

# DESIGN OF THE QUESTION PAPER

## Science and Technology Class IX (Practicals)

Time : 1 ½ hours

Maximum Marks : 20

The weightage of distribution of marks over different dimensions of the question paper shall be as follows

### A UNIT-WISE WEIGTAGE

S. No.	Unit	Relevant experiments in the syllabus	Marks allotted
1.	I Matter Nature and Behaviour	1,2,3	4.5
2.	II Energy (motion, force and work)	4,5,6,7,8	6.5
3.	III Living World (organization in the living world)	9,10,13	5.0
4.	IV Natural Resources	11,12	2
5.	V Our Environment	14,15	2
	<b>TOTAL</b>	<b>15 Experiments</b>	<b>20</b>

### B. SKILL-WISE WEIGHTAGE

Most questions involve multiple skills, and it may not always be possible to precisely assign particular skills to a given question. The skill-wise weightage given in the table below should therefore be considered as only indicative of what is required in the question paper.

Objective	Weightage
Procedural and manipulative skills	35%
Observational skills	35%
Drawing Skills	15%
Reporting and Interpretative Skills	15%
<b>TOTAL</b>	<b>100%</b>

### C QUESTION-WISE WEIGHTAGE

All the 30 questions would be of the multiple choice variety having only one correct answer. First 20 questions will carry 0.5 mark each while rest of 10 questions will carry 1 mark each

### D EXPECTED TIME

Approximate time for reading and answering one question : 2.5 minutes

Revision time : 15 minutes

### E DIFFICULTY-WISE WEIGHTAGE

S. No.	Estimated difficulty level	Percentage
1.	Easy	15
2	Average	70
3	Difficult	15

# Sample Question Paper I

Time: 1 ½ hours

Maximum Marks: 20

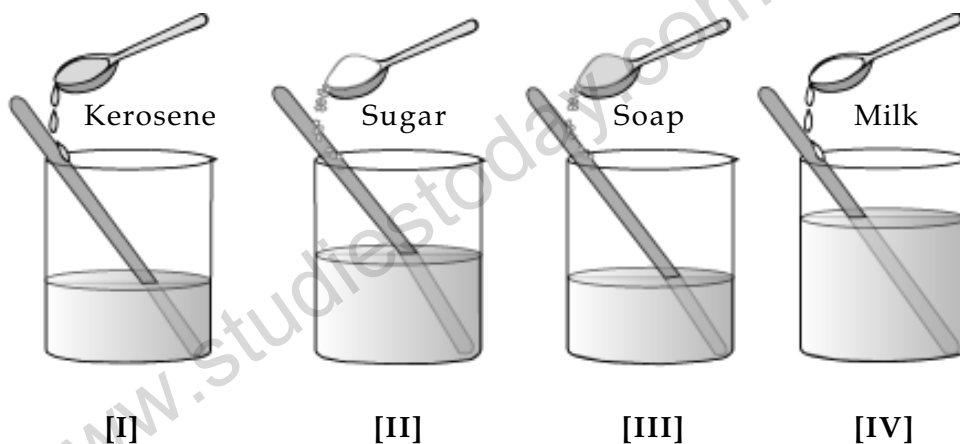
## INSTRUCTIONS :

1. Attempt all questions.
2. There are 30 multiple choice questions in total. Only one of the options in every question is correct.
3. The question paper consists of two parts - Part A and Part B. Each of the 20 Questions in part A carries 0.5 mark and each of the 10 questions in part B carries 1.0 mark.

## SECTION - A

1. The following substances are added to water in a beaker as shown below. The mixture is stirred well. A true solution is found in the beaker

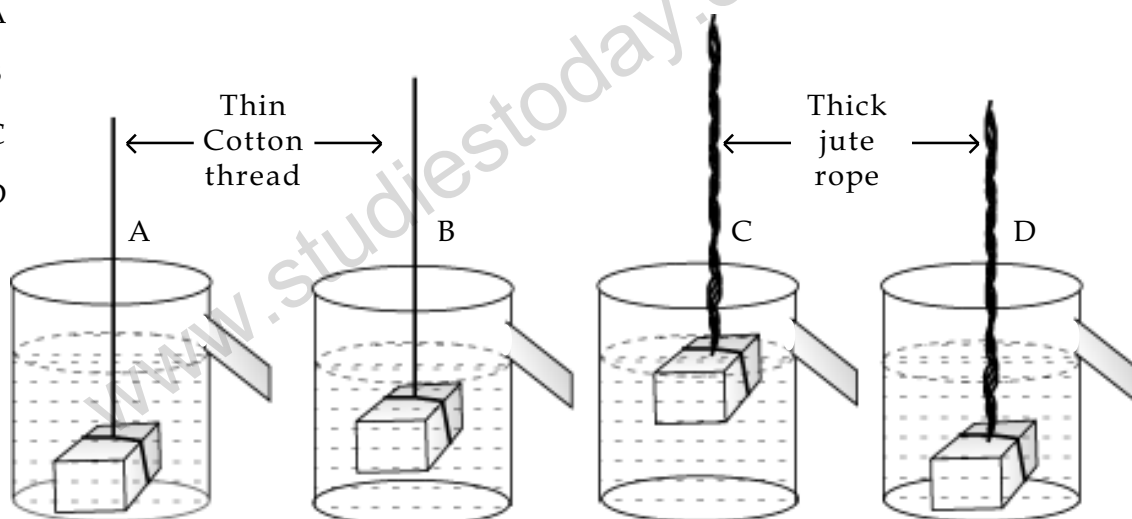
- (a) I
- (b) II
- (c) III
- (d) IV



2. When we start heating a mixture of sulphur powder and iron filings, we would observe that
  - (a) sulphur starts melting.
  - (b) iron filings start melting.
  - (c) mixture becomes red hot.
  - (d) mixture evaporates.
3. When magnesium combines with oxygen it produces magnesium oxide that appears to be like
  - (a) wood ash.
  - (b) chalk powder.
  - (c) table salt.
  - (d) powdered sugar.

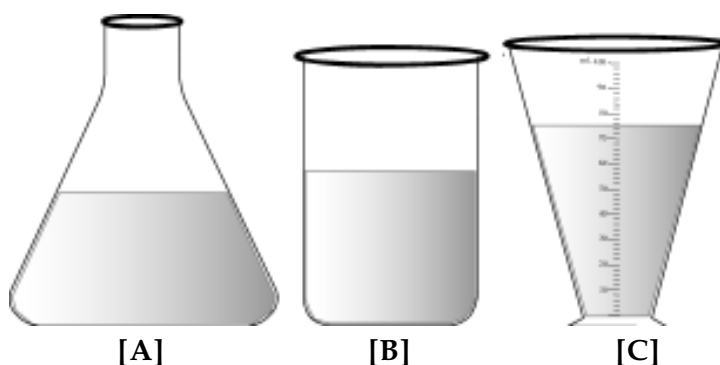
4. When dilute sulphuric acid is added to zinc granules, you will observe that
- a precipitate is formed.
  - the reaction mixture turns yellow.
  - the container becomes hot.
  - bubbles start coming out from the surface of zinc granules.
5. The correct observation when you mix barium chloride solution with sodium sulphate solution is that
- a white precipitate is formed after some time.
  - a yellow precipitate is formed after some time.
  - a white precipitate is formed instantaneously.
  - a yellow precipitate is formed instantaneously.
6. In the experiment to establish the relation between loss in weight of an immersed solid with the weight of water displaced by it, the correct setup is shown in figure

- A
- B
- C
- D



7. A given solid is weighed in air using a spring balance. It is then weighed by immersing it fully, in each of the three vessels containing water, as shown. Its weight when immersed, will be

- least in vessel C.
- least in vessel B.
- least in vessel A.
- equal in all the three vessels.



8. A block of wood of mass 100 g is placed on a smooth table in the experimental set up used in the study of limiting friction. A student is asked to choose from the following:

- (i) either pan of mass 30 g or 10 g
- (ii) either slotted discs of mass 10 g each or of 2 g each.

The most suitable combination that she should choose would be

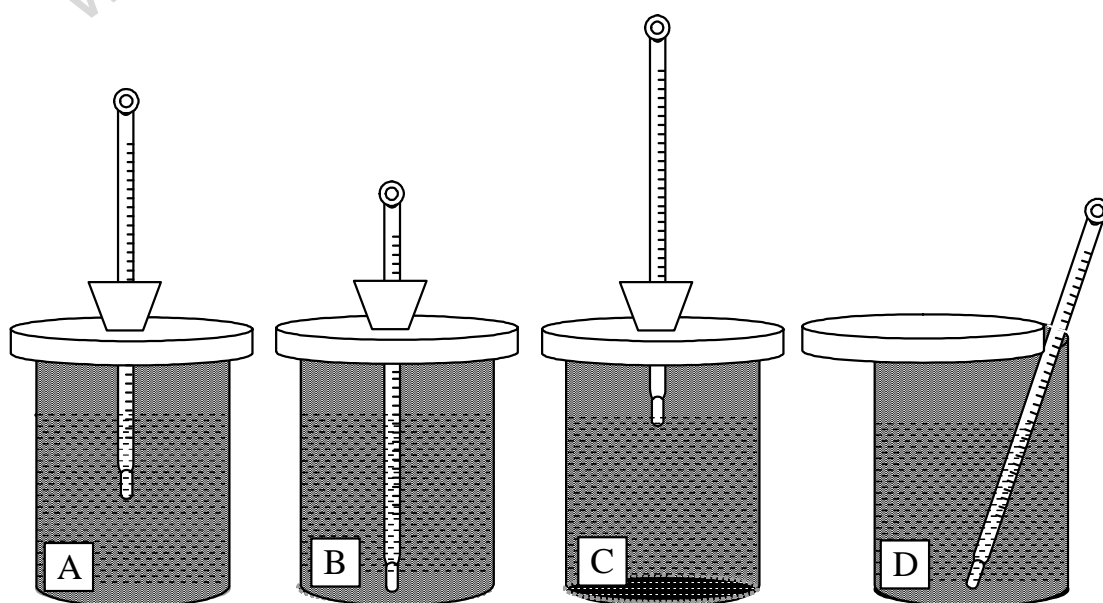
- (a) pan of 30 g and slotted discs of 10 g each.
- (b) pan of 30 g and slotted discs of 2 g each.
- (c) pan of 10 g and slotted discs of 10 g each.
- (d) pan of 10 g and slotted discs of 2 g each.

9. Three students used different kinds of attachments while measuring limiting friction of a block placed over a table. Student A used a rubber band; B used a woollen thread; and C used a cotton thread. The best choice is

- (a) that of A.
- (b) that of B.
- (c) that of C.
- (d) independent of the kind of attachment used.

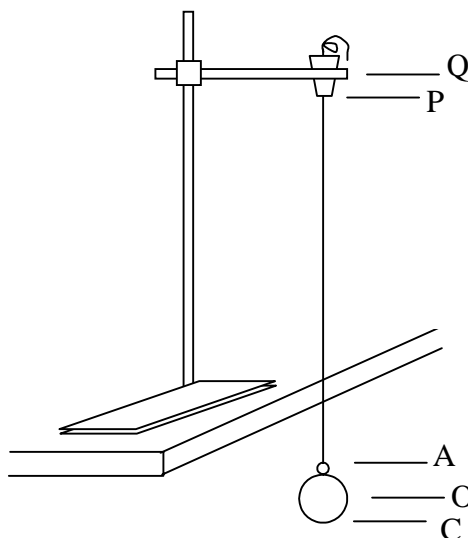
10. The correct arrangement for taking temperature in the study of the temperature-time graph is shown in figure

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



11. For the simple pendulum shown in the figure, the effective length is

- (a) AP
- (b) OP
- (c) CP
- (d) CQ



12. The initial (A) and final (B) readings on a stop clock for 20 oscillations of a simple pendulum are shown in the figure. The time period of the simple pendulum is

- (a) 2.0 s
- (b) 2.2 s
- (c) 2.5 s
- (d) 5.0 s



13. Nikita observed a slide of human cheek cells under a microscope in its (i) low magnifying power, (ii) high magnifying power settings. In the first setting, she must have observed

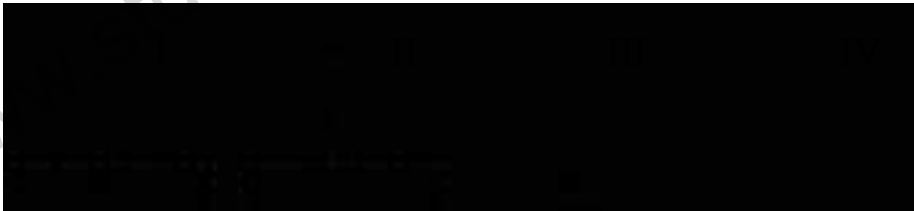
- (a) fewer cells in a darker field of view.
- (b) more cells in a brighter field of view.
- (c) more cells in a darker field of view.
- (d) fewer cells in a brighter field of view.

14. To observe cells in an onion peel, we must prepare the slide by mounting on it

- (a) crushed pulp of onion.
- (b) dry scale leaf.
- (c) green leaf of onion (spring onion)
- (d) thin layer of fleshy leaf of onion.

15. The cellular component NOT seen while observing the slide of an onion peel under a compound microscope is

- (a) chromosomes.
- (b) cell wall.
- (c) nucleus.
- (d) cytoplasm.

16. You are shown two slides of plant tissues: parenchyma and sclerenchyma. You can identify the sclerenchyma by the
- location of nucleus.
  - thickness of cell wall.
  - size of cells.
  - position of vacuoles.
17. Raj observed nerve cells under the microscope, and made the following sketch. The mistake in his drawing is the cyton with
- cilia.
  - dendrites.
  - nucleus.
  - cytoplasm.
18. A student added only two drops of iodine to a rice extract in test tube A. Another student added a little rice extract to iodine solution in test tube B. They would then observe
- a change of colour to blue black in test tube A but not in test tube B.
  - a change of colour to blue black in test tube B but not in test tube A.
  - a change of colour to blue black in both test tubes A and B.
  - no change of colour in any test tube.
19. The proper experimental arrangement to collect methane gas is assembly
- I
  - II
  - III
  - IV
- 
20. Alkaline potassium permanganate solution is used to differentiate between saturated and unsaturated compounds. The container used to store this reagent should be a
- colourless glass bottle.
  - brown coloured bottle.
  - white plastic bottle.
  - sealed aluminium can.

### SECTION - B

21. When an iron nail, rubbed with sand paper, is dipped in copper sulphate solution, we observe that copper gets deposited
- first on the lower part of the nail and proceeds to the upper part.
  - first on the upper part of the nail and proceeds to the lower part.
  - on the entire surface of the nail.
  - on the nail in small patches.

22. When solid lead nitrate is heated in a test tube, what is NOT observed during the reaction is:
- (a) a crackling sound is produced.
  - (b) a brown gas is produced.
  - (c) a light yellow solid is formed.
  - (d) swelling of lead nitrate takes place.
23. The mass of a solid iron cube of side 4 cm is to be determined. Of the four spring balances available, the one best suited for this purpose would have
- (a) range = 0 to 100g, and least count = 1g.
  - (b) range = 0 to 100g, and least count = 5g.
  - (c) range = 0 to 1000g, and least count = 10g.
  - (d) range = 0 to 1000g, and least count = 25g.
24. A student notes down the observations in the two spring balances and the measuring cylinder shown in the figure. From the given observations, the volume of the solid
- (a) is 64 cc
  - (b) is 36 cc
  - (c) is 28 cc
  - (d) 100 cc





25. The table alongside gives the observations reported by two students X and Y for an experiment on the study of temperature-time graph. The experiment is likely to have been performed correctly by

- (a) X.  
 (b) Y.  
 (c) both X and Y.  
 (d) neither X nor Y.

Time (min)	Temp (°C)	observed by
	Student X	Student Y
0	61.0	61.0
2	60.5	59.0
4	60.0	58.0
6	59.0	57.5
8	58.0	57.0
10	56.5	56.5
12	54.0	56.0

26. Four samples of arhar dal (tuvar dal) were taken in four test tubes with some water in each and labelled P, Q, R and S. A few drops of the following were added to these test tubes: water to test tube P, HCl to test tube Q, NaOH to test tube R and alcohol to test tube S. We would be able to confirm adulteration of the dal with metanil yellow in test tubes

- (a) P and Q.  
 (b) Q and R.  
 (c) R and S.  
 (d) S and P.

27. Samples of kerosene, vegetable ghee, groundnut oil and butter are taken in four different test tubes. A few drops of bromine water are added to each of the test tubes. You will observe the decolorisation of bromine water in the case of

- (a) kerosene and butter.  
 (b) kerosene and vegetable ghee.  
 (c) groundnut oil and butter.  
 (d) butter and vegetable ghee.

28. Sana would not believe that the cactus in her garden was a xerophyte. Out of the following,

- A. succulent leaves and deep root system  
 B. fleshy stem and spiny leaves  
 C. green stem and branched root system  
 D. woody stem and spiny leaves

the features of the cactus that show it is a xerophyte are

- (a) A and D.
- (b) B and C.
- (c) A, B and C.
- (d) A, B, C and D.

29. Observe the pictures of honey bee and cockroach. The common feature that assigns them to the same phylum is

- (a) wings.
- (b) three pair of legs.
- (c) jointed appendages.
- (d) antennae.



30. A student found the posterior part of a male cockroach in the laboratory. The following sketch was made. The missing part in the sketch is

- (a) anal cerci.
- (b) anal style.
- (c) brood pouch.
- (d) antennae.



## Scoring Key for Sample Paper I

Q. No.	Key	Explanation
1.	(b)	Sugar makes a true solution.
2.	(a)	Sulphur has a lower melting point than iron.
3.	(a)	Colour and fineness of the powder after complete combustion of wood.
4.	(d)	Reaction occurs at the contact point of the reactants.
5.	(c)	Being an ionic reaction, precipitation is instantaneous.
6.	(b)	The solid must be suspended by an inextensible string in the centre of the overflow can without touching its bottom.
7.	(d)	The loss in weight does not depend upon the shape of the vessel or the volume of water in it.
8.	(d)	A pan of mass 30 g may itself cause a 100 g block to slide on a smooth table. Also, a better least count is always desirable.
9.	(c)	We need an inextensible string.
10.	(a)	The thermometer must be dipped vertically in the water level away from the bottom and sides of the calorimeter and close to the middle of the water level.
11.	(b)	The length of the pendulum equals the length from the bottom of the suspension to the centre of the bob.
12.	(c)	The zero error of 5 seconds has to be added to the observed reading here.
13.	(b)	Lower the magnifying power, more is the number of cells seen. (in a brighter field.)
14.	(d)	To observe a living plant cell with a distinct Nucleus, this is the best material
15.	(a)	Chromosomes are not seen in interphase cells.
16.	(b)	Parenchyma is thin walled, sclerenchyma is thick walled.
17.	(a)	No cilia in cyton.
18.	(c)	Iodine + Starch solution -----> Blue black colour.
19.	(a)	Methane is insoluble in water.
20.	(b)	Sensitive to light.
21.	(c)	Iron nail was rubbed before doing the experiment to expose the entire surface
22.	(d)	Lead Nitrate decomposes into Brown $\text{NO}_2$ gas and yellow Pbo on heating.

23.	(c)	We must have a smaller least count. We must have a rough estimate of the measurement to be taken to select the range.
24.	(c)	The volume of the solid (in cc) has the same magnitude as its loss in weight (in grams) in water.
25.	(b)	The rate of fall of temperature is faster first and slower later.
26.	(a)	Metanil yellow is soluble in water and becomes pink with HCl.
27.	(c)	Unstaturated compounds decolourise Bromine water.
28.	(c)	Paucity of water; hence long roots, fleshy stem.
29.	(c)	All arthropods have jointed appendages.
30.	(b)	Only male cockroaches have anal styles along with anal styles.

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## Questionwise Analysis for Sample Paper I

Q. No.	Unit name	Expt. No.	Skill Tested
1.	Unit I	1	R
2.	Unit I	2	O
3.	Unit I	3	O
4.	Unit I	3	O, R
5.	Unit I	3	O, R
6.	Unit II	4	M
7.	Unit II	5	O, R
8.	Unit II	6	P
9.	Unit II	6	M
10.	Unit II	7	M
11.	Unit II	8	P, D
12.	Unit II	8	O, D, R
13.	Unit III	9	O, R
14.	Unit III	9	P, M
15.	Unit III	9	O
16.	Unit III	10	O
17.	Unit III	10	D
18.	Unit III	13	O, R
19.	Unit IV	11	M
20.	Unit IV	12	P, O
21.	Unit I	3	O
22.	Unit I	3	O
23.	Unit II	4	M
24.	Unit II	5	O, R
25.	Unit II	7	O, R
26.	Unit III	13	P
27.	Unit IV	12	O, R
28.	Unit V	14	O, R
29.	Unit V	15	O, D, R
30.	Unit V	15	O, D

P: Procedural skills; M: Manipulative skills; O: Observational skills;

D: Drawing skills; R: Reporting and interpretative skills