



Somalwar Academy's Annasaheb Somalwar Memorial Initiative of Rewarding Excellence

A SEARCH OF INNATE TALENT

Class X

Round II – Major Test

Max Marks : 100

Duration : 2 hrs.

General Instructions :

- All questions are compulsory
- Each question carries 2 Marks
- There is no negative marking
- Please read and follow the instructions on OMR sheets while solving this test

- 1) Shown are symbols used for different functions. Identify the correct sequence of their description from the given options:



- Chemical weapon, Computing, Cosmology, Death
 - Chemical Bonds, Computing, Aliens, War Zone
 - Isotopes, Computing, Biohazard, Devil Spirits
 - Chemical weapon, Radioactive, Biohazard, Toxic
- 2) Consider a scenario in India in the year 2000: Women from several nomadic tribes are in danger of having complicated pregnancies. At times, they have little or no knowledge of pregnancy or childbirth related ailments, interventions and government schemes. The problem is worsened by the fact that women's literacy within these communities is low and since they keep moving from place to place, access to electricity is low. An NGO decides to address this problem and hopes to improve maternal health in this community through information dissemination. Which of the following could be effective in communicating this information to this community?
- Smartphone applications
 - Smart watches with health monitoring sensors
 - Camps and workshops
 - Folk songs
 - Radio
 - Folk theatre
 - Pregnancy tracking websites
 - Posters
 - Printed booklets

Options:-

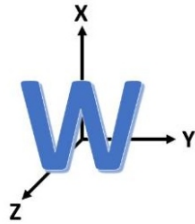
- (a) I, II, VII (b) III, IV, VI (c) V, II, VII (d) VII, VII, IX

3) How many fonts are used in the given set of words?

amazing *discussion* worried **sampled** entrance *happily* demarcate
greetings **deployed** *canine* metal *relinquish* estate transfer
wavelength cautiously *temporary* lavender *sandalwood* workable patient
karmic *safety* fantastic *encourage* **delightful** achievement.

- (a) 6 (b) 8 (c) 10 (d) 11

4) What letter will you get by rotating W first by 180° about the Y axis, then by 180° about the X axis and then by 90° about the Z axis?



- (a) W (b) M (c) E (d) None

5) Read the poem given below and identify the 'रस' (Rasa) in it.

Ashadha's ending on the mountain found
Him weakened, gold ring slipping from his wrist,
And mixed his pleasure when a cloud came down
So playfully to hug the summit mist,
As elephants in heat will butt the ground.

In tears withheld he took that fall from grace,
From wealth attending on the King of Kings.
The otherworld that brimmed in cloudy air
Was still discomfort when
A breath to hold him to that neck's embrace.

With now the rainy month stood close at hand,
To fresh Kutaja blooms he adds his plea
And asks most courteously the cloud bring news
Of welfare to his loved-one-words that she,
Revived to hear of him, will understand.

- (a) Veera often translated as Valour (b) Hasya often translated as Comic
(c) Adbhuta often translated as Wonder (d) Shringara often translated as Love

6) Which of the following statements would you consider to be TRUE about the hour and minute hands of analogue clocks?



- I. The hour hand and the minute hand would make 90 degrees angle with each other 24 times in a day
- II. The hour hand and minute hand will overlap less than 24 times in a day
- III. The hour hand and minute hand will overlap exactly on the hour number marker only once every half a day
- IV. The hour hand and minute hand will make acute angle to each other for almost as long as it will make obtuse angle to each other during the entire day
- (a) I, II, III (b) II, III, IV (c) III, IV, I (d) only I and III

7) **Biomimicry is the practice of looking to nature for inspiration to solve design problems. Shown below are plants and animals (top row) that have inspired the design of products (bottom row). Which of the options listed below correctly identifies the plant and/or animal with the product that it inspired?**



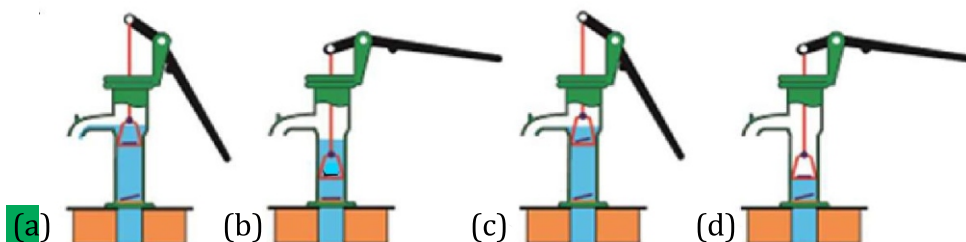
- (a) P - 3, Q - 1, R - 4, S - 2 (b) P - 4, Q - 2, R - 1, S - 3
- (c) P - 3, Q - 4, R - 1, S - 2 (d) P - 1, Q - 3, R - 2, S - 4

8) **You can set preferences in a mobile app by making a series of selections. You want to be notified of promotions and transactions, but do not want to receive newsletters. You want to allow access to your location and mic, but do not want to allow access to your contacts. What is the correct sequence of actions?**

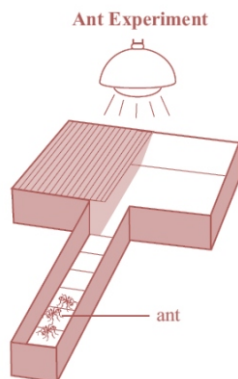
- Do not notify me on Promotions
- Send me Newsletter
- Notify my Transactions
- Do not allow access to my Contacts
- Allow access to my Location
- Allow access to my Mic

- (a) Check, skip, check, check, skip, check (b) Skip, Skip, check, skip, check, check
- (c) Check, skip, skip, skip, check, check (d) Skip, skip, check, check, check, check

9) **Shown below are the vertical cross-sections of hand pumps. Which of the following options depicts the correct working principle?**



10) Use the picture below to answer the question.



Which question does this experiment test?

- (a) Where do ants get food? (b) What is the mass of the ants?
(c) How many kinds of ants are there? (d) Will ants go to a dark or light area?

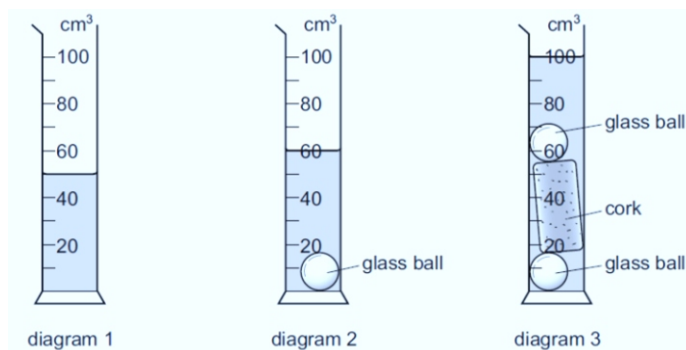
11) Which of the following is a valid scientific argument?

- (a) Measurements of sea level on the Gulf Coast taken this year are lower than normal; the average monthly measurements were almost 0.1 cm lower than normal in some areas. These facts prove that sea level rise is not a problem.
- (b) A strain of mice was genetically engineered to lack a certain gene, and the mice were unable to reproduce. Introduction of the gene back into the mutant mice restored their ability to reproduce. These facts indicate that the gene is essential for mouse reproduction.
- (c) A poll revealed that 34% of Americans believe that dinosaurs and early humans co-existed because fossil footprints of each species were found in the same location. This widespread belief is appropriate evidence to support the claim that humans did not evolve from ape ancestors.
- (d) This winter, the northeastern US received record amounts of snowfall, and the average monthly temperatures were more than 2°F lower than normal in some areas. These facts indicate that climate change is occurring.

12) Which of the following involve matter and energy?

- (a) Using a microwave oven to heat food
(b) Combining ingredients and baking a cake
(c) Mixing different colors of paint to produce new colors
(d) All of the above

13) A measuring cylinder contains some water. A small glass ball is then submerged into it. Finally, another similar glass ball attached to a cork is submerged. The diagrams show the measuring cylinder at each stage of this process.



What is the volume of piece of cork?

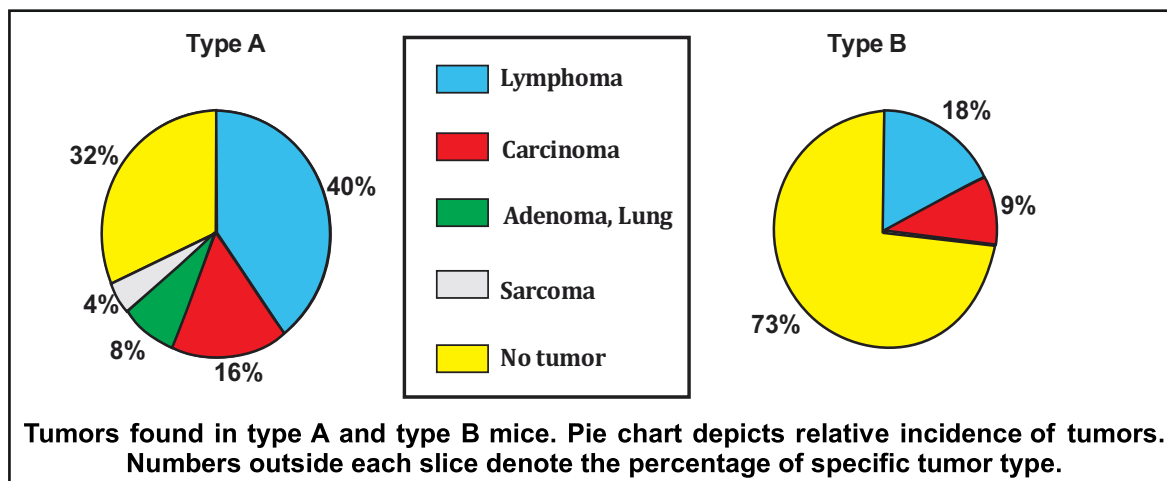
- (a) 10 cm^3 (b) 25 cm^3 (c) 30 cm^3 (d) 40 cm^3

- 14) The drawing shows the asteroid 951 Gaspra as seen by the Galileo spacecraft as it passed through the asteroid belt.



How is this asteroid different from a moon?

- (a) Unlike a moon, Gaspra has a gravitational force.
(b) Unlike a moon, Gaspra is made of solid materials.
(c) Gaspra would be classified as a moon if it were close to a planet.
(d) Gaspra would be classified as a moon if it began orbiting a planet.
- 15) Which of the following is the best interpretation of the graph below?



- (a) Type "A" mice with Lymphoma were more common than type "A" mice with no tumors.
(b) Type "B" mice were more likely to have tumors than type "A" mice.
(c) Lymphoma was equally common among type "A" and type "B" mice.
(d) Carcinoma was less common than Lymphoma only in type "B" mice.
- 16) What happens to the carbon dioxide in two opened cans of soda pop if can A is left on the counter and can B is left in the refrigerator?
- (a) Both cans lose carbon dioxide gas, but the can in the refrigerator loses gas faster.
(b) Both cans lose carbon dioxide gas, but the can in the refrigerator loses gas slower.
(c) The two cans lose carbon dioxide gas at the same rate.
(d) Only the can on the counter loses carbon dioxide gas




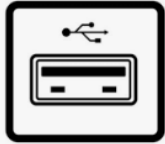


17) From the data in the table given below, which is the VALID conclusion that can be reached?

Table of Approximate Brain and Body Sizes of Various Animals					Ratio of Body to Brain Weight
	Brain Length (cm)	Brain Weight (g)	Body Length (cm)	Body Weight (g)	
Human	15	1400	100	62,000	44
Baboon	8	140	75	30,000	214
Monkey	5	100	30	7,000	70
Camel	15	680	200	529,000	778
Dolphin	NA	1700	305	160,000	94
Kangaroo	5	56	150	35,000	625
Cat	5	30	60	3,300	110
Rabbit	5	12	30	2,500	208
Squirrel	3	6	20	900	150
Frog	2	0.1	10	18	180

- I. Animals with greater brain lengths are more intelligent.
- II. Animals with higher body lengths are more intelligent.
- III. Animals with lower body to brain weight ratio are more intelligent.
- IV. Animals' intelligence is unrelated to brain dimensions.

(a) I and III (b) II and IV (c) I and II **(d) III and IV**

18) Match the following column I and column II.

	Column I		Column II
1)		(a)	Network port
2)		(b)	USB port
3)		(c)	VGA port
4)		(d)	Speaker port
5)		(e)	HDMI port
6)		(f)	Power port

Options :-

(a) (1 - e), (2 - d), (3 - a), (4 - b), (5 - f), (6 - c)

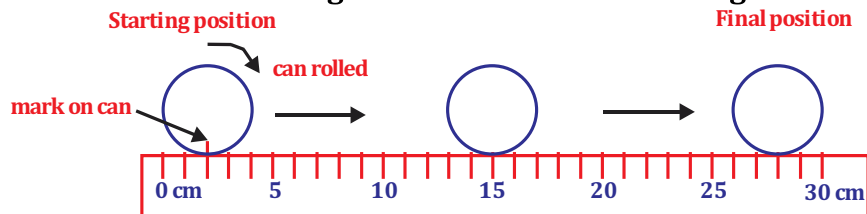
(b) (1 - a), (2 - c), (3 - b), (4 - d), (5 - e), (6 - f)

(c) (1 - b), (2 - a), (3 - c), (4 - d), (5 - e), (6 - f)

(d) (1 - a), (2 - b), (3 - c), (4 - d), (5 - f), (6 - e)

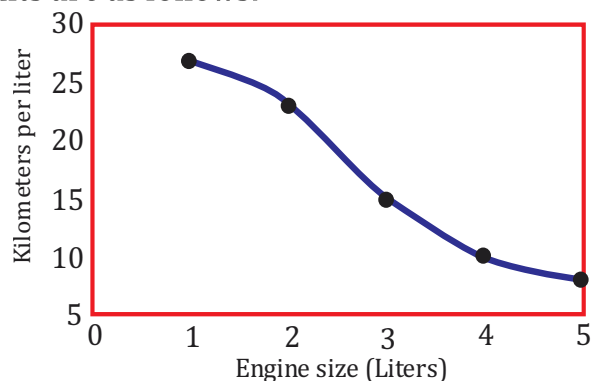
- 19) Jigar thinks that the more air pressure in a basketball, the higher it will bounce. To investigate this hypothesis, he collects several basketballs and an air pump with a pressure gauge. How should Jigar test his hypothesis?
- (a) Bounce basketballs with different amounts of force from the same height.
(b) Bounce basketballs having different air pressures from the same height.
 (c) Bounce basketballs having the same air pressure at different angles from the floor.
 (d) Bounce basketballs having the same amount of air pressure from different heights.

- 20) A cylindrical can is rolled along the ruler shown in the diagram.



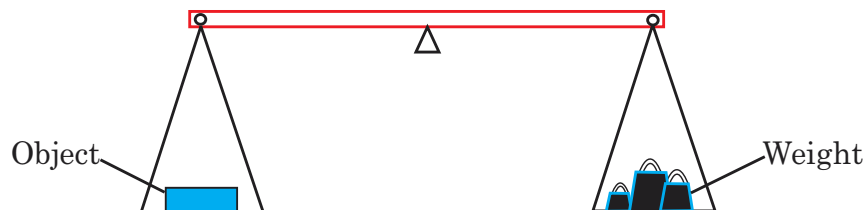
The can rolls over twice. What is the circumference (distance all round) of the can ?

- (a) 13 cm** (b) 14 cm (c) 26 cm (d) 28 cm
- 21) A consumer group measures the mileage of cars with different sizes of engines. The results are as follows:



Which of the following describes the relationship between the variables?

- (a) The larger the engine the more mileage the car gets.
 (b) The lower mileage the car gets, the smaller the engine.
(c) The smaller the engine, the more mileage the car gets.
 (d) The more mileage for a car, the larger the engine.
- 22) A hurricane wiped out 40% of the wild rats in a coastal city. Then, a disease spread through stagnant water killing 20% of the rats that survived the hurricane. What percentage of the original population of rats is left after these 2 events?
- (a) 40% **(b) 48%** (c) 60%
 (d) Cannot be calculated without knowing the original number of rats.
- 23) The weight of an object is found using the balance shown in the diagram. The object is put in the left-hand pan and various weights are put in the right-hand pan.



These are the results

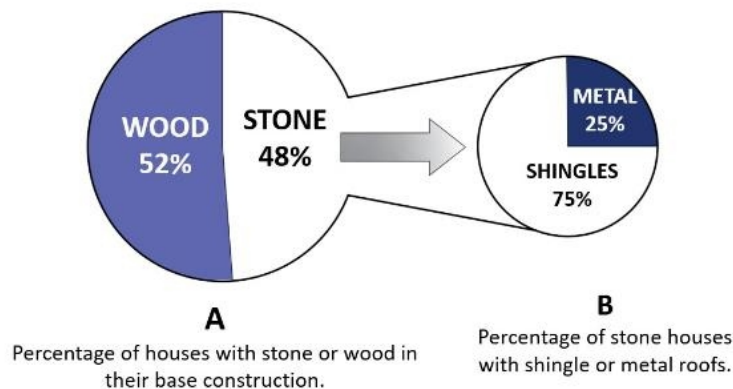
Weights in the right - hand pan	Effect
0.1N, 0.1 N, 0.05 N, 0.02 N	balance tips down slightly on the left hand side
0.2N, 0.1 N, 0.01 N	balance tips down slightly on the right hand side

What is the best estimate of the weight of the object ?

- (a) 0.27 N (b) 0.29 N (c) 0.31 N (d) 0.58 N

- 24) Energy efficiency of houses depends on the construction materials used and how they are suited to different climates. Data was collected about the types of building materials used in house construction (results shown below). Stone houses are more energy efficient, but to determine if that efficiency depends on roof style, data was also collected on the percentage of stone houses that had either shingles or a metal roof.

Breakdown of Building Materials Used in Constructing Houses



What proportion of houses were constructed of a stone base with a shingled roof?

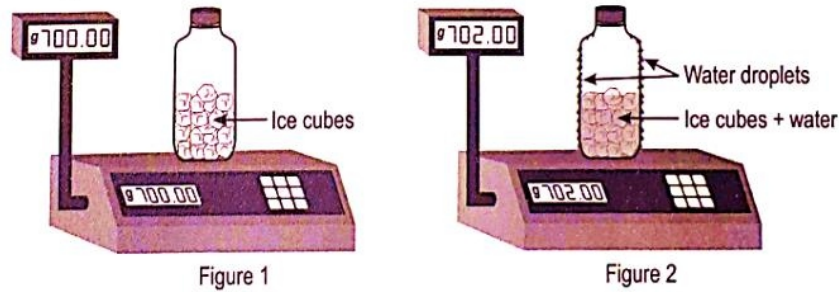
- (a) 25% (b) 36% (c) 48%
(d) Cannot be calculated without knowing the original number of survey participants.

- 25) When the paint roller moves _____, Point X will _____



- (a) up, rotate clockwise (b) down, rotate clockwise
(c) down, rotate counterclockwise (d) up or down, remain stationary

- 26) Kailash placed some ice cubes inside a glass bottle and then closed the bottle tightly. He placed the bottle on a weighing balance, as shown in figure 1. He saw water droplets forming on the inside and on the outside of the bottle and that the weight of the bottle kept increasing as shown in figure 2.



- The increase in the weight of the bottle is due to?**
- (a) the water formed from the melted ice
 - (b) the water droplets formed on the inside of the bottle
 - (c) the water droplets formed on the outside of the bottle**
 - (d) the increase in the temperature of water inside the bottle
- 27) Two cars with identical engines exerting the same power. Car A has smaller-diameter tires, while Car B has larger-diameter tires. If both cars are driving on a flat road, which statement best describes the relationship between their speed and tire diameter?



- (a) Car A will move faster than Car B because smaller tires rotate faster for the same power.
 - (b) Car B will move faster than Car A because larger tires cover more distance per rotation.**
 - (c) Both cars will move at the same speed because the power exerted by the engine is identical.
 - (d) Speed is independent of tire diameter.
- 28) **Read the following paragraph and answer the question that follows.(Round 2)**
- The most (i) respect in which ideas have helped mankind is numbers. There must have been a time when homo sapiens was a very rare species, subsisting precariously in jungles and caves, terrified of wild beasts, having difficulty in securing nourishment. At this period the biological advantage of his greater intelligence, which was cumulative because it could be handed on from generation to generation, had scarcely begun to outweigh the disadvantages of his long infancy, his lessened (ii) as compared with monkeys, and his lack of (iii) protection against cold. In those days, the number of men must certainly have been very small. The main use to which, throughout the ages, men have put their technical skill has been (iv) the total population. I do not mean that this was the intention, but that it was, in fact, the effect. If this is something to rejoice in, then we have occasion to rejoice.

In the above passage identify the missing words. The table below contains possible words for each blank. Choose one word from each column for the 4 blanks.

i	ii	iii	iv
equivocal	freedom	hirsute	increase
inconclusive	agility	stubbled	decrease
indubitable	confidence	feathery	endanger
uncertain	appetite	unshaven	extol

The correct answer is

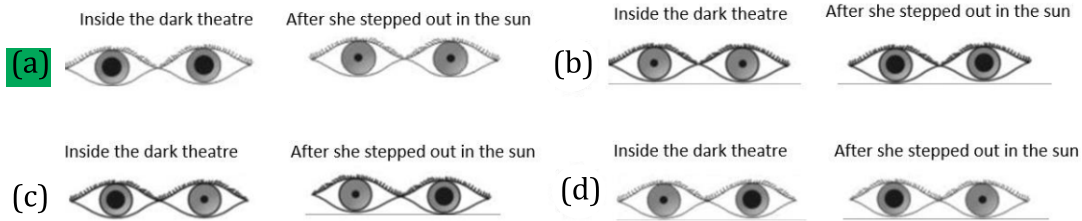
- (a) uncertain, freedom, stubbled, extol
- (b) equivocal, confidence, unshaven, endanger
- (c) inconclusive, appetite, hirsute, decrease
- (d) indubitable, agility, hirsute, increase**

- 29) Use the tables below to answer the questions. Students perform an investigation using the swings on a playground. One of the students sits on swing 1. The swing is pulled as far as it could go and is released. The students count the number of swings in 60 seconds. The same student sits on swings 2 and 3, and repeats the procedure. The students perform a second investigation, but this time with three different release points. The students want to find out if the release point affects the number of swings in 60 seconds. They conclude that the release point does not affect the number of swings in 60 seconds. What is the experimental design flaw in their second investigation?

Investigation 1			
Swing	Chain Length	Number of Swings in 60 Seconds	Release Point
1	250 centimeters	18	Full
2	220 centimeters	20	Full
3	190 centimeters	22	Full
Investigation 2			
Swing	Chain Length	Number of Swings in 60 Seconds	Release Point
1	250 centimeters	18	$\frac{3}{4}$
2	220 centimeters	20	$\frac{1}{2}$
3	190 centimeters	22	$\frac{1}{4}$

- (a) chain length and time are both changed
- (b) all variables are controlled except chain length
- (c) release point and chain length are both changed**
- (d) all variables are controlled except release point

- 30) The eye has an opening through which light enters. It is called the PUPIL. Uma was watching a Hindi film. How would her pupils look inside the dark theatre and after she stepped out in the sun?



- 31) Rain drops fall from great height. Which among the following statements is true regarding it?

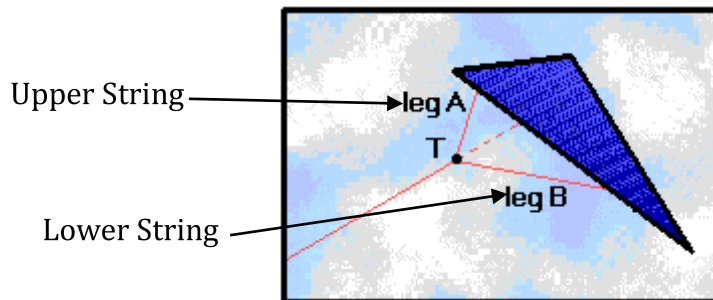
- (a) their velocity increases and they fall with the same velocity on the earth
 (b) they fall with the same ultimate velocity
 (c) their velocity increases and they fall with different velocities on the surface of the earth
 (d) they fall with that ultimate velocity which is different for different droplets

- 32) What happens when ice builds up in the refrigerator

- (a) It helps maintain the temperature
 (b) It causes the fridge to use more energy
 (c) It makes the fridge run quieter
 (d) It cools the food faster

- 33) In light wind conditions, which string length is preferable for stable kite flying?

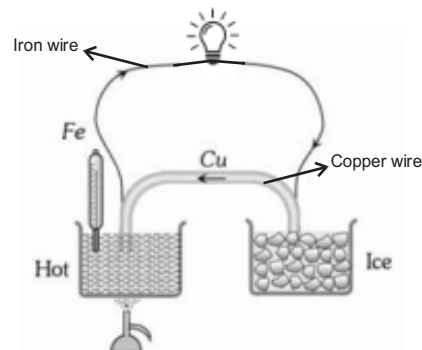
- (a) Longer upper string (b) Longer lower string
 (c) Both should be equal (d) No specific preference



- 34) When 2 liters of kerosene is mixed with 1 liter of water, the approximate total volume of the mixture will be:

- (a) 2 liters (b) 2.5liters (c) 3 liters (d) More than 3liters

- 35) If the battery is not connected in the circuit, will the bulb still glow ?



(a) Yes, as there is temperature difference

(b) No, battery is essential

(c) Yes, but only if both junction are at same temperature

(d) No, as ice is bad conductor

36) Which of the following holds true in the process of freezing (solidification)?

(a) Heat energy is released, interparticle attraction decreases, interparticle space increases.

(b) Heat energy is absorbed, interparticle attraction increases, interparticle space decreases.

(c) Heat energy is absorbed, interparticle attraction decreases, interparticle space increases.

(d) Heat energy is released, interparticle attraction increases, interparticle space decreases.

37) Once, Dr. Sharma needed to stitch a surgical wound after a major operation. He had the following materials available from different animals. Which one should he choose for stitching the wound?

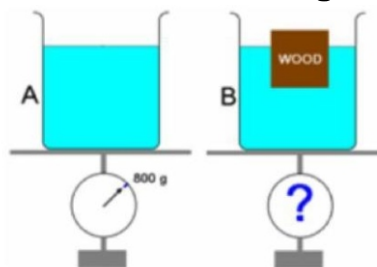
(a) Intestine of an animal

(b) Tail hair of a horse

(c) Hair from the mane of a camel

(d) Inner layer of skin

38) Two identical beakers hold water at the same height, but one of them has a wooden block floating in it. Which beaker weighs more?



(a) Beaker (A)

(b) Beaker (B)

(c) Both Beaker weighs same

(d) depends on mass of wood

39) If a bomb is released from a plane moving with uniform velocity, then by the time the bomb reaches the ground, the plane will be

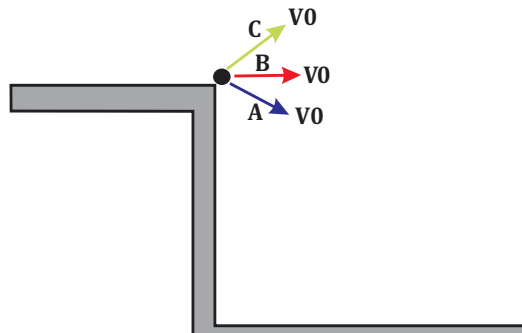
(a) Vertically above the bomb

(b) Ahead of the bomb

(c) Behind the bomb

(d) Ahead or behind, depending on its velocity

40) A ball is launched from the same height repeatedly with the same speed V_0 but in different directions A, B, and C as shown below. It reaches the ground with speeds V_A , V_B , and V_C respectively. Which of the following is true about these speeds?



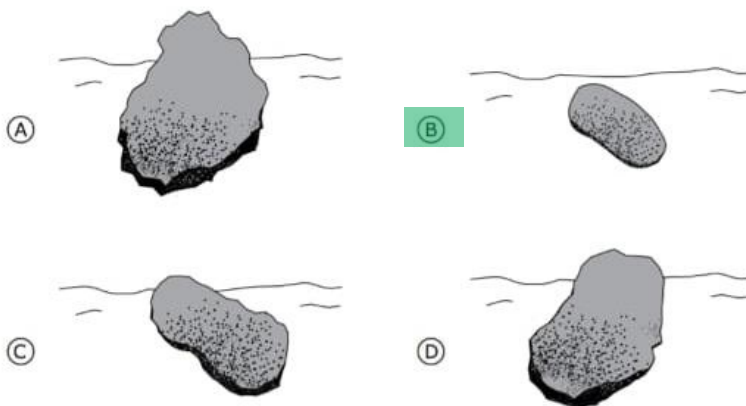
(a) $V_A = V_B = V_C$

(b) $V_A > V_B > V_C$

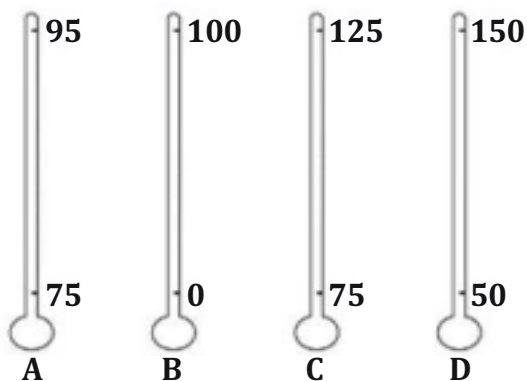
(c) $V_A < V_B < V_C$

(d) None of these

- 41) Lily found four rocks of the same material in a riverbed. They had different shapes and sizes. Which rock has most likely been carried the farthest down the river ?



- 42) Write the following steps in sequential order to prove that the angle of incident sound is equal to the angle of reflected sound.
- Now keep your ear to the open end of Q and adjust the position of Q to listen to the ticking sound.
 - Repeat the experiment by changing the inclination of P and correspondingly, the inclination of Q.
 - Measure the angle made by the two pipes with the normal.
 - Mount a smooth and hard wooden plank vertically on the surface of a table and clamp two pipes P and Q inclined at certain angles on the table.
 - Place a ticking clock 'S' closer to pipe 'P'.
 - Measure the angles in each case and you find the sound which is incident and reflected from the wooden plank makes equal angles with the normal.
- (a) a b c d e f (b) a b e d c f (c) f c a d b e (d) d e a c b f
- 43) At different altitudes, the boiling point of water ranges from about 80° C to 100° C. Which of the Celsius thermometers shown below would give the most accurate measurement of the boiling point of water at different altitudes?



Thermometer

- (a) Thermometer A (b) Thermometer B
 (c) Thermometer C (d) Thermometer D

44) Fig. (A) Shows a man pushing a shopping trolley forwards.



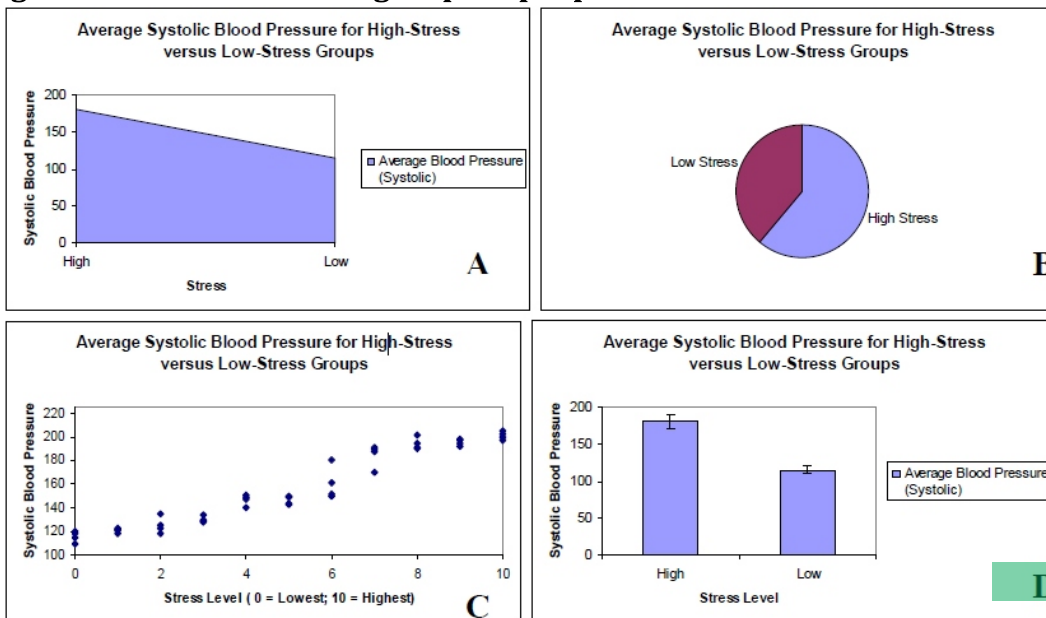
Figure (A)



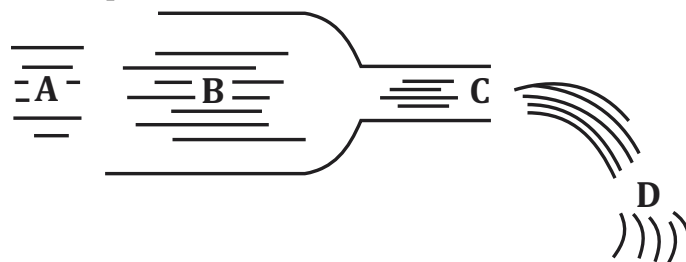
Figure (B)

Fig. (B) shows four forces, P, Q, R and S acting on the shopping trolley as the man pushes it. Which pair of forces are responsible for stopping of trolley ?

- (a) P & Q **(b) Q & R** (c) S & R (d) P & R
- 45) Researchers found that chronically stressed individuals have significantly higher blood pressure compared to individuals with little stress. Which graph would be most appropriate for displaying the mean (average) blood pressure scores for high-stress and low-stress groups of people?

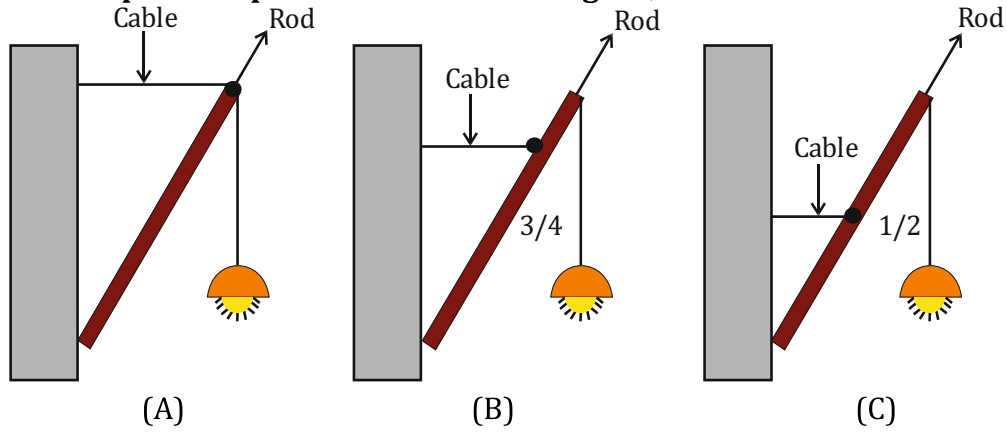


46) A considerable amount of water is gushing out through a large pipe which narrows at the outlets. At which point does the water flow the fastest ?

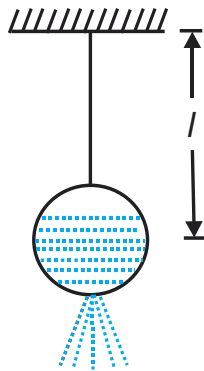


- (a) A (b) B (c) C **(d) D**

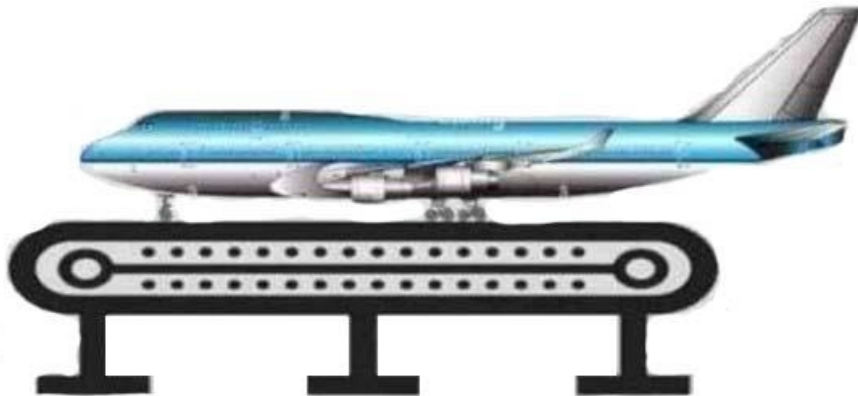
- 47) If a street light of mass M is suspended from the end of a uniform rod of length L in different possible patterns as shown in figure, then



- (a) All will have same sturdiness
 (b) Pattern A is more sturdy
 (c) Pattern B is more sturdy
 (d) Pattern C is more sturdy
- 48) A pot filled with water is suspended from a string to act as pendulum. As water leaks out of the pot-



- (a) The time period of the pendulum decreases
 (b) The time period of pendulum increases
 (c) The time period of the pendulum first increases and then decreases
 (d) The time period of the pendulum remains constant.
- 49) Imagine a Boeing 747 is sitting on a conveyor belt, as wide and long as a runway. The conveyor belt is designed to exactly match the speed of the wheels, moving in the opposite direction. Can the plane take off?



- (a) Yes, as plane generates desired speed for take-off
 (b) No, as plane cannot generate desired speed for take-off

(c) Yes, as conveyor belt simulates runway

(d) No, as lift is not generated

- 50) A metal rod AB is bent into the shape shown. If the rod is heated uniformly, the space between the point A and B will



(a) Increase

(b) Decrease

(c) Remain Same

(d) Can't be Determined

* * * * *

Feedback Section

- 51) Please select the most appropriate option according to you and provide us your valuable feedback about the test paper.

(a) Interesting but Difficult

(b) Interesting and Easy

(c) Easy but Boring

(d) Difficult and Boring