

**Examination Syllabus for Qualification of  
Meteorological Data Operational Personnel  
(Trial)**

**China Meteorological Administration  
January 2015**

## Table of Contents

<b>Chapter 1 Nature of the Examination .....</b>	<b>错误!未定义书签。</b>
<b>Chapter 2 Requirements of the Examination....</b>	<b>错误!未定义书签。</b>
<b>I. Basic Knowledge and Capacity Requirements.....</b>	<b>3</b>
<b>II. Examination Paper Requirements .....</b>	<b>4</b>
<b>Chapter 3 Exam on Basic Knowledge of Meteorological Data Operation .....</b>	<b>错误!未定义书签。</b>
<b>I. Basic Knowledge of Meteorology and Statistics</b>	<b>错误!未定义 书签。</b>
<b>II. Meteorological Operational Observation and Its Error Sources.....</b>	<b>4</b>
<b>III. Meteorological Data Operational System and Infrastructure in China.....</b>	<b>错误!未定义书签。</b>
<b>IV. Conventional Observation Data, Quality Control and Product Generation .....</b>	<b>错误!未定义书签。</b>
<b>V. New Generation Weather Radar Data and Their Quality Control .....</b>	<b>错误!未定义书签。</b>
<b>VI. Meteorological Observation Data and Products</b>	<b>错误!未定 义书签。</b>
<b>Chapter 4 Exam on Skill in Using Meteorological Data Operational System .....</b>	<b>7</b>
<b>Chapter 5 The Proportion of Test Content.....</b>	<b>错误!未定义书签。</b>
<b>Chapter 6 Examination Modality and Structure</b>	<b>错误!未定义书签。</b>
<b>Chapter 7 Statistics of Exam Scores .....</b>	<b>错误!未定义书签。</b>

## **Chapter 1 Nature of the Examination**

Qualification Test of Meteorological Data Operational Personnel is mandatory to those who engage in meteorological data operation. The examination is organized by the China Meteorological Administration and a Qualification Certificate of Meteorological Data Operational Personnel will be granted to him/her who passes it.

## **Chapter 2 Requirements of the Examination**

Qualification Test of Meteorological Data Operational Personnel focuses on basic theoretical knowledge related to meteorological data operation, while emphasizing the application of theoretical knowledge and the operation of practical data, with a combination of the basic knowledge and practical operation to comprehensively check the meteorological data operational ability and qualification of the candidates.

### **I. Basic Knowledge and Capacity Requirements**

#### **1. Basic Knowledge Required**

Basic knowledge refers to the basic concept, theory, and data processing method of meteorology, atmospheric sounding, statistics and computer science which are closely related to meteorological data operation.

The requirements for basic knowledge can be divided into three levels: understanding, mastering and integrated use.

(1) Understanding: Gain preliminary and perceptual awareness of knowledge required and its background, learn the basic concept of this knowledge and relevant content, and identify it in the relevant issues.

(2) Mastering: It is required to gain a more profound understanding of the knowledge to explain, illustrate or infer

and to solve related problems using the knowledge.

(3) Integrated use: It is required to master the inner link of the knowledge and to analyze and solve complex or comprehensive problems using knowledge learnt.

## 2. Capacity Requirements

It is required to be able to comprehensively use basic knowledge and methods relating to meteorological data operation, according to technical requirements and regulations of meteorological data specifications, to complete basic meteorological data operation including data exchange and collection, storage and archiving, as well as shared services, and to understand and master the routine meteorological data processing and quality control methods, being preliminarily capable to process new observational data from satellites and new generation weather radars.

## II. Examination Paper Requirements

The examination focuses both on basic knowledge and basic data operational skill and practical application ability. Taking into account the fundamentality, integrity and contemporaneity of test questions, the examination pays attention to their hierarchy by reasonably regulating their degree of integration. The examination also aims to achieve a comprehensive test of the overall quality from multiple angles and levels.

## Chapter 3 Exam on Basic Knowledge of Meteorological Data Operation

### I. Basic Knowledge of Meteorology and Statistics

Exam Content: basics of meteorology; the concept of basic meteorological elements and their distribution and variation pattern; the basic characteristics of atmospheric motion and its cause and variation pattern; evolution of major weather

systems and atmospheric phenomena; commonly used statistical methods and content of meteorological data, including basic statistic amount, probability distribution, and commonly used statistical tests and statistical methods of meteorological data.

## **II. Meteorological Operational Observation and Its Error Sources**

Exam Content: the connotation and components of national integrated meteorological observation systems; the main observation instruments corresponding to ground, space and air-based observing systems; basic performance indicators of meteorological instruments; the basic approach, data and error sources of conventional ground and upper-air meteorological observation; classification of observation errors; evolution of ground-based observation; metadata information.

## **III. Meteorological Data Operational System and Infrastructure in China**

Exam Content: the definition and types of meteorological data; three characteristics of meteorological data; operational layout of national meteorological data; the operational process of national meteorological data; sharing approach of meteorological data management; privacy policy on meteorological data operation; foreign-related policy on provision and use of meteorological data; hierarchical management approach on releasing and receiving meteorological data in Internet; the elements and indicators of quality assessment of real-time observation data from nationwide ground automatic stations; meteorological record archiving and requirements; structure and layout of meteorological data storage management database; China's major meteorological information system, including the functions and applications of Global Telecommunication

System (GTS), China Meteorological Administration satellite broadcasting system (CMACast system), the national comprehensive meteorological information sharing platform (CIMISS); features and applications of meteorological data operational system (MDOS).

#### **IV. Conventional Observation Data, Quality Control and Product Generation**

Exam Content: Classification of meteorological data; formats commonly used in meteorological data; the purpose and significance of data quality control; content and process of meteorological data quality control; common technical methods and basic concept of meteorological data processing; national quality control system of basic observation data; quality testing for historical basic meteorological data with ground elements; quality control of observations from ground automatic weather stations; comprehensive quality control of extremely abnormal weather data; quality control content and methods of upper air observations, radiation observations, agrometeorological observations, and acid rain monitoring; quality control methods for monthly ground climate data in China; production and naming rules for datasets of hourly, daily, monthly, annual, standard values of terrestrial, aerial and radiation data; gridding techniques and products based on site information; homogeneity detection and correction of meteorological data and products; meteorological data reanalysis products and application; and multi-source data fusion methods and products.

#### **V. A New Generation Weather Radar Data and Their Quality Control**

Exam Content: networking layout of the new generation weather radar; level, category, timeliness, format, and purpose of the new generation weather radar products; the basic

detection principles of the new generation weather radar and product generation; radar data quality issues including speed blur, distance blur, ground clutter, wave echo, clear air echo, electromagnetic interference, failure echo, noise echo and bright band echoes and the main quality control methods; mosaic data and products of the new generation weather radar.

## **VI. Meteorological Observation Data and Products**

Exam Content: the impact of polar orbiting and geostationary meteorological satellite positioning and calibration algorithms on satellite data; the major products, definitions, product level of polar-orbiting and geostationary satellites and product generation principle; meteorological satellite data classification; hierarchical data formats of meteorological satellite products; the main features of polar-orbiting and geostationary satellite products and their data formats and applications; satellite data acquisition and sharing methods.

### **Chapter 4 Exam on Skill in Using Meteorological Data**

#### **Use of Meteorological Data Operational System**

Exam Content: the operation and use of meteorological data operational system.

### **Chapter 5 The Proportion of Test Content**

Qualification Test of Meteorological Data Operational Personnel includes two components: basic knowledge and basic skill of meteorological data operation.

In the exam of basic knowledge of meteorological data operation, the commonly used statistical methods in meteorological data accounts for 8%, meteorological observation operation and error sources for 14%,

meteorological data operational system and basic integrated meteorological data operational system and infrastructure for 18%, conventional observation data and quality control for 46%, the new generation weather radar data and quality control for 8%, and Chinese meteorological satellite observation data and quality control for 6%.

In the exam of basic skill of meteorological data operation, the operation and use of meteorological data operational system accounts for 100%.

## **Chapter 6 Examination Modality and Structure**

In the exam of basic knowledge of meteorological data operation, it takes a form of closed book with a full score of 100, and the examination time is 90 minutes.

The exam of basic skill of meteorological data operation focuses on the use of operational software in the closed book form, which takes 90 minutes. According to the candidates' proficiency in relevant skills, the results of basic skill examination can be divided into four levels: unqualified, qualified, good, and excellent.

remplir le vide rempli exige seulement le résultat direct;

Exam questions typically include multiple choice, blank fill-in, glossary, short answer, and practical operation. The multiple choice questions include single-choice out of four and multiple-choice; blank fill-in only requires a direct result; glossary requires an explanation of the definition or concepts of the proposed terms; short answer requires an answer to or analysis of problems in written form based on the questions or charts listed; practical operation includes the use of meteorological data operational system and field operations.

The exam papers are comprised of the basic requirements, expanded requirements and enhanced requirements, being appropriate in terms of global difficulty, in which questions



with the basic requirements account for 80%.

## **Chapter 7 Statistics of Exam Scores**

The test scores for basic knowledge and basic skill of meteorological data operation are to be counted separately. After examination, those who get greater than or equal to 60 scores in exam for basic knowledge of meteorological data operation and qualify in exam for basic skill of meteorological data operation will be granted a qualification certificate.