

# SPECTRA PRE-BOARD EXAMINATION

## SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

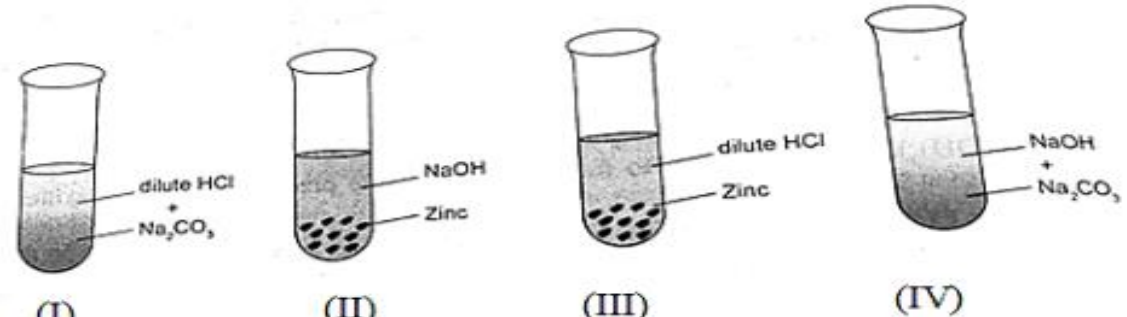
MM:80

General Instruction:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

### SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1-20.

1.	The colour of the residue left in the test tube after heating ferrous sulphate which undergoes decomposition is (a) yellowish-brown (b) black (c) white (d) grey	1
2.	Solid sodium bicarbonate was placed on a strip of pH paper. The color of the strip (a) turned red (b) did not change (c) turned green and slightly yellow (d) turned pink	1
3.	Four students were asked by their teacher to arrange the set up I-IV as given below and identify the gas evolved in each case, if any   <p>(I)                      (II)                      (III)                      (IV)</p>	1

After observation, they arrived at the following inferences and recorded their observations in the form of a table as given below:

**Centre** Gole Market & Minto Road Complex, New Delhi

**Phone** 9650618171, 9013160531, 9899349601

**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

# SPECTRA PRE-BOARD EXAMINATION

## SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	STUDENT	I	II	III	IV	
	A	H <sub>2</sub>	No gas	CO <sub>2</sub>	H <sub>2</sub>	
	B	CO <sub>2</sub>	H <sub>2</sub>	No gas	CO <sub>2</sub>	
	C	CO <sub>2</sub>	H <sub>2</sub>	H <sub>2</sub>	No gas	
	D	No gas	CO <sub>2</sub>	CO <sub>2</sub>	H <sub>2</sub>	

Find which student recorded the correct observation.

4.	When aqueous solutions of potassium iodide and lead nitrate are mixed, an insoluble substance separates out. The chemical equation for the reaction involved is (a) $KI + PbNO_3 \rightarrow PbI + KNO_3$ (b) $2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$ (c) $KI + Pb(NO_3)_2 \rightarrow PbI + KNO_3$ (d) $KI + PbNO_3 \rightarrow PbI_2 + KNO_3$	1																									
5.	A researcher adds barium hydroxide to hydrochloric acid to form a white-coloured barium chloride. Which of the following option gives the balanced chemical equation of the reaction? (a) $HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2H_2O$ (b) $2HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2H_2O$ (c) $2HCl + Ba(OH)_2 \rightarrow BaH_2 + 2H_2O + O_2$ (d) $HCl + 2Ba(OH)_2 \rightarrow 2BaCl_2 + 2H_2O + O_2$	1																									
6.	Sodium hydroxide is termed an alkali while Ferric hydroxide is not because (a) Sodium hydroxide is a strong base, while Ferric hydroxide is a weak base. (b) Sodium hydroxide is a base which is soluble in water while Ferric hydroxide is also a base but it is not soluble in water. (c) Sodium hydroxide is a strong base while Ferric hydroxide is a strong acid. (d) Sodium hydroxide and Ferric hydroxide both are strong base but the solubility of Sodium hydroxide in water is comparatively higher than that of Ferric hydroxide.	1																									
7.	Select the correct matching in the following table in connection with the given chemical equation. $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$ <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 20%;">Initial colour of solution</th> <th style="width: 20%;">Final colour of solution</th> <th style="width: 20%;">Final colour of iron nail</th> <th style="width: 25%;">Type of reaction</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(a)</td> <td>Pale green</td> <td>Blue</td> <td>Grey</td> <td>Displacement</td> </tr> <tr> <td style="text-align: center;">(b)</td> <td>Blue</td> <td>Pale green</td> <td>Brownish</td> <td>Double displacement</td> </tr> <tr> <td style="text-align: center;">(c)</td> <td>Blue</td> <td>Light blue</td> <td>Grey</td> <td>Double displacement</td> </tr> <tr> <td style="text-align: center;">(d)</td> <td>Blue</td> <td>Pale green</td> <td>Brownish</td> <td>Displacement</td> </tr> </tbody> </table>		Initial colour of solution	Final colour of solution	Final colour of iron nail	Type of reaction	(a)	Pale green	Blue	Grey	Displacement	(b)	Blue	Pale green	Brownish	Double displacement	(c)	Blue	Light blue	Grey	Double displacement	(d)	Blue	Pale green	Brownish	Displacement	1
	Initial colour of solution	Final colour of solution	Final colour of iron nail	Type of reaction																							
(a)	Pale green	Blue	Grey	Displacement																							
(b)	Blue	Pale green	Brownish	Double displacement																							
(c)	Blue	Light blue	Grey	Double displacement																							
(d)	Blue	Pale green	Brownish	Displacement																							

**SPECTRA PRE-BOARD EXAMINATION**

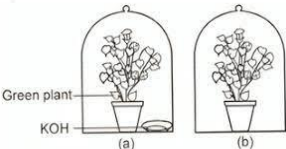
SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

8.	Seeds are called products of sexual reproduction because they a) Give rise to new plants b) Are formed by fusion of gametes c) Are formed by fusion of pollen tubes d) Can survive for longer periods	1
9.	What will be the percentage of purple stemmed plants in the F <sub>2</sub> generation, when the F <sub>1</sub> generation resulted due to cross breeding of green stemmed (Gg) tomato plants with purple stemmed (gg) tomato plants, are self pollinated? (a) 10% (b) 25% (c) 75% (d) 50%	1
10.	Fruits are formed from (a) Stamen (b) Stigma (c) Ovary (d) Ovule	1
11.	A student was asked to write a stepwise procedure to demonstrate that carbon dioxide is necessary for photosynthesis. He wrote the following steps. The wrongly worded step is –  (a) Both potted plants are kept in dark room for at least three days. (b) Bottom of the bell jars is sealed to make them air tight. (c) Both potted plants are kept in sunlight after the starch test. (d) A leaf from both the plants is taken to test the presence of starch.	1
12.	The correct statements with reference to single celled organisms are i Complex substances are not broken down into simpler substances, ii Simple diffusion is sufficient to meet the requirement of exchange of gases. iii Specialised tissues perform different functions in the organism. iv Entire surface of the organism is in contact with the environment for taking in food. (a) (i) and (iii) (b) (i) and (ii) (c) (ii) and (iv) (d) (i) and (iv)	1
13.	At the time of the short circuit, the current in the circuit. (a) reduces substantially (b) does not change (c) increases heavily	1

**Centre** Gole Market & Minto Road Complex, New Delhi**Phone** 9650618171, 9013160531, 9899349601**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

# SPECTRA PRE-BOARD EXAMINATION

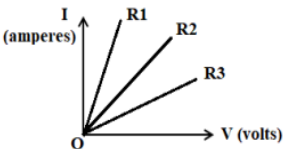
SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	(d) vary continuously	
14.	When a fuse is rated 8A, it means : a) It will not work if current is less than 8A b) It has a resistance of 8 ohm c) It will work only if current is 8A d) It will burn if current exceeds 8A	1
15.	A student carries out an experiment and plots the V-I graphs of three samples of nichrome wire with resistances R <sub>1</sub> , R <sub>2</sub> and R <sub>3</sub> respectively. Which of the following is true?  (a) R <sub>1</sub> = R <sub>2</sub> = R <sub>3</sub> (b) R <sub>1</sub> > R <sub>2</sub> > R <sub>3</sub> (c) R <sub>3</sub> > R <sub>2</sub> > R <sub>1</sub> (d) R <sub>2</sub> > R <sub>3</sub> > R <sub>1</sub>	1
16.	The name of the salt used to remove permanent hardness of water is (a) Sodium hydrogen carbonate (NaHCO <sub>3</sub> ) (b) Sodium chloride (NaCl) (c) Sodium carbonate decahydrate (Na <sub>2</sub> CO <sub>3</sub> .10H <sub>2</sub> O) (d) Calcium sulphate hemihydrate (CaSO <sub>4</sub> . $\frac{1}{2}$ H <sub>2</sub> O)	1
<p><b>Q.no17 to 20 are Assertion – Reasoning based questions.</b>  <b>These consist of two statements–Assertion(A)and Reason(R) Answer these questions selecting the appropriate option given below:</b></p> <p>(a) <b>Both A and R are true and R is the correct explanation of A</b>                      (b) <b>Both A and R are true and R is not the correct explanation of A</b>                      (c) <b>A is true but R is false</b>                      (d) <b>A is False but R is true</b></p>		
17.	Assertion (A): Decomposition of vegetable matter into compost is an example of exothermic reactions. Reason (R): Exothermic reaction are those reactions in which heat is evolved.	1
18.	Assertion (A): The sex of a child in human beings will be determined by the type of chromosome he/she inherits from the father. Reason (R): A child who inherits the ‘X’ chromosome from his father would be a girl (XX), while a child who inherits a ‘Y’ chromosome from the father would be a boy (XY).	1
19.	Assertion(A): A geneticist crossed two pea plants and got 50% tall and 50% dwarf in the progeny. Reason (R): One plant was heterozygous tall and the other was dwarf.	1
20.	Assertion : When a wire is stretched to three times its length, its resistance becomes 9times.	1

**Centre** Gole Market & Minto Road Complex, New Delhi

**Phone** 9650618171, 9013160531, 9899349601

**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

# SPECTRA PRE-BOARD EXAMINATION

SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

Reason: Resistance is directly proportional to length of wire.

## SECTION - B

Q. no. 21 to 26 are very short answer questions.

21.	<p>In the following schematic diagram for the preparation of hydrogen gas as shown in Figure given below, what would happen if following changes are made?</p> <div style="text-align: center;"> </div> <p>(a) In place of zinc granules, the same amount of zinc dust is taken in the test tube                  (b) Instead of dilute sulphuric acid, dilute hydrochloric acid is taken                  (c) In place of zinc, copper turnings are taken                  (d) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.</p> <p style="text-align: center;">OR</p> <p>A clear solution of slaked lime is made by dissolving <math>\text{Ca(OH)}_2</math> in an excess of water. This solution is left exposed to air. The solution slowly goes milky as a faint white precipitate forms. Explain why a faint white precipitate forms, support your response with the help of a chemical equation.</p>	2
22.	<p>(a) Name the substrate acted upon by pepsin and amylase enzyme in the alimentary canal.                  (b) 'Stomata remain closed in desert plants during daytime'. How do they perform photosynthesis?</p>	2
23.	List two functions of finger-like projections present in the small intestine.	2
24.	<p>Label parts A, B and C. State the function of part A.</p> <div style="text-align: center;"> </div>	2
25.	You are given three resistors of 2 ohms, 4 ohms, and 6 ohms. With the help of these resistors, how can you get a resultant resistance of (i) 12 ohms, and (ii)	2



**SPECTRA PRE-BOARD EXAMINATION**

SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	3 ohms? Draw diagrams to illustrate your answer. <b>OR</b> The electrical resistivity of a few materials is given below in ohm-metre. Which of these materials can be used for making element of a heating device? A $6.84 \times 10^{-8}$ B $1.60 \times 10^{-8}$ C $1.00 \times 10^{-4}$ D $2.50 \times 10^{12}$ E $4.40 \times 10^{-5}$ F $2.30 \times 10^{17}$ Give reason for your answer.	
26.	(a) From the following group of organisms create a food chain which is most advantageous for human beings in terms of energy. Hawk, Rat, Cereal plant, Goat, Snake, Human being (b) State the possible disadvantage if the cereal plant is growing in soil rich in pesticides.	2
<b>SECTION - C</b> Q.no. 27 to 33 are short answer questions		
27.	A white precipitate is obtained when adding a drop of barium chloride solution to an aqueous sodium sulphite solution. (a) Write a balanced chemical equation of the reaction involved (b) What other name can be given to this precipitation reaction? (c) On adding dilute hydrochloric acid to the reaction mixture, white residue disappears. Why?	3
28.	Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained from their ores? Take an example to explain the process of extraction along with chemical equations.	3
29.	Give reasons: (a) Herbivores need a longer small intestine while carnivores have shorter small intestine. (b) The lungs are designed in human beings to maximise the area for exchange of gases. (c) Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates. <b>OR</b> Draw a flow chart to show the breakdown of glucose by various pathways.	3
30.	Draw the circuit diagram of an electric circuit containing a battery of 6 V, a key, an ammeter, a resistor of $4 \Omega$ in series with a combination of two resistors of $8 \Omega$ each in parallel, and a voltmeter across the parallel combination. (a) Calculate the resistance of the circuit. (b) Find the current flowing in the circuit. (c) What will be the voltage across the parallel combination of resistors?	3

**Centre** Gole Market & Minto Road Complex, New Delhi**Phone** 9650618171, 9013160531, 9899349601**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

**SPECTRA PRE-BOARD EXAMINATION****SPECTRA CLASSES**CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

31.	(a) Two lenses have power of (i) + 2 D (ii) -4 D. What is the nature and focal length of each lens? (b) An object is kept at a distance of 100 cm from each of the above lenses. Calculate the (i) image distance (ii) magnification in each of the two cases.	3
32.	(i) State the law that explains the heating effect of current with respect to the measurable properties in an electrical circuit. (ii) List the factors on which the resistance of a conductor depends.	3
33.	What is meant by trophic level in a food chain? Construct an aquatic food chain with trophic levels. The energy flow in a food chain is always unidirectional. Why?	3
<b>SECTION-D</b> Q.no.34 to36 are Long answer questions		
34.	(a) On dropping a small piece of sodium in a test tube containing carbon compound 'X' with molecular formula $C_2H_6O$ , a brisk effervescence is observed and a gas 'Y' is produced. On bringing a burning splinter at the mouth of the test tube the gas evolved burns with a pop sound. Identify 'X' and 'Y'. Also write the chemical equation for the reaction. Write the name and structure of the product formed, when you heat 'X' with excess conc.sulphuric acid. (b) What is an oxidising agent? What happens when an oxidising agent is added to ethanol? <b>OR</b> (a) What happens when a small piece of sodium is dropped in ethanol? Write the equation for this reaction. (b) Why is glacial acetic called so? (c) What happens when ethanol is heated at 443K in the presence of conc. $H_2SO_4$ ? Write the role of conc. $H_2SO_4$ in this case. (d) Write an equation showing saponification.	5
35.	(a) Define the term pollination. Differentiate between self-pollination and cross-pollination. (b) Describe the post pollination changes taking place in plants with the help of diagram. <b>OR</b> Give two reasons for avoiding frequent pregnancies of women. Explain the following methods of contraception giving one example of each : (i) Barrier method (ii) Chemical method (iii) Surgical method	5
36.	In a household electric circuit different appliances are connected in parallel to one another. Give two reasons.  An electrician puts a fuse of rating 5 A in that part of domestic electrical circuit in which an electric heater of rating 1.5 kW, 220 V is operating. What	5

**Centre** Gole Market & Minto Road Complex, New Delhi**Phone** 9650618171, 9013160531, 9899349601**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

# SPECTRA PRE-BOARD EXAMINATION

## SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	is likely to happen in this case and why? What change, if any, needs to be made?	
<b>SECTION-E</b>		
Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.		
37.	<p>pH is quite useful to us in a number of ways in daily life. Some of its applications are:</p> <p>Control of pH of the soil: Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of <math>H^+</math> and <math>OH^-</math>. The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials.</p> <p>Regaining shine of a tarnished copper vessel by use of acids: A copper vessel gets tarnished due to formation of an oxide layer on its surface. On rubbing lemon on the vessel, the surface is cleaned and the vessel begins to shine again. This is due to the fact that copper oxide is basic in nature, which reacts with the acid (citric acid) present in lemon to form a salt (copper citrate) which is washed away with water. As a result, the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed.</p> <p><b>(i) When black copper oxide placed in a beaker is treated with dilute HCl, its colour changes to</b></p> <p>(a) white (b) dark red (c) bluish green (d) no change.</p> <p><b>(ii) P is an aqueous solution of acid and Q is an aqueous solution of base. When these two are diluted separately, then</b></p> <p>(a) pH of P increases while that of Q decreases till neutralisation. (b) pH of P decreases while that of Q increases till neutralisation. (c) pH of both P and Q decrease. (d) pH of both P and Q increase.</p> <p><b>(iii) Which of the following acids is present in bee sting?</b></p> <p>(a) Formic acid (b) Acetic acid (c) Citric acid (d) Hydrochloric acid</p> <p><b>(iv) Sting of ant can be cured by rubbing the affected area with soap because</b></p> <p>(a) it contains oxalic acid which neutralises the effect of formic acid (b) it contains aluminium hydroxide which neutralises the effect of formic acid</p>	4

**Centre** Gole Market & Minto Road Complex, New Delhi

**Phone** 9650618171, 9013160531, 9899349601

**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)



# SPECTRA PRE-BOARD EXAMINATION

SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	<p>(c) it contains sodium hydroxide which neutralises the effect of formic acid (d) none of these</p> <p style="text-align: center;"><b>OR</b></p> <p><b>(iv) The pH of soil X is 7.5 while that of soil Y is 4.5. Which of the two soils, should be treated with powdered chalk to adjust its pH?</b> (a) X only (b) Y only (c) Both X and Y (d) none of these</p>	
38.	<p>Pea plants can have smooth seeds or wrinkled seeds. One of the phenotypes is completely dominant over the other. A farmer decides to pollinate one flower of a plant with smooth seeds using pollen from plant with wrinkled seeds. The resulting pea pod has all smooth seeds.</p> <p><b>(i) Which of the following conclusions can be drawn?</b> (1) The allele for smooth seeds is dominated over that of wrinkled seeds. (2) The plant with smooth seeds is heterozygous. (3) The plant with wrinkled seeds is homozygous. (a) 1 only (b) 1 and 2 only (c) 1 and 3 only (d) 1, 2 and 3</p> <p><b>(ii) Which of the following crosses will give smooth and wrinkled seeds in same proportion?</b> (a) RR X rr (b) Rr Xrr (c) RRX Rr (d) rr X rr</p> <p><b>(iii) On crossing of two heterozygous smooth seeded plants (Rr), a total of 1000 plants were obtained in F<sub>1</sub> generation. What will be the respective number of smooth and wrinkled seeds obtained in F<sub>1</sub> generation?</b> (a) 750, 250 (b) 500, 500 (c) 800, 200 (d) 950, 50</p> <p><b>(iv) The characters which appear in the first filial generation are called</b> (a) recessive characters (b) dominant characters (c) lethal characters (d) non-mendelian characters.</p> <p style="text-align: center;"><b>OR</b></p>	4

**Centre** Gole Market & Minto Road Complex, New Delhi

**Phone** 9650618171, 9013160531, 9899349601

**Web** [www.spectraclasses.com](http://www.spectraclasses.com) **Email** [info@spectraclasses.com](mailto:info@spectraclasses.com)

# SPECTRA PRE-BOARD EXAMINATION

SPECTRA CLASSES

CLASS 10<sup>TH</sup>

SUBJECT- SCIENCE

TIME-3HR.

MM:80

	<p><b>(iv) The genotypic ratio obtained in Mendel's monohybrid cross is</b></p> <p>(a) 1:3 (b) 3:1 (c) 1:2:1 (d) 9:3:3:1</p>	
39.	<p>A current - carrying conductor is placed in a magnetic field. Now answer the following:</p> <p>(i) List the factors on which the magnitude of force experienced by conductor depends.</p> <p>(ii) When is the magnitude of this force maximum?</p> <p>(iii) State the rule which helps in finding the direction of motion of conductor.</p> <p>(iv) If initially this force was acting from right to left, how will the direction of force change, if (a) direction of magnetic field is reversed? (b) direction of current is reversed?</p> <p style="text-align: center;"><b>OR</b></p> <p>The ciliary muscles of a normal eye are in their:</p> <p>(i) most relaxed state (ii) most contracted state</p> <p>(a) In which of the two cases is the focal length of the eye-lens more? (b) In which of the two cases is the power of the eye-lens more?</p> <p>Give reason for your answer.</p>	4