ZIAUDDIN UNIVERSITY EXAMINATION BOARD

Higher Secondary School Certificate (HSSC)

Examination syllabus

Biology
XII

Based on Provincial revised curriculum (Sindh)

You can approach us:

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PREFACE

The Ziauddin University Examination Board (ZUEB) was established under **Sindh ACT XLI 2018**, with the primary objective of enhancing the quality of education in Sindh. ZUEB is responsible for administering examinations for the **Secondary School Certificate (SSC)** and **Higher Secondary School Certificate (HSSC)** in alignment with the most recent revisions to the **National Curriculum**, as outlined by the **Directorate of Curriculum Assessment and Research (DCAR), Sindh**. Through its ordinance, ZUEB is mandated to provide examination services for both English, Urdu, and Sindhi medium candidates from private schools across Sindh. This examination syllabus reflects ZUEB's dedication to achieving the educational goals set by the provincial authorities.

In collaboration with subject professors, ZUEB has developed a comprehensive syllabus for each subject. It is important to distinguish between the syllabus and the curriculum. The syllabus serves as a guide for both teachers and students, outlining the key areas of focus within the subject. It provides students with a clear understanding of what is expected of them in their studies and helps them prepare effectively for their exams.

This examination syllabus incorporates all cognitive outcomes derived from the **Provincial Curriculum Statement**, ensuring that assessments are both valid and reliable. While the focus is primarily on the cognitive domain, significant emphasis is placed on the application of knowledge and understanding.

The syllabus is made available to all stakeholders via the ZUEB website to assist affiliated schools in planning their teaching. It is crucial to note that the syllabus, rather than the prescribed textbook, forms the foundation of ZUEB examinations. Additionally, this syllabus supports the development of learning materials for both students and teachers. ZUEB remains committed to supporting students undertaking the SSC and HSSC courses by facilitating their learning outcomes through this detailed syllabus document.

To further assist in the learning process, ZUEB provides a dedicated **e-resource tab** on its website, offering both text-based and video content on various subjects. These 15-20 minute instructional videos, created around key subject concepts, allow students to learn at their own pace and convenience. The videos can be used as a reinforcement tool to revisit lessons already taught or as pre-lesson material. This initiative is an ongoing effort, and new videos will continue to be uploaded.

We encourage all students and educators to make the most of these resources for a more enriched and flexible learning experience.

Sincerely,

Shahbaz Nasim
Head – Measurement & Testing
Ziauddin University Examination Board

Reviewed by Beena Kohati-Bilal
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Rationale For The Reviewed Provincial Curriculum

The process of revising the National Curriculum 2006 began in August 2004, when the newly elected government of Pakistan initiated education reforms across the country. These reforms included the introduction of a new National Education Policy, a National Education Census, and a revision of curricula (Ministry of Education, 2009).

In practice, the overhaul of the secondary school curriculum began in 2006, leading to a review of the scheme of studies for classes I to XII and the revision of curricula for 25 compulsory subjects.

The 18th Amendment to the Constitution of Pakistan, enacted in 2010, significantly altered the federal-provincial relationship by abolishing the "concurrent legislative list." This amendment granted provinces greater legislative and financial autonomy in sectors such as education and health. The most notable implication of the 18th Amendment for education was the transfer of responsibility for curriculum development, syllabus planning, policy formation, and educational standards to the provinces, marking a significant step forward for education.

In Sindh, the School Education Department tasked a Curriculum Review Team with revising the National Curriculum 2006 for all subjects. The goal was to create a curriculum better suited to the needs of students and teachers while aligning with the principles of the 18th Amendment. Subject-specific curriculum review committees were established to critically examine and align the curriculum's content, both contextually and textually, ensuring coherence across various subjects. The Bureau of Curriculum (BoC) played a crucial role in organizing workshops and meetings in Hyderabad to facilitate the completion of this task. The support of numerous educationists, researchers, and teachers was invaluable in successfully revising the curriculum.

The revised National Curriculum, along with the original version, is available on the DCAR website at http://dcar.gos.pk/BoC_Other_Pages/curriculum_dev.html for easy access.

The Ziauddin University Examination Board (ZUEB) SSC and HSSC syllabi are developed in accordance with the Sindh Revised Curriculum. To date, textbooks for various subjects have been developed based on the revised curriculum.

DOMAIN A: NUMBERS & ALGEBRA

Functions and Graphs

[SLO:M-12-A-01]: Define function, domain, co-domain, range of a function, one-to-one (injective), onto (surjective), and bijective functions.

[SLO:M-12-A-02]: Explain constant, linear, quadratic, square root, reciprocal and modulus/absolute value functions.

[SLO:M-12-A-03]: Define inverse functions and identify their domain and range with examples.

[SLO:M-12-A-04]: Sketch graphs of:

- constant functions: $y = c$, where c is a real number
- linear functions: $y = ax + b$
- non-linear functions: $y = x^n$ where n is an integer, $(x \neq 0)$, and n is a rational number for $x > 0$
- quadratic functions: $y = ax^2 + bx + c$ where a, b, c are real numbers and $a \neq 0$

[SLO:M-12-A-05]: Draw the graph of modulus/absolute value function.

[SLO:M-12-A-06]: Represent the relation between bijective function and its inverse through graph.

[SLO:M-12-A-07]: Draw graph of quadratic functions using factors.

[SLO:M-12-A-08]: Identify functions from their graphs; use the factor form to identify the equation of a function of the type:

$$f(x) = ax^2 + bx + c$$

[SLO:M-12-A-09]: Find the intersecting point graphically when intersection occurs between:

- a linear function and coordinate axes
- two linear functions
- a linear and a quadratic function

[SLO:M-12-A-10]: Solve real-life problems graphically.

[SLO:M-12-A-11]: Define transcendental functions and describe various transcendental functions such as:

- Trigonometric functions
- Inverse trigonometric functions
- Logarithmic function
- Exponential function

[SLO:M-12-A-12]: Identify the domain and range of fundamental transcendental functions.

[SLO:M-12-A-13]: Classify the algebraic and transcendental functions.

[SLO:M-12-A-14]: Sketch the graphs of exponential and logarithmic functions and analyse.

[SLO:M-12-A-15]: Apply the concept of exponential function to solve real-life problems i.e. finding bacterial growth/decay, banking and accounting.

[SLO:M-12-A-16]: Demonstrate the transformations of a graph through horizontal shift, vertical shift, and scaling.

Limit and Continuity of a Function

[SLO:M-12-A-17]: Define and find the limit of a sequence.

[SLO:M-12-A-18]: Define and find the limit of a function when:

- $x \rightarrow 0$
- $x \rightarrow a$
- $x \rightarrow \pm \infty$

[SLO:M-12-A-19]: State and apply theorems on limit of sum, difference, product and quotient of functions to algebraic, exponential, logarithmic and trigonometric functions.

[SLO:M-12-A-20]: Define left and right hand limits with examples.

[SLO:M-12-A-21]: Examine continuity and discontinuity of a function at a point.

[SLO:M-12-A-22]: Apply concepts of limit of functions and continuity to solve real-life problems (such as growth and decay, mechanics, finance, economics and predicting long-term stock prices).

Introduction to Differentiation

[SLO:M-12-A-23]: Define increment and decrement with examples also average and instantaneous rates of a function.

[SLO:M-12-A-24]: Define meaning of derivative as a rate of change and as a slope of a tangent line.

[SLO:M-12-A-25]: Find the derivative of various algebraic and transcendental functions by ab-initio/first principle method such as:

- Power function
- Trigonometric functions
- Inverse trigonometric functions
- Exponential functions
- Logarithmic functions

[SLO:M-12-A-26]: State, prove and apply rules of derivative such as:

- Scalar multiplication rule
- Sum and difference rules
- Product rule
- Quotient rule
- Chain rule

[SLO:M-12-A-27]: Explain with examples:

- logarithmic differentiation
- implicit differentiation
- parametric differentiation

[SLO:M-12-A-28]: State the connection between continuity and derivatives.

[SLO:M-12-A-29]: Find higher order derivatives (up to 4th order) of functions such as:

- Algebraic e.g. $y = (ax + b)^m$, where m is a +ve integer; and
- $y = \frac{1}{ax+b}$
- Trigonometric e.g. $y = sin(ax + b)$ and $y = cos(ax + b)$
- Logarithmic function e.g. $y = ln(ax + b)$
- Exponential function e.g. $y = e^{ax+b}$

Applications of derivatives

[SLO:M-12-A-30]: Calculate rate of change of displacement, velocity and acceleration of an object moving along a straight line.

[SLO:M-12-A-31]: Use derivatives to find equations of tangent and normal to a curve at a point.

[SLO:M-12-A-32]: Explain differentials and related applications.

[SLO:M-12-A-33]: Calculate the relative error and percentage error by using differential approximation. (e.g. area and volume)

[SLO:M-12-A-34]: Explain the increasing and decreasing functions by using derivatives.

[SLO:M-12-A-35]: Illustrate stationary/critical points, inflection points, global extrema (absolute extrema) and local extrema (relative extrema).

[SLO:M-12-A-36]: Find the extreme values by applying the second derivative test.

[SLO:M-12-A-37]: Find the maximum and the minimum values of a function to solve real-life problems.

[SLO:M-12-A-38]: Apply the concept of derivatives to solve real-life problems (such as transportation devices, rate of spread of a disease, rate of improvement of performance in psychology, radar guns, economics, data science and artificial intelligence).

Vector Valued Function

[SLO:M-12-B -39]: Explain the vector valued function, its uses, and differentiate scalar and vector valued functions.

[SLO:M-12-B -40]: Construct a vector valued function, and identify its domain and range.

[SLO:M-12-B-41]: Explain and find derivative of a vector function of a single variable.

[SLO:M-12-B -42]: Apply vector differentiation to calculate velocity and acceleration of a vector valued function.

[SLO:M-12 -B -43]: Apply concepts of vector valued functions to solve real-life problems.

Integration

[SLO:M-12-A-44]: Define integration, integrand, variable of integration, integral/ antiderivative and constant of integration.

[SLO:M-12-A-45]: Find the general antiderivative/integral of a given function.

[SLO:M-12-A-46]: State the power rule for integrals with examples.

[SLO:M-12-A-47]: Define indefinite integrals with examples; state and apply the properties of indefinite integrals.

[SLO:M-12-A-48]: Explain the techniques of integration:

- Integration by formulae
- Integration by substitution
- Integration by trigonometric substitution
- Integration by parts
- Integration by partial fractions

[SLO:M-12-A-49]: Describe definite integral and limits of integration with examples.

[SLO:M-12-A-50]: State and apply fundamental theorem of calculus to evaluate the definite integrals.

[SLO:M-12-A-51]: State and apply the properties of definite integrals.

[SLO:M-12-A-52]: Describe the relationship between the definite integral and net area.

[SLO:M-12-A-53]: Find the area of a region bounded by a curve and lines parallel to axes, between a curve and a line, or between two curves.

[SLO:M-12-A-54]: Find volume of a solid of revolution about one of the axes.

[SLO:M-12-A-55]: Apply concepts of integration to solve real-life problems (such as volume of a container, work done, growth rate of a population, drug dosage required by integrating the concentration).

[SLO:M-12-A-56]: Explain and find the integration of vector valued functions of a single variable.

Mechanics Kinematics of motion in a straight line

[SLO:M-12-A-57]: Define vector differentiation and vector integration with examples.

[SLO:M-12-A-58]: Use differentiation and integration with respect to time to solve simple problems concerning displacement, velocity and acceleration.

Differential Equations

[SLO:M-12-A-59]: Define ordinary and partial differential equations.

[SLO:M-12-A-60]: Explain order and degree of ordinary differential equations with examples.

[SLO:M-12-A-61]: Explain solution and types of solution of ordinary differential equations (ODEs).

[SLO:M-12-A-62]: Explain initial and boundary conditions with examples.

[SLO:M-12-A-63]: Form ordinary differential equations by elimination of arbitrary constant(s).

[SLO:M-12-A-64]: Describe and apply techniques for solution of ordinary differential equations:

- Separable variable method
- Equations reducible to separable form
- Homogeneous equations

[SLO:M-12-A-65]: Apply concepts of first order differential equations to solve real-life problems (such as growth and decay, Cooling/Warming law, flow of electricity, series circuits, economics, finance and machine learning).

Numerical Solution of Nonlinear Equations

[SLO:M-12-A-66]: Analyse roots/zeros of nonlinear equations ($f(x)$ = 0) graphically and by using intermediate value theorem (IVT).

[SLO:M-12-A-67]: Find real roots of a nonlinear equation in one variable by:

- Bisection method
- Regula-falsi method
- Newton-Raphson method

[SLO:M-12-A-68]: Apply methods of nonlinear equations to solve real-life problems (such as chemical reactions, regulation of heart beats, electronic circuits, and cryptography).

DOMAIN B: GEOMETRY

Analytical Geometry Concurrency of Straight lines

[SLO:M-12-B -01]: Explain and use the condition of concurrency of three straight lines.

[SLO:M-12-B -02]: Find the equation of median, altitude and right bisector of a triangle.

[SLO:M-12-B -03]: Show that:

- three right bisectors
- three medians, and
- three altitudes

    of a triangle are concurrent.

[SLO:M-12-B -04]: Find the area of a triangular region whose vertices are given.

[SLO:M-12-B -05]: Explain and recognise homogeneous linear and quadratic equations in two variables.

[SLO:M-12-B -06]: Show that the 2nd degree homogeneous equation in two variables represents a pair of straight lines through the origin, and find an acute angle between them.

[SLO:M-12 -B -07]: Apply concepts of analytical geometry to solve real-life problems (such as distance between planets and satellites, space science and engineering).

Conics

[SLO:M-12-B -08]: Demonstrate conics and members of its family i.e. circle, parabola, ellipse and hyperbola.

[SLO:M-12-B -09]: Derive and apply equation of a circle in standard and general form.

[SLO:M-12-B -10]: Find the equation of a circle passing through: three non collinear points, two points and having its centre on a given line, two points and equation of tangent at one of these points is known, two points and touching a given line.

[SLO:M-12-B -11]: Find the condition when:

- a line intersects the circle
- a line touches the circle.

[SLO:M-12-B -12]: Find the equation of a tangent and normal to a circle in slope form at a point.

[SLO:M-12-B -13]: Find the length of tangent to a circle from a given external point.

[SLO:M-12-B -14]: Derive and apply the standard equation of a parabola.

[SLO:M-12-B -15]: Sketch the graphs of parabola and find its elements.

[SLO:M-12-B -16]: Find the equation of a parabola with the following given elements: focus and vertex, focus and directrix, vertex and directrix.

[SLO:M-12-B-17]: Find the condition when a line is tangent to a parabola at a point.

[SLO:M-12-B-18]: Find the equation of a tangent and a normal to a parabola at a point.

[SLO:M-12-B-19]: Derive and apply the standard form of equation of an ellipse and identify its elements.

[SLO:M-12-B-20]: Convert a given equation to the standard form of equation of an ellipse, find its elements and draw the graph.

[SLO:M-12-B -21]: Find the condition of tangency of an ellipse and points of intersection of a line and the ellipse.

[SLO:M-12-B -22]: Find the equation of a tangent and a normal to an ellipse at a point.

[SLO:M-12-B -23]: Derive and apply   standard form of equation of a hyperbola and identify its elements.

[SLO:M-12-B -24]: Find the equation of a hyperbola with the following given elements: transverse and conjugate axes with centre at origin, two points, eccentricity, latera recta and transverse axes, foci, eccentricity and centre, centre and directrix.

[SLO:M-12-B-25]: Find the condition of tangency of a hyperbola and points of intersection of a line and the hyperbola.

[SLO:M-12-B-26]: Find the equation of a tangent and a normal to a hyperbola at a point.

[SLO:M-12 -B-27]: Apply concepts of conics to solve real-life problems (such as suspension and reflection problems related to parabola, Satellite system, elliptic movement of electrons in the at around the nucleus, radio system use as hyperbolic functions flashlights, conics in architecture).

Inverse Trigonometric Functions

[SLO:M-12-B-28]: Find domains and ranges of principal trigonometric functions, inverse trigonometric functions.

[SLO:M-12-B-29]: Draw the graphs of the inverse trigonometric functions of cosine, sine, tangent,

secant, cosecant and cotangent within the domain from -2π to 2π .

[SLO: M-12-B-30]: State, prove and apply the addition and subtraction formulae of inverse trigonometric functions.

[SLO: M-12-B-31]: Solve trigonometric equations of the type: sin $\theta = k$, cos $\theta = k \ and \ tan\theta = k$, where k $\in R$, using periodic, even, odd and translation properties.

[SLO: M-12-B-32]: Solve graphically the trigonometric equations of the type:

- $\sin\theta = \dfrac{\theta}{2}$, $\cos\theta = \theta$,
  $\tan\theta = 2\theta$,
  where $-\pi < \theta < \pi$

[SLO: M-12-B -33]: Use the periods of trigonometric functions to find the general solution of the trigonometric equations.

[SLO: M-12 -B -34]: Apply concepts of inverse trigonometric functions to solve real-life problems

(such as mechanical engineering, architecture to find the height of the building, angle of elevation and depression, identifying the angle of bridges to build scale models).

DEFINITIONS OF COGNITIVE LEVELS

Remember

Remembering is the act of retrieving knowledge and can be used to produce things like definitions or lists. The student must be able to recall or recognise information and concepts. The teacher must present information about a subject to the student, ask questions that require the student to recall that information and provide written or verbal assessment that can be answered by remembering the information learnt.

Question Stems

- Can you name all the …?
- Describe what happens when …?
- How is (are) …?
- How would you define …?
- How would you identify …?
- How would you outline …?
- How would you recognise…?
- List the … in order.
- What do you remember about …?
- What does it mean?
- What happened after?
- What is (are) …?
- What is the best one?
- What would you choose …?
- When did …?
- Where is (are) …?
- Which one …?
- Who spoke to …?
- Who was …?
- Why did …?

Understand

The next level in the taxonomic structure is Understanding, which is defined as the construction of meaning and relationships. Here the student must understand the main idea of material heard, viewed, or read and interpret or summarise the ideas in their own words. The teacher must ask questions that the student can answer in their own words by identifying the main idea.

Question Stems

- Can you clarify…?
- Can you illustrate …?
- Condense this paragraph.
- Contrast …
- Does everyone think in the way that … does?
- Elaborate on …
- Explain why …
- Give an example
- How can you describe...?
- How would you clarify the meaning...?
- How would you compare …?
- How would you differentiate between …?
- How would you describe…?
- How would you generalise…?
- How would you identify …?
- Is it valid that …?
- Is this the same as …?
- Outline …
- Select the best definition...
- State in your own words...
- This represents …
- What are they saying?
- What can you infer from …?
- What can you say about …?
- What could have happened next?
- What did you observe?

- What does this mean?
- What expectations are there?
- What information can you infer from…?
- What is the main idea of …?
- What restrictions would you add?
- What seems likely?
- What seems to be …?
- What would happen if …?
- What might happen if …?
- Which are the facts?
- Which statements support …?

Apply

The third level in Bloom's taxonomy, Applying, marks a fundamental shift from the pre-Bloom's learning era because it involves remembering what has been learnt, having a good understanding of the knowledge, and applying it to real-world exercises, challenges or situations. Students must apply an abstract idea in a concrete case to solve a problem or relate it to prior experience. The teacher must provide opportunities for students to use theories and problem-solving techniques in new situations and review and check their work. Assessment questions should be provided that allow students to define and solve problems.

Question Stems

- Can you group by characteristics such as …?
- Choose the best statements that apply...
- Clarify why …
- Do you know of another instance where …?
- Draw a story map...
- Explain why a character acted in the way that he did...
- From the information given, can you develop a set of instructions about …?
- How would you develop …?
- How would you change …?
- How would you demonstrate…?

Analyse

Analysing is the cognitive level where students can take the knowledge they have remembered, understood and applied, then delve into that knowledge to make associations, discernments or comparisons. Students should break down a concept or idea into parts and show relationships between these parts. Teachers must give students time to examine concepts and their requisite elements. Students are required to explain why they chose a solution.

Question Stems

- Can you distinguish between …?
- Can you explain what must have happened when …?
- Determine the point of view, bias, values, or intent underlying the presented material...
- Discuss the pros and cons of …
- How can you classify … according to …?
- How can you compare the different parts?
- How can you sort the different parts…?
- How is … connected to …?
- How is … similar to …?
- How would you categorise…?
- How would you explain...?

• How would you develop?	• What could the ending have been if ... had taken place?
• How would you explain …?	• State the point of view of …
• How would you modify …?	• What are some of the problems of …?
• How would you present…?	• What assumptions …?
• How would you solve … ?	• What can you infer about…?
• Identify the results of …	• What can you point out about ?
• Illustrate the …	• What conclusions …?
• Judge the effects of … What would result …?	• What do you see as other possible outcomes?
• Predict what would happen if …	• What does the author assume?
• Tell how much change there would be if …	• What explanation do you have for …?
• Tell what would happen if …	• What ideas justify the conclusion?
• What actions would you take to perform …?	• What ideas validate…?
• What do you think could have happened next?	• What is the analysis of …?
• What examples can you find that ?	• What is the function of …?
• What other way would you choose to …?	• What is the problem with …?
• What questions would you ask of …?	• What motive is there?
• What was the main idea …?	• What persuasive technique is used?
• What would the result be if …?	• What statement is relevant?
• Which factors would you change if …?	• What was the turning point?
• Who do you think…?	• What were some of the motives behind …?
• Why does this work?	• What's fact? Opinion?
• Write a brief outline …	• What's the main idea?
• Write in your own words …	• What's the relationship between?
	• Which events could not have happened?
	• Why did … changes occur?
	• Why do you think ?

BLOOM'S TAXONOMY WITH EXAMPLES

Conclusion

If you are a teacher looking for ways to engage your students in learning, this LIST of questions might be interesting for your classroom practice. Bloom's Taxonomy question stems can help elicit higher-order thinking skills and promote critical thinking among learners at different taxonomy levels. These question stems can also encourage students to think about their knowledge through reflection before answering questions.

ACTION WORDS FOR COGNITIVE LEVELS

Knowledge	Understand	Apply	Analyze	Evaluate	Create
define	explain	solve	analyze	reframe	design
identify	describe	apply	appraise	criticize	compose
describe	interpret	illustrate	judge	evaluate	create
label	paraphrase	modify	support	order	plan
list	summarize	use	compare	compare	combine
name	classify	calculate	decide	classify	formulate
state	compare	change	discriminate	contrast	invent
match	differentiate	choose	recommend	distinguish	hypothesize
recognize	discuss	demonstrate	summarize	infer	substitute
select	distinguish	discover	assess	separate	write
examine	extend	experiment	choose	explain	compile
locate	predict	relate	convince	select	construct
memorize	associate	show	defend	categorize	develop
quote	contrast	sketch	estimate	connect	generalize
recall	convert	complete	grade	differentiate	integrate
reproduce	demonstrate	construct	measure	divide	modify
tabulate	estimate	dramatize	predict	order	organize
tell	express	interpret	rank	prioritize	prepare
Copy	identify	manipulate	score	survey	produce

discover	indicate	paint	select	calculate	rearrange
duplicate	infer	prepare	test	conclude	rewrite
enumerate	relate	teach	argue	correlate	adapt
listen	restate	act	conclude	deduce	anticipate
observe	select	collect	consider	devise	arrange
omit	translate	compute	critique	diagram	assemble
read	ask	explain	debate	dissect	choose
recite	cite	list	distinguish	estimate	collaborate
record	discover	operate	editorialize	evaluate	facilitate
repeat	generalize	practice	justify	experiment	imagine
retell	group	simulate	persuade	focus	intervene
visualize	illustrate	transfer	rate	illustrate	make
	judge	write	weigh	organize	manage
	observe			outline	originate
	order			plan	propose
	report			question	simulate
	represent			test	solve
	research				support
	review				test
	rewrite				validate
	show				

GROUP: PRE-MEDICAL

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
PHYSICS	85	15	100
CHEMISTRY	85	15	100
BIOLOGY	85	15	100
TOTAL	505	45	550

GROUP: PRE-ENGINEERING

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
PHYSICS	85	15	100
CHEMISTRY	85	15	100
MATHEMATICS	100	--	100
TOTAL	520	30	550

GROUP: GENERAL SCIENCE

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
PHYSICS	85	15	100
COMPUTER SCIENCE	75	25	100
MATHEMATICS	100	--	100
TOTAL	510	40	550

GROUP: COMMERCE

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
ECONOMICS	75	-	75
P.O.C	75	-	75
ACCOUNTING	100	--	100
BUSINESS MATHEMATICS	50		50
TOTAL	550	---	550

GROUP: HUMANITIES

(Any Three Electives)

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
COMPUTER SCIENCE	75	25	100
ISLAMIC STUDIES	100		100
MATHEMATICS	100	-	100
SOCIOLOGY	100	--	100
ECONOMICS	100		100
EDUCATION	100		100
CIVICS	100		100
NURSING	85	15	100
TOTAL	550	---	550

GROUP: MEDICAL TECHNOLOGY

SUBJECT	THEORY	PBA	TOTAL
ENGLISH	100	-	100
URDU NORMAL / SINDHI NORMAL	100	-	100
PAKISTAN STUDIES	50	-	50
MICROBIOLOGY	85	15	100
CHEMICAL PATHOLOGY & SEROLOGY	85	15	100
ELEMENTARY CHEMISTRY & CHEMICAL PATHOLOGY	85	15	100
TOTAL	505	45	550