BOARD QUESTION PAPER : MARCH 2015
SCIENCE AND TECHNOLOGY

Time: 3 Hours **Total Marks: 80**

Note:
i. Use the same answer-sheet for Section A and Section B.
ii. Draw well-labelled diagrams wherever necessary.
iii. All questions are compulsory.
iv. Students should write the answers of questions in sequence.

SECTION A

1. (A) (a) Rewrite the following statements with suitable words in the blanks: **[2]**

i. The device used for producing electric current is called a _____.
ii. _____, the second layer of the atmosphere reaches 48 km above the earth's surface.

(b) Rewrite the following table so as to match the second column with the first column: **[2]**

	Column A		Column B
i.	eosin	1.	losing hydrogen
ii.	oxidation	2.	synthetic indicator
		3.	losing oxygen
		4.	natural indicator

(c) Give the molecular formula of bleaching powder. **[1]**

(B) Rewrite the following statements by selecting the correct options: **[5]**

i. When phenolphthalein is added to NaOH, the colour of the solution will become:
(A) colourless (B) red
(C) pink (D) yellow

ii. If the potential difference across the ends of a conductor is 220 V and the resistance of the conductor is 44 Ω (ohm), then the current flowing through is:
(A) 0.2 A (B) 0.5 A
(C) 2 A (D) 5 A

iii. 1 A = _____ mA
(A) 10^2 (B) 10^3
(C) 10^{-3} (D) 10^{-6}

iv. The distance between principal focus and optical centre of the lens is:
(A) diameter (B) focal length
(C) principal axis (D) optical centre

v. When rays of light are incident on a glass slab, then the incident ray and emergent ray are _____ to each other.
(A) perpendicular (B) parallel
(C) opposite (D) concurrent

2. Answer any five of the following: **[10]**

i. Give scientific reason: Danger signals are red in colour.
ii. Complete the following reaction, balance it and write the name of the products:
$CuO + HCl \rightarrow$ _____ + _____
iii. State Newlands' Law of Octaves.
iv. The velocity of light in a medium is 1.5×10^8 m/s. What is the refractive index of the medium with respect to air, if the velocity in air is 3×10^8 m/s?
v. Differentiate between resistances in series and parallel.
vi. Draw a ray diagram for concave mirror when the object is between centre of curvature and focus.

3. Answer any five of the following: **[15]**

i. Explain the role of citizen in pollution control.

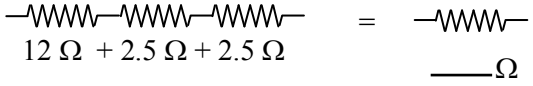
ii. What is a spectrum? Why do we get a spectrum of seven colours when white light is dispersed by a prism?

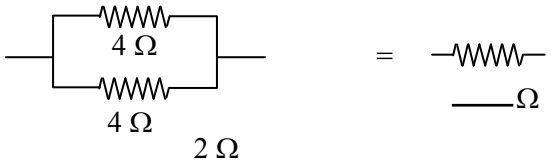
iii. State four most common electrical appliances based on heating effect of electric current. Why do we use finely heated platinum wire in surgery?

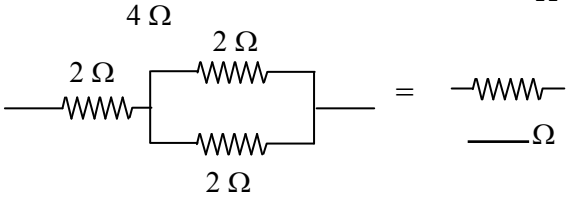
iv. Name the product obtained when Plaster of Paris is mixed with water. State the use of the product. Give two uses of POP.

v. Classify the following elements into metals, non-metals and metalloids: C, Mg, Si, S, Hg, As.

vi. Complete the following:

a. 

b. 

c. 

4. Attempt any one of the following: **[5]**

(A) Often when electricity is used we come across electrical fires caused. Answer the following questions related to the following terms:

a. When does short circuiting take place?

b. What happens to the resistance of the circuit during a short circuit?

c. What happens to the flow of electric current during a short circuit?

d. What is overloading?

e. How can the effects of overloading be avoided?

(B) In a Std X class, out of 40 students, 10 students use spectacles, 2 students have positive power and 8 students have negative power of lenses in their spectacles.
Answer the following questions:

a. What does the negative power indicate?

b. What does the positive power indicate?

c. Generally which type of spectacles do most of the students use?

d. What defect of eyesight do most of the students suffer from?

e. Give two possible reasons for the above defect.

SECTION B

5. (A) (a) Find the correlation in the given pair and rewrite the answer: **[2]**

i. Tinning : Tin :: Galvanizing : _____.

ii. Mammals : _____ :: Amphibia : Fishes.

(b) State True or False: **[3]**

i. Solar water-heater works on renewable energy system.

ii. In human beings, the blood goes to the heart in one cycle once.

iii. In frogs, thyroid secretion stimulates the metamorphosis from tadpole to adult frog.

(B) Rewrite the following statements by selecting the correct options: **[5]**

i. The molecular formula of acetic acid is _____.

(A) CH_3COOH (B) $CH_3 - CH_3$

(C) C_6H_6 (D) C_2H_4

ii. Carbon dioxide enters into the leaves through tiny pores present on the surface of the leaf called _____.

(A) chlorophyll (B) chloroplast

(C) stomata (D) epidermis

iii. _____ solution is blue in colour.

(A) $CuSO_4$ (B) $FeSO_4$

(C) $ZnSO_4$ (D) $Al_2(SO_4)_3$

iv. Yeast reproduces by _____.

(A) spore formation (B) multiple fission

(C) fragmentation (D) budding

v. Raisins put in water absorb water by the process of _____.

(A) diffusion (B) osmosis

(C) transpiration (D) excretion

6. Solve any five of the following: **[10]**

i. Give scientific reason: Common salt has high melting point and boiling point.

ii. Draw neat labelled diagram of the Pancreas with their associated structures.

iii. State the connecting links between Peripatus with Annelida and Arthropoda.

iv. Name the two plant hormones and state their functions.

v. Differentiate between Toilet soap and Laundry soap.

vi. State any four objectives of sustainable development.

7. Answer any five of the following: **[15]**

i. What is an alloy? Give two examples with their chemical composition.

ii. Name the following:

a. Cells that assist the neuron in their function.

b. The small gap between the consecutive neurons.

c. Part of the brain that co-ordinates the voluntary functions.

iii. Explain the process of fertilization, development and birth in human beings.

iv. What are vestigial organs? Give two examples each in human beings and plants.

v. What is recycling of waste? Explain with one example. State two advantages of recycling.

vi. Which mode of reproduction gives rise to variation? Give the importance of variation in survival of species.

8. Attempt any one of the following: **[5]**

(A) Given below are the end products of different reactions involving glucose. Write the appropriate end product in front of the following:

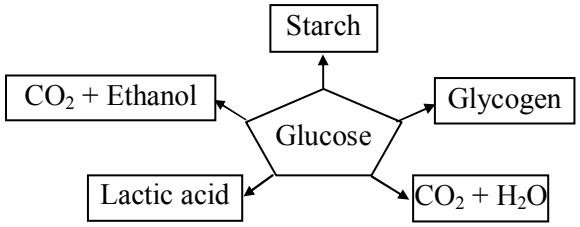
i. Anaerobic reaction =

ii. Reaction in human muscles =

iii. Aerobic respiration =

iv. Reaction in plant cells =

v. Reaction in liver =



(B) Answer the following questions:

i. Give other two names of ethanol. 1

ii. Give the structural formula of ethanol. 1

iii. Give two properties of ethanol. 1

iv. Explain the action of phosphorus trichloride with ethanol. Write the balanced chemical equation of the above reaction. 2