Study guide
2024

Master's degree

Evaluación de Saberes Imprescindibles para Ingresar a Estudios de Maestría

ESIIEM - BPH

Extended Diagnostic Exam
MS in Clinical Research

exBach®
Tecnología Educativa S. C.

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Universidad Autónoma de Coahuila

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STUDY GUIDE ®

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I. Introduction

exBach *Tecnología Educativa (**exBach**) is a Civil Society whose main duties, reflected in its Object of creation, are to develop, patent, register authorship and commercialize technologies based on software, hardware, electronic devices, robots, drones, and all those technologies that can be oriented for learning evaluation purposes or to support teaching and learning processes in their facilitation, enablement, and management modalities.*

In its trajectory towards achieving its Object, ***exBach*** has had the following achievements and activities:

- Application - to more than 650,000 applicants - of admission exams for high school, undergraduate, and graduate studies, under the BPH[1] model, in more than 195 technological institutes, polytechnic universities, intercultural universities, technological universities, autonomous universities, and normal schools located in 20 states of the country.
- Application of high school knowledge certification exams to more than twenty thousand people from 19 states of the country.
- Application of Open High School exams throughout the state of Guanajuato through under the BPH scheme as of February 2021.
- Application of Comprehensive Exit Exams for Higher Education (EXIEES) to more than 500 bachelor's degree graduates.

These achievements are based on 38 years of work by ***exBach***'s founders in the field of computer-assisted learning and knowledge assessment, including their participation in the Microsep project (1985-1986), Self-learning System for Secondary Education Assessment (SAESES 2000-2006), and Special Program for Basic Education Certification (INEA-PEC-2016).

The exams applied by ***exBach*** - regardless of the educational level of their candidates - contribute, due to their design, to significantly reducing the fear, stress, fatigue, and uncertainty to which they are usually subjected when taking a traditional exam. They also contribute to the reduction of the bureaucracy implicit in traditional evaluation methods, derived from the need to control exam booklets and supervise the evaluation process to prevent candidates from engaging in non-standard practices.

[1] exBach was the first institution, in Latin America and much of Europe, to apply admission, progress, and exit exams at home, naming this modality exBach BPH Exams (Under the Protection of the Home). These types of exams, with different purposes, began to be applied, due to the COVID-19 pandemic, in the second week of April 2020.

II. Type of exam

The ***exBach*** entrance, progress, and exit exams to evaluate knowledge are designed with the tool called ***reactivo semilla*** [2], which allows to recover evidence of the skills that every student should have, according to their academic preparation, such as:

- To formulate and to solve problems;
- To identify trend patterns in numerical, alphanumeric, and figure series;
- To make inferences;
- To classify, to process, and to interpretate information;
- To know basic concepts of their academic formation;
- To identify language vices;
- To recognize writing errors; and
- To distinguish between different types of texts.

III. Objetive

To provide institutions with a diagnostic exam application service in the areas and level of its their interest, with superior features to those provided by other service providers in terms of attributes such as price, speed in delivering results, tools for data analysis, the possibility of weighting modules and disciplinary fields, and flexibility to adapt the evaluation to their specific needs.

In its BPH modality, ***exBach*** adds to the above objective the ability to allow exam application at home, ensuring - through proven authentication and supervision procedures - that the candidate is the one registered to take the exam, is not impersonated during it, and only relies on authorized materials and media to answer the exam.

IV. About the quality the of items'

Due to the properties of its Reactivos Semilla®, all ***exBach*** exams are different; however, they share the same degree of difficulty, reliability, validity, and discrimination. These parameters are estimated by the ***exBach*** system. When, as a result of these calculations, the system detects a question that does not meet the established quality specifications, it issues an alert for the question to be reviewed and, if necessary, removed.

Content validity of the questions is determined by the group of experts from of ***exBach*** Educational Technology who, before issuing a validity assessment, compare the statements and response options against the corresponding learning objectives and competencies.

[2] Seed reagents are an innovation of ***exBach*** in which each reagent manifests randomly, in multiple (from tens to billions) equivalent forms, depending on its nature.

V. Exam structure

The following table shows the number of abilities evaluated, the number of items, and the time limit to answer them. It is noteworthy in this table that the number of items is, in all modules, equal to the number of abilities. The reason for this is that each ability is represented by an item, while each item is associated with an ability.

Type of exam	Subject	Capability's quantity	Items' quantity	Time (min)
Basic knowledge Exam	Basic Math and Physics	20	20	40
	Analytical reasoning	20	20	35
	Language proficiency	20	20	30
	Specialized text comprehension	20	20	35
Specialized knowledge Exam	Scientific and Technological Research	20	20	30
	Comprehension of Scientific and Technological Text in English	20	40	35
	Total	**120**	**140**	**205**

VI. Types of questions

The ***exBach*** items belong to one of the following types:

a) Typical question.

These items begin and end with a question mark and consist of questions about a specific topic, concept, or fact. The person is asked to choose the option that contains the correct answer.

b) Selection of response

These items usually begin with the phrase: "Select the option". The options contain four alternatives, of which only one makes sense or is true to the statement of the item.

c) Completion

One or more words are omitted from the statements. The options present the word(s) that must be placed in the statement for it to make sense.

d) Ordering

A list is presented to the test-taker, which makes sense only if it is ordered under a certain criterion. The test-taker is asked to choose the option that contains the elements of the list in order and the ordering criterion is explained.

e) Matching columns

Two lists are presented, and some elements from the first list are linked, through a criterion established in the statement, to elements from the second list. The test-taker must choose, among the options, the one that correctly associates the two lists.

VII. Support for the test-taker

exBach offers test-takers this **free guide** that lists the skills evaluated in each module. Additionally, it provides the possibility for each test-taker to practice on their computer or mobile device, with guiding items regarding the content of the exam, in an environment similar to the one they will experience during the actual exam.

VIII. Skills to be evaluated by subject

SUBJECT I. BASIC MATH AND PHYSICS

Arithmetic

1. To perform basic operations with fractions and decimals.
2. To perform operations with signed numbers.
3. To calculate least common multiple and greatest common divisor.
4. To solve percentage problems.
5. To solve problems using direct proportion.

Algebra

6. To understand algebraic language.
7. To perform basic algebraic operations.
8. To perform operations with notable products.
9. To solve first- and second-degree equations with one unknown.
10. To solve systems of equations with two unknowns.

Probability and statistics

11. To interpret tables and graphs.
12. To calculate measures of central tendency.
13. To calculate measures of variability for ungrouped data.
14. To calculate measures of position for ungrouped data.
15. To state the basic concepts of probability and calculate the probability of simple events.

Fundamentals of physics

16. To identify the concept of physics, its branches, and its relationship with other sciences.
17. To define the concept of measurement and the physical magnitudes of the International System of Units (SI).
18. To solve problems of unit conversion and scientific notation.
19. To identify the concepts of heat and temperature.
20. To explain the behavior of fluids.

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SUBJECT II. ANALYTICAL REASONING

Integration of information

1. To draw conclusions from two texts.
2. To identify the concepts of syllogism and premise.
3. To identify erroneous textual propositions.
4. To draw conclusions from a text and a table.

Interpretation of logical relationships

5. To identify analogies between phrases.
6. To identify analogies between pairs of words.

Messages and codes

7. To encode messages.
8. To decode messages.

Recognition of patterns

9. To recognize an object based on its characteristics.
10. To discriminate between objects based on their similarities and differences.
11. To group objects based on their common characteristic.
12. To recognize patterns in numerical sequences.
13. To recognize patterns in alphanumeric sequences.
14. Recognize patterns in sequences of figures.

Spatial vision

15. To identify objects according to their visual perspective: shadows, reflections, views, and rotation.
16. To identify combined figures.
17. To identify developments of geometric figures.
18. To identify objects resulting from cuts.
19. To count the elements that are part of or missing in figures or objects.
20. To interpret Venn diagrams using figures as elements of sets

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SUBJECT III. LANGUAGE PROFICIENCY

Verbs, nouns, adjectives, adverbs, and prepositions

1. To differentiate between simple and compound verb tenses.
2. To use verb periphrases correctly in different contexts.
3. To use the subjunctive mode to express doubt, uncertainty, subjectivity, possibility, hypothesis.
4. To identify the non-personal forms of the verb.
5. To derive irregular nouns correctly.
6. To derive adjectives in comparatives and superlatives.
7. To identify the type of adverb according to the context of the sentence.
8. Use prepositions correctly in a sentence.

Orthographic rules: Punctuation and accentuation

9. To use punctuation marks correctly.
10. To classify words according to their phonetic stress.
11. To recognize words with diacritical accent.

Orthographic rules: Spellings

12. To distinguish correct spelling from spellings that cause confusion.
13. To relate spelling to the graphic representation of language.

Semantic relationships: Synonyms and antonyms

14. To establish semantic relationships with synonyms and antonyms.
15. To distinguish between denotative language and connotative language.

Semantic relationships: Paronyms

16. To establish semantic relationships with homophones and homonyms.
17. To demonstrate command of the language vocabulary.

Textual logic: Cohesion

18. To lnow the syntax of the compound sentence.
19. To identify types of connections between sentences.
20. To identify relationships of subordination.

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SUBJECT IV. SPECIALIZED TEXT COMPREHENSION

Message of the explicit and implicit text

1. To recognize temporal and narrative sequences in a text
2. To identify characters and environment in a text
3. To relate the time period in which a text is written to the time period it portrays
4. To recognize the actions of characters in a text
5. To locate information in a text
6. To summarize a text
7. To identify the main idea in a text
8. To recognize the conclusion of a text

Appropriateness for function: lexicon corresponding to the text

9. To use appropriate language for the context
10. To recognize the characteristic features of scientific and technological texts
11. To recognize the characteristic features of popular science texts
12. To recognize different text prototypes
13. To infer the title of a text from its content
14. To infer the content of a book from its cover
15. To identify the epigraph in a text
16. To identify the epilogue in a text
17. To identify the paratextual elements

Purpose and usefulness of the text

18. To identify the purpose of a text
19. To determine the usefulness of a text
20. To identify biases and fallacies in a text

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SUBJECT V. SCIENTIFIC AND TECHNOLOGICAL RESEARCH

Foundations for research

1. To differentiate between scientific and technological research.
2. To know the phases of the scientific method.
3. To identify sources of relevant information for the research topic.
4. To distinguish between the concepts of technique, science, technology, and innovation.

Formulating the research project

5. To differentiate between social and experimental sciences.
6. To determine the objectives, scope, and justification of a research project.
7. To formulate hypotheses in a research project.
8. To select the most appropriate strategy to solve a research problem.

Execution of the research project

9. To design an observation or experimentation model that is suitable for the research problem.
10. To recognize different methods of data collection and analysis for research.

Analysis of the produced information

11. To process basic statistical data resulting from a research project.
12. To interpret basic statistical information resulting from a research project using tables, graphs, and measures of central tendency, dispersion, position, and trend.
13. To formulate conclusions as a result of a research project.
14. To write research reports with a high level of language proficiency.
15. To recognize and use different formats to present the results of a research project.
16. To apply existing standard citation styles such as APA and Harvard

Production

17. To write literature reviews as a record of documentary research.
18. To identify the distinctive features of specialized texts.
19. To identify the disciplinary field(s) linked to a research project.
20. To assess the time distribution for the development of a long-term research project.

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SUBJECT VI. COMPREHENSION OF SCIENTIFIC AND TECHNOLOGICAL TEXT IN ENGLISH.

Comprehension

1. To choose the most appropriate title for a specialized text (scientific or technological).
2. To summarize a specialized text.
3. To understand the purpose of research work.
4. To understand the central idea of specialized texts.
5. To identify cause-effect relationships in specialized texts.
6. To classify a scientific text according to its intentionality.
7. To identify an author's stand on a topic of specialization.
8. To draw conclusions from a specialized text.
9. To understand the main idea of a lecture.
10. To understand dialogues on specialized topics.

Grammar

11. To express scientific and technological concepts.
12. To correct usage of antonyms and synonyms.
13. Proper use of compound verbs commonly found in texts and specialized journals.
14. To make proper common comparisons in texts and specialized journals.
15. To express research routines.
16. To express academic actions in progress.
17. Express cause-effect relationships through verb phrases, adverbs, and connectors.
18. To express scientific concerns.
19. To differentiate a translation from an interpretation.
20. To infer the content of a scientific or technological text from its title.

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