

भारत मौसम विज्ञान विभाग
सूचना संचार एवं उपकरण प्रशिक्षण केंद्र, नई दिल्ली
(विश्व मौसम संगठन का क्षेत्रीय प्रशिक्षण केंद्र, नई दिल्ली)

**Advance Training Course in Meteorological Instrumentation
&
Information System (Batch No – XI)**

Final Exam: Paper –II

Max. Marks -100

Date: 01.03.2023

Time: - 10:30-13:30

Operation & Maintenance of various weather radars

1. (A) Fill in the blanks: (Answer any 4)

(1 × 4 = 4 Marks)

- i. _____ products from Doppler Weather radars are useful for aviation safety.
- ii. Generally Electro-magnetic waves in radar are _____ polarized.
- iii. _____ is the RF generating sub-unit of Radar.
- iv. _____ is a forecasting technique valid for 2 to 4 hours duration.
- v. _____ mode of operation is used in Radars for continuous and automatic operation of Weather Radars.

1. (B) Indicate True or False with justification: (Answer any 3)

(2 × 3 = 6 Marks)

- i. S-band radars cannot be used for thunderstorm studies.
- ii. Very accurate velocity measurements are made at the core of cyclone when cyclones are more than 350 kms away from radar station.
- iii. Zero Watt power is equal to 0 dBm in logarithmic scale.
- iv. Z, V, W are secondary products produced by DWRs.

RADAR Meteorology

2. (A) Fill in the blanks: (Answer any 7)

(1 × 7 = 7 Marks)

- i. IMD has installed a number of S-band Radars in entire coastline to observe and track _____.
- ii. RADAR is a _____ sensor.
- iii. Doppler Weather Radars have benefit over the conventional Radars due to its _____ product.
- iv. Radar cross-section is expressed in _____.
- v. Phased array radar is used for _____.
- vi. Presentation of longer range echoes in shorter range displays are known as _____ folded echoes.
- vii. The reflectivity of a radar beam depends on the diameter of the _____.
- viii. An S-shaped radial velocity pattern indicates a _____ and indicates _____.

2. (B) Indicate True or False with justification: (Answer any 5)

(2 × 5 = 10 Marks)

- i. RADAR is an acronym for Range Detection with Radio.
- ii. Bounded weak echo region is due to updraft in Thunderstorm.
- iii. In a RADAR system the transmitter of the radar is more sensitive than the receiver.
- iv. The velocity component of a target relative to the radar beam is known as the "Spectral Width".
- v. If the back scattering cross-section area of large targets is equal to their physical size, it is known as Rayleigh scattering.
- vi. Differing colors on radar reflectivity refer to Height of clouds.
- vii. For radar system, antennas with a large beam width are preferred over narrow beam antennas.

2. (C) Write Short Note: (Answer any 1)

(3 × 1 = 3 Marks)

- i. What is Doppler Dilemma?
- ii. Name the base products generated by a DWR. Describe them briefly.

Radar Technology

3. (A) Fill in the blanks: (Answer any 4)

(1 × 4 = 4 Marks)

- i. The mode of propagation in Co-axial cable is _____.
- ii. The Electric force on a charged particle is given by the formula, $F = \dots$.
- iii. If the minimum range is to be doubled in radar, the peak power has to be increased by a factor of _____.
- iv. The aggregation phenomena of electrons in Klystron tube are called _____.
- v. The Doppler dilemma states there is an _____ relationship between the unambiguous range and the unambiguous velocity.

3. (B) Please Explain in brief: (Answer any 3)

(2 × 3 = 6 Marks)

- i. Define Super refraction and Sub Refraction.
- ii. Explain In-field and Cross-field Microwave Tubes. Give example of each type.
- iii. If the minimum range is to be doubled in radar, find the factor by which the peak power has to be increased.
- iv. Explain the various types of Polarization.

Meteorological Communication Systems

4. (A) Fill in the blanks: (Answer any 7)

(1 × 7 = 7 Marks)

- i. GRIB is abbreviation of _____.
- ii. Compression and decompression techniques are used in Video Conference to _____.
- iii. For remote locations and during natural calamities, _____ is the best method of communication.
- iv. BUFR means _____.
- v. Compression and decompression techniques are used in Video Conference for _____.
- vi. AFTN is the short form of _____.
- vii. Airline Operators retrieve OPMET data from _____.
- viii. At RTH/AMSS bulletin transmission at scheduled times is managed by _____.

4. (B) Indicate True or False with justification: (Answer any 5)

(2 × 5 = 10 Marks)

- i. AMSS Chennai has direct link with Tokyo.
- ii. There are several NCs connected with GISC.
- iii. From Routing Catalogue, it is possible to know the source of message.
- iv. CIPS is installed at each RMC.
- v. In WMO GTS message, destination address is written.
- vi. Synergie system is a message communication tool.

4. (C) Write short note: (Answer any 1)

(3 × 1 = 3 Marks)

- i. Explain RTH/AMSS Scheduler.
- ii. Give brief description of PWS.

Introduction to HTML and PHP, GIS Platform and Development

5. (A) Fill in the blanks: (Answer any 4)

(1 × 4 = 4 Marks)

- i. HTML stands for _____.
- ii. GIS represents X-coordinate in _____ direction.
- iii. _____ property is used for changing the font face.
- iv. Java script is _____ language? (Interpreted/Compiled)
- v. The extension of CSS file is _____.

5. (B) Answer the questions: (Answer any 3)

(2 × 3 = 6 Marks)

- i. List three ways to include CSS in the webpage?
- ii. What are the major GIS functions?
- iii. How to create a hyperlink in HTML?
- iv. What is web server?

5. (C) Indicate True or false with justification:(Answer any 2)

(2 × 2 = 4 Marks)

- i. HTML is used for development of web pages? True/False. Explain briefly
- ii. JavaScript is a case sensitive language.
- iii. Do all HTML tags have an end tag?

5. (D) Answer the questions: (Answer any 2)

(3 × 2 = 6 Marks)

- i. Write short note on HTML and XML.
- ii. Discuss two types of data models in GIS?
- iii. Briefly discuss the feature of JavaScript.

Linux and server Management

6. (A) Fill in the blanks: (Answer any 4)

(1 × 4 = 4 Marks)

- i. SWAP partition can be _____ if RAM is 2GB.
- ii. Linux is _____ operating system.
- iii. The hidden files are preceded with _____ in file list.
- iv. One directory of all ordinary users by default is _____.
- v. Only _____ is allowed executing user mode command.
- vi. _____ is responsible for memory, process, and file management in Linux.

6. (B) Answer the questions: (Answer any 3)

(2 × 3 = 6 Marks)

- i. Enlist five basic Linux commands to find file content?
- ii. Enlist some Linux networking and troubleshooting commands.
- iii. Explain the utility of Linux 'if config' command.

6. (C) Answer the questions: (Answer any 2)

(5 × 2 = 10 Marks)

- i. Explain the redirection operator with examples.
- ii. How to get a List of All Users in Linux? Describe the information contained in each field.
- iii. What are the basic partitions required to be created for Linux installation? What should be the partition sizes for a Disk drive space of 40GB and RAM size 2GB?
