INDIA METEOROLOGICAL DEPARTMENT

QUESTION BANK

OF

INTEGRATED MET. TRAINING COURSE (IMTC)

FINAL EXAMINATION

BASED ON 1-11 BATCHES (2013-2021)

PAPER-IV: MET TELECOMMUNICATION AND INSTRUMENTATION

PART : A AND B

INDIA METEOROLOGICAL DEPARTMENT

INTEGRATED MET. TRAINING COURSE (IMTC)

QUESTION BANK FOR FINAL EXAMINATION

BASED ON QUESTION FROM BATCH 1 TO 11

PART A : MET TELECOMMUNICATION

Q 1. Fill in the blanks

1. _____ indices are associated with forecasting of thunderstorm.
2. _____ trough develops off the west coast of India.
3. _____ is an example of mesoscale systems.
4. _____ command is used to display the name of the operating system.
5. _____ is a major part of WMO information system (WIS).
6. _____ antenna is used to make the microwave beam unidirectional.
7. _____ is used to delete the data inside the table, and not the table itself.
8. _____command is issued to view all the current TCP/IP network configurations values of the computer.
9. 192.168.0 / 24 is a Class _____network.
10. 192.168.5.0 / 24 is a class _____ network.
11. All variables in PHP start with the symbol _____.
12. Along a Ridge line_____ changes abruptly and pressure _____ on both sides.
13. AMMS is stands for _____.
14. AMSS receive, check and forward automatically, meteorological data and products according to the_____standards.
15. Binary code of "A" is _____ .
16. CCCC indicate the _____ in the messages.
17. Compared with Windows, the main advantage of LINUX systems is _____.
18. CSS stands for _____and SQL stands for _____.
19. Frequency range of HF is _____ .
20. Full form of ASCII is _____ and Full form of BUFR is _____.
21. GSM Mobile technology uses two principles _____ and _____ .
22. GSM operates on two frequency bands i.e either _____ or _____ MHZ .
23. GISC is stands for _____.
24. GSM stands for _____ and GPRS stands for _____.
25. GTS stands for _____ and WMO stands for _____ .
26. HSDT stands for_____ and VSAT stands for _____.
27. HTML stands for _____ and it displays _____ .
28. In PHP, function _____ is used to access MySQL database.
29. In PHP, function _____ is used to delete the database.
30. IVRS is popularly known a weather on telephone and its toll free No is_____

31. IVRS stands for Interactive _____Response Systems
32. Java Script is executed on _____, while PHP is executed on _____.
33. LAN stands for _____ .
34. LUF stands for _____ and MUF stands for _____.
35. Microburst produces ____ damage whereas tornadoes generally have _____ damage.
36. Microwave is used in _____ communication.
37. Microwaves are the electromagnetic waves of short wavelength ranging from nearly_____.
38. Mirror RTH is situated at _____
39. One of the binary message formats used in meteorological communication is _____.
40. _____.
41. One of the binary message formats used in meteorological communication is _____ .

a) OS b) Unix c) Kernel d) Uname

42. RFID stands for _____ and is used for _____.
43. The _____ software is the most AMSS GUI based software available in IMD.
44. The _____ is a useful command for getting information from DNS server.
45. The _____command is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping, or other DNS records.
46. The CIPS system is stands for _____.
47. The command 'chmod' is used to change the _____ of the file in linux.
48. The command used in Linux to change group of a file is _____ .
49. The _____ server maintains the name to IP address mapping of the domain for which it is the name server .
50. The name of the latest Forecaster workstation in IMD is _____.
51. The output of the statement $str = 'a\b '; is _____.
52. The ping command verifies_____ to other hosts.
53. The process of imposing an input signal on a carrier wave is known as _____ and the process in which an extracting the original information-carrying signal from a modulated carrier wave is known as _____.
54. The statements (1) $c = 'a * b' ; and (2) echo $c; gives the result _____.
55. The_____ command traces the route of the packet.
56. The_____ server maintains the name to IP address mapping of the domain for which it is the name server.
57. The_____command traces the route of the packet.
58. The_____command is usually used as a simple way to verify that a computer can communicate over the network with another computer or network device.
59. There are _____ different IPv4 Address classes.
60. Two ROBEX centres in India are _____ and _____ .
61. URL stands for _____ and html stands for _____.
62. V-SAT stands for _____

63. WAN stands for _____ .
64. _____ command is used to display operating system name .
65. Which command is used to display operating system name?
66. WWW stands for _____in WMO program

Q 2. Write True or false with reason

1. 5G is a fifth generation wireless technology that brings wider channels (speed), lower latency and more bandwidth.
2. A VPN (Virtual Private Network), allows you to create a secure connection to another network over the Internet.
3. AMSS located at 6 different locations.
4. CIPS Data Centre Working based on WINDOWS Operating System.
5. CIPS is used as forecasting system in IMD.
6. CREX is a format for binary data. Give reason.
7. Describe the headers for the following data types
8. DHCP server responds the devices by assigning an IP address.
9. Explain VSAT.
10. GISC stands for Geographical Information System Centre .
11. GTS is the communication and data management component in WWW of WMO.
12. IMD is using the transponder of Satellite 3D and 3DR.
13. IPv4 addresses are 128-bit address written in hexadecimal.
14. IPv4 addresses are 32-bit numbers that are typically displayed in dotted decimal notation.
15. IPv6 addresses are 64-bit address written in decimal.
16. LAN is used to connect computers inside a room.
17. Mirror RTH is situated at C R & S ,Pune.
18. Mirror RTH is situated at Mausam Bhawan, New Delhi
19. More IPs can be allotted in IPv6 as to compared to IPv4.
20. Network spread geographically (Country or across the Globe) is called as LAN (Local Area Network).
21. One RTH is situated at Mausam Bhawan, New Delhi.
22. SYNOP Message (SMIN90) is a binary message.
23. TDMA is used in GPRS Communication.

24. The benefit of MPLS is to eliminate dependence on particular data link layer technology.
25. The DHCP is controlled by DHCP server that dynamically distributes network configuration parameters such as IP addresses, subnet mask and gateway address.
26. The metadata is data of Metar data
27. There are seven AMSS in IMD?
28. TRANSMET System is not GUI of AMSS.
29. Unix is more secured than Windows. .
30. Vertical time section may be plotted either from east to west or from west to east.
31. VHF and UHF waves fall under the category of Sky waves.
32. VHF and UHF waves fall under the category of Sky waves.
33. VSAT technology is a telecommunication system based on wireless satellite technology.
34. WAN is used to connect computers inside a room.
35. WANs are used to connect LANs and other types of networks together so that users and computers in one location can communicate with users and computers in other locations.
36. What is NKN. Mention its connectivity in IMD.
37. What is the difference between HF and Microwave Communication.
38. What is the difference between IPv4 and IPv6
39. What is the difference between LAN, WAN and VPN.
40. What is VPN. Which protocol is used in VPN.
41. Windows is open source software.
42. Write the use of IVRS and HSDT in IMD.
43. WWW is world wide web in WMO program.

Q 3. Answer the following questions

1. Briefly describe LAN, WAN and TCP /IP protocol.
2. Briefly describe the functions of TRANSMET System.
3. Create a message of a METAR in both WMO and ICAO standard.
4. Describe the main purpose of Synergie System?

5. Describe any two components of WWW Components?
6. Describe briefly GTS.
7. Describe briefly OSI layer structure.
8. Describe briefly the applications on the Intra-IMD portal METNET.
9. Describe briefly the applications on the Intra-IMD portal METNET.
10. Describe briefly the difference between Switch, Hub and Router.
11. Describe Components of WIS (WMO Information System).
12. Describe hierarchical structure (on three level) of GTS?
13. Describe OSI Model /TCP/IP Protocol.
14. Describe the headers for the following data types
15. Describe the main three application of synergie system.
16. Draw schematic diagram showing connectivity of RTH New Delhi With National Network.
17. Explain the synergie system
18. Explain $_GET[] and $_POST[].
19. Explain concept of GISC in brief?
20. Explain concept of WIS and GISC
21. Explain concept of WIS.
22. Explain elements of communication System.
23. Explain is the differences between FTP and TELNET protocol.
24. Explain the block diagram of communication Systems and also explain elements of communication System.
25. Explain the block diagram of communication Systems.
26. Explain the concept of GISC in brief ?
27. Explain the following commands in linux :- chmod, ifconfig, pwd, reboot and mkdir.
28. Explain the principle of Optical Fiber Communication and describe briefly OSI layer structure
29. Explain the synergie system and Describe the main purpose of Synergie System?
30. Give examples, one for each, where BUFR and CREX formats are being used.
31. Give some example, in terms of frequency bands for LOS propagation?
32. Give some example, in terms of frequency bands. What is LOS propagation?
33. Give the difference between IPv4 and IPv6.

34. Give the difference between Router and Firewall.
35. Give the difference between Switch and router.
36. How does GIS works ?
37. How does the intensity of wave fall in LOS proagation with distance and why ?
38. How does the intensity of wave fall in LOS propagation with distance and why ?
39. Steps to establish connection from PHP to MySQL
40. TDMA ? What is the advantage of TDMA over to traditional format ?
41. What are BUFR and CREX ? Give examples, one for each, where these formats are being used.
42. What are main components of WIS ?
43. What are the benefits of communication over Optic Fiber Cable ?
44. What are the functions of Automatic Message Switching System (AMSS) ?
45. What does WIS Stands for ?
46. What is a GIS ?
47. What is a GIS and How does GIS works ?
48. What is a Mesh topology ?
49. What is a ring topology ?
50. What is a WIS Stands for ? What are its main components ?
51. What is AMSS and explain in detail the functioning of AMSS.
52. What is BUFR and CREX ?
53. What is CIPS ? Write down Main features of CIPS.
54. What is difference between Hub, switch and router?
55. What is importance of OPMET ?
56. What is LOS propagation?
57. What is OPMET ? What is its importance ?
58. What is TDMA ?
59. What is the advantage of TDMA over to traditional format ?
60. What is the basic components of communication system ?
61. What is the classification of radio waves depending upon the mode of propagation?
62. What is the total internal reflection phenomenon and how it is useful in Optical Fiber Communication.
63. What is WMO Information System (WIS). Explain the role of GISCs and DCPCs.

64. What is WWW in WMO program and Mention components of WWW?
65. Which principle is used in optical fiber communication ?
66. Why IPv6 is more secured than IPv4 ?
67. Write a role of Data Collection Production Center (DCPC).
68. Write a role of National Centers (NC). I
69. Write a sample code to establish connection from PHP to MySQL
70. Write advantages and disadvantages of using PHP.
71. Write down the active and passive components in Networking.
72. Write down the layers in OSI Model / TCP/IP Protocol
73. Write in brief about use of one of the following tools used in web designing with at least one example : (a) JAVA, (b) PHP (c) HTML
74. Write the names of six Met Telecommunication Systems used in IMD.
75. Write the names of six Met Telecommunication Systems used in IMD.
76. Write the use of IVRS and HSDT in IMD ?

Q 4 Write Short notes on

1. Briefly describe LAN, WAN and TCP/IP protocol.
2. Describe briefly GTS and its hierarchical structure (on three level)?
3. Describe Components of WIS (WMO Information System).
4. Describe OSI Model /TCP/IP Protocol.
5. Describe the main purpose of Synergie System
6. Difference between Switch and Router.
7. Explain the synergie system and describe its main purpose?
8. Explain $_GET[] and $_POST[].
9. Explain is the differences between FTP and TELNET protocol.
10. Explain the following commands in linux :- chmod, ifconfig, pwd, reboot and mkdir.
11. Explain VSAT briefly?
12. Describe Components of WIS (WMO Information System)?
13. Geographical Information System (GIS).
14. List all the Met Telecommunication systems available in IMD and Describe any two of them briefly?
15. ROBEX bulletin

16. Steps to establish connection from PHP to MySQL
17. What are the benefits of communication over Optic Fiber Cable ?
18. What is difference between Hub, switch and router?
19. What is GIS and Explain its type and methodology?
20. Write in brief about use of one of the following tools used in web designing with at least one example : (a) JAVA, (b) PHP (c) HTML
21. Write steps to establish connection from PHP to MySQL with sample code

PART B : INSTRUMENTATION

B1- (SURFACE INSTRUMENTS)

Q 1. Fill in the blanks

1. _____ command is used to display the name of the operating system.
2. _____ is used to delete the data inside the table, and not the table itself.
3. _____ antenna is used to make the microwave beam unidirectional.
4. _____height of station is necessary for calculating QNH.
5. A black body is _____ absorber of radiation.
6. All variables in PHP start with the symbol _____.
7. An aneroid barometer must be calibrated against the _____.
8. Anemometer is used for measurement of _____ .
9. Compared with Windows, the main advantage of LINUX systems is _____.
10. CSS stands for _____and SQL stands for _____.
11. Data retrieval is possible from an Astra data logger by _____.
12. Datum point is an object whose _____ is already known.
13. Diffuse Solar radiation is measured by _____and _____.
14. DIWE has two sensors namely_____ and _____.

15. DPTA stands for _____ .
16. During night P.B. Observation ---------- is attached to the balloon.
17. Frequency range of HF is _____ .
18. Full form of ASCII is _____ and Full form of BUFR is _____.
19. GPRS stands for _____ .
20. GPS receiver and its antenna is used in satellite based AWS for .
21. GSM stands for _____ and GPRS stands for _____.
22. GTS stands for _____ and VSAT stands for _____.
23. HTML stands for _____and URL stands for _____.
24. Hygrograph is used for measurement _____.
25. IF frequency of SAMEER Radio theodolite is _____ MHz.
26. If the air temperature is coded as 676 for Sutron AWS, the actual value is _____°C
27. IMD has a network of 56 Stations in its RS/RW upper air network.
28. In kew pattern barometer pressure is read in _____ .
29. In minimum thermometer ---------- is used as sensing liquid.
30. In PHP, function _____ is used to access MySQL database.
31. In PHP, function _____ is used to delete the database.
32. Name an analog sensor used in existing AWS of IMD._____.
33. Nephascope is used for measuring the ----------of cloud.
34. One of the binary message formats used in meteorological communication is _____.
35. One of the WMO GUAN standard station in IMD's upper air network is Portblair / Srinagar / Chennai / Goa (Choose correct one).
36. PRBS & TDMA is the acronym for _____ and _____.
37. Pyrheliometer installed on _____ is used in solar radiation station for measurement of _____
38. Runway visual range (RVR) is measured _____.
39. SAMEER radiotheodolite antenna consist of 32 dipoles.
40. Significant levels are ---------- reported in P.B. message when they are observed below 1 K.M. a.s.l.

41. Solar Radiation Station used to measure _____ and _____.
42. Stevenson screen is used for keeping of _____ .
43. Sun photometer is used for the measurement of _____.
44. Temperature-humidity sensor is mounted at a height of _____ in the mast.
45. The density of moist air is ---------- than that of the dry air.
46. The antenna of the satellite based AWS faces the direction of _____ .
47. The antenna of the satellite based AWS faces the direction of _____ .
48. The antenna used in IMS-1500 system is of Dish (parabolic)Type.
49. The AWS transmission are in _____ and _____ mode.
50. The balloon is tracked initially through the _____ telescope for a few minutes.
51. The battery of the AWS is charged using _____.
52. The battery rating (V/Ah) used in AWS / ARG in general is _____ .
53. The calibration of all surface instruments at observatory is required at an interval of _____.
54. The centre of gravity of the wind vane coincides with the _____.
55. The command 'chmod' is used to change the ____ _____ of the file in linux.
56. The GPS based radio sounding system operates at 403 MHz (any value between 400-406 MHz) frequency.
57. The height of the wind sensor w.r.t surface is _____ .
58. The hourly message transmitted by an AWS consisting of _____ bits.
59. The instrument used to measure the height of the cloud is called _____.
60. The line joining projection of moving balloon horizontally is known as _____of the balloon.
61. The link satellite of AWS is _____ and placed at _____ ˚ E.
62. The name of instrument used for cloud height in Airport is called _____.
63. The name of instrument used for recording visibility is called _____ .
64. The name of the latest Forecaster workstation in IMD is _____.
65. The number of AWS sites that can be accommodated in a particular uplink frequency in TDMA technology is _____.

66. The number of tips shown by a TBRG used in IMD with 200 mm collector diameter for 100 ml of water is._____.
67. The output of the statement $str = 'a\b '; is _____.
68. The soil sensors of Agro AWS is used for _____.
69. The Solar panel is the used to Charge _____ of AWS /Agro AWS/ ARG.
70. The statements (1) $c = 'a * b' ; and (2) echo $c; gives the result _____.
71. The TBRG sensor has _____ output.
72. The Temperature sensor have _____ output.
73. The Thermograph and Hygrograph used in Surface observatory is kept in _____.
74. The wind sensors used for Agro AWS should be installed at a height of _____
75. Thermograph is used for measurement _____.
76. Thermometer used in Surface observatory for the purpose_____
77. URL stands for _____ and html stands for _____.
78. Usually the preventive maintenance of the AWS/ARG is done at the interval of _____ .
79. Usually the preventive maintenance of the AWS/ARG is done at the interval of _____ .
80. Wind direction is measured in ---------- point of compass.

Q 2. State the following statement whether True or False with Justification

1. A tail with flags is attached the balloon during day time P.B. ascent.
2. Analog anemometer is used for measuring wind speed in DIWE/CWIS.
3. AWS /ARG transmit the hourly data to polar orbiting satellites.
4. Caustic Soda and Ferro silicon are used for generation of Hydrogen.
5. Cloudy nights are normally warmer.
6. Constant rate of ascent is assumed for day PB ascent.
7. Conventional measuring jar of ORG can be used to calibrate TBRG.
8. Conventional Rain Gauge can be used for the AWS
9. Conventional Thermometer can be used for the AWS.
10. DCWIS is used for Wind measurement only in airports.
11. DHCP server responds the devices by assigning an IP address.

12. Direct Solar Radiation & Global Solar Radiation are same parameters.
13. DIWE is used for Wind measurement in airports.
14. GPRS modem is not required for satellite communication.
15. GPS antenna is used in AWS for data transmission
16. GPS is essential for automatic transmission in the existing AWS.
17. GPS is essential for time synchronisation of Datalogger of AWS/Agro AWS/ARG.
18. Identification letter for surface and ship code are BBXX & AAXX respectively.
19. In P.B. message 50 is added in date (YY).
20. IPv4 addresses are 128-bit address written in hexadecimal.
21. Iron can be used as an earthing material.
22. Look angles are important for orienting an antenna.
23. Low Noise Amplifier in AWS data receiving earth station antenna should have high noise temperature.
24. Maximum thermometer is kept slightly in a tilted position.
25. More IPs can be allotted in the IPv6 compared to IPv4.
26. Non-recording rain gages do not require chart and clock for continuous measurement of rainfall.
27. On-site calibration of pressure / rainfall sensor is required during every site visit.
28. Photo detectors are used for spectral measurements of specific wavelengths.
29. Potentiometric wind vane has resistance varying from 0 to 10 ohm.
30. Pressure sensors used in AWS give Station level pressure.
31. Pyranometer is used for long wave radiation measurement.
32. Pyrheliometer is used for long wave radiation measurement.
33. Radiotheodolite systems use super-hetrodyne type of Receivers.
34. RS 422 communication is used at the output of pressure sensor of AWS.
35. RSGE sounding systems are used as stand by equipment at each of the RS/RW station.
36. Self-recording rain gages (SRRG) do not require chart and clock for continuous measurement of rainfall.
37. Short Wave Radiation and Long wave radiation have same wavelength.
38. SODAR system works on Microwave Frequencies.
39. Solar panel is mounted facing East.
40. Solar panel is mounted facing north.

41. Solar tracker is used for tracking the sun.
42. Sunshine duration cannot be measured automatically
43. SYNOP Message (SMIN90) is a binary message.
44. TBRG is an analog sensor in AWS.
45. TDMA is used in GSM Communication.
46. Temperature and Relative Humidity sensors used in AWS/ARG/ Agro AWS also provide DEW Point in Datalogger.
47. The area of an ARG site is 10mX10m.
48. The benefit of MPLS is to eliminate dependence on particular data link layer technology.
49. The direction of door opening of Stevenson screen is north in northern hemisphere.
50. The GPS antenna is a Tx antenna.
51. The quality control parameters can be implemented at the earth station of AWS.
52. The resolution of TBRG sensor used in IMD is 0.1 mm.
53. The resolution of TBRG sensors used in IMD AWS/Agro AWS/ ARG is 7 mm.
54. The resolution of wind speed is 0.01 m/s
55. The response time of the 'Supersonic wind sensor' is very large.
56. There should be at least one datum point in each direction quadrants of the P.B. observatory.
57. Thermograph requires daily maintenance..
58. Tracking of pilot balloon (PB) in optical theodolites is a fully automatic observation.
59. Turbid atmosphere cools the surface environment.
60. Ultrasonic wind sensor requires regular maintenance.
61. Ultrasonic wind sensor used in AWS has moving parts and requires maintenance
62. Ultrasonic wind sensor used in AWS requires frequent maintenance.
63. UV C radiation reaches to Earth.
64. WAN is used to connect computers inside a room.
65. What is the difference between LAN, WAN and VPN.
66. Wind sensor installed at 10 ft height.
67. Wind Vane used for measurement of wind direction requires regular maintenance.
68. Windows is open source software.

Q 3. Answer the following question

1. Briefly explain the working of IMS 1500 Radio theodolite with a block diagram.
2. (Two sentence explanation of each part.)
3. Briefly describe the functions of TRANSMET System.
4. Define AWS, Agro AWS and ARG systems.
5. Define Synop message of AWS/ARG .
6. Describe the working principle of Laser Ceilometers.
7. Describe the working principle of Laser Ceilometers. Discuss the advantages & disadvantages of a ceilometers.
8. Describe briefly OSI layer structure.
9. Describe briefly the applications on the Intra-IMD portal METNET.
10. Describe the difference between CWIS and DWIE
11. Describe the difference between MOR & RVR.
12. Describe the principle of all sensor used for Argo AWS.
13. Describe the telemetry of AWS system.
14. Describe the working principle of ultrasonic wind sensor of AWS
15. Describe the working principle of ultrasonic wind sensor of AWS
16. Describe Working principle of a Pyranometer
17. Describe Working principle of a Pyranometer & Pyrheliometers.
18. Describe Working principle Pyrheliometers.
19. Discuss about Current Weather Indicating System (CWIS), sensors used in CWIS and communication of data.
20. Draw the block diagram of the component of an AWS/ARG data receiving earth station
21. Explain all the sensors used in AWOS systems for measurement of all meteorological parameters.
22. Explain briefly about the characteristics range and other aspects of a meteorological sensors used in AWS.
23. Explain briefly the functional aspects of components of AWS/ARG.
24. Explain concept of WIS and GISC
25. Explain in brief the working principle of Transmissometer .

26. Explain the principle of Optical Fiber Communication and describe briefly OSI layer structure
27. Explain the site selection criteria for installation AWS, Agro AWS and ARG. Explain the details for sensors used in Agro AWS.
28. Give a short detail of the exposure conditions for AWS sensors.
29. How it is being for measurement of Station level Pressure and Mean sea level Pressure?
30. Importance of radiation measurements.
31. List the parameters observed in radiosounding upper air profile, and explain how the winds are derived in GPS based sounding system.
32. Major Merits of Integrated Aviation Meteorological Systems
33. Normal Height card
34. Setting of minimum and maximum thermometer
35. Significant wind level
36. State the general instructions for preventive maintenance of AWS, Agro AWS and ARG.
37. State the general instructions for preventive maintenance.
38. What are the major advantages of a ceilometers .
39. What is Allard's Law.
40. What is AMSS and explain in detail the functioning of AMSS.
41. What is Barometer?
42. What is datum pressure in AWS .
43. What is difference between AWOS and CWIS?
44. What is difference between AWOS and DWIE? Explain all the sensors used in DWIE systems for measurement of all meteorological parameters.
45. What is digital barometer and also write the advantages and disadvantage with mercury barometer
46. What is direct solar radiation and explain working principle of a Pyrheliometer
47. What is Koschmeider's Law.
48. What is Pyranometer? How it is being for measurement of global and diffuse solar radiation?
49. What is the principle of wind Anemometer?
50. What is WMO Information System (WIS). Explain the role of GISCs and DCPCs.

51. Why it datum pressure necessary?
52. Wind Instrument its maintenance and exposure conditions
53. Working Principle of potentiometric wind vane
54. Write a short note on Wind Profiler system.
55. Write advantages and disadvantages of using PHP.
56. Write in brief about Current Weather Indicating System (CWIS)
57. Write the sensors used in CWIS and communication of data.

Q 4 Write Short notes on

1. Briefly describe LAN, WAN and TCP/IP protocol.
2. Detail the purpose of establishing AWS network.
3. Difference between Switch and Router.
4. Draw the block diagram of an AWS and explain all the components
5. Explain $_GET[] and $_POST[].
6. Explain is the differences between FTP and TELNET protocol.
7. Explain the following commands in linux :- chmod, ifconfig, pwd, reboot and mkdir.
8. Importance of radiation in the study of Meteorology
9. QFE & QNH
10. Steps to establish connection from PHP to MySQL
11. What are the sensors used in Astra-make Agro AWS?
12. What is Ceilometer and Transmissometer and explain its principle. b) What is Ultrasonic wind sensors. Explain its principle of operation c) What is META data. Why it is very important for surface observations
13. What is difference between Hub, switch and router?
14. What is SRRG (Self Recording Rain gauge) and explain its principle.
15. What is wind sensors and how many types. Explain its principle of operation of any one type of wind sensors?
16. What is AWS? Why it is very important for surface observations
17. Working Principle of potentiometric wind vane.
18. Write in brief about use of one of the following tools used in web designing with at least one example : (a) JAVA, (b) PHP (c) HTML
19. Write steps to establish connection from PHP to MySQL with sample code

PART B : INSTRUMENTATION B2- (UPPER INSTRUMENTS)

Q 1. Fill in the blanks

1. _____(88/99/77) Indicator in TTAA of Temp code represents Pressure level of Tropo pause.
2. A Zener diode operates in the _____region.
3. A black body is absolute absorber of radiation.
4. A circuit with a voltage gain of one is said to have_____ .
5. AND , OR and NOR represent three …….. on logic variables .
6. Approximate weight of the GPS Sonde is _____ .
7. Basic sensor for measurement of Temperature in Radio sonde is _____
8. Calibration is the process of …….. an instrument
9. DIWE has two sensors namely Wind anemometer and wind vane
10. Altitude of Stations height of station is necessary for calculating QNH.
11. Frequency range of HF is ……
12. Gain of Antenna is expressed in _____(dBi/ dBm)
13. IF frequency of SAMEER Radiotheodolite is _____.
14. IMD has a network of ____ Pilot Balloon stations
15. IMD has a network of _____ WMO GUAN standard Stations in its RS/RW upper air network. i) 6 ii) 12 iii) 56
16. IMS-1500 radiotheodolite antenna is of …….. type.
17. In a transmitter …….. oscillator is used.
18. In Frequency Modulation the amplitude of the carrier is _____.
19. In Hydrogen Factory Agra, Hydrogen gas is collected in the Gas holder (Gasometer) through the process called _____
20. Inductance oppose ……. In current in a circuit.
21. Isotropic Antenna radiates signal _____
22. Maximum Wind indicator group in Temp code is _____

23. Power factor is given by the ratio of the resistance and _____.
24. Radio sonde transmitter uses _____(Directional / Isotropic / both) antenna .
25. Rectifier converts _____ into _____.

26. SAMEER radiotheodolite antenna consists of …….. Dipoles.
27. Temperature-humidity sensor is mounted at a height of 2m height in the mast.
28. The antenna used in RSGE is of ……..Type.
29. The battery of the AWS is charged using solar battery
30. The battery rating (V/Ah) used in AWS / ARG in general is 12 V, 65 AH SMF BATTERY
31. The centre of gravity of the wind vane coincides with the Centre of gravity lies on spindle of wind vane.
32. The e.m.f. induced in a coil of N turns is given by ……..
33. The FM process does not increase the _____content of the carrier wave.
34. The gain of an ideal operational voltage amplifier is _____.
35. The GPS based radio sounding system operates in the following frequency range: i) 400-406 MHz ii) 800-900 MHz iii) 1200-1400 MHz
36. The height of the wind sensor w.r.t surface is 10 m height.
37. The Humidity sensor in GPS based radiosounding is of. i) Bead type ii) Digital IC iii) Capacitive type
38. The Intermediate frequency (IF) of IMS-1500 system is…….MHz.
39. The name of instrument used for recording visibility is called Transmissometer
40. The observation of upper winds in radiosounding are based on. i) Drift of balloon in air ii) Atmospheric pressure iii) Atmospheric humidit.
41. The observation of upper winds in radiosounding are based on. i) Drift of balloon in air ii) Atmospheric pressure iii) Atmospheric humidity
42. The Temperature sensor in GPS based radiosounding is of. i) Bead type ii) Digital IC iii) Capacitive type
43. Total antenna efficiency (E_T) = _____ .
44. Usually the preventive maintenance of the AWS/ARG is done at the interval of Every three months (or Quarterly basis) .

45. Which is a scheduled time of observation for upper air balloon ascents. i) 0530 UTC ii) 0830 IST iii) 1730 IST

46. Which is not a scheduled time of observation for upper air balloon ascents. i) 0530 IST ii) 0830 IST iii) 1730 IST

47. Which of the following parameter is directly observed in general in RS/RW ascent i) Dew point temperature ii) Pressure iii) Height a. m. s. l.

Q 2. State the following statement whether True or False with Justification / Do as directed.

1. A band pass filter is built in the radiosonde transmitter circuit just before transmitting antenna.
2. A parallel a.c. circuit draws maximum current when in resonance.
3. A power amplifier is built in the radiosonde transmitter circuit just before transmitting antenna.
4. A pre-amplifier is provided with the antenna of a radiosounding system situated at the roof top.
5. AND gate may not be obtained using NOR gate.
6. Caustic Soda and Ferro silicon are used for generation of Hydrogen
7. Cloudy nights are normally warmer.
8. Conventional measuring jar of ORG can be used to calibrate TBRG.
9. Conventional Rain Gauge can be used for the AWS
10. Conventional Thermometer can be used for the AWS.
11. Crystal oscillator is a fixed frequency oscillator
12. dB is a logarithmic transformation of unit
13. Direct Solar Radiation & Global Solar Radiation are same parameters.
14. Ferro silicon is used in Hydrogen generation.
15. GPS based systems are semi-automatic systems.
16. GPS is essential for automatic transmission in the existing AWS.
17. Hygristor is used as a pressure sensor in Radio Sondes.
18. If two inputs of XOR gate are 1 and 1 output logical level is Zero
19. IMS-1500 radio theodolite system uses super-heterodyne type of receiver.
20. In a purely inductive circuit , the reactance is zero when the emf source is DC.

21. In AND gate if A=0 , B=1 then X=0.
22. In OR gate if A=0 , B=1 then X=1
23. In AND gate if one of the Input is 0 output is 0.
24. In the N. H long curved cards during summer (from 12April to 2 September inclusive) and short cards during winter (from 15 October to the last day of February inclusive) are used for measuring duration of sunshine.
25. Intermediate frequency (IF) of RSGE radiotheodolite system is 33 MHz.
26. Intermediate frequency (IF) of SAMEER radio theodolite system is 10.7 MHz
27. Low Noise Amplifier (LNA) isused in Radio communication to amplify signals of very low strength.
28. NAND gate is called universal gate.
29. Operational Amplifier is used as an integrator.
30. Photo detectors are used for spectral measurements of specific wavelengths.
31. Pressure is directly measured in GPS based radio sonding system.
32. Radio sounding on SAMEER radio-theodolite is automatic in terms of balloon tracking as well as sounding computation.
33. Resonant frequency of LCR circuit inversely proportional to the capacitance.
34. RSGE sounding systems are used as stand by equipment at each of the RS/RW station.
35. SAMEER Radiosthedolite system is semi- automatic systems.
36. SAMEER radiotheodolite system uses super-heterodyne type of receiver.
37. Intermediate frequency (IF) of RSGE radiotheodolite is 33 MHz.
38. The antenna of IMS 1500 Radio theodolite is spherical.
39. The current lags the source voltage in a series RC circuit.
40. The magnitude of the e.m.f. induced in a circuit depends on the change of flux linkages.
41. The peak current at resonance in LCR circuit is infinite when R=0.
42. The role of caustic soda in the electrolyte of the Knowles cells is as a catalyst.
43. The thread used in GPS sonde is 5 meter for attaching GPS sonde and balloon
44. Turbid atmosphere cools the surface environment.
45. Upper air Winds information is computed from GPS sensor of Radiosonde
46. Using NAND gates only, can be converted into OR and AND gate.

47. Using NOR gate only, we cannot obtain AND gate.
48. Wind Profiler uses VHF & UHF frequencies for obtaining upper winds
49. Wind profilers are Doppler radars with limited utility.

Q 3. Answer the following question

1. Block Diagram of GPS Radio sonde and explanation of each block
2. Briefly explain the working of GPS based radio sounding system with the help of block diagram.
3. Briefly explain the working of IMS 1500 Radiotheodolite with a block diagram.
4. Briefly explain the working of SAMEER make Radiotheodolite with the help of block diagram.
5. Define LCR circuit.
6. Define LCR circuit. Using vector diagram find the expression for the resonant frequency .
7. Describe filling and safety aspects of Hydrogen shed.
8. Describe Operational Amplifier as Differential Amplifier.
9. Describe the difference between MOR & RVR.
10. Describe the Hydrogen gas generation, filling and safety aspects of Hydrogen shed.
11. Describe the Hydrogen gas generation.
12. Describe the working of GPS based Radiosonde Observations.
13. Describe Working principle of a Pyranomete
14. Discus characteristics of antenna.
15. Explain in brief OP-AMP as an integrator
16. Explain the advantages of GPS based radio sounding system
17. Explain the advantages of Wind profiler over manual PB observations.
18. Explain the operation of GPS based Radio Sounding System.
19. Explain the working of GPS based radiosounding system by a block diagram.
20. Explain the working of SAMEER radio-theodolite with block diagram.
21. Explain why base check is to be performed before releasing Balloon.
22. Explain with examples how Data processing computer of Radio sonde computes Winds from these basic parameters.
23. Give advantages of frequency modulation over amplitude modulation.

24. GPS Radio sonde Ground station covering all ground instruments and its importance
25. How TBRG of 0.5 mm resolution and collector area 200 cm can be calibrated using a 20 mm measuring glass of ordinary rain gauge?
26. Methods of Hydrogen gas generation for Radio sonde Ascent .
27. Methods of Hydrogen gas generation for Radio sonde Ascent and precisions to be taken while filling hydrogen in the Balloon. What are the disadvantages of filling more than required Hydrogen gas.
28. NOR gate as a universal building block.
29. precisions to be taken while filling hydrogen in the Balloon.
30. State the general instructions for preventive maintenance.
31. Using vector diagram find the expression for the resonant frequency .
32. What are the basic output parameters from the GPS sensor of GPS Radio sonde.
33. What are the disadvantages of filling more than required Hydrogen gas.
34. What do you understand by frequency modulation?
35. What do you understand by frequency modulation? Give its advantages over amplitude modulation.
36. What is TTAA & TTBB in the Temp code. The group in TTAA for Pressure at Tropo Pause and Pressure for Maximum wind.
37. Working Principle of potentiometric wind vane.
38. Write different methods of balloon tracking in upper air observation.
39. Write about any one sensor used in Radio Sonde's.
40. Write different methods of balloon tracking in upper air observation
41. Write down the characteristics of an ideal OP-AMP and explain OP-AMP as an integrator.
42. Write down the main characteristics of an ideal OP-AMP
43. Write in brief about SODAR system.
44. Briefly explain the working of SAMEER Radiotheodolite system with the help of block diagram.
45. GPS pilot-sonde system.

Q 4 Write short notes

1. Advantages of GPS based radiosounding system.
2. Briefly explain the working of IMS 1500 Radiotheodolite with a block diagram
3. Describe Operational Amplifier as Differential Amplifier.

4. Explain the working of a super heterodyne receiver with the help of a block diagram. Give the advantages of a super heterodyne receiver.
5. I) Explain the advantage of frequency modulation over amplitude modulation.
6. ii) Define attenuation, dBz and dBm.
7. NOR gate as a universal building block.
8. Parameters observed in radisounding radiowind observations.
9. SODAR system
10. GPS pilot-sonde system
11. SODAR system.
12. What are the basic output parameters from the GPS sensor of GPS Radio sonde. Explain with examples how Data processing computer of Radio sonde computes Winds from these basic parameters.
13. Wind Profiler
14. WMO accuracies required for Temperature, Pressure & Humidity of upper air and sensors its working principle used in Radio sonde for meeting the WMO accuracies.
15. Write about any two sensors used in Radio Sonde's.
16. Write about different methods of balloon tracking in upper air observation.
17. Write about different methods of balloon tracking in upper air observation