

Rajasthan State Open School, Jaipur

Courses of Practical Examinations (Senior Secondary)



Dr. Sarvapalli Radhakrishnan Shiksha Sankul

J.L.N. Marg, Jaipur (Raj.) - 302015

Ph.: 0141- 5180926, 2705067, Fax : 0141-2705067



Senior Secondary Level
Physics
Practical Examination

Times Allowed : 3 hours

Max. Marks: 20

1.1 Distribution of Marks

There will be a practical examination of 20 marks apart from the theory examination. The distribution of 20 marks is as follows:

- | | |
|---|----------|
| (i) Viva | 4 Marks |
| (ii) Record Book | 2 Marks |
| (iii) Two Experiments (2 experiments x 7 marks) | 14 Marks |

Note : There are 30 experiments in three Groups A, B and C. In the practical examination candidate has to do two experiments *which should not be from the same group and each experiment carries 7 marks.*

1.2 General Instructions For Physics Practicals

1.2.1 Instructions for the Candidates

- Record your observations by pen (ink) or ball point and draw your diagrams by pencils. Calculations should be done by pen or ball point pen. If some observation is wrongly recorded, it should be rewritten. Do not over-write or erase any observations.
- One principal observation must be shown to the examiner, otherwise the experiment will be treated as incomplete. Calculations may be done, using preferably log tables.
- Draw labeled diagrams and graphs wherever necessary.
- Candidates allotted electricity or electronic experiments must draw circuit diagrams and get them checked by the examiner before starting the experiment.
- Candidates performing optics experiment must draw the ray diagrams and get them checked by the examiner before starting the experiment.
- Candidates will be required to perform two experiments in 3 hours. These two experiments should not be from same group.

1.2.1 General Instructions for Examiners

- The above "instructions for the candidates" are to be announced to the candidates before the start of the examination.

- ii. For each batch of 20 candidates, the student will be allotted two experiments from two different groups - A, B and C.
- iii. The examiner is to select different combinations for different batches.
- iv. The examiner must sign, after checking, at least one observation in each experiment.
- v. The distribution of marks for each experiment will be :

| | |
|---|-------------|
| a) Setting the Apparatus correctly | 1 mark |
| b) Taking observations and recording in the table | 2 1/2 marks |
| c) Calculations and Result | 2 1/2 marks |
| d) Sources of Error and Precautions | 1 mark |

1.3 List of Experiments

Group A

1. Determine the internal diameter and depth of a cylindrical container (like tin can, calorimeter), using a vernier calipers and find its capacity. Verify the result using a graduated cylinder.
2. Determine the diameter of a given wire using a screw gauge and its length with the help of metre scale. Determine mass of the wire using a physical balance and calculate the density of the material of the wire in kg./m^3 .
3. Determine the radius of curvature of a concave mirror using a spherometer. Verify the result by parallax method using one needle.
4. Find the time period of a simple pendulum for small amplitudes and draw the graph of length of the pendulum against square of the time period. Use the graph to find the length of the second's pendulum.

OR

- Find the time period of a simple pendulum of different initial amplitudes (up to about 60°) and draw a graph between the time period and amplitude of the simple pendulum for a given length and analyse the result.
5. Find the weight of a given body using law of parallelogram of vectors and verify it by spring balance.
 6. Study the Newton's law of cooling by plotting a graph between cooling time and temperature difference between calorimeter and surroundings.
 7. Determine the specific heat of a solid using the method of mixtures.

OR

- Determine the specific heat of liquid using the method of mixtures.
8. Find the spring constant of a helical spring by measuring its extension by a known load. Then to find acceleration due to gravity by measuring time period of vertical oscillations of a known load.
 9. Find the time required to empty a burette, filled with water, to $1/2$ of its volume to V^* of its volume, to $1/8$ of its volume and so on. Plot a graph between volume of water in the burette and time. And thus study at each stage that the fractional rate of flow $\Delta v/\Delta t$ is the same (Analogy to radio-active decay).
 10. Determine the radius of gyration about the centre of gravity of a metre scale used as bar pendulum by studying its oscillations about axes close to its C.G.

Group B

11. Determine (i) the wave length of sound produced in an air column and (ii) the velocity of sound in air at room temperature using a resonance column and tuning fork.
12. Compare the frequencies of two tuning forks by finding first and second resonance in a resonance tube positions.
13. Establish graphically the relation between the tension and length of a string of sonometer vibrating in its fundamental mode resonating with a given tuning fork. Use the graph to determine the mass per unit length of the string.
14. Find the volume of v for different values of u in case of a concave mirror and find its focal length (f) by plotting graph between $1/u$ and $1/v$.
15. Find the focal length (f) of convex lens by plotting graph between $1/u$ and $1/v$.
16. Find the focal length of convex mirror using a convex lens.
17. Determine the focal length of concave lens by combining it with a suitable convex lens.
18. Draw a graph between the angle of incidence (i) and angle of deviation (D) for a glass prism. Determine the refractive index of the glass of the prism using this graph.
19. Compare the refractive indices of two transparent liquids using a concave mirror and single pin.
20. Set up an astronomical telescope and find its magnifying power.

Group C

21. Verify law of combination (series and parallel) of resistance using ammeter-voltmeter method and coils of known resistances.
22. Compare the e.m.f.s. of two given primary cells using a potentiometer.
23. Determine the specific resistance of the material of two given wires using a meter bridge.
24. Determine the internal resistance of a cell using a potentiometer.
25. Determine the inductance and resistance of a given coil using suitable series resistance and A.C. voltmeter.
26. Study decay of current in R.C. circuit using a galvanometer and find the time constant of the circuits.
27. Draw the characteristic curve in forward biased pn junction diode and to determine the static and dynamic resistance of the given diode.
28. Study the characteristics of an npn transistor in common emitter mode and to find out the values of current and voltage gains.
29. Draw lines of force due to a bar magnet keeping,
 - (i) North pole pointing geographical north
 - (ii) North pole pointing geographical southLocate the position of neutral points.
30. Determine the internal resistance of a moving coil galvanometer by half deflection method. Convert the galvanometer into a voltmeter of suitable range and verify it.

1.4 Material Required

a). *Non-Consumable*

A vernier callipers, a graduated cylinder, a glass slab, screw gauge, metre scale, physical balance, weight box, fractional weight box, Spherometer, metre rod, optical bench, knitting needle, screen, spherical bob, stop watch (with least count of 0.1 second or less) tall laboratory stand with clamp, Parallelogram law of forces apparatus (Gravesand's apparatus), slotted weights, a spring balance, Calrimeter with stirrer, thermometers with $1/2^\circ$ graduation, heating device, large metal box blackened inside and outside, insulated box and stirrer, brass bob. The spring, a pan. half-metre scale, two laboratory stands, Stop clock. A metre scale along the central line of which there are holes of equal diameter (<1.6 mm) at different marks, an axle, knife edge, Resonance tube apparatus, tuning forks, rubber mallet or block, Sonometer, weight hanger, mirror, holder, pins, spirit lamp. Convex lens, Convex mirror, prism, protractor, vertical clamp stand, Battery, Ammeter, Voltmeter, Rheostat, One way key, Coils of known resistance, Connecting wires, Potentiometer, Galvanometer, Resistance box, jockey, Leclanche cell, Daniell cell, Two way key, Meter bridge. Step-down transformer, Electrolytic capacitor 2000 μ F 10V, 3V/9V battery, bar magnets, magnetic needle, compass box, Ge diode OA79, 0-30 ma meter, 2 V lead accumulator, Medium power npn transistor CL 100, 0-300 micro amp DC meter.

b). *Consumable Items*

Given wire, concave mirror, spit cork, fine thread, two small wooden blocks, plumb line, white drawing paper sheet, drawing pins, mirror strip, pencil, set square/ protractor, oil (mustard or any other), measuring glass cylinder, light aluminium strip with a pointer, A 50 ml burette with a least count of 0.2 ml or 0.1 ml, a thistle funnel, rubber tube, 4 sheets of Cartesian graph paper, Concave mirror, Drawing board, pins, pencil, drawing pins, cello-tape, Sand paper.

Times Allowed : 3 hours

Maximum Marks: 20

2.1 Distribution of Marks

There will be a practical examination of 20 marks. The distribution of 20 marks is as follows:

| | |
|--|-----------|
| a) Group I Salt Analysis. | 4 |
| (one cation + one anion) | |
| b) Group II Volumetric Analysis | |
| i. (Write-up in which student may be asked to write brief method, indicator, equation, end point.) | 2 |
| ii. Set-up of experiment | 2 |
| iii. Results | 2 |
| c) Group III | |
| i. Detection of elements in an organic compound | 2 |
| ii. Detection of functional group | 2 |
| OR | |
| Setting up of one experiment from experiments at serial number 2 to 10, 12 and 13. | 4 |
| d) Viva-voice | 3 |
| e) Record book | 3 |
| Total | 20 |

2.2 General Instructions for Chemistry Practicals**2.2.1 Instructions for the candidates**

- i. Record your observations by pen (ink), or ball point and draw your diagrams (if required) by pencils. Calculations should be done by pen or ball point pen. If some observation is wrongly recorded, it should be rewritten. Do not over-write or erase any observations.
- ii. One principal observation must be shown to the examiner, otherwise the experiment will be treated as incomplete. Calculations may be done by using preferably log tables.
- iii. Draw labelled diagrams and graphs wherever necessary.
- iv. Candidates will be required to perform three experiments in 3 hours.

- v. Hazardous chemicals should be handled very carefully and in case of any injury, report immediately to the examiner.

2.2.2 Instructions for the Examiners

- i. The above "instructions for the candidates" are to be announced to the candidates before the start of the examination.
- ii. For each batch of candidates, the student will be allotted three experiments - one each from groups I, II and III.
- iii. The examiner is to select different combinations for different batches,
- iv. The examiner must sign, after checking, at least one observation in each experiment.
- v. The record books should be crossed or punched after examination/
- vi. If an examiner due to one reason or the other reason fails to produce lab. record, the examiner may award up to 1 mark on the basis of general performance.

2.3 List of Experiments

2.3.1 Group I: Salt Analysis

Elementary qualitative analysis of a salt involving detection of one cation and one anion from the following groups. (Salts insoluble in hydrochloric acid excluded).

Cations:

Pb^{2+} , Cu^{2+} , Cd^{2+} , Fe^{3+} , Al^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ca^{2+} , NH_4^+

Anions:

CO_3^{2-} , S^{2-} , Cl^- , Br^- , I^- , NO_2^- , NO_3^- , SO_4^{2-} , PO_4^{3-}

Distribution of Marks

| | |
|---|---------|
| Application of correct tests for cation | 1 mark |
| Correct identification of cation | 1 mark |
| Application of correct tests for anion | 1 mark |
| Correct identification of anion | 1 mark |
| <i>Total</i> | 4 marks |

2.3.2 Group II. Volumetric Analysis

(Any one of the following experiments may be allotted to the candidates at the examination)

1. Study of acid-base titration.
2. Study of redox titration

(In each case, it has to be a single titration only and both the solutions are to be provided to the candidates).

3. Acid- base titration

Oxalic acid and sodium hydroxide

(Candidates may be asked to determine the strength/concentration of the given alkali solution in Molarity)

4. Ferrous ammonium sulphate and potassium permanganate.

Candidates may be asked to determine the strength/concentration of the given potassium permanganate solution in Molarity)

Note :

- (i) The examiner should carry out test titration with identical solutions and apparatus as supplied to the candidates and the values so obtained should be taken as standard for marking. Values of x, wherever necessary, are to be provided by the examiners to the candidates for making calculations.
- (ii) In a group at least two to four different concentrations of oxalic acid/ferrous ammonium sulphate potassium permanganate solutions', of which the concentration/strength are to be determined by the candidates, may be supplied.
- (iii) The examiner will check at least one initial reading and one final reading while a candidate is performing the titration.

Distribution of marks

| | |
|--|----------------|
| a) Correct set-up of experiment including correct choice of indicator (if any) | 1 mark |
| b) Correct and appropriate choice of apparatus, properly cleaning the apparatus at the end of the experiment | 1 " |
| c) Correct use of pipette | 1 " |
| d) Correct burette reading (initial and final) | ½ |
| e) Correct end point | 1 " |
| f) Correct substitution | ½ |
| g) Correct result | 1 " |
| Total | 6 marks |

2.3.3 Group III

Each candidate will perform both experiments (i) and (ii) mentioned below OR the experiment mentioned at serial number (iii) below:

(i) **Detection of elements in an Organic compound.**

Detection of nitrogen, sulphur and halogens in the given organic compound (combinations of halogens to be avoided). Not more than two of the above elements should be present in the given organic compound.

(ii) **Detection of Functional group present in an Organic compound.**

Detection of the presence of carboxylic acid group, aldehydic group and ketonic group in the given organic compound(s). Not more than one functional group should be given.

Distribution of marks

| | |
|---|--------|
| (a) Detection of elements | 1 mark |
| Preparation of sodium extract correct result (1/2+1/2) if two elements are given) | 1 mark |

| | | |
|-----|--|----------------|
| (b) | Detection of functional group correct description/choice of test | 1 mark |
| (c) | Correct result | 1 mark |
| | Total | 4 marks |

OR

(iii) *Set up any one of the following experiments :*

1. Preparation, collection and study of some important physical and chemical properties of any one of the following gases :
Hydrogen, Oxygen, Carbon dioxide, Hydrogen sulphide
2. Preparation of a dilute solution of known concentration of any one of the following : sulphuric acid, hydrochloric acid and nitric acid. (Dilution should be carried out strictly under the supervision of a teacher).
3. Study of interaction of metals (any four) with their salt solutions and arranging them according to their activity (to form activity series). Metals and salts may be selected from the following : Mg, Zn, Fe, Sn, Pb, Cu and Al and their salts.
4. (a) Determination of the any two the following substances by using a universal indicator solution of pH papers.
 - (i) a salt solution
 - (ii) one acid and one base.
 - (iii) any one vegetable or fruit juice
 (b) study of pH change by common-ion effect in case of weak acids and weak bases by above method (for example CH_3COOH and CH_3COONa and NH_4H and NH_4Cl)
5. Determination of the melting point of a solid substance of low melting point (below 100 C e.g. urea) by glass capillary tube method (water or paraffin oil may be used as bath).
6. Study of the solubility of a solid substance in water at different temperatures and plotting the solubility curve.
7. Study of the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of their ions.
8. Study of:
 - (a) The effect of concentration on the rate of reaction between sodium thiosulphate and hydrochloric acid.

OR

- (b) The effect of temperature on the rate of reaction between sodium thisulphate and hydrochloric acid.
9. Separation of coloured substances by paper chromatography and comparison of their R values.
 - (a) a mixture of red and blue ink or black ink
 - (b) juice of a flower or grass.

OR

10. Study of simple reactions of carbohydrates, fats and proteins in pure form or detection of their presence in given food stuffs.
11. Preparation of soap by using any one vegetable oil and its comparison with the market soap by determining the foaming capacity and cleaning effect.

Distribution of marks

| | |
|---------------------------------------|----------------|
| Correct choice of apparatus | 1½ marks |
| Correct choice of substances/reagents | 1½ marks |
| Total | 3 marks |

OR

| | |
|---|----------------|
| Correct, neat and labelled diagram of the experimental set up | 1½ marks |
| Description of the method for performing the exercise along with the list of materials required | 1½ marks |
| Total | 3 marks |

2.4 Apparatus and Chemicals Required

1. *Articles to be provided at each seat* - beakers (250ml)-2, burette (50ml) with laboratory stand-1, pipette (20ml), funnel with stand-1, conical flask-2, tile-1, glassrod-1, glass tube bent 1 each, porcelain dish-1, test tubes-6, boiling tubes-2 test tube stand-1, blow pipe-1, charcoal block-1, tripod stand-1, pair of tongs-1, wash bottle containing distilled water, heating device preferably, LPG gas stove.
2. Side shelf reagents to be readily accessible to candidates.
3. Ferrous ammonium sulphate, oxalic acid and KMnO_4 (laboratory grade) for preparing standard solutions for titration.
4. All the reagents required for salt analysis/organic substances for detection of elements and functional groups.
5. Chromatographic papers.
6. Balance and weight box.
7. Three thermometers (-10°C to 110°C).
8. Stop clock/watch
9. Salts which are soluble in water such as carbonates, chlorides, bromides, iodides, nitrates of sodium or potassium.
10. Other items of daily use such as soaps and detergents, vinegar, dusters etc.
11. pH paper, universal indicator, phenolphthalein.



Senior Secondary Level
Biology
Practical Examination

(NEW COURSE)

**SENIOR SECNDORY LEVEL
BIOLOGY
PRACTICAL EXAMINATION**

Times Allowed : 3 hours

Maximum Marks: 20

3.1 Distributions of Marks

- 1. To perform an experiment (any one of the following)** 4 marks
 - (i) To study the structure and function of different parts of the given flower.
 - (ii) To study the (a) texture and (b) water holding capacity of different types of soil.
 - (iii) To study the structure and germination in gram or bean seed (demonstration experiment).
 - (iv) To demonstrate respiration in germinating seeds.
 - (v) To study the stages of mitosis from temporary stained mount of onion root tips.
 - (vi) To study the morphological adaptations of (a) plants living in a xeric and aquatic habitats eg. Cactus and water hyacinth, (b) Animals to parasitic mode of life eg tapeworm.

- 2. To prepare a temporary stained glycerin mount of the material provided and to identify and make a labeled sketch:** 3 marks
 - (i) Epidermal peel of onion.
 - (ii) Check cells of humans.
 - (iii) Epidermal peel of leaf to observed stomata
 - (iv) Straited muscles from cockroach leg.
 - (v) To study the rate of photosynthesis in aquatic plants
 - (vi) To study osmosis by potato osmometer.

3. To identify and comment upon 4 specimens/slides (A-C) 4 marks
4. To submit a project report (prepared during the academic session). 3 marks
5. Practical record Book 3 marks
6. Viva voce 3 marks

3.2 List of Experiments in Biology

3.2.1 Demonstration, carrying out of any one exercise and to make sketch

- (i) To study the structure and function of different parts of the given flower.
- (ii) To study the (a) texture and (b) water holding capacity of different types of soil.
- (iii) To study the structure and germination in gram or bean seed (demonstration experiment).
- (iv) To demonstrate respiration in germinating gram seeds.
- (v) To study the stages of mistosis from temporary stained mount of onion root tips.

- (vi) To study the morphological adaptations of (a) plants living in a xeric and aquatic habitats eg. Cactus and water hyacinth, (b) Animals to parasitic mode of life eg tapeworm.

- | Setting up of the experiment and demonstration 2
- | Recording the observation and conclusions 2

(2+2=4)

3.2.3 To identify and comment upon the four specimens/slides

a. Any one prepared slide showing microscopy structures of the following:

- (i) Dicot Stem (ii) Dicot Root (iii) Monocot Root (iv) Monocot Stem (v) Cartilage
(vi) Bone (vii) Blood (viii) Testis (ix) Ovary

b. Any one modification of the following

- (i) Root (1) Storage (Carrot/beet root/radish)
(2) Support (Prop root, stilt root)
(ii) Stem (1) Underground-Rhizome, Tuber, conn, Bulb
(2) Aerial-Tendrils, Thorn, phylloclade, cladode

c. Identification and classification upto class and listing main features of any two of the following specimen:

- (i) Sponge (ii) Earthworm (iii) butterfly (iv) Snail (v) Starfish (vi) Bony fish (vii) Cartilaginous fish (viii) House Lizard (ix) Pigeon (x) Bat

Identification $\frac{1}{4}$ Marks

Comments $\frac{1}{2}$ marks

Labelled diagram/ $\frac{1}{4}$ marks

Classification

4 items x 4 = 4 marks

3.2.4 Submission of a project report on any one topic of interest or you can choose project topics suggested below as samples

1. Collection, preservation and presentation of flora (herbarium)/Fauna. Make a herbarium with 10-15 plants. Collect, press and stick them on the herbarium sheet. Write their names and classification and present the herbarium at the time of the examination.
2. Take water in an old bulb or jam bottle. Grow a small piece of money plant (Pothos) with one or two leaves in the bottle. Observe and record time taken for new roots, leaves to come and increase in length of stem.
3. Culture Drosophila by collecting them from fruit market on overripe banana. Identify the red eyed Drosophila. They would lay eggs on banana. From the second day onwards observe and record the time taken for larval life, pupal life and emergence of adult of new generation.
4. Enrichment information on any text related items (clippings from newspapers or journals etc.)
5. Preparation of bird record diary-listing birds observed during different seasons in the neighbourhood and record their feeding and other habits including nesting etc.
6. Hereditary observation-making family pedigrees showing occurrence of (i) tongue rolling (ii) PTC tasting (iii) thumb bending etc.

3.3 Apparatus and material required for Biology Practical

1. Dissecting microscopes
2. Compound microscopes
3. Hand lenses
4. Slides
5. Cover slips
6. Glass ware required for various experiments
7. Stains
8. Glycerine
9. Different chemicals required for exercises
10. Plant or animal material required for temporary mount preparation.
11. prepared slides and specimens listed in the curriculum
12. Blotting/ filter paper.

3.4 Marking Scheme

1. For experiment
 1. Setting up of the experiment and demonstration 2-
 1. Recording the observation and conclusions 2(2+2=4)
2. Slides preparation 2 marks
Labeled diagram 1 marks
(If material mount is incorrect or missing, no marks be awarded at all)
3. Identification $\frac{1}{4}$ marks
Comments $\frac{1}{2}$ marks
Labelled diagram /classification $\frac{1}{4}$ marks
4 items x 1 = 4 marks
4. Project Report 3 marks
5. Maintenance of record Book 3 marks
(Proper m sketching & Statements)
6. Viva Voice 3 marks
Two questions on the project prepared $2 \times \frac{1}{2} = 1$
Two questions on the exercise performed $2 \times \frac{1}{2} = 1$
Two questions related to practical record $2 \times \frac{1}{2} = 1$
(1+1+1=3)



Senior Secondary Level
Home Science
Practical Examination

NEW Course

Times Allowed : 3 hours

Maximum Marks: 20

1.1 Distribution of marks

1. Practical work

A. Group 1 (two practicals)

4 x 2 = 8

marks

(core modules)

B. Group 2 (one practical)

4

marks

(optional modules)

1.2 List of practicals

1. To prepare a label depicting each of the following marks of standardisation : i) ISI ii) FPO iii) Agmark.
2. To fill in various forms at a bank : i) cheque ii) pay in slip iii) withdrawal form.
3. To study the resource use pattern of various family members at your home.
4. To list habits of members of your family and neighbours which degrade the environment and suggest ways to conserve it.
5. To identify the discriminations against a girl child (if any) in your family and find justifications for the same.
6. To identify a child labourer in your locality and develop a profile of the child.
7. To identify a child with special needs and study the family's efforts in his/her achieving independence.
8. To develop a questionnaire to study a family's efforts in helping an adolescent achieve the developmental tasks.
9. To identify various types of fibres using : i) burning test ii) visual inspection.
10. To tie and dye a cotton fabric using various methods of tying.
11. To remove the following stains from white cotton fabrics : i) curry ii) blood iii) mud iv) ink v) tea/coffee.
12. To prepare simple dishes using the following methods of food enrichment: i) combination ii) fermentation iii) germination.

13. To study the nutritional intake and its effect on the nutritional status of a family by maintaining a food diary.
14. To study the programme at a play centre to determine the center's role in: i) socio-emotional development ii) physical motor development iii) cognitive development.
15. To develop a plan to set up a laundry unit to provide door to door service in: i) rural area ii) area with government flats iii) posh society.

1.3 List of articles required for the Practical

A. Articles to be made available by the examination centre :

1. *Cooking utensils :-*

Degchi with cover, karahi, tawa, thali, chakla - belan, karchi, spoons, frying pan, pressure cooker, steamer, strainer, grater, knife.

2. *Raw materials :-*

All spices, salt, sugar, jaggery, preservatives, colours, ghee/oil, sprouted/fermented Cereals or pulses, atta, besan, rice, chivra, suji, dalia, maida, pulses, groundnuts, bread, buttermilk, curd.

3. Water arrangement
4. Bottles for jam, pickle, ketchup
5. Sample of stains on 2"x2" white cotton cloth : curry, blood, mud, ink, tea/coffee.
6. Stain removers - glycerin, soap, salt, lime juice, talcum powder, sourbutter milk, borax powder
7. Buckets, mugs, tubs, brush
8. Dyeing colours for tie and dye
9. Bank pay in slips/withdrawal forms
10. 2"x2" pieces of various fabrics for fibre identification
11. Spirit lamp and pair of tweezers
12. Empty food packets for evaluation of labels of ISI, FPO, AGMARK

B. Articles to be brought by the students :-

1. Pen, pencil, ruler, eraser, colour pencils
2. Objects for use in tying in tie and dye
3. Thread for tying in tie and dye
4. Dusters (2 per student), old newspaper, overall, rags

1.4 Marking scheme

1. Practical work

A. Group 1

i) completion of practical activity

3 x 2 = 6 marks

ii) Method of work and neatness

1 x 2 = 2 marks

| | |
|--|----------|
| B. Group 2 | |
| i) completion of practical activity | 3 marks |
| ii) Method of work and neatness | 1 mark |
| 2. Record as practical manual (completed and checked by Teacher at AI) | 4 marks |
| 3. Viva-voice based on any of the practical activities performed by learner | 4 marks |
| Total | 20 marks |

PRACTICAL ACTIVITIES

| | |
|---|--|
| <p>1. To preserve seasonal foods.</p> | <p>11. To remove curry, blood, mud, ink and tea/coffee stains from white cotton fabrics.</p> |
| <p>2. To prepare and evaluate dishes using the following methods of food enrichment such as:</p> <ul style="list-style-type: none"> - Combination - Fermentation - Germination | <p>12. To launder the following materials:</p> <ul style="list-style-type: none"> - Cotton-'A' line frock/pillow case/petticoat/pyjama - Silk - blouse/scarf - Wool - cardigan/cap/scarf - Synthetic - shrit/saree/pant |
| <p>3. To collect different food items that are available at home and categorize them under various food groups.</p> | <p>OPTIONAL MODULE</p> <p>A. HOUSE KEEPING</p> <p>1. To care for, maintain and clean wooden, floor, brass, aluminum, silver and plastic.</p> <p>2. To use waste material for preparing useful household items.</p> <p>3. To practice cleaning the following (to be done under adult supervision only)</p> <ul style="list-style-type: none"> - An electric Fuse - 3 pin plug of an electric iron <p>B. CREATIVE HAND EMBROIDERY</p> <p>1. To make a colour wheel</p> <p>2. To prepare samples of various embroidery stitches.</p> |
| <p>4. To identify sources of pollution in one's area and to suggest remedial measures.</p> | |
| <p>5. To take one's own family as an example and</p> <ul style="list-style-type: none"> - List the household and related task performed by each member - Analyse the work patterns according to age and gender differences in responsibility - Comment on this division of tasks | |
| <p>6. (i) To record the expenditure for one's own family for a month,</p> <p>(ii) To evaluate the family's pattern of expenditure and on the basis of the evaluation prepare a budget for the family.</p> | |
| <p>7. To observe children in the age group of 1 yr. 6 months-3 yrs. for their language achievements.</p> | |
| <p>8. (i) To observe a child in the age group of 1-2 yrs. and record how he/she expresses anger and fear:</p> | |
| | |
| | |

| | |
|---|---|
| (ii) To visit a nearby nursery school and observe any three children for their social behaviour. | 3. To do enlargement and reduction of motifs created. |
| 9. To obtain a teenager's view about the physical changes and the social and emotional problems faced during adolescence. | |
| 10. (i) To weave plain and twill weaves using strips of paper. (ii) To collect six samples each of fabrics made by these two weaves. | |

5

Senior Secondary Level
Geography
Practical Examination

Times Allowed : Three hours

Distribution of Marks

Maximum Marks: 20

1. Out of total marks (20), 3 marks are allotted for Viva-Voice, 4 marks for practical book and 13 marks for practical examinations (written work).
2. The examiner may ask simple questions from each of the following units (details are given in the Practical Manual in Geography).

| | |
|--------------------------|---------|
| a. Map and its Elements | 3 Marks |
| b. Map Interpretation | 5 |
| Marks | 5 |
| c. Statistical Diagrams | 5 |
| Marks | 3 |
| d. Viva-voce | 3 |
| Marks | 4 Marks |
| e. Practical Record Book | 4 Marks |

Total **20 Marks**

3 Marks

List of Practical

- a. **Map and its Elements**
 1. Map: definition, types and importance, History of maps in India
 2. Directions - Geographical North and Magnetic North
 3. Conventional signs and symbols
 4. Scale-Representation of scale in map
 - i) Statement of scale
 - ii) Representation Fraction (R.F.)
 - iii) Linear scale and its construction
 5. Latitudes and Longitudes
 - i) Important latitudes
 - ii) Longitude and time, 1ST and international date line and

iii) Grid of latitudes and longitudes and locating of places on maps

6. Map Projections

i) The globe and map-their merits and demerits

ii) Developable and non-developable surfaces

iii) Classification of map projections. Uses and limitations

iv) Enlargement and reduction of maps using the square method and the triangle method.

b. Maps, Photographs, Diagrams and their Interpretation

5 Marks

Identifying physical and cultural features on a map, photographs, diagram-drawing sketches and sketch maps.

Interpretation of Topographical Maps:

1. Marginal Information
2. Use of conventional signs and symbols
3. Methods of representing relief on map-contours, techniques of interpolation, layer colouring, spot heights, benchmarks; triangulation points
4. Identification of relief features on a map through contours-conical hill, plateau, ridge, v-shaped valley, cliff, waterfall, type of slopes (convex and concave, gentle and steep)
5. Drawing of cross-section or a profile from contour map; concept of Horizontal Equivalent and Vertical Exaggeration
6. Interpretation of Topographical sheets; SCALE 1 : 1000000
7. Photographs and Diagrams and their interpretation

Or

Interpretation of Weather Maps:

1. Weather instruments, uses and the data collected from them
2. Significance of weather maps
3. Weather Symbols
4. Study of January and July weather maps in respect of temperature, pressure/ wind direction, velocity, cloud cover and precipitation

Note: Examiners are advised to get xeroxed copies of these maps provided in the Practical Manual.

c. Data and its Interpretation using Statistical Diagrams

5 Marks

1. Data presentation and interpretation - sources of geographical data - primary and secondary data - types and sources. Mean, Median, Mode, Percentiles.
2. Representation of statistical data through diagrams, (both physical and economic data)
 - i. Line-graph
 - ii. Pie-diagram
 - iii. Bar-diagram
 - iv. Star diagram
 - v. Distribution maps - dot maps and choropleth

Note: Examiners are expected to provide latest data for the above diagrams.



Senior Secondary Level
Computer Science
Practical Examination

Times Allowed : 2 Hours

Maximum Marks: 40

Note: Given below are distribution of marks, list of practicals and a sample question paper for practical examination. The examiner should set a similar paper for the candidates prior to the exam. The examiner may ensure that the software C++ compiler, Internet connection and Operation system (Windows 98). must be available in the computer.

6.1 Distribution of Marks

| | Marks | Time |
|--|-----------------|---------|
| 1. Operation System and Internet | | |
| 2. Introduction to C++, Control Statements and Functions | 8 | 25 Min. |
| 3. Array structure and Special Data Types | 15 | 40 Min. |
| 4. Pointer and Files | 10 | 30 Min. |
| | 7 | 25 Min. |
| Total | 40 marks | |

6.2 List of Practicals

1. Switching between command prompt and shut down system.
2. Loading of operating system (Windows 98).
3. Creating, deleting and renaming files/folders.
4. Moving and copying files/folders.
5. Recovering a delete file.
6. Locating a file/folder using windows explorer or using find.
7. Creating short-cut on Desktop.
8. Working on Internet and sending e-mail
9. Setting up sharing option for files and folders.
10. Writing programs to create a class called student with one private data member called m. of type into, and two public member function: putdata () and getdata ()
11. Writing a program that will ask the user to enter a character Check it is alphabetic or not. If alphabetic, check whether it is an upper case or lower case.
12. Writing a program to print student roll no., name, marks and store in a file.
13. Writing a program a generate a table of a given number.

14. Performing string operation using pointers.

6.3 Sample Question Paper for Computer Science Practical

Time Allowed: 2 hours

Subject Code: 330

Max. Marks : 40

1. (a) Create a file named PQR using notepad. Type the 'following content "I love my India".
 - (i) Create a folder under my document. Give the name ABC. Copy the above file in the folder ABC. 2½ Marks.
 - (ii) Rename the file PQR in folder. ABC. Now delete the file PQR permanently from my document. 2½ Marks
- (b) Open the Internet Explore, visit Yahoo.com and open an email account for given user name and password. 3 Marks

(Assuming the e-mail account is already created and you are connected to the Internet)

2. Write a program in C++ to print the largest of three given numbers using functions. 15 Marks
3. Find the presence of a given number in a set of numbers using arrays. Also find the position of 'the number'. 10 Marks.
4. Answer any one of the following.
 - (a) Write a programme in C++ named Exam.dat in output mode containing name and total marks of students. Input this name and marks for three students in the given table.

| Name | Marks |
|--------|-------|
| Aditya | 50 |
| Ramesh | 60 |
| Kabir | 70 |

Or

- (b) Write program in C++ to display the contents of a file named student. dat containing names and marks. (Assuming that the file student. dat is already available in the computer).



Senior Secondary Level
Data Entry Operations
Practical Examination

SUBJECT : Data Entry Operations
Course Code : 336
Total marks : 60
Total Time : 2 Hours (Including the time for viva)

Note: Given below are distribution of marks, list of practicals and a sample question paper for practical examination. The examiner should set a similar paper for the candidates prior to the exam.

Distribution of Marks

| | Topic | Marks | Time (Mins) |
|---|------------------|-----------|-------------|
| 1 | Operating System | 4 | 10 |
| 2 | Word Processing | 15 | 30 |
| 3 | Spreadsheet | 20 | 40 |
| 4 | Presentation | 6 | 15 |
| 5 | Internent | 5 | 15 |
| 5 | Viva | 10 | - |
| | Total | 60 | 110 |

Instruction for the Candidates and Examiners/Invigilators

- (i) All the questions are compulsory.
- (ii) Students are advised to attempt the questions sequentially.
- (iii) Marks and tentative time for each question are indicated.
- (iv) Printout or the answers on the answer sheet are to be submitted to the examiner/Invigilator.
- (v) Examiner/Invigilator should ensure that the required operating system and software packages are properly installed on each computer.
- (vi) Each computer should have the printing facility.
- (vii) Examiner/Invigilator should ensure that each computer is connected to internet.

List of Practicals

- (1) Write down the following details,
 - (i) Configuration of your system
 - (ii) RAM Capacity
 - (iii) Hard disk Capacity
 - (iv) Different drives available on your system.
- (2) Enter your Bio-data with following details with Times New Roman, font size 10 and save this file with name 'Details' in My documents
 - (i) Name :
 - (ii) Father's Name :
 - (iii) Date of Birth :
 - (iv) Postal Address :
 - (v) Sex :
 - (vi) Nationality :
 - (vii) Educational Qualification :
 - (viii) Work Experience :

Close this file
- (3) Open the file "Details" and Perform the following activities
 - (a) Make the headings from serial no. (i) to (viii) bold.
 - (b) Make the entry at serial no. (v) underline
 - (c) Make the entry at serial no. (iii) italics.
 - (d) Select the entry at serial no. (ii) and increase its font size by 2 points.
- (4)
 - (i) Create a workbook containing three worksheets.
 - (ii) Save the workbook with the name 'Marksheet'.
 - (iii) Rename the three worksheets as 'Marksheet-1', 'Marksheet-2, and 'Maksheet-3'.
- (5)
 - (i) Enter the data in Marksheet - 1 as follows.

| | A | B | C | D | E | F |
|---|-------------------------|-----------------|----------------|-----------------|------------------|-----------------|
| 1 | Name of Students | Roll No. | Paper I | Paper II | Paper III | Paper IV |
| 2 | Ajay Bhatia | 1259 | 79 | 81 | 72 | 85 |
| 3 | Rita Sharma | 1029 | 70 | 69 | 65 | 72 |
| 4 | Vina Bhasin | 1526 | 82 | 84 | 81 | 85 |
| 5 | Rekha Mishra | 1301 | 73 | 74 | 71 | 76 |
| 6 | Ankit Sinha | 1250 | 64 | 69 | 67 | 65 |

- (ii) Copy above data in Marksheet -2 and Marksheet -3

(6) Create a presentation using following slides and save this with the name 'My family'.

Your Name

Addre
Phone No.

Your
photograph

Slide 1

MY FAMILY

Slide 2

Family Members

| Father's Name : _____

| Mother's Name : _____

| Brother's Name : _____

| Sister's Name : _____

Slide 3

Picture of Your House

Slide 4

(7) Create your e-mail ID in at least two free Internet Service Providers like Yahoo, Gmail, Hotmail etc. Send a letter to your friend inviting him to attend a family function from your created e-mail ID.

(8) Search websites of popular newspaper like TOI or HT and download important events related to sports on a particular day.

Sample Question Paper for Data Entry Operations (336)

Code: 229

Time Allowed: 2 hours

Max. Marks: 60

Approx. Time: 10 Min.

Marks =4

- Q.1 (a) Create a folder 'abc' in My Documents
(b) Copy the folder 'abc' from My Document to the Desktop and rename it as 'xyz'
(c) Delete the folder 'xyz' from the Desktop.

Approx. Time: 5 Min.

Marks =4

- Q.2 Type the following passage in Word in Times Roman, size 10 and save it as "Invitation" in the folder 'abc' created in Q 1 (a).

Our institute is pioneer in the field of education for the last 24 years. Very soon we are going to complete 25 years. As the institute is entering into its Silver Jubilee year, we have planned a programme to celebrate the same.

All of you are cordially invited for the silverjubilee program of our institute on the 1st of next month in the Auditorium Hall at 2.30 pm.

Let us remain together and wish our institute to become more and more popular in providing the valuable education to the new generation of our country.

Approx. Time: 5 Min.

Marks =3

- Q.3 (i) Type a heading "Invitation" on the top of the passage as created in Q. No. 2, make it UPPER CASE, centre it and change the font to Arial Black and size 12. Save this file and take its print out.
(ii) Select the entire text in the file "Invitation" and make it justified with double spacing.

Approx. Time: 8 Min.

Marks =4

- Q.4 Create a table in Word for List of Invitees having following details and save it as "Invitees" in the folder 'abc', and take its print out.

| Title | First Name | Surname | Designation | Institute | City | State |
|-------|------------|---------|-----------------|-----------|----------|-------|
| Shri | Manoj | Sharma | Director | ABC | Patna | Bihar |
| Dr. | Ashok | Jain | Chairman | XYZ | Guwahati | Assam |
| Smt. | Vidya | Arora | Vice chancellor | PQR | Lucknow | U.P. |
| Dr. | Hari | Menon | Professor | KKR | Chennai | T.N. |

Approx. Time: 12 Min.

Marks =4

- Q.5 With the help of Mail Merge facility, use the file 'Invitation' as Main Document, 'Invitees' as Data Source and merge them with the following format:

<Title> <First Name> <Surname>

<Designation>

<Institute>

<City>(<State>)

Save it as 'Invitation letter' in the folder 'abc'. Take print out of this Merged Document (Invitation letter) and all the four merged letters.

Approx. Time: 10 Min.

Marks =5

- Q.6 Using a Spreadsheet program, enter the following data in a work sheet, save it as 'Result' in the folder 'abc' and take its print out.

Statement of Mark sheet of Class X

| | A | B | C | D |
|---|--------|---------|-------|---------|
| 1 | Name | English | Maths | Science |
| 2 | Ajay | 60 | 78 | 79 |
| 3 | Ankita | 74 | 85 | 84 |
| 4 | Rakesh | 65 | 69 | 72 |
| 5 | Reema | 58 | 54 | 65 |

Approx. Time: 15 Min.

Marks -10

- Q.7 Insert one column and one row in the above worksheet as per the following:

(i) Column to be inserted between B and C and row between 2 and 3:

(iii) Data for column

History

65

68

67

69

(iv) Data for row

Aakash

69

66

77

79

- (ii) Calculate total marks for each student using appropriate formula and enter it in column F, giving its column heading as Total.
- (iii) Plot a Barchart for the Total marks vs Names based on the above data, save it and take its print out.

Approx. Time: 15 Min.

Marks =5

- Q.8. A flower basket contains the flowers in different proportions. Plot a Pie chart using the following data, save it and take its printout.

TITLE

A Flower Basket

| | |
|--------------|------|
| Jasmine | -15% |
| Lily | -18% |
| Rose | -12% |
| Mongra | -5% |
| Marigold | -10% |
| Crysanthemum | -40% |

Approx. Time: 15 Min.

Marks =6

- Q.9 With the help of presentation program, prepare a suitable presentation having the following three slides.

- (a) Slide 1.

Results

- Class IX
- Class X

- (b) Slide 2.

Result of Class X

Insert the table of Q.
no (6)

- (c) Slide 3.

Graphical Comparison

Insert a chart from Q.
no 7 (C)

Save this with a file name "Demo" and take its print out.

Approx. Time: 10 Min.

Marks =3

- Q.10 (a) From your E-mail address compose the following message and send it to yourself along with attachment of the file "invitation" created in Q (3). With the subject "Welcome". Send a cc to your friend and Bcc to your teacher

Dear Sir/Madam,

Please join us for the celebrations, details are given in the attached file "invitation".

check your Inbox and take the print out of the entire message.

Approx. Time: 5 Min.

Marks =2

- (b) Search for NIOS website and download academic course offered by NIOS at senior secondary level. Take its print out.



Senior Secondary Level
Painting
Practical Examination

Times Allowed : 3 hrs

Maximum Marks: 70

8.1 Distribution of Marks

Three Practical works :- (Marks 20+20+15)

| | | |
|---|---|-----------------|
| 1. Object Drawing | - | 20 Marks |
| 2. Painting and Composition | - | 20 Marks |
| 3. Folk Art as Motif | - | 15 Marks |
| 4. Portfolio submission (Home Assignment) | - | 15 Marks |
| Total : | | 70 Marks |

8.2 List of Practical works

8.2.1. Object Drawing

Marks : 20

For exam object drawing by placing the object in front of the student and to let them draw. For example:-

- (i) A pot and glass to be arrange on the table,
- (ii) A book placed under the apple to be arrange on the table,
- (iii) Chair-table and flower vase .placed on the table etc.
(Should be done with Pencil or water colour)

8.2.2 Painting and Composition

Marks: 20

Free hand drawing like Human Figures, Building, Interior of a room, Bus stop, Market Place, Vehicles, etc. colouring on a given topic like Festival, Fair, Railway Station, Man reading a book or newspaper, Playing with the pet, Eating out, Night scene, Rainy day, Wedding, Gram Panchayat, Pollution, Library, Mother and Child etc. using imagination and everyday sketches. (Water colour or Acrylic colour or colour pencil would be used)

8.2.3 Folk Art as Motif

Marks: 15

Use the motif of any folk art of your locality or any well known India folk art. (Example Madhubani, Worli, Kalamkari, Kalighat, Phar and Alpana/Rangoli etc.)

To re-arrange a composition in your own style.

(Any colour or black and white colour are allowed only for Folk Painting)

8.2.4 Port-folio Submission

Marks :15

Learners need to submit portfolio with minimum Twelve Original works, and one sketchbook, must include (sketchbook should include sketches from memory, nature and objects-animate and inanimate objects etc.)

a) Suggested Original Works

Concept of presentation, which includes dating, mounting and maintaining the work.

1. **Four Object and Nature Studies**- paper size $\frac{1}{2}$ imperial size or (15"x22") approximate, with one in Line, (ii) one with Tone in pencil and two in colours;
2. **Four Paintings and Compositions**- paper size- $\frac{1}{4}$ imperial size or (15"x11") approximate size two composition in colours and two in mix media on any four topics which are already mentioned.
3. **Four Regional Folk Paintings**- in any traditional or locally available materials, paper size- $\frac{1}{4}$ imperial size or (15'x11") approximate.

b) Sketch Work

Sketchbook (i) size 8"/11" and minimum 20 pages of any available paper, (ii) sketches in soft pencil. It should include all the sketches which you have studied so as to make your composition (figurative) and other studies like landscape, animal-birds, huts, flowers, plants etc.

8.3 Materials to be used

Portfolio whether readymade or self made album from available materials.

8.4 Marking Scheme Painting (Practical)

| Question No. | Specific Aspects of Assessment | Distribution of Marks | Total |
|--------------|--|-----------------------|-----------|
| 1. | Object Drawing | | 20 |
| 1.1 | Space division | 2 | |
| 1.2 | Setting of the mass and volume on the space | 2 | |
| 1.3 | Fluency and strength of line | 2 | |
| 1.4 | Correct use of light from a particular source to define the shadow | 2 | |
| 1.5 | Delineation of tactile quality | 2 | |
| 1.6 | Proper use of texture | 2 | |
| 1.7 | Neatness | 2 | |
| 1.8 | Overall compositional quality: Colour and Arrangement of forms. | 3+3=6 | |
| 2. | Painting and Composition | | 20 |
| 2.1 | Space division | 2 | |
| 2.2 | Setting of the mass and volume on the space | 2 | |
| 2.3 | Fluency and strength of line | 2 | |
| 2.4 | Correct use of light from a particular source to define the shadow | 2 | |
| 2.5 | Delineation of tactile quality | 2 | |
| 2.6 | Proper use of texture | 2 | |
| 2.7 | Neatness | 2 | |
| 2.8 | Expression of proper mood and emotions | (3+3) 2 | |
| 3. | Folk Art as Motif | | 15 |
| 3.1 | Perfect choice of motif | 3 | |
| 3.2 | Knowledge of maximum number of motifs | 3 | |
| 3.3 | Capacity to re-arrange and combine different Folk motifs | 3 | |
| 3.4 | Execute individual creativity in the picture | 3 | |
| 3.5 | Overall compositional quality | 3 | |
| 4. | Portfolio submission | | 15 |
| | | Total | 70 |

N.B. Portfolio submission:-

Learner should follow the above mention criteria in each part, when they draw, and presentation is one of very important things, when they are going to submit their work.

Senior Secondary Level
Environmental Science
Practical Examination

Times Allowed : 3 hours

Maximum Marks: 20

9.1 Distribution of Marks

A. FIELD STUDIES (Any three of the following exercise)

05 marks

1. Study a simple ecosystem (suggested habitats- pond, river, estuarine, lake, grassland, forest, and desert) and describe the biotic and abiotic components of the ecosystem.
2. Study of the effect of human interactions with the natural environment.
3. Survey of vegetation, birds, insects and other animals in your locality.
4. Choose five common tree species plants from your neighbourhood and list their common names. Describe each plant in terms of its height and leaf characteristics.
5. Describe the environmental problem of your locality and suggest their remedy.
6. Visit to different water bodies in your village/locality and describe their uses and source of water pollution. If any
7. To segregate domestic solid waste into biodegradable and non-biodegradable components.

B. LABORATORY EXERCISES (All are compulsory)

05 (3+2) marks

1. Study of water quality.
2. Soil texture and analysis of components.
3. To estimate dust (paniculate) deposition on the leaves of road side plants.
4. To study the effect of light intensity on the growth of plants.

C. CREATIVE ACTIVITIES (Any two of the following exercises)

05 marks

1. Set up an aquarium.
2. To study the biodiversity birds and insects in your locality.
3. To prepare a list of plants and animals which are used as food for humans and to comment on their habit and habitat.
4. Make herbarium sheets of 10 different plants/trees. Consult your teacher how to make a herbarium sheet.

5. To describe: a) climate of an urban areas; b) yearly variation in suspended particulate matter in the same area.
6. To make an audit of the electrical energy consumption by various house hold appliance of your home.

D. PRACTICAL RECORD

03 marks

E. VIVA VOCE

02 marks

9.2 List of Experiment in Environmental Science

9.2.1 FIELD STUDIES (Any three of the following exercise)

05 marks

1. Study a simple ecosystem (suggested habitats- pond, river, estuarine, lake, grassland, forest, and desert) and describe the biotic and abiotic components of the ecosystem.
2. Study of the effect of human interactions with the natural environment.
3. Survey of vegetation, birds, insects and other animals in your locality.
4. Choose five common tree species plants from your neighbourhood and list their common names. Describe each plant in terms of its height and leaf characteristics.
5. Describe the environmental problem of your locality and suggest their remedy.
6. Visit to different water bodies in your village/locality and describe their uses and source of water pollution. If any
7. To segregate domestic solid waste into biodegradable and non-biodegradable components.

9.2.2 LABORATORY EXERCISES (All are compulsory) 5 (3+2)

1. Study of water quality.
2. Soil texture and analysis of components.
3. To estimate dust (particulate) deposition on the leaves of road side plants.
4. To study the effect of light intensity on the growth of plants.

9.2.3 CREATIVE ACTIVITIES (Any two of the following exercise)

1. Set up an aquarium.
2. To study the biodiversity birds and insects in your locality.
3. To prepare a list of plants and animals which are used as food for humans and to comment on their habit and habitat.
4. Make herbarium sheets of 10 different plants/trees. Consult your teacher how to make herbarium sheet.
5. To describe: a) climate of an urban areas; b) yearly variation in suspended particulate matter in the same area.

6. To make an audit of the electrical energy consumption by various house hold appliances of your home.

9.3 Apparatus and material required for Environmental Science Practical

List of apparatus as mentioned in the exercise to be included accordingly.

9.4 Marking Scheme

| | | |
|--|---|-----------------|
| 1. Field Studies | : | 05 marks |
| 2. Laboratory exercises (1 experiment) | : | |
| • Setting up of the experiment and demonstration | ∴ | 03 marks |
| • Recording the observation and conclusion | ∴ | 02 marks |
| | | (03+02=5 marks) |
| 3. Creative activity | : | 05 marks |
| 4. Practical record | : | 03 marks |
| 5. Viva-voce Total | : | 02 marks |
| Total | : | 20 marks |