

PARA MEDICAL BOARD KARNATAKA BANGALORE

SYLLABUS FOR THE FIRST YEAR

OF

CERTIFICATE COURSE IN PARA MEDICAL SUBJECTS

FOR

S S L C PASSES CANDIDATES

PAPER	SUBJECTS	TEACHING HRS.		EXAMINATION		MARKS Total
		THEORY	PRACTICAL	Int. Ass.	Board Exam	
I	ENGLISH	60	-	5	45	50
II	PHYSICS	60	10	5	45	50
III	CHEMISTRY	50	10	5	45	50
IV	BIOLOGY	50	10	5	45	50
	TOTAL			20	180	200

NOTE Duration of the Board's Examination is 1 1/2 hrs. each paper.

ENGLISH 1104

Item No.1

Articles: There are two types of articles. They are:

(1) Definite article (2) Indefinite article.

1. Definite article - THE

It is not used before proper nouns. But it is used before famous rivers, mountains and epics.

Examples:

Rivers - the Ganges, the Amazon

Mountains - The Himalayas, The Vindya, The Alps

Epics - The Ramayana, The Mahabharata, The Allied, The Odessy,
The Quron.

2. Indefinite articles are 'a' and 'an'. They are used to denote the singularity of an object. 'A' is used before a consonant and 'An' is used before a vowel. Vowel sounds are a,e,i,o,u.

Examples:

- a) Indefinite article 'A' - A ball, a village, a school, a cat, a dog, a yacht,
a woman, a man etc

Consonants are Ka, Cha, ta, tha, Pa

- b) 'An' - used before vowel sounds.

an aunt, an apple, an european, an egg, an ink bottle, an ox, an umbrella.

Tense:

i. Present Tense

ii. Simple present or Present Indefinite:

Ex: I teach	He teaches	They teach
I swim	He swims	They swim

iii. Present continuous:

He is teaching

She is teaching

They are teaching

iv. Present Perfect:

He has taught .

She has taught

They have taught

II Present Perfect Continuous:

- i. He has been teaching
- ii . She has been teaching . iii. They have been.teaching

2. Past tense

- i. Simple past He taught
She taught They taught
- ii. Past continuous He was teaching She was teaching
They were teaching

iii. Past Perfect tense:

He had taught
She had taught They had taught

II Past Perfect Continuous:

He had been teaching She had been teaching
They had been teaching

3. Future tense

- i. Simple future
He will teach She will teach They will teach
- ii. Future continuous
He will be teaching She will be teaching They will be teaching
- iii. Future Perfect
He will have taught. She will have taught They will have taught

IV Future Perfect Continuous

He will have been teaching She will have been teaching
They will have been teaching

4. Active Voice & Passive Voice.

No details

Simple sentences to be transformed from Active to Passive voice.

5. Direct & Indirect speeches:

Direct Speech: The teacher said to the students "I am not well".

Indirect Speech: The teacher told the students that he was not well.

Note:.

- i. In reported speech verb 'say' of Direct speech becomes 'tell' in Indirect speech.
 - ii. becomes 'he'
 - iii. Tense is changed to its corresponding past.
- b. Direct Speech: The teacher said to the student "Are you not keeping well?"
Indirect Speech: The teacher enquired the student if he was not keeping well.
- c. Direct Speech: The teacher said to the student "Get out of the class".
Indirect Speech: The teacher ordered the student to get out of the class,
- d. Direct Speech: Mary said to John, "Please lend me your book?"
Indirect Speech: Mary requested John to lend her, his book.
- e. Mary said "What a surprise!"
Mary exclaimed that it was a surprise.
- f. Direct Speech: The Police asked the stranger, "Where are you going?"
Indirect Speech: The police enquired the stranger as to where he was going.
- g- Direct Speech: The Police said to the thief: "Where did you steal the scooter?"
Indirect Speech: The Police interrogated the thief as to where he stole the scooter from.

Item 6 Linkers:

- | | | |
|-------------------|------------|----------------------------|
| 1. In addition to | 2. Besides | 3. Moreover |
| 4. However | 5. Because | 6. Either-Or, Neither-nor. |

1. Rama is very obedient

Rama is a loving husband

Rama, in addition to being obedient, is a loving husband also.

2. John is good in studies

John is good in sports

John besides being good in studies, is good in sports as well.

3. James is a successful business man.
James is hardworking.
James is a successful business man. Moreover, he is hardworking.
4. Mary did not study well.
Mary passed the exam.
Mary did not study well. However, she passed the exam.
5. Suresh is honest.
Suresh is respected.
Because Suresh is honest, he is respected.
6. You study:
You go to sleep.
Either you study or go to sleep.
7. The doctor was present in the hospital.
The nurse was present in the hospital
Neither the doctor nor the nurse was present in the hospital.

Example of using Linkers in Paragraph

Taking photographs of birds is more difficult than wild animals. Because, the wild animals pose at least for a few minutes. But birds camera shy, and do not stay in one place for long. Moreover, any slight noise or movement is enough to distract the birds. Hence, a great deal of patience is required for a wild life photograph.

This passage also can be used as an example for paragraph writing.

Item No. 8 Paragraph writing:

- A. A paragraph can be begun with a topic sentence.

Example: Elephant is a useful animal.

After this topic sentence, show how an elephant is useful to man.

OR

B. Write uses of an elephant and finally end, with the topic sentence that 'Elephant is a useful animal.

Item No. (8) Letter writing

1. Formal letter or Official letter: Format:

Bangalore

21.10.99

From

T.K.Suresh

176, 36 'A' Cross, 18th

Main Road,

4 - T Block, Jayanagar,

Bangalore - 560 041

To

The Principal

The National College,

Basavanagudi,

Bangalore - 560 004

Sub: Request for Transfer Certificate Sir,

I am a student of your college, studying in II B.Sc Computers. I have passed I B.Sc.

with Reg. No. Due to unexpected circumstances, I am going to continue my studies in Karnataka Science College, Dharwar. Therefore, I request you to send my TC to the Principal, Karnataka Science College, Dharwar.

Thanking you,

Yours faithfully,

T.K.SURESH

Application format

Bangalore
21.10.03

From

Gopinath C.

127, Shirur Park Road

Sheshadripuram

BANGALORE - 560 020 To

The Head Master

Gandhinagar High School

Gandhinagar

BANGALORE - 560 009

Dear Sir,

Yours' advertisement appeared in Deccan Herald Dt. 15.10.03

In response to the reference cited above, I am submitting my application for the post of typist in your school. I have passed the senior typewriting exams both in Kannada and in English after PUC. I have worked for a private finance company as a typist. I am enclosing the required documents.

Kindly consider my application favourably.

With regards,

Yours faithfully,

Signature

Item No.9 Report Writing

Students must be told to pay attention to factual details. Passive sentences to be used while reporting (If it is a medical report - appropriate method should be followed).

Item 10 Telegrams

- 1. Learners must be instructed to write the address of the person in detail.**

Messages must be brief.

Sender's name should be brief, and short, if it going to charged.

- 2. Sender's' address must be given at the bottom of the application.**

- 3. E — Mail**

Item No. 11 Essay writing

Essay in English on recent topics (Main Question 10 Marks)

Item No. 12 Spoken English

Provision for learning "Spoken English" should be provided to all students of Certificate Course by way of Lingophone with accessories to be provided in Library of the College.

PHYSICS 1101

Theory- 60 hours

Practicals - 10 hours

year students of Para Medical Courses who have joined the course on X or S.S.L.C. basis.

UNIT-1 UNITS AND DIMENSIONS

- 1.1 Definition of Unit. C.G.S. and Si. units Definition of Dimension. Dimensions of certain Physical quantities (10 examples). Mention of uses of dimensions. 1 Hour

UNIT-2 DYNAMICS

- 2.1 Motion of a particle, definitions of Speed, Uniform speed and variable speed, velocity, Uniform and variable velocity, acceleration, Uniform and variable Equations of motion for a uniformly accelerated particle (no derivation). Acceleration due to gravity corresponding equations. Newton's law of gravitation. Artificial satellite, orbital and escape velocity, expressions (no derivation) 3 Hours
- Problems (direct substitution problems) 1 Hour
- 2.2 Newton's laws of motion. Mention of $F=ma$. Law of conservation of momentum (Statement and explanation) 1 Hour
- Problems (direct substitution problems) 1 Hour
- 2.3 Work, Power, Energy - definition,. Units, expressions for potential and kinetic energies (no derivation). Law of conservation of energy statement. Explanation with respect to a freely falling body (qualitative) S.H.M.definition examples. Problems 3 Hrs. 1 Hour

UNIT- 3 STATICS

3.1 Scalars and vectors. Concurrent co-planar forces. Resultant Law of Parallelogram of forces. Expression for resultant (no derivation) special cases, Law of triangle of forces Lami's Theorem. Components of a force. Resolution - rectangular components.

Problems

1 Hour

UNIT- 4

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|-----|--|--------|
| 4.1 | Surface tension, phenomenon, Definition, Unit Viscosity -
Definition and Unit | 1 Hour |
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UNIT- 5 HEAT

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|-----|---|---------|
| 5.1 | Heat and Temperature. Units - mention of different types of
thermometers | 1 Hour |
| 5.2 | Expansion of solids, Liquids and gases. Gas laws - Boyle's and
Charle's law. Statement - explanation. Mention of perfect gas
equation and problems. | 2 Hours |
| 5.3 | Thermal radiation - properties and uses | 1 Hour |

UNIT- 6 GEOMETRICAL OPTICS

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|---------------|---|---|
| 6.1
Hour | Introduction to light. Optical medium. Rectilinear propagation
of light - Illustration | 1 |
| 6.2
Hours | Laws of reflection. Plane mirror. Image formation. Spherical
mirrors. Definitions of pole centre of curvature, focal length -
aperture, radius of curvature. Mention of mirror formula,
magnification and formula for magnification (no derivation). | 2 |
| Hour | Simple Problems | 1 |
| 6.3
Hour | Refraction - Laws, refractive index (relative and absolute).
Critical angle and total internal reflection. | 1 |
| 6.4
Hours | Refraction through a <i>lens</i> Image formation in a lens. Mention of
Lens formula, magnification and formula for magnification | 2 |
| Hour | Problems | 1 |
| 6.5
Hour | Dispersion - Definition, refraction through a
prism - Spectrum - pure and impure spectrum. | 1 |
| 6.6.
Hours | Simple microscope, compound microscope Telescope | 5 |

(Astronomical and Galilean) . Description without ray diagram.
 Formula for magnifying power (no derivation). Spectrometer.
 Description (without diagram). Simple problems

UNIT-7 WAVES AND SOUND

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|-----|--|-----------------------|
| 7.1 | Wave, wave motion, longitudinal and transverse waves, characteristics of wave motion mention of $V = f \lambda$. Propagation of waves from one medium to another medium.
Problems. | 2 Hours |
| 7.2 | Sound - Introduction - Properties Newton - Laplace equation (no derivation) variation of velocity of sound w.r.t. pressure, temperature and humidity (qualitative)
Problems | 2 Hours

1 Hour |
| 7.3 | Ultrasonics, Infrasonics and Audible frequency, Ultrasonics properties and uses | 1 Hour |

UNIT-8 ELECTROSTATICS

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|-----|--|-----------------------|
| 8.1 | Friction, charge - types of charges. Electroscope and Electrometer, (without description). Coulomb's Law (Statement and equation). Electric field, Electric intensity and potential units and expressions. Important applications of static electricity
Simple problems | 2 Hours

1 Hour |
| 8.2 | Capacitance, Definition, Unit, Capacitor. Mention of different types of capacitors, uses. | 1 Hour |

UNIT- 9 CURRENT ELECTRICITY

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|-----|--|---------|
| 9.1 | Introduction, Definition of current unit, potential difference, Ohm's law, Statement, Explanation, Resistance, Conductance units - Limitations of ohm's law. variation of resistance with respect to dimensions and temperature. Specific resistance (resistivity) and temperature co-efficient of resistance. Combination of resistances in series and in parallel. Effective resistance in series and parallel - expressions (without derivation), branch currents in parallel circuit (expressions only).
E.m.f. of a cell, internal resistance, terminal P.D. (expression to be mentioned).
Ohm's law applied ,to a circuit. | 4 Hours |
|-----|--|---------|

	Problems	1 Hour
9.2	Brief description of ammeter and voltmeter and mode of connection in an electrical circuit.	1 Hour
9.3	Electromagnetic induction - phenomenon Laws - Statement and mention of applications.	1 Hour
9.4	D.C. and A.C. generation of A.C. (principle only), peak value r.m.s.value of current and voltage and expression. Definition of impedance. Brief description of transformer.	2 Hours

UNIT- 10 MODERN PHYSICS

10.1	Introduction - Cathode Rays properties, uses Photoelectric effect and its applications. X-rays - production and uses.	3 Hours
10.2	Radioactivity - properties of Nuclear radiations, Radio isotopes and their uses. Nuclear fission, Nuclear fusion. Nuclear reactor and its uses.	3 Hours
10.3	Semi conductors, p-type, n-type p-n junction diode, Transistor and its uses.	1 Hour

NOTE: Only S.I. units should be given for all physical quantities.

PRACTICAL WORK [DEMONSTRATION] 10 Hours

1. Measurement with slide Callipers and Screw Gauge.
2. Focal length of a concave mirror.
3. Focal length and refractive index of the material of a convex lens.
4. Refractive index of the material of the prism using a spectrometer.
5. Resonance column experiment - To find V_t & V_o
6. Verification of ohm's law and calculation of resistance.
7. Verification of law of resistances in series and parallel.
8. Determination of specific resistance of the material of a wire using Wheatstone's bridge or Metre-bridge.

Note:

1. Use of logarithm should be explained in calculation.
2. Elements of trigonometry should be taught.

10 Hours

5 Marks from internal examinations

CHEMISTRY 1102

Theory - 50 hours

Practicals - 10 hours

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|----|--|---------|
| 1. | Hydrogen peroxide - preparation, Properties and uses. | 1 Hour |
| 2. | Sulphuric acid - manufacture by contact process - properties and uses. | 2 Hours |
| 3. | Nitric acid - manufacture by ostwald's process - properties and uses. | 2 Hours |
| 4. | Halogens:-
Fluorine - preparation, properties and uses Chlorine - preparation, properties and uses
Bromine - preparation, properties and uses Iodine - preparation, properties and uses | 3 Hours |
| 5. | Structure of an Atom, Atomic weight, Molecular weight.
Equivalent weight of an element - definition, methods of determination -
to determine the equivalent weight of Magnesium by Hydrogen displacement method -
To determine the equivalent weight of copper by oxide - method.
To determine the equivalent weight of lead by. chloride method
- Problems | 3 Hours |
| 6. | Acids, bases and salts, indicators Equivalent weight of an - acid, base, oxidising and reducing agent.
Normality, Molarity, Molality
Volumetric analysis - problems | 3 Hours |
| 7. | Hydrocarbons - saturated and unsaturated - Alkanes - methane, ethane - preparation, properties and uses. Alkene - ethylene, - preparation, properties and uses. Alkyne - acetylene - preparation, properties and uses. | 3 Hours |
| 8. | Colloids - differences between colloids and crystalloids - classification of colloids - methods of preparation of sols - dialysis Tyndal effect and Brownian movement - applications of colloids in medicine, food, - cottrell's electrical precipitator. | 3 Hours |
| 9. | Electro-Chemistry: Arhenius theory of electrolytic dissociation - merits and demerits.
Acids and bases - Lowry and Brousted concept
Hydrogen ion concentration - pH, pOH of a solution. pH | 6 Hours |

values of Biological fluids.

Buffer solutions - Definition - Different

types of buffer solutions.

To determine the pH of a solution using

buffer solution (Indicator method).

Henderson's equation

Importance of buffer solutions in medicine

10 Radioactivity - natural radio activity - properties of alpha, beta and gamma particles. - Half life period - Isotopes - applications of ^{60}Co , ^{32}P , ^{131}I , ^{24}Na 3 Hours

11. Sodium hydroxide - method of manufacture (Nelson cell) - properties and uses. 3 Hours
Sodium carbonate - method of manufacture - properties and uses.

12 a. Ethyl alcohol - manufacture from molasses - properties and uses.

Benzyl alcohol - preparation - properties and uses.

b. Phenol - manufacture from Coal tar - properties and uses.

c. Aldehydes - Formaldehyde, acetaldehyde, benzaldehyde - preparation, properties and uses.

d. Ketones - acetone - preparation, properties and uses.

e. Acids - Formic, Acetic, Benzoic and Salicylic acids.

f. Esters - ethyl acetate - preparation, properties and uses.

g. Diethyl ether - preparation, properties and uses. Amines 10 Hours
Classification.

13 Carbohydrates:-

Classification, open and ring structures of glucose, fructose.

Ring structure of Maltose, sucrose and lactose.

Partial representation of structure of cellulose, starch, glycogen.

Carbohydrates as a source of energy. 3 Hours

- | | | |
|----|--|---------|
| 14 | Proteins - Amino acids - Formulae of amino acids such as glycine, alanine, serine, cysteine, aspartic acid, lysine, tyrosine.
Peptide linkage Functional properties of proteins such as enzymes, antibodies, transport agents, biochemical messengers -
Hormones oxytocin) 3 Hours | 2 Hours |
| 15 | Nucleic acids -DNA and RNA - purine and pyrimidine bases -
Biological importance of Nucleic acids. | 2 Hours |

PRACTICALS	10 Hours
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TITRATIONS

1. Preparation of Sodium Carbonate using standard hydrochloric acid.
2. Estimation of Sodium hydroxide using standard Hydrochloric acid.
3. Estimation of Oxalic Acid using standard Potassium Permanganate.
4. Estimation of Iodine using standard Sodium thio Sulphate
5. Tests for Carbohydrates and Proteins

BIOLOGY 1103

Theory - 50 hours

Practicals - 10 hours

- | | | |
|----|---|-----------------------|
| I | A. Study of cell-Ultra structure of cell membranes cell organelles
endoplasmic reticulum, mitochondria golgibodies, ribosomes,
lysosomes, centrosomes & nucleus.
cell division - mitosis and meiosis | 2 Hours |
| | B. Ultrastructure of a typical chromosome.
Branches of Biology - cell Biology
Physiology, Anatomy, Histology,
Biochemistry - fundamentals. | |
| | II Viruses - General structure of a virus. | 1 1/2 Hours |
| | A. Diseases caused by viruses-encephalitis,
Polio, Mumps, Measles, Small pox, Aids. | |
| | B. Bacteria- General structure of a Bacteria, Types of Bacteria
based on shape Bacterial disease-diphtheria, cholera, gonorrhea,
syphilis, plague, pneumonia, tetanus, typhoid,
tuberculosis. | 1 1/2 Hours |
| | III Enzymes - Nature classification & mechanism of its action. | |
| | A. | |
| | B. Nucleic acids - Occurrences, structures of functions of DNA
and RNA. | 1 1/2 Hours |
| IV | Genetics - (1) Sex determination in human
(2) Human blood groups & Rh factors genetic
engineering | 1 1/2 Hours |
| V | Bio technology -
1) Basics of gene-cloning
2) Basics of genetic finger printing
3) Biological molecules-carbohydrates, proteins, lipids. | 3 Hours |
| VI | Human Histology - Structure & functions of Basic tissue
1. Epithelium
2. connective tissues-Areolar tissue, Adipose, Cartilage,
Bone | 11/2 Hours
2 Hours |

3. Muscular.	1 Hour
4. Blood & lymph.	1 Hour
5. Nervous tissue.	1 Hour
6. Transverse of small intestine, Liver & Pancreas.	2 Hours

VII Human Anatomy & Physiology.

1. Digestive system- Digestion of proteins, Lipids & Carbohydrate.	3 Hours
2. Circulatory system- Structure of Heart, Artery & Vein. Mechanism of Working of Heart, Blood pressure.	1 Hour
3. Respiratory system + Mechanism of breathing Brief account of cellular respiration Glycolysis & Krebs' s cycle	1 Y2 Hours 1 Hour
a) Excretory system + Ultrastructure of nephron.	11/2 Hours
b) Urine formation.	
c) Important nitrogenous wastes-Urea, uric acid, NH ₃ , cratine & creatinine	1 Hour
5. Nervous system: Main divisions- . a) Central Nervous system. b) Peripheral Nervous system. c) Autonomic Nervous system.	 11/2 Hours
Main parts of the Brain & their functions	11/2 Hours

VIII Reproductive system & Embryology

1) Male & Female Reproductive systems	2 Hours
2) Structures of sperm & graafian follicle	1 Hour
3) Brief account of fertilization	1 Hour
4) Cleavage & early development upto blastocyst stage	1 Hour
5) Germ layers & their derivative	1 Hour
6) Implantation.	1 Hour
7) Placenta- Structure & function	1 Hour

IX Endocrinology - Hormones of the following endocrine glands & their functions. Effects of their Hypo & Hyper secretion.

1) Pituitary

2) Thyroid

3) Adrenal

X Cancer Biology

Cancer characteristics and causes, Listing of types of cancer and preventive measures.

Biology Practicals **10 Hours**

Microscopic study of typical cell, virus bacterium **1 Hour**

II Study of Basic tissues **4 Hours**

HI T.S. of Liver & Pancreas **1 Hour**

IV Study of Sperm & Graafian Follicle **1 Hour**

V Physiology **3 Hours**

1) Test for protein-Biuret test

2) Test for Carbohydrate - Iodine test

3) Test for fats - Acroic test

4) Test for urine sugar - Benedicts test.

PATTERN OF THE QUESTION PAPER FOR FINAL EXAMINATION
(COMMON FOR ENGLISH, PHYSICS, CHEMISTRY & BIOLOGY)

Duration : 1 1/2 hrs.

Maximum Marks: 45

Part A: 10 questions of 1 mark each Part B:

5 questions of 5 marks each Part

C: 5 questions of 2 marks each