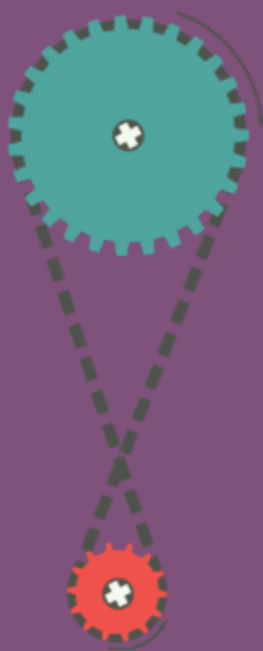


# ISC

## Indian School Certificate Examination

# LABORATORY REQUIREMENT

CLASSES XI & XII



COUNCIL FOR THE INDIAN SCHOOL CERTIFICATE EXAMINATIONS,  
NEW DELHI

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- Schools to motivate pupils towards the cultivation of:  
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**Values** - Spiritual and cultural - to be the bedrock of the educational experience.
- Schools to have an 'Indian Ethos', strong roots in the national psyche and be sensitive to national aspirations.

# FOREWORD

*“Laboratory and discovery are related terms. Do away with laboratories and the physical sciences will be stricken with barrenness and death.”*

***Louis Pasteur***

According to National Education Policy (NEP) 2020, curriculum, pedagogy, continuous assessment and learner support are the cornerstones of high-quality learning. To enhance the capacities of teachers in the teaching of practical-based subjects and to provide learners with an outcome-based environment, teaching and learning practices must be supplemented with engaging and supportive laboratory experiences.

A well-equipped laboratory helps in enhancing the learner's comprehension of theoretical concepts and acquiring of basic experimental skills through enquiry-based approach and hands-on experience.

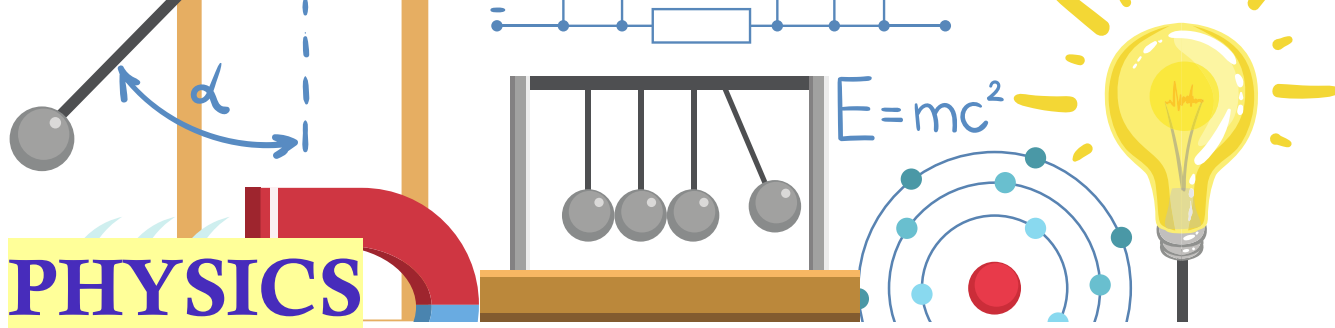
The document entitled “**Laboratory Requirements**” (at the ISC level) was last brought out in the year 2014, wherein details regarding the materials and equipment required for the conduct of practicals were provided for the three Science subjects, i.e., Physics, Chemistry and Biology. Since then, there have been several modifications in the syllabi of these subjects. Furthermore, with the addition of a number of new Practical-based subjects at the ISC level, over the past few years, it has become imperative that this document be revised and updated.

The revised document entitled “**Laboratory Requirement**” has been reviewed with respect to the latest ISC syllabus for science and other practical based subjects. This revised document will provide broad guidelines to CISCE affiliated schools regarding the basic materials/equipment for the conduct of practicals in school laboratories.

I would like to thank all the resource persons who have contributed towards the preparation of this document. We warmly welcome comments and suggestions from the subject experts for further improvement of this document.

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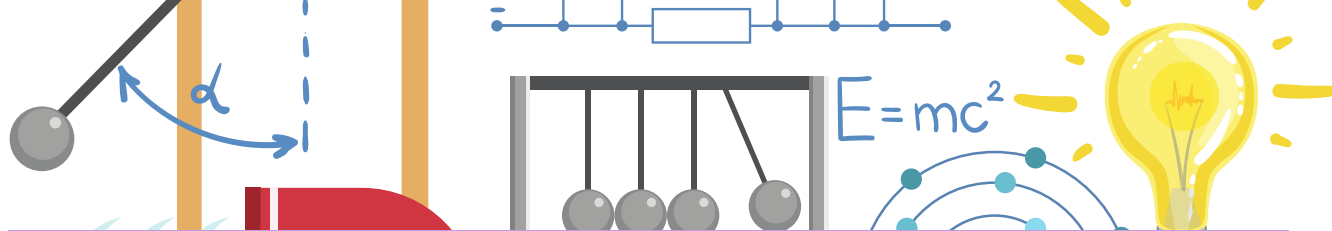
<b>01</b>	<b>Physics</b>
<b>06</b>	<b>Chemistry</b>
<b>12</b>	<b>Biology</b>
<b>19</b>	<b>Home Science</b>
<b>22</b>	<b>Fashion Designing</b>
<b>23</b>	<b>Computer Science</b>
<b>24</b>	<b>Biotechnology</b>
<b>25</b>	<b>Mass Media &amp; Communication</b>
<b>26</b>	<b>Hospitality Management</b>



## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Apparatus/Equipment	Quantity
<b>Common Apparatus</b>		
1.	Physical balance with weight box	03
2.	Spring balance up to (250 gf)	15
3.	Spiral spring with hook	10
4.	Gravesand's apparatus for law of triangles	05
5.	Horizontal friction table	15
6.	Inclined friction table (movable)	10
7.	Loose weight (100 g)	30
8.	Loose weight (50 g)	15
9.	Loose weight (20 g)	15
10.	Loose weight (10 g)	15
11.	Loose weight (5 g)	15
12.	Loose weight (2 g)	15
13.	Glass capillary of different diameters	10
14.	Travelling microscope	02
15.	Half meter ruler (50 cm)	30
16.	Meter ruler (100 cm)	30
17.	Measuring cylinder (200 ml)	10
18.	Measuring cylinder (500 ml)	10



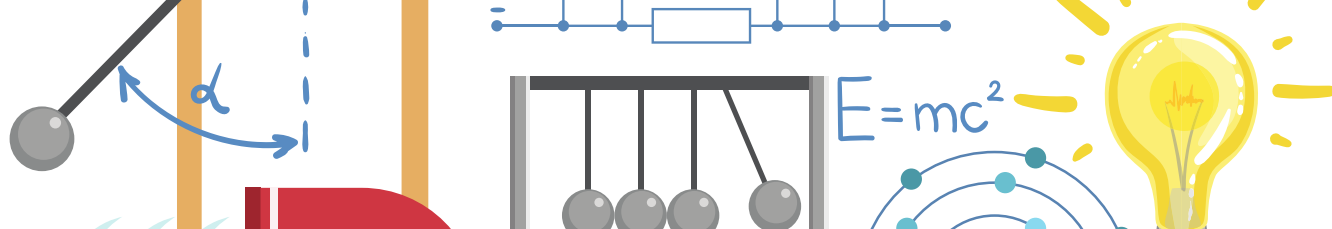
S. No.	Apparatus/Equipment	Quantity
19.	Beaker (200 ml)	15
20.	Test tube (big)	15
21.	Long glass jar	15
22.	Spherometer	10
23.	Vernier caliper	15
24.	Screw gauge	15
25.	Brass bob (for pendulum)	15
26.	Split corks	15 pairs
27.	Retort stand	15
28.	Plane glass plate 10 cm x 10 cm	15
29.	Searle's apparatus to determine Young's modulus (for demonstration)	01
30.	Petri dish	15
31.	Mercury	1 kg
32.	(a) Drawing board (b) Drawing pins	15 60
33.	Viscometer (for demonstration)	01

### ***Heat***

34.	Calorimeter with stirrer	10
35.	Newton's cooling apparatus	01
36.	Boyle's law apparatus	03

### ***Sound***

37.	Resonance tube (complete set)	05
38.	Sonometer	05

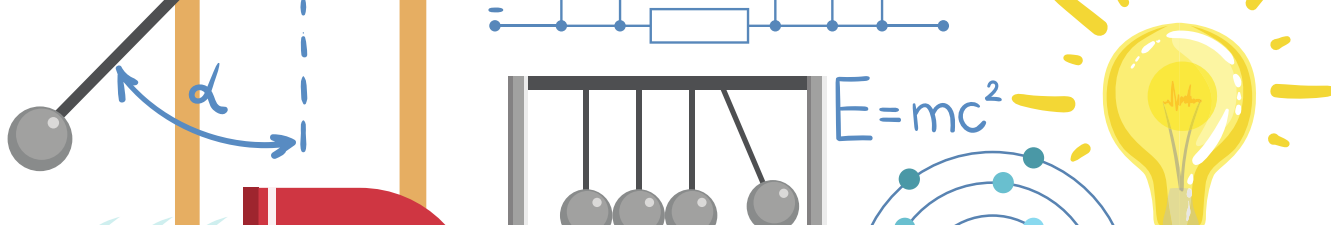


S. No.	Apparatus/Equipment	Quantity
39.	Complete set of tuning forks with hard rubber bungs for striking the tuning forks	10

### ***Light***

40.	Plane mirror square 5cm x 5cm	15
41.	Plane mirror strip 10cm x 3cm	15
42.	Plane mirror holder (a pair of wood or hard rubber)	15
43.	Lens holder	30
44.	Object pin with holder	30
45.	Concave mirror (focal length 15 cm)	15
46.	Concave lens (focal length 30 cm)	15
47.	Convex lens (focal length 10 cm)	15
48.	Convex lens (focal length 15 cm)	15
49.	Convex lens (focal length 20 cm)	15
50.	Equilateral glass prism (big)	15
51.	Right angled glass prism	03
52.	(a) Spectrometer (for demonstration)	01
	(b) Mercury bulb for spectrometer	01
	(c) Spectroscopic prism	01
53.	Optical bench with accessories	03
54.	Biprism (for demonstration)	01

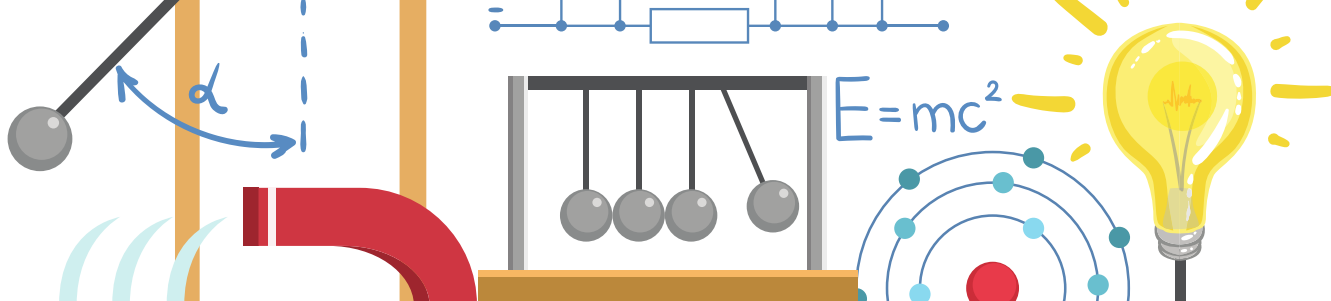




S. No.	Apparatus/Equipment	Quantity
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### *Electricity*

55.	Dry cell 1.5 v	15
56.	Electronic battery 2 v (or 2-4 v dc supply)	15
57.	Leclanche cell	03
58.	Tapping key	10
59.	(a) Plug key	15
	(b) Two-way key	03
60.	Jockey	15
61.	Resistance wire (nichrome) $4 \Omega \text{ m}^{-1}$	20 m
62.	Rheostat ( $30 \Omega$ )	15
63.	Resistance box 1 – 10 $\Omega$	15
64.	One meter long resistance wire mounted on a meter scale (with terminals)	15
65.	$\frac{1}{2}$ meter long resistance wire mounted on a half meter scale (with terminals)	15
66.	50 cm long wire wound on a wooden cylinder (resistance $r \sim 2 \Omega$ )	15
67.	Centre zero galvanometer	15
68.	Ammeter (0-2 a)	15
69.	Voltmeter (0-3 v)	15
70.	Connecting wire (40 cm length)	120
71.	Milliammeter	05
72.	Crocodile clip	15
73.	(a) Meter bridge (for demonstration)	03
	(b) Post office box	03



S. No.	Apparatus/Equipment	Quantity
74.	10 wire potentiometers (for demonstration)	03
75.	Kelvin's bridge (optional for demonstration)	01
76.	(a) Diode characteristic demonstration set	01
	(b) Zener diode	01
77.	Transistor characteristic demonstration set	01

### ***Magnetism***

78.	Bar magnet (small)	30
79.	Bar magnet (big)	30
80.	Magnetic compass	15
81.	Dip circle	02
82.	Electromagnet (for demonstration)	01

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS

# CHEMISTRY

## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Apparatus/Equipment	Quantity
<b>Common Apparatus</b>		
1.	Kipp's apparatus	As required
2.	Balance	As required
3.	Measuring cylinder (1000 ml)	As required
4.	Beaker (1000 ml, 500 ml, 250 ml)	As required
5.	Reagent bottle	As required
6.	Glass trough	As required
7.	Plastic container (for distilled water)	As required
8.	Plastic container (for solutions)	As required
9.	Dropper (plastic and glass)	As required
10.	Mortar and pestle	As required
11.	Spatula	As required
12.	Filter paper	As required
13.	Litmus paper	As required
14.	Starch iodide paper	As required
15.	Chromatography paper or Whatman filter paper	As required
16.	Chromatography apparatus	As required
17.	Universal indicator	As required
18.	Test tube	As required
19.	Test tube rack	As required
20.	Boiling tube	30
21.	Delivery tube	30





<i>S. No.</i>	<i>Apparatus/Equipment</i>	<i>Quantity</i>
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### ***Aluminium Salts***

<i>47.</i>	Aluminium bromide	250 g
<i>48.</i>	Aluminium sulphate	500 g
<i>49.</i>	Aluminium carbonate	500 g
<i>50.</i>	Aluminium nitrate	500 g

### ***Barium Salts***

<i>51.</i>	Barium chloride	250 g
<i>52.</i>	Barium nitrate	250 g

### ***Calcium Salts***

<i>53.</i>	Calcium carbonate	500 g
<i>54.</i>	Calcium nitrate	500 g
<i>55.</i>	Calcium hydroxide	500 g
<i>56.</i>	Calcium oxalate	500 g

### ***Copper Salts***

<i>57.</i>	Copper carbonate	500 g
<i>58.</i>	Copper sulphate	500 g
<i>59.</i>	Copper nitrate	500 g

### ***Iron Salts***

<i>60.</i>	Ferric chloride	500 g
<i>61.</i>	Ferrous sulphate	500 g
<i>62.</i>	Ferrous ammonium sulphate	500 g
<i>63.</i>	Ferrous sulphide sticks	500 g

### ***Lead Salts***

<i>64.</i>	Lead acetate	250 g
<i>65.</i>	Lead carbonate	250 g
<i>66.</i>	Lead nitrate	500 g
<i>67.</i>	Lead dioxide	250 g



<b>S. No.</b>	<b>Apparatus/Equipment</b>	<b>Quantity</b>
68.	Red lead (trilead tetroxide)	250 g

### ***Magnesium Salts***

69.	Magnesium carbonate	250 g
70.	Magnesium nitrate	250 g
71.	Magnesium sulphate	500 g
72.	Magnesium oxalate	500 g

### ***Manganese Salts***

73.	Manganese dioxide	500 g
74.	Manganese chloride	250 g

### ***Potassium Salts***

75.	Potassium chromate	250 g
76.	Potassium dichromate	500 g
77.	Potassium chloride	500 g
78.	Potassium ferrocyanide	250 g
79.	Potassium ferricyanide	250 g
80.	Potassium hydroxide	250 g
81.	Potassium iodide	250 g
82.	Potassium permanganate	250 g
83.	Potassium thiocyanate	250 g
84.	Potassium hydrogen sulphate	250 g

### ***Sodium Salts***

85.	Sodium acetate	250 g
86.	Sodium bicarbonate	250 g
87.	Sodium carbonate	500 g
88.	Sodium bisulphite	250 g
89.	Sodium nitrate	250 g
90.	Sodium nitrite	250 g



<b>S. No.</b>	<b>Apparatus/Equipment</b>	<b>Quantity</b>
91.	Sodium thiosulphate	500 g
92.	Disodium hydrogen phosphate	250 g
93.	Sodium hydroxide (pellets)	500 g

### ***Zinc Salts***

94.	Zinc acetate	500 g
95.	Zinc carbonate	500 g
96.	Zinc nitrate	250 g
97.	Zinc sulphate	250 g

### ***Metals Required***

98.	Copper turnings, magnesium strips, zinc electrode, copper electrode	
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### ***Additional Chemicals***

99.	Borax	250 g
100.	Nickel nitrate	250 g
101.	Iodine crystals	100 g
102.	Dimethylglyoxime	100 g
103.	2, 4 dinitrophenylhydrazine	100 g
104.	Phenylhydrazine	100 g
105.	Glucose	500 g
106.	Iodine	100 g
107.	Oxalic acid	500 g
108.	Pyrogallol	250 g
109.	Phenolphthalein	50 ml
110.	Resorcinol	100 g
111.	Starch	500 g
112.	Strontium nitrate	250 g
113.	Alpha – naphthol	100 g
114.	Beta – naphthol	100 g



<b>S. No.</b>	<b>Apparatus/Equipment</b>	<b>Quantity</b>
115.	Ceric ammonium nitrate	100 g
116.	Silver nitrate	100 g
117.	Benzoic acid	250 g
118.	Sodium nitroprusside	100 g
119.	Fehling's Solution A and B	250 ml + 250 ml
120.	Formaldehyde	500 ml
121.	Ammonium sulphide	100 g
122.	Glycerol	500 ml
123.	Chlorine water	500 ml
124.	Bromine water	500 ml
125.	Ethanol	500 ml
126.	Silver nitrate	100 g
127.	Aniline	500 g
128.	Acetone	500 g
129.	Blue litmus solution	500 g
130.	Methyl orange	50 g
131.	Sodium hypochlorite	500 ml
132.	Schiff's reagent	500 ml

### ***Acids***

133.	Concentrated sulphuric acid	2.5 litres
134.	Concentrated hydrochloric acid	2.5 litres
135.	Concentrated nitric acid	2.5 litres
136.	Glacial acetic acid	2.5 litres

### ***Bases***

137.	Ammonium hydroxide	2.5 litres
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### ***Test for Proteins and Carbohydrates***

138.	Benedict's solution
139.	Sudan III

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS





## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Apparatus/Equipment	Quantity
<b><i>Common Apparatus</i></b>		
1.	Dissecting microscope	03
2.	Compound microscope	10
3.	Electronic weighing balance	02
4.	Electric oven	02
5.	Desiccator	02
6.	Ganong's or Darwin's potometer	01
7.	Table lamps with a bulb of 60 W	30
8.	Ruler (15 cm and 50 cm)	30
9.	Water bath	05
10.	Pestle and mortar	03
11.	pH meter	01
12.	pH papers	05 pkts
13.	pH tablets/solutions (for calibrating pH meter) pH 4, 7 and 9	As required
14.	Forceps	30
15.	Needles (mounted)	60
16.	Thermometer	30
17.	Beaker (50 ml, 100 ml, 250 ml & 500 ml, 1000 ml)	30 each
18.	Funnel (short stem)	30
19.	Conical flask (500 ml)	02
20.	Test tube	200
21.	Test tube stand	30



S. No.	Apparatus/Equipment	Quantity
22.	Test tube holder	30
23.	Thistle funnel	30
24.	Peeler / knife	30
25.	Razor/blade	30
26.	Scissors	30
27.	Parchment paper (semi-permeable membrane)	01 pkt
28.	Brush	30
29.	Glass rod	30
30.	Measuring cylinder (10 cc, 25 cc, 100 cc)	30 each
31.	Measuring cylinder (500 cc)	05
32.	Dropper	60
33.	Scalpel	30
34.	Spatula	10
35.	Magnifying lens	30
36.	Petri dish	60
37.	Watch glass	60
38.	Spirit lamp/Bunsen burner	30
39.	Tripod stand	15
40.	Wire gauge	15
41.	Cork borer	30
42.	Pipette (1 ml, 5 ml)	30 each
43.	Marker pen for glass labelling/sticky labels	05/1 pkt
44.	Cover slips	1 box containing 20 pkts
45.	Slide box with slides	02
46.	Filter paper	06 pkts
47.	Whatman filter paper (no.1)	One large sheet



S. No.	Apparatus/Equipment	Quantity
48.	Cobalt chloride paper	05 pkts
<b>Reagents</b>		
49.	Iodine solution	As required
50.	Dilute hydrochloric acid	250 ml
51.	Sodium bicarbonate	500 g
52.	NaH <sub>2</sub> PO <sub>4</sub> and Na <sub>2</sub> HPO <sub>4</sub> (or phosphate buffer pH = 7)	500 g x 2
53.	Starch	500 g
54.	Glucose	500 g
55.	Sucrose	500 g
56.	Benedict's reagent	500 ml
57.	Millon's reagent	500 ml
58.	Biuret reagent	500 ml
59.	Ninhydrin	500 ml
60.	Sudan III	100 g
61.	Sodium hydroxide	500 g
62.	Potassium hydroxide	500 g
63.	Diastase / amylase	100 g x 2
64.	Barium sulphate	500 g
65.	Distilled water	As required
66.	Cavity slide	As required
67.	Calcium nitrate	As required
68.	Calcium chloride	As required
69.	Boric acid	As required
70.	Potassium nitrate	As required
71.	Magnesium sulphate	As required
72.	Detergent powder	As required
73.	Liquid detergent	As required



<b>S. No.</b>	<b>Apparatus/Equipment</b>	<b>Quantity</b>
74.	Methyl alcohol	500 ml
75.	Sodium chloride	500 gm x 2
76.	Nitric acid	250 ml
77.	Fehling's solutions A and B	500 ml each
78.	Glycerol/glycerine	500 ml
79.	Ethyl alcohol	500 ml
80.	Olive oil or coconut oil or mustard oil (for lipid test)	As required
81.	Egg white/pea extract (source of protein)	As required
82.	Ammonia (for xanthoproteic test)	As required
83.	Ice (to demonstrate the effect of temp. on membrane permeability, DNA extraction)	As required
84.	Liquid detergent	As required
85.	Beetroot	As required
86.	Rhoeo leaves/onion bulb	As required
87.	Spinach leaf extract	As required
88.	Hydrilla or any aquatic plant	As required
89.	Potato tuber	As required
90.	Rubber cork (for chromatography)	As required
91.	Capillary tubes (for chromatography)	As required
92.	Gas jar with lid or boiling test tube (for chromatography)	As required
93.	Stopwatch (timer)	As required
94.	Copper sulphate solution	250 ml
95.	Acetone	500 ml
96.	Chloroform	500 ml
97.	Solvent ether	500 ml

### ***Charts***

### ***Plant Life***

98.	Transverse section of young dicot & monocot stem	As required
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<b>S. No.</b>	<b>Apparatus/Equipment</b>	<b>Quantity</b>
99.	Transverse section of monocot & dicot leaf	As required
100.	Transverse section of monocot & dicot root	As required
101.	Plant families: (a) Malvaceae: China rose (b) Solanaceae: petunia / datura (c) Papilionaceae: sweet pea (d) Liliaceae: onion (e) Amaryllidaceae: lily/gladiolus	As required
102.	Different types of inflorescences: racemose (typical raceme), cymose, and capitulum	As required
103.	Modifications of root, stem, and leaf	As required
104.	Types of phyllotaxy	As required
105.	Types of venations in leaves	As required
106.	Different shapes of leaves	As required
107.	Simple leaf versus compound leaf	As required
108.	Pollination by an insect	As required
109.	Pollination by wind	As required

### ***Stains***

110.	Methylene blue	5 bottles of 125ml each
111.	Safranin	5 bottles of 125ml each
112.	Fast green	5 bottles of 125ml each
113.	Eosin	5 bottles of 125ml each
114.	Acetocarmine	1 bottle of 125ml

### ***Permanent Slides***

115.	Onion peel (plant cell)
116.	Mitosis and meiosis
117.	Transverse section of testis of mammal
118.	Transverse section of ovary of mammal



S. No.	Apparatus/Equipment	Quantity
119.	Transverse section blastula (slide/chart)	
120.	Transverse section of ovary of plant showing marginal placentation	
121.	Transverse section of ovary of plant showing axile placentation	
122.	Transverse section of ovary of plant showing parietal placentation	
123.	Longitudinal section of ovary of plant showing basal placentation	
124.	Transverse section of monocot & dicot stem	
125.	Transverse section of monocot & dicot root	
126.	Mammalian blood cells	
127.	Bacteria	
128.	Germinating pollen grains (slide/chart)	

### **Identification Of Plants**

#### ***Specimens/Permanent Slides/Models/Charts***

129.	Algae ( <i>spirogyra</i> )
130.	Fungi (yeast, mushroom, <i>rhizopus</i> and <i>mucor</i> )
131.	Moss
132.	Fern
133.	Liverwort
134.	<i>Pinus</i>
135.	A monocot plant (bamboo)
136.	A dicot plant ( <i>petunia</i> )
137.	A phylloclade (cactus)

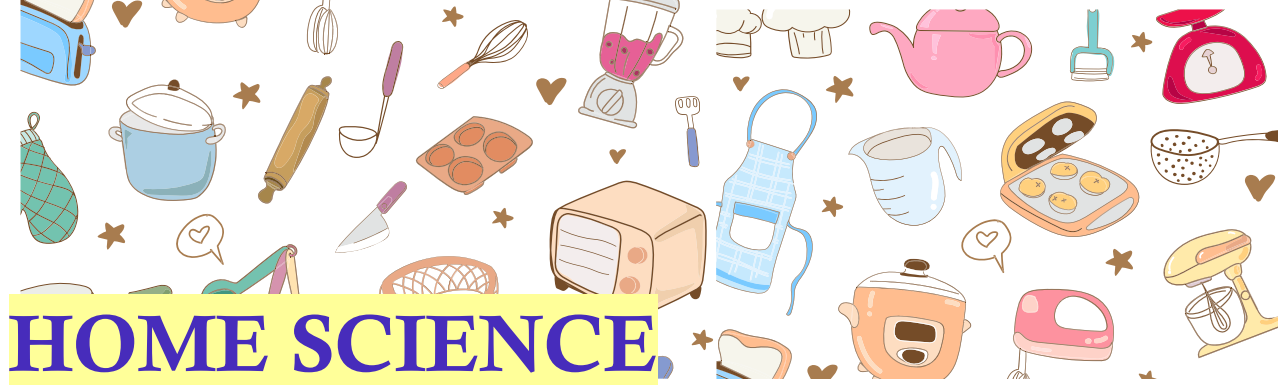
#### **Identification Of Animals**

138.	Amoeba (slide – W.M. or chart)
139.	<i>Entamoeba histolytica</i> trophozoite (slide - W.M. or chart)
140.	<i>Plasmodium</i> sporozoite (slide – W.M. or chart)
141.	Sponge
142.	Hydra (slide)



S. No.	Apparatus/Equipment	Quantity
143.	Tape worm	
144.	Ascaris (male and female)	
145.	Leech	
146.	Silkworm	
147.	Rohu fish (aquatic adaptations)	
148.	Camel model/chart (xeric adaptations)	
149.	Soil samples from two different places	

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS



## CLASSES XI – XII

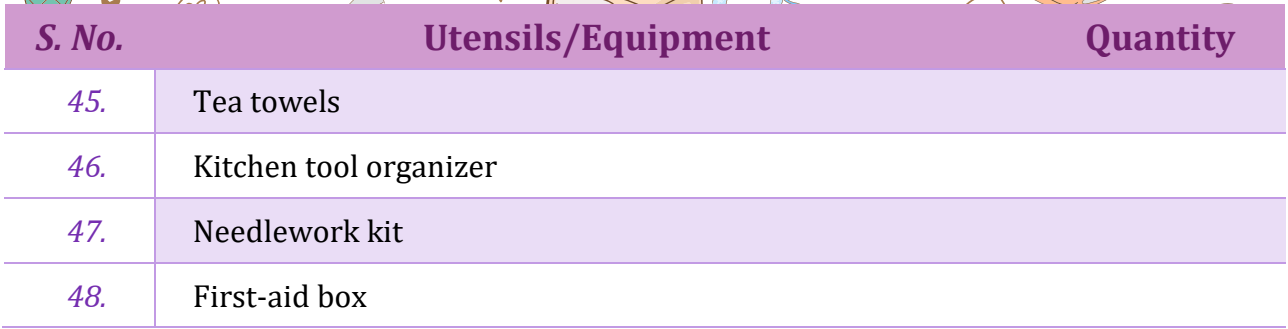
### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Utensils/Equipment	Quantity
<i>For Cooking</i>		
1.	Chef's knife	30
2.	Paring knife	10
3.	Knife sharpening/honing rod	10
4.	Bread knife	10
5.	Chopping/cutting board(s)	30
6.	Kitchen shears/scissors	05
7.	Vegetable peeler	30
8.	Garlic press	05
9.	Grater	10
10.	Kitchen scale	03
11.	Measuring jug	10
12.	Measuring spoon	10
13.	Measuring cup	10
14.	Mixing bowl	30
15.	Colander/pasta strainer	10
16.	Sieve	10
17.	Rolling pin	10
18.	Can opener	05
19.	Blender	03
20.	Frying pan/skillet	15





S. No.	Utensils/Equipment	Quantity
21.	Saucepan	15
22.	Ovenproof dish	10
23.	Pressure cooker	10
24.	Wok (deep and shallow both)	30 total
25.	Roasting pan	10
26.	Baking sheet	2 rolls
27.	Stirring spoon	30
28.	Slotted spoon	30
29.	Spatula	30
30.	Tongs	30
31.	Masher	10
32.	Balloon whisk	10
33.	Oven gloves	15
34.	Potholders	15
35.	Food/meat thermometer	Optional
<b><i>For Serving</i></b>		
36.	Ladle	30
37.	Pasta fork	10
38.	Pizza cutter	05
39.	Corkscrew	05
40.	Bottle opener	05
<b><i>For storage</i></b>		
41.	Eco-friendly storage container	10
42.	Bread bin	05
<b><i>Miscellaneous</i></b>		
43.	Butter paper	
44.	Eco-friendly parchment paper	



***NOTE: LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS***

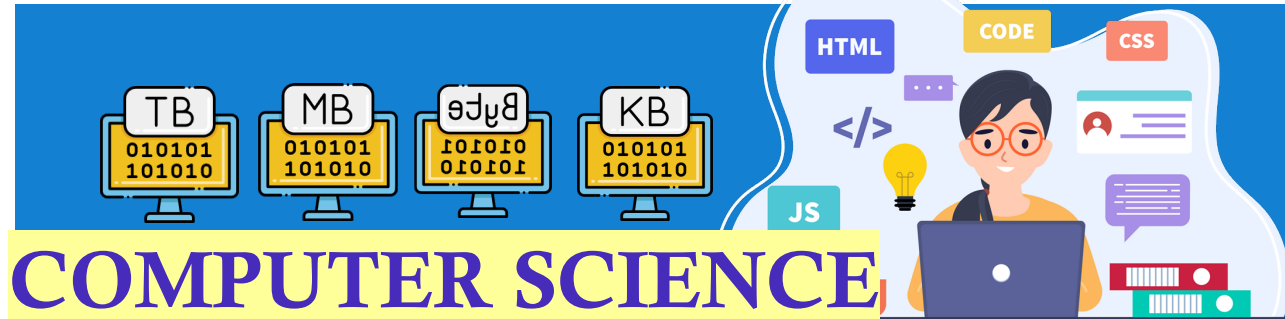


## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Equipment	Quantity
1.	Gas stove	04
2.	Direct dye	100 g
3.	Salt	1 kg
4.	Steel vessels (700-800 ml capacity)	08
5.	Stirring rods (steel/ glass)	10
6.	Plastic measuring jar	04
7.	Gas cylinder	02
8.	Tubs / bucket	05
9.	Detergent powder	1 kg
10.	Liquid detergent	1 litre
11.	Starch powder or liquid	500 g
12.	Gum crystals (for silk)	500 g
13.	Nylon cord for drying clothes	02
14.	Nylon <i>dori</i>	1 kg
15.	Acrylic colours (2-3 colours)	2-3 bottles
16.	Colour palettes	10
17.	Paint brushes (medium size)	10
18.	Sponge sheets	10
19.	Microscope	05
20.	Microscope slides	1 box

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS



# COMPUTER SCIENCE

## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Equipment	Quantity
<b>Hardware</b>		
1.	Personal computer (PC) with a minimum of 2GB RAM with dual- core processor	30
2.	Local area network (LAN) with high-speed internet facility	
3.	Smartboard with a multimedia projector/interactive T.V./LCD/OHP attached to the computer	01
4.	High speed, good quality printer on LAN (shared)	01
5.	White/green board	01
<b>Software</b>		
6.	Any suitable operating system can be used	
7.	JDK 6 or later version	
8.	Documentation for the JDK version being used	
9.	A suitable text editor, a development environment (IDE) with a debugger is preferred (e.g., BlueJ, Eclipse, NetBeans) BlueJ (version 3.2 or higher) is recommended for its ease of use and simplicity	

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS



# BIOTECHNOLOGY

## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Apparatus/Equipment	Quantity
1.	Table-top centrifuge	01
2.	Thermostatic water bath (with the capacity to accommodate 6 beakers)	01
3.	Spectrophotometer (UV visible range)/colorimeter	01
4.	Refrigerator	01
5.	Lactometer	03
6.	pH meter	01
7.	Hot air oven	01
8.	Autoclave	01
9.	Desiccator	02
10.	Micro-filtration unit	01
11.	Incubator	01
12.	Magnetic stirrer with hot plate	01
13.	Laminar flow cabinet	01
14.	Weighing balance (electrical)	01
15.	Hot plate	01
16.	Binocular microscope	15
17.	Haemocytometer	01
18.	Colony counter	01
19.	Antiserum (set of A, B and D)	1 set
20.	Electrophoresis chamber	01
21.	Micropipettes	2 – 3

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS



## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Equipment	Quantity
1.	Smartboard/projector set-up	01
2.	If smartboard/projector set-up <u>is not available</u> , <i>one</i> computer per five students	06
3.	Sound mixer	01
4.	Microphones	02
5.	Headphones	02
6.	Leads for mixer to other devices	04
7.	10 feet x 10 feet open area/stage area	
8.	Speakers	02
9.	Teacher's computer	01
10. *	Sound-proofing for walls and ceiling	
11. *	Video camera set-up	01
12. *	Lecterns	02
13. *	Internet access	As required
14. *	Display boards for charts and explanation	02
15. *	Backup power for equipment	As required
16. *	Access to teleconferencing/Skype/Zoom/etc.	As required

\*Equipment mentioned from S. No. 10 to 16 are optional.

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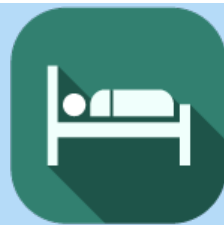


# HOSPITALITY MANAGEMENT

## CLASSES XI – XII

### LIST OF LABORATORY REQUIREMENT – FOR A CLASS OF 30 STUDENTS

S. No.	Utensils/Equipment/Ingredients	Quantity
<b><i>For Vegetable Cuts</i></b>		
1.	Chef's knife	30
2.	Knife sharpening/honing rod	10
3.	Chopping/cutting board(s)	30
4.	Kitchen shears/scissors	05
5.	Vegetable peeler	30
6.	Vegetable grater	10
7.	Mandoline for vegetable cut	30
8.	Vegetables – carrot, cucumber, spinach/cabbage	30 pcs each
<b><i>For Cooking – Salad/Chaat/Sandwich</i></b>		
9.	Sandwich bread	10
10.	Bread knife	10
11.	Butter	05
12.	Vegetables – cucumber, tomato, onion, capsicum, cabbage & lemon	15 pcs each
13.	Sauces – pizza topping, mayonnaise, sandwich spread	02 bottles each
14.	Ingredients – mustard powder, black pepper powder, salt & sugar	02 packs each
15.	Bowls for mixing	30
16.	Dinner spoon & fork	30
17.	Dinner plate for serving/presentation	30
18.	Napkin	05 packs



S. No.	Utensils/Equipment/Ingredients	Quantity
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***Cutlery For Table Layout – A La Carte/Table D’ Hote – For Cover of 04 Packs***

19.	Dinner plate/full plate	04
20.	Side plate/bread & butter plate	04
21.	Bread & butter knife	04
22.	Dinner spoon	04
23.	Dinner fork	04
24.	Dinner knife	04
25.	Dessert spoon & fork	04 each
26.	Soup bowl	04
27.	Soup spoon	04
28.	Water goblet (glass)	04
29.	Steward salver	05
30.	Cruet set	01
31.	Food & beverage napkin for table set- up	10

***Miscellaneous***

32.	Dusters	15
33.	Apron	30
34.	Disposable chef caps	30
35.	Chef gloves	30
36.	Water supply for washing vegetables & utensils	As required
37.	Wiping cloth for cutlery	10
38.	First-aid box	As required

**NOTE:** LABORATORY REQUIREMENT ARE SUBJECT TO CHANGE BASED ON CHANGES IN THE SYLLABUS