden Gate Bridge made of concrete.



Which of the following best explains why the engineers used concrete to build this part of the bridge?

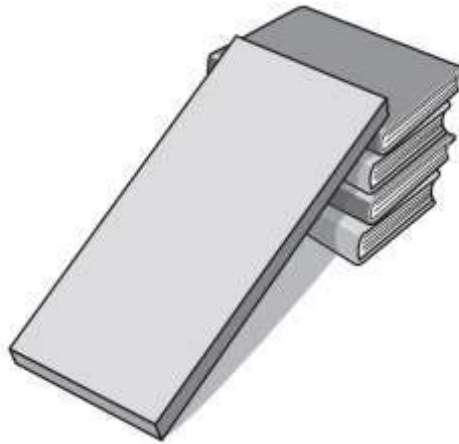
- A. Concrete is low in density so this part of the bridge can float on top of the water.
 - B. Concrete is very heavy so this part of the bridge can move back and forth in the wind.
 - C. Concrete is low in density so this part of the bridge can move back and forth in the wind.
 - D. Concrete is high in strength so this part of the bridge can support a large amount of weight.
14. A student removes a pitcher of chilled lemonade from a 5°C refrigerator and leaves the pitcher in a 20°C room for several hours. Which of the following statements best describes the flow of energy during this time?
- A. Cold energy flows from the lemonade to the room until the room is colder than the lemonade.
 - B. Heat energy flows from the room to the lemonade until the lemonade is warmer than the room.
 - C. Cold energy flows from the lemonade to the room until the lemonade and the room are the same temperature.
 - D. Heat energy flows from the room to the lemonade until the lemonade and the room are the same temperature
15. A crop of corn plants is genetically modified so that the plants produce a natural pesticide.

People are concerned that these corn plants might transfer modified genetic material to other plants. Which of the following is the best way to further modify the plants to prevent them from transferring their genetic materials to other plants?

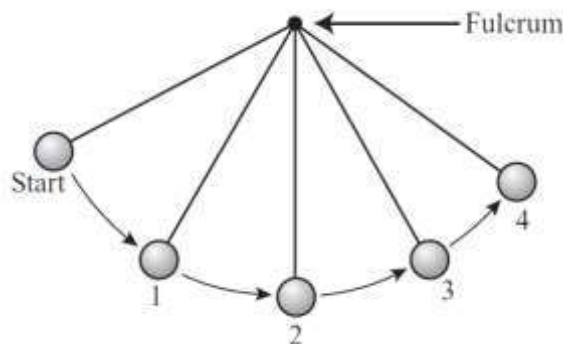
- A. changing the plants so they do not make pollen
- B. changing the plants so they do not harm insects
- C. changing the plants so they cannot produce nutrients
- D. changing the plants so they cannot be easily identified

16. A student rolls a ball down the ramp shown in the picture below. The ramp is supported by four stacked books.

The student removes two books from the stack supporting the ramp and rolls the ball down the ramp again. Which of the following statements **best** describes how the ball's motion is different after the books are removed?



- A. The ball accelerates more quickly down the ramp.
B. The ball takes more time to reach the bottom of the ramp.
C. The ball has a higher speed at the top of the ramp.
D. The ball has a higher average speed when it rolls off the ramp.
17. The diagram below shows some positions in the path of a pendulum swinging from a fixed point called a fulcrum.



The pendulum is raised to the start position and released. At which two numbered positions is the potential energy of the pendulum most likely the same?

- A. position 1 and position 3
- B. position 1 and position 4
- C. position 2 and position 3
- D. position 2 and position 4

18. The tools shown in the picture below are used in a factory.



In which of the following manufacturing processes are these tools most likely used?

- A. assembling
- B. cutting
- C. finishing
- D. shaping

19. The picture below shows a television satellite dish.



The satellite dish is an example of which of the following components of a television communications system?

- A. Decoder
- B. Encoder
- C. Receiver
- D. Transmitter

20. For a rocket to leave the gravitational pull of the Earth, it needs to reach a very special speed.



Once it reaches this speed, the gravity of the Earth can no longer pull it back, and it can "boldly go" off into space.

What term is used to describe this special speed?

- A. Tangential Velocity
- B. Terminal Velocity
- C. Escape Velocity
- D. Orbital Velocity

21. If white is called blue, blue is called red, red is called yellow, yellow is called green, green is called black, black is called violet and violet is called orange, what would be color of human blood?

- A. Red
- B. Yellow
- C. Green
- D. Violet

22. A cricket ball is lighter than a hockey ball. A volleyball is lighter than a football. The hockey ball is lighter than the football but heavier than a tennis ball. Which of the following is the heaviest?

- A. Hockey ball
- B. Football
- C. Cricket ball
- D. Volley ball

23. Aditya went 15 km to the west from his house, then turned left and walked 20 kms. He then turned East and walked 25 kms and finally turning covered 20 kms. How far was he from his house?

- A. 5 kms
- B. 10 kms
- C. 40 kms
- D. 80 kms

24. In a class of 34 children, Ajay's rank from the top is twelve. Manoj is eight ranks below Ajay. What is Manoj's rank from the bottom?

- A. 15
- B. 16
- C. 14
- D. 12

25.If in any coded TIMBER is written as BERMIT then in same coded language what would stand for BANTER?

- A. TERNAB
- B. RETNAB
- C. TENBAR
- D. TABNER

- 1) Zach is going to ride a bicycle where he is applying an unbalanced force to the bicycle pedals when not in motion. As a result, the bicycle would gain acceleration and therefore begin to move. Which phenomenon of motion could be best applied here?



- A. Law of Inertia (Answer)
B. Newton's First Law
C. Force of Friction
D. Force of Air Resistance
- 2) Kabir rubbed an inflated balloon on his brother's hair. He was then able to stick the balloon on the wall without any pasting mechanism because of static charge which of the following conditions results in the build-up of static charge on the balloon?
- A. When neutral charge outnumber negative charge
B. When there are more positive charge than neutral charge
C. When there are more negative charges than positive charges (answer)
D. When all neutral charges have been removed from the object
- 3) A balloon is inflated with room temperature air and then put in a sunny place. The balloon expands slightly due to a temperature rise. Which of the following best describes the molecules of air inside the balloon when the balloon is left under the sunlight as compared to when it was first inflated?



- A. The molecules are moving faster (answer)
 - B. There are more molecules in the balloon
 - C. There are fewer interactions between the molecules
 - D. The molecules stop colliding with the walls of the balloon.
- 4) In many microwave ovens, a turntable slowly rotates food while the oven is in operation. The turntable, however, was not part of the original microwave oven design. Which of the following statements is the most likely reason the turntable was added to the microwave oven?

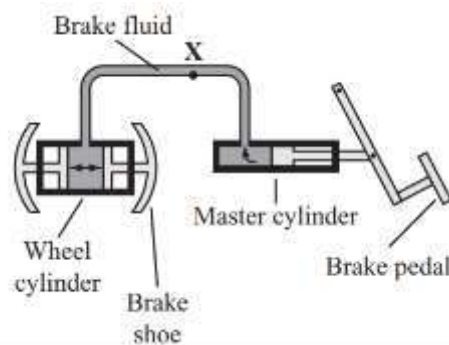


- A. Food did not cook evenly. (answer)
- B. The oven used too much power.
- C. Food did not receive enough energy.
- D. The oven became too hot during operation.

- 5) A company is designing a new automobile brake system. After repeated testing of the brake system prototype, engineers presented a report to their company explaining that they discovered a major problem in the system. Which of the following should the engineers do next?



- A. Redesign the brake system (answer)
B. Build a full-scale version of the brake system
C. Identify the reasons for building the brake system
D. Evaluate the quality of the report about the brake system
- 6) The hydraulic drum brake system used in cars typically contains a master cylinder and a wheel cylinder for each wheel, as shown in the cross-section below.



A small leak occurs at point X. Which of the following will most likely happen if the brake pedal is pushed shortly after the leak occurs?

- A. The fluid pressure of the system will be lower than expected. (answer)
B. The fluid pressure of the system will be higher than expected.
C. The piston in the wheel cylinder will not be able to move.
D. The piston in the master cylinder will not be able to move.

- 7) Emmanuel did an experiment in which he took two ice cubes and two glasses of water. In one of the glasses of water, he added salt and in the other one was just plain water. He observed that the ice cube in the salt water was melting slower than the normal water, what could be the feasible reason for the same?



- A. Because of impurities presence in the salt water.
- B. Because of high melting point than fresh water.
- C. Because of lower freezing point than fresh water. (answer)
- D. Because of lower freezing point than salt water.
- 8) If a piece of rock is brought from the moon to the Earth, its
- A. Volume, density and weight will remain the same as it was on the moon
- B. Volume and weight will remain the same as it was on the moon
- C. Density and weight will remain the same as it was on the moon
- D. Volume and density will remain the same as it was on the moon.
- 9) Which of the following is a factor affecting the power efficiency of a solar panel?
1. The direction where the solar panel is facing
 2. The hours of rainy day per year
 3. The level of air pollution in the area



- A. 1 and 2 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3 (answer)

10) How many spokes are there in the wheel of a sports car if any two spokes form an angle of 15° ?



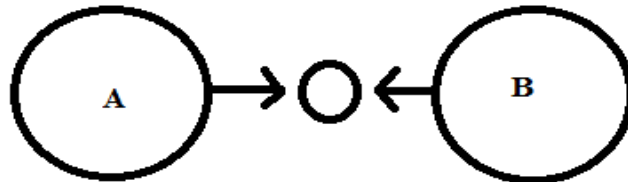
- A. 12
- B. 15
- C. 22
- D. 24 (answer)

11) Which of the following sensor detects the rotation or tilt of Smart phones?



- A. GPS
- B. Camera
- C. Gyroscope Sensor (answer)
- D. Proximity Sensor

12) Two identical metal balls P and Q moving in opposite directions hit each other at point O as shown in the figure. Changes are most likely to appear in their



- A. Shapes and directions
- B. Speed and directions (answer)
- C. Directions and volumes
- D. Volumes and shapes

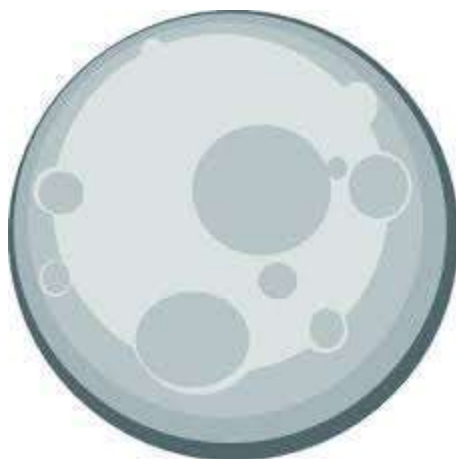
13) A boy rolls a rubber ball on a wooden surface. The ball travels a short distance before coming to rest. To make the same ball travel longer distance before coming to rest, he may



- A. spread a carpet on the wooden surface.
- B. cover the ball with a piece of cloth.
- C. sprinkle talcum powder on the wooden surface. (answer)
- D. sprinkle sand on the wooden surface.

14) An astronaut drops a hammer on the Moon, and a scientist drops an identical hammer on Earth. Both hammers are dropped from the same height. The hammer dropped on Earth falls to the ground faster than the hammer dropped on the Moon.

Why does the hammer on Earth fall faster than the hammer on the Moon?



- A. Earth has a stronger magnetic field than the Moon because Earth orbits the Sun.
- B. Earth has a stronger magnetic field than the Moon because Earth has an iron core.
- C. Gravitational attraction is stronger on Earth than on the Moon because Earth rotates on its axis.
- D. Gravitational attraction is stronger on Earth than on the Moon because Earth has a larger mass. (answer)

15) There are two bottles of glass, one bottle is two third filled with water and another bottle is filled one third with water. When we blow across the mouth of each bottle, then

(i) The bottle with the less air in it gives the note of higher pitch

(ii) The shorter the air column, the higher the pitch of the note produced.

- A. Both (i) and (ii) are correct and (ii) is the correct explanation of (i). (answer)
- B. Both (i) and (ii) are correct but (ii) is not the correct explanation of (i).
- C. Only (i) is correct.
- D. Only (ii) is correct.
- 16) In a large commercial complex there are four ways to reach the main road. One of the path has loose soil, the second is laid with polished marble, the third is laid with bricks and the fourth has gravel surface. It is raining heavily and Paheli wishes to reach the main road. The path on which she is least likely to slip is

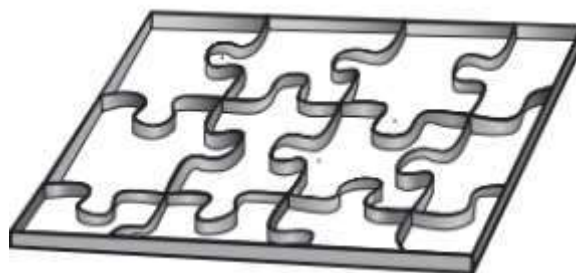


- A. loose soil.
- B. polished marble.
- C. bricks.
- D. gravel. (answer)

- 17) A student heats two pans of water on a stove using the highest setting. One pan contains 1 L of water and the other pan contains 3 L of water. The student heats each pan until the water boils. Which of the following statements best describes what happens to the water in the pans?

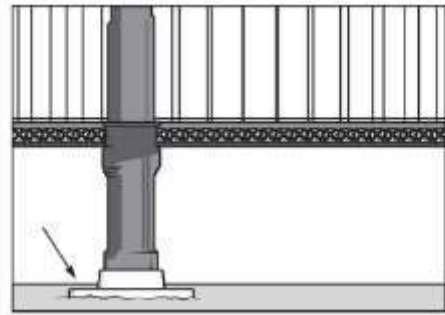


- A. The water in both pans boils at the same time.
 - B. The water in both pans boils at the same temperature. (answer)
 - C. the 3 L of water gets hotter than the 1 L of water before boiling.
 - D. the 3 L of water absorbs heat more quickly than the 1 L of water.
- 18) The picture below shows a group of sharp steel strips arranged in a pattern that is used to manufacture cardboard jigsaw puzzles. What is the purpose of the group of steel strips?



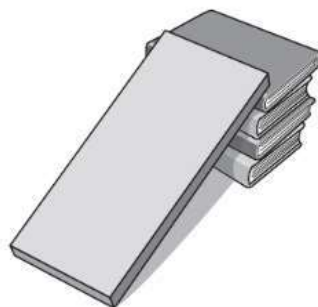
- A. to cut the puzzle pieces out of cardboard (answer)
- B. to join the puzzle pieces together for packaging
- C. to assemble the puzzle pieces for store displays
- D. to finish the puzzle pieces by smoothing the cardboard

- 19) The arrow in the picture points to a part of the Golden Gate Bridge made of concrete.



Which of the following best explains why the engineers used concrete to build this part of the bridge?

- A. Concrete is low in density so this part of the bridge can float on top of the water.
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- 20) A student rolls a ball down the ramp shown in the picture below. The ramp is supported by four stacked books. The student removes two books from the stack supporting the ramp and rolls the ball down the ramp again. Which of the following statements best describes how the ball's motion is different after the books are removed?



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- C. The ball takes more time to reach the bottom of the ramp. (answer)
- D. The ball has a higher average speed when it rolls off the ramp.

21) Manufacturers typically indicate blender motor power in watts. The majority of household models fall within 500 to 750 watts. What does the wattage number on the blender motor measure?



- A. Power generated by the blender motor
- B. Heat released by the blender motor
- C. Power felt by the user
- D. Power consumed by the blender motor (answer)

22) The tools shown in the picture below are used in a factory.



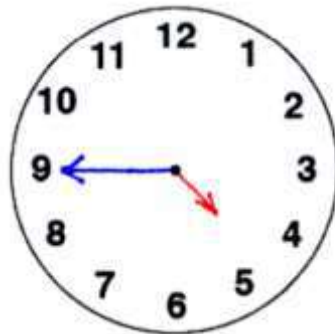
In which of the following manufacturing processes are these tools most likely used?

- A. assembling (answer)
- B. cutting
- C. finishing
- D. shaping

23) The age of a man is same as his wife's age with the digits reversed. Then sum of their ages is 99 and the man is 9 years older than his wife. How old is the man?

- A. 50
- B. 49
- C. 54 (answer)
- D. 44

24) The number of times in a day the hour hand and the minute hand of a clock are at right angles is



- A. 44 (answer)
- B. 48
- C. 24
- D. 12.

25) A, B, C, D, E and F, not necessarily in that order, are sitting on six chairs regularly placed around a round table. It is observed that A is between D and F, C is opposite D, D and E are not on neighbouring chairs. The person sitting opposite B is

- A. A
- B. D
- C. E
- D. F (answer)