

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 B-IX

Date: 28.02.2022

Final Exam (Paper-II)

Max. Marks -100

Time: - 10:30-13:30

Operation and Maintenance of Radar(10 marks)

A(1)FILL IN THE BLANKS (Any 4 out of 6)

4x1 = 4 marks

- a. Ground clutter results from backscattering from the radar beam -----.
- b. As a train with a whistle approaches a stationary observer, the whistle will have a _____ frequency (pitch) and lower wavelength relative to the observer's detection as the train approaches the observer as compared to when the train whistle is moving away from the observer.
- c. Ducting is due to the -----phenomenon suffered by radar beam.
- d. For Cyclone detection _____(X- Band,/S-Band,/C-Band) used
- e. Beam attenuation is ----- while passing through a large number of hydrometeors.
- f. Number of degrees the beam is transmitted above the horizon is called -----.

A(2)TRUE OR FALSE WITH BRIEF REASONS (Any 3 out of 5)

3x2 = 6 Marks

- a. Radar can detect a tornado.
- b. The total number of base products in a dual-polarized DWR is three.
- c. Radar beam spread helps to detect small snow crystals.
- d. The resolution of radar data decrease with distance away from the radar site.
- e. Echoes detected by sidelobes at low elevation beam angles are true echoes.

Radar Meteorology(20 marks)

B(1)FILL IN THE BLANKS (Any 10 out of 12)

10x1 = 10 marks

- a. ----- and ----- are the two types of radar based on signal type.
- b. If the bright colour patch (dBZ> 40) is seen in maxZ product of any Doppler Weather Radar up to 8 km height, the cloud being observed is most probably -----cloud.
- c. The most common wavelength used for RF transmission in C-band Radars is ----- Centimeter.
- d. Doppler Weather Radars have benefit over the conventional Radars due to its ----- product.
- e. ----- scattering approximation is used in Weather Radars detecting precipitation

- f. If the bending of wave is downward towards the earth more than the anticipated path of the beam for a particular elevation it is called
- g. occurs just below the freezing level when the melting ice particles mimic like very large drops
- h. A Radar antenna is generally a parabolic dish antenna that is very sensitive with gain
- i. principle of Doppler Effect is used for distinguishing the ----- targets from ----- objects.
- j. is a process of bending of electro-magnetic radiation while travelling between two media of different refractive index
- k. Wavelength of X-Band RADAR is _____ (less/more) than that of S-Band Radar.
- l. The resolution of a pulsed radar can be improved by _____ - (Increasing/decreasing) the pulse width.

B(2)TRUE OR FALSE WITH BRIEF REASON (Any 3 out of 5)

3x2 = 6 Marks

- RADAR is an acronym for Range Detection with Radio
- S-band radar are economic than C-band radar.
- Range Height Indicator product (RHI) is in which reflectivity, radial velocity or spectral width is presented on a conical surface of a constant elevation as an output image
- Meteorological targets like clouds are Distributed targets, with the billions of raindrops that contribute to the returned energy
- Radar echo can detect rain may not be recorded by rain gauge at same place.

B(3)SHORT ANSWER TYPE (Any 2 out of 3)

2X2=4marks

- What is spectrum width and the importance it has?
- Draw labelled block diagram of basic Doppler weather radar.
- Explain the impact of scattering on radar beam.

Radar Technology(10 marks)

C(1)(Any 4 out of 6)

4x1 = 4 marks

- Bring out the comparison of antenna size between S-band DWR and C-band DWR.
- What are the operating frequency bands used in IMD for RADAR?
- How many basic parameters measured by Doppler weather radars?
- What are the additional parameters measured by polarimetric radars?
- Which unit is used to protect receiver from high power transmitted signal?
- Name the data products of Doppler radar.

C(2)TRUE OR FALSE WITH BRIEF REASON (Any 3 out of 5)

3x2 = 6 Marks

- Output power of magnetron is higher than that of klystron.
- Doppler radar utilizes the phase property of electromagnetic radiation for estimation of distance of the scatterer.
- COHO in receiver is used to determine Intermediate frequency.
- X band radars having large antenna than S band.
- Jaipur C-band DWR is dual polarized.

Meteorological communication systems (20 marks)

D(1) FILL IN THE BLANKS (Any 10 out of 11)

1x10 =10 marks

- a. Full form of TDCF is _____.
- b. RTH is responsible for ----- data exchange.
- c. SADIS is used to disseminate _____.
- d. Airline Operators retrieve OPMET data from _____.
- e. compression and decompression techniques are used in Video Conference to -----
- f. _____ is the best method of communication for remote locations and during natural calamities.
- g. At RTH/AMSS bulletin transmission at scheduled times is managed by _____.
- h. AFTN is the short form of _____.
- i. AFTN Address has _____ characters
- j. GRIB is abbreviation of _____.
- k. How many components are there in WIS ?

D(2) TRUE OR FALSE WITH BRIEF REASON (Any 5 out of 7)

5x2 = 10 Marks

- a. AMSS Mumbai has direct link with Tokyo.
- b. From Routing Catalogue, it is possible to know the source of message.
- c. In WMO GTS message, destination address is written.
- d. CIPS is installed at each RMC.
- e. Synergie System is a message communication tool.
- f. There are several NCs connected with GISC.
- g. It is not possible to convert SYNOP to BUFR message.

Introduction to HTML and PHP/GIS (20 marks)

E(1) FILL IN THE BLANKS (Any 10 out of 12)

1x10 = 10 marks

- a. PHP is acronym for.....
- b. Android is an.....operating system.
- c. PHP is ...scripting language.
- d. WWW stands for.....
- e. Correct HTML tag to describe HTML document.....
- f. GIS stands for.....
- g. Java Programming invented by.....
- h. XML stands for.....
- i. Vector data features are Line, ,
- j. GIS captures and analyses , type of data.
- k. Android is a mobile operating system based onkernel.
- l. is Default programming language of Android.

E(2) TRUE OR FALSE WITH BRIEF REASON (Any 5 out of 7)

5x2 =10 Marks

- a. HTML is used for development of web pages
- b. Java is platform dependent

- c. PHP doesn't support database
- d. GIS handles both raster and vector data
- e. All XML elements must have a closing tag
- f. Drupal is used to create Content Management System
- g. HTML can be used in PHP

Linux & server Management(20 marks)

F(1) FILL IN THE BLANKS (Any 10 out of 12)

1x10 = 10 marks

- a. Linux is -----operating system.
- b. SWAP partition can be -----GB if RAM is 2GB.
- c. The hidden files are preceded with -----in file list.
- d. Home directory of all ordinary users by default is -----.
- e. Only----- is allowed to execute usermod command.
- f. Command for removing file in Linux is
- g. files are preceded by a dot
- h.are similar to short cut in windows
- i. Command to find memory in Linux
- j. Command to find disk space in Linux.....
- k. is used to for wild card entries
- l. Linux is more secure than

F(2) SHORT ANSWER TYPE QUESTION (Any 5 out of 7)

5x2 = 10 marks

- a. How do you terminate an ongoing process?
- b. How to find and set user expiry date?
- c. How can you append one file to another in Linux?
- d. What is redirection?
- e. How to exit from vi editors?
- f. What is the utility of linuxifconfig command?
- g. What are the kinds of permissions under Linux?