



2024

BRICS SKILLS COMPETITION

(BRICS FUTURE SKILLS & TECHNOLOGY CHALLENGE)

Software Test

BRICS-FS-42

Technical Description

(Offline_International Finals)

August, 2024



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1 Introduction

1.1 Name and description of the competition

1.1.1 Name of the competition

The 2024 BRICS Skills Competition ((BRICS Future Skills and Technology Challenge)) - Software Test (Mobile Applications Development). Event number: BRICS-FS-42.

1.1.2 Description of the skill competition

The Skill Software Test of the 2024 BRICS Skills Competition (BRICS Future Skills and Technology Challenge) focuses on Software Test. Participants in this competition are required to possess a solid foundation in computer science and Software Test, adhere to Software Test processes and standards, execute testing tasks at various stages, manage Software Test, achieve Software Test objectives, and ensure the quality of software products. Notably, the Software Test event is an individual competition.

The Skill of Software Test includes several aspects: the competitors should understand the whole process of software from requirements analysis to design, coding, testing and deployment, conduct appropriate testing strategies at each stage, and be familiar with various testing tools and testing techniques, such as black box test, white box test, functional test, performance test, automated test, etc. Skills include designing test cases, creating test scenarios, executing tests, and writing test reports. Additionally, professionals should possess other general abilities, such as the ability to read professional English, problem-solving skills, and organizational and communication skills.

1.2 Relevance and importance of the document

The document contains the standards required for this skills competition, as well as information on the evaluation principles, methods, and procedures for managing the competition.

Every expert and competitor must read the technical description.

2 Skills standard

2.1 General description of the skill standards

The skill standards outline the knowledge, understanding, and specific skills that represent international best practices in technical and professional performance. They reflect a global consensus on what the respective job roles or professions embody within industries and enterprises.

Skill competitions aim to mirror these international best practices described in the skill

standards, as well as the level of proficiency that can be achieved. Consequently, the standards serve as a guideline for the training and preparation required for skill competitions.

The standards are divided into distinct sections, each with a title and a reference number.

Each section is assigned a percentage of the total score, indicating its relative importance within the standards. This is commonly referred to as "weighting." The sum of all percentages equals 100. The weighting determines the distribution of marks within the scoring criteria.

Through competition tasks, the scoring schemes evaluate only the skills outlined in the standards. They strive to comprehensively reflect the standards within the constraints of the skill competition.

The scoring schemes will adhere to the weight distribution assigned in the standards to the extent practically possible. A 5% variation is allowed, but it must not alter the weight distribution prescribed by the standard specifications.

2.2 Skill standards

Requirements related to skill standards		weight
1	Work organization and management	5%
	Individuals need to know and understand that: <ul style="list-style-type: none"> (1) Principles and measures of efficient team work; (2) Proactively, identify, analyze and evaluate information from various resources; (3) Identify multiple solutions to the problem; (4) How to prepare the test case list and complete the full report; (5) How to integrate company standards (style guidelines) into the testing cycle. 	
	Individuals should be able to: <ul style="list-style-type: none"> (1) Eliminate common test risks and test scripting problems; (2) Consider the time limits and deadlines; (3) Allocate the time reasonably to develop a daily test plan; (4) Use research skills and skills to follow the latest industry 	

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	<p>standards;</p> <p>(5) Check whether your work meets the needs of customers and organizations;</p> <p>(6) Use computers or devices and a range of software packages.</p>	
2	Communication and interpersonal skills	5%
	<p>Individuals need to know and understand that:</p> <p>(1) The importance of listening, writing, and oral communication skills;</p> <p>(2) The importance of rigor and confidentiality when communicating with customers;</p> <p>(3) The importance of addressing misunderstanding and conflict needs;</p> <p>(4) The importance of gaining customer trust and building efficient working relationships with them;</p> <p>(5) How to provide appropriate reports and communicate about the defects found.</p>	
3	Preliminary plan, design, and testing framework	30%
	<p>Individuals need to know and understand that:</p> <p>(1) Based on robust analysis and judgment for the best interests of the client;</p> <p>(2) The importance of using the system analysis and design methods;</p> <p>(3) The behavior of users of various terminal software product applications;</p> <p>(4) The impact of functions on software products (such as size and</p>	

	<p>various parameters);</p> <p>(5) Software Test technology and methods (such as black box, white box test, etc.);</p> <p>(6) Software Test model (such as V models and W models, etc.) and process and stage</p>	
	<p>Individuals should be able to:</p> <p>(1) Prepare the test plan and formulate the appropriate test plan;</p> <p>(2) Write test cases and fully review evaluation;</p> <p>(3) Select the appropriate test tool and build the corresponding environment;</p> <p>(4) Use tools to manage test case sets and optimize them;</p> <p>(5) Analyze and optimize the key problems of hardware and software;</p> <p>(6) Select the appropriate test framework, tools or libraries for practical operation;</p> <p>(7) Identify software product status, risk estimates and plan adjustment.</p>	
4	Implementing the plan, and conducting the Software Test	60%
	<p>Individuals need to know and understand that:</p> <p>(1) The process of each stage of the test and the test content;</p> <p>(2) The integrity and predictability of the test piece or source code;</p> <p>(3) Definition principles of the severity and priority of software defects;</p>	

	<p>(4) Life cycle of software defects and defect repair status;</p> <p>(5) General test tools and management tools;</p>	
	<p>Individuals should be able to:</p> <p>(1) Establish a reusable, automated testing process;</p> <p>(2) Track and manage the defects found;</p> <p>(3) Combine with the quantified test coverage domain and the defect tracking report;</p> <p>(4) Use testing development languages, such as Python, Java, etc. ;</p> <p>(5) Write the automatic test script and perform the automatic test;</p> <p>(6) Debug techniques and operations for handling exceptions, errors, etc;</p> <p>(7) Conduct the test summary report and consider the next test optimization recommendations.</p>	

3, of the scoring scheme

3.1 Scoring method

The scoring for this competition will be completed by the judges on-site offline. If any contestant engages in cheating or other violations during the competition, the referees will handle the situation based on the severity of the violation, and those with serious violations may have their scores disqualified.

3.2 Scoring rules

1. The one with the highest total score will be ranked first;
2. For those with the same total score, the highest module score will follow the order of module E, module D, module C, module B and module A. See Section 4 of this article for details.

3.3 Evaluation basis

In the process of competition design, the choice of criteria and evaluation methods will be determined by the scoring scheme and competition questions.

Evaluation basis, including but not limited to:

- Functional test case design knowledge, how to write a defect report, testing report
- HTTP protocol and status code, and interface testing method
- Performance requirements analysis, knowledge of performance testing indicators, and knowledge of performance testing script design
- Automated testing model, Selenium API knowledge
- White-box testing method, knowledge of Junit syntax

4 Competition questions

4.1 Format / frame of the competition questions

The competition questions are composed of five independent modules:

Module A: Functional test

Module B: Interface test

Module C: Performance test

Module D: Automatic test

Module E: White box test

4.2 Time allocation and score weight of competition questions

module	duration (min)	Score value weight (%)
Module A: Functional test	180	20
Module B: Interface test		10
Module C: Performance test		20
Module D: Automatic test	180	25

Module E: White box test		25
amount to	360	100

4.3 Operation contents and requirements of each module

Module A: Functional test

According to the tested system and requirements, complete the test case document, complete the provided test case specification, execute the functional test case, discover and record the defects, and output the defect report document and the test report document.

Module B: Interface test

According to the requirements, the competitors should use the interface test tools, use HTTP protocol, design data or variables, perform the interface test, and output the execution process and screenshots of the results.

Module C: Performance test

The competitors need to design the performance test according to the performance test scenario, use the performance test tool, design the performance test script, perform the performance test, and output the test results.

Module D: Automatic test

According to the requirements of the topic, the competitors should use the provided tools or test framework, adopt the appropriate data-driven, assertion and other design modes, write and execute the automatic test script, and output the automatic test results.

Module E: White box test

According to the requirements of the test questions, competitors should write the test code, simulate the test data, and use various coverage methods such as judgment conditions and basic paths of conditions to obtain the test results.

4.4 Competition sample questions announced

This competition is a closed book. After the technical documents are published, the assessment ideas and proposition direction will be published immediately; the sample questions will be published 14 days before the competition. The secret section is announced at the official competition. The sample questions will be available through the website (<http://www.briskills.com/jzzy/index.html>) was published.

5. Skill management and communication

5.1 Expert panel

The skill expert group is composed of chief expert, deputy chief expert and expert members, who are responsible for further revising the technical documents of the remote final and daily skill management.

5.2 Discussion forum

Online communication will be conducted with instant messaging tool QQ, and the offline discussion forum will be held by the Chinese organization.

6 Security requirements

6.1 Organizational structure

1. Establish a competition safety and security team, led by the director of the competition's executive committee. Members will be the safety officers responsible for each competition venue. Each venue will appoint a safety officer who is fully responsible for the venue's safety, and in the event of an emergency, will be in charge of mobilizing rescue teams and professional rescue personnel, and arranging for the evacuation of people within the venue.

2. Establish a coordination mechanism with relevant departments such as public security, fire services, judicial administration, transportation, health, food, and quality inspection to ensure the safety of the competition. Develop emergency plans and respond to incidents in a timely manner. Set up dedicated contact lines for medical staff, firefighters, and security personnel, and determine the contact persons on the other side, who will be contacted by the venue's safety officer. The layout of the competition venue and the use of equipment must strictly follow safety construction regulations. The venue layout should be divided into areas, with evacuation routes set according to safety requirements, and diagrams of the evacuation routes and directions should be prominently posted on the walls.

6.2 Competition security management

1. The installation of competition equipment and facilities shall be constructed in strict accordance with the safety construction standards, and the power wiring and electrical installation shall be constructed according to the specifications.

2. Arrange the fire extinguishers according to the fire safety requirements, and designate the responsible person to use them in an emergency.

3. The norms, regulations and qualification certificate requirements of the national (or

industrial) related occupational post safety are specified in the competition procedures.

4. The executive committee shall conduct safety training to all the referees and staffs of the competition before the competition. According to the Labor Law of the People's Republic of China and other laws and regulations, a perfect safety accident prevention system shall be established, and the players shall be trained before the competition to avoid personal injury accidents.

5. The executive Committee will establish a special plan to ensure the safety of the process of competition proposition, storage, distribution, recycling and evaluation.

6.3 Security management of the competition environment

1. Before the competition, the executive committee shall organize special personnel to inspect the competition site, accommodation place and transportation guarantee, and put forward clear requirements for safety work. The layout of the stadium, the equipment and equipment in the stadium shall comply with the relevant national safety regulations. And conduct the competition field simulation simulation test, in order to find out the possible problems. The organizer shall eliminate the potential safety risks before the competition according to the requirements of the competition executive committee.

2. A police cordon shall be set up around the stadium to prevent irrelevant personnel from entering and causing accidents. Provide necessary labor protection for the players in the competition site according to the requirements of relevant professional positions. In the dangerous operation link, the referee should check and confirm that the equipment is normal before the competition, and strictly prevent the players from making mistakes during the competition.

3. In order to ensure the smooth progress of this competition, the undertaking college has established the corresponding security system during the competition, which will be implemented by the security, campus environment and health and medical security group.

(1) During the competition, all vehicles and personnel entering the competition area need vouchers to enter and show them to the staff voluntarily.

(2) Before the competition begins, the contestants should carefully read the Admission Instructions and the emergency evacuation map posted in the field.

(3) The referee shall supervise the completion of the whole inspection process before the electrical control system is powered on in the competition field, and remind and stop the operation hidden dangers in time.

(4) Each competition equipment uses an independent power supply to ensure safety. Use the computer programming of the player in time to avoid data loss caused by sudden power failure, and the lost data time is not make up.

(5) During the competition, the competitors should strictly abide by the safety operation rules. In case of emergency, the power should be cut off immediately and leave in an orderly

manner under the arrangement of the staff.

(6) All kinds of personnel shall strictly abide by the rules of the stadium, and it is strictly prohibited to carry prohibited items into the stadium.

(7) The security personnel shall timely inform the personnel in charge of the stadium if they find any potential safety risks.

(8) Smoking is strictly prohibited in the competition venue, and the security personnel shall not lend their certificates to others.

(9) If there are security problems, participants should quickly evacuate the scene according to the emergency evacuation route under the command of the security personnel.

4. In the areas where the competition venue should set up complete instruction signs and increase the guiding personnel, the executive committee and the organizers shall open up standby channels.

5. During the competition, the competition organizers will increase their strength in the key positions and establish a safety management log.

6. In the players into the position, the referee staff into the workplace, the undertaking unit shall remind and supervise the contestants, the referee staff is forbidden to carry communication, photographic recording equipment, it is forbidden to carry without permission record equipment, and security equipment, to enter the important area for security.

6.4 Guarantee of living conditions

1. During the competition, the event organizer will arrange the accommodation for the competitors and the instructors. The undertaking unit shall respect the religious beliefs and cultural customs of the minority participants, and arrange the food and living of the minority participants and teachers according to the relevant national ethnic and religious policies.

2. The accommodation place arranged during the competition must have the qualification of hotel and accommodation business license.

3. During the competition, the competition area executive committee is responsible for the traffic safety of the organized visit and observation activities. The executive committee and the organizers shall ensure the traffic safety of the players, instructors, referees and staff during the competition.

4. In addition to necessary security isolation measures, strictly abide by relevant national laws and regulations to protect personal privacy and personal freedom.

6.5 Team Responsibilities

1. When organizing the team, each participant shall arrange to purchase personal accident insurance for the competitors during the competition.

2. After the formation of each unit team, relevant management systems shall be

formulated, and safety education shall be conducted for all the contestants and instructors.

3. All participating teams shall strengthen the safety management of the participants and connect with the safety management of the venue.

4. If the participating teams have vehicles, they will enter and exit the stadium with the certificate issued by the executive committee, and drive according to the designated route and park at the designated place.

6.6 Emergency treatment

In case of an accident during the competition, the discoverer shall report to the executive committee at the first time and take measures to avoid the expansion of the situation. The competition executive committee shall immediately start the plan to solve the problem. Events with major safety problems shall be suspended by the regional executive committee. After the event, the executive committee of the competition area shall issue a detailed report.

6.7 Punishment measures

1. In case of a major safety accident in the event, the qualification of the undertaking unit shall be suspended.

2. In case of a major security accident due to the reasons, the team will be disqualified.

3. If the participating team has a serious safety accident and the warning and warning, it will be disqualified to continue the competition.

4. If the event staff violates the rules, they shall be investigated for responsibility according to the corresponding system. If the circumstances are bad and such a major safety accident is caused, the judicial organ shall investigate the corresponding legal responsibility.

7 Materials and equipment

7.1 List of competition equipment

7.1.1 Technology Platform

order number	Platform name	quantity	remarks
1	Software Test platform of Zhonghui Yunqi Technologies Group	1	\

7.1.2 Specification and parameters

order	Platform	Specification parameters
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number	name	
1	Software Test platform of Zhonghui Yunqi Technologies Group	The test platform is built upon mainstream Internet of Things (IoT) technologies and is designed with the principles of software engineering in mind. The platform has implemented the management of the entire lifecycle of Software Test.

7.1.3 List of machine software

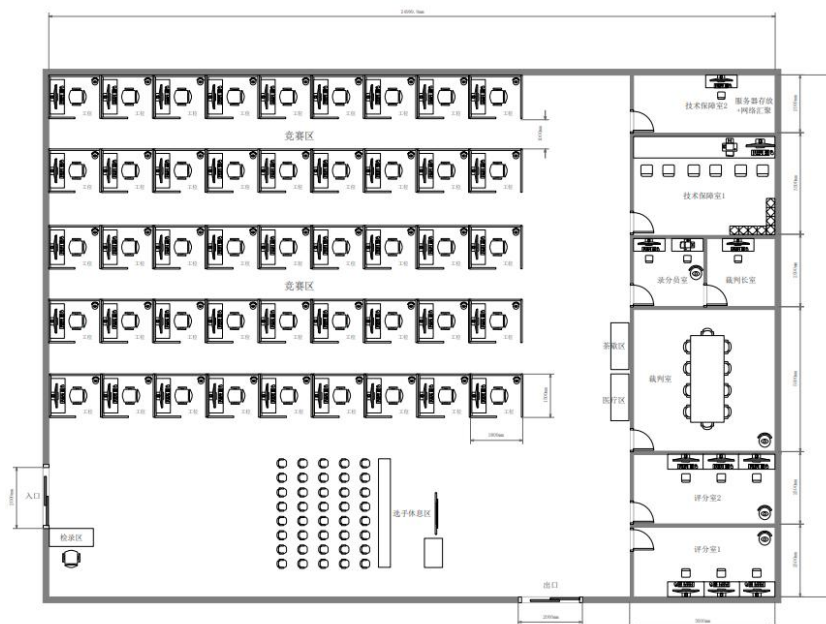
name	technical specifications
Wps office	11.1
JDK	1.8
Chrome Browser	114.0.5735.110
Postman	10.6
apache-jmeter	5.4.3
Chrome Driver	114.0.5735.90
Python	3.11.8
PyCharm Community Edition	2023.3.4
IntelliJ IDEA Community Edition	2023.3.4
Junit	4.13.2
Selenium	4.10.0

(* If not specified, all systems and software of this competition will be available in English, and no additional dependency database will be provided except the dependency database necessary for the project).

7.2 Materials and equipment prohibited in the skill area

Any materials and equipment carried by the participants shall be declared (presented) to the expert. Experts may prohibit the use of any item unrelated to the performance of the task or that may confer an unfair advantage on a competitor.

7.3 Proposed competition area layout



(Reference layout according to actual)

