

**INDIA METEOROLOGICAL
DEPARTMENT
QUESTION BANK
OF
ADVANCED METEOROLOGICAL
TRAINING COURSE (AMTC)
SEMESTER-II EXAMINATION
BASED ON 176-181 BATCHES
(2015-2021)**

**PAPER-IV: ADVANCED WEATHER
ANALYSIS & FORECASTING AND
ADVANCED AVIATION
METEOROLOGY**

PART A AND B

India Meteorological Department
Meteorological Training Institute
Advanced Meteorological Training Course
SEMISTER-II

**PAPER-IV: ADVANCED WEATHER ANALYSIS & FORECASTING
AND ADVANCED AVIATION METEOROLOGY**

PART 'A': ADVANCED WEATHER ANALYSIS & FORECASTING

Q.1.Fill in the blanks

1. ----- initial conditions are necessary for ensemble forecasting.
2. ----- is a good indicator of the amount of moisture potentially available to realize as rainfall.
3. ----- is a good indicator of the amount of moisture potentially available for rainfall.
4. ----- is a multiple linear regression technique in which predictands, are related statistically to one or more predictors.
5. ----- is the measure of relative accuracy of the forecast over some reference forecast.
6. ----- is the process of assessing the quality/goodness of forecasts rainfall
7. ----- is a good indicator of the amount of moisture potentially available to realize as rainfall.
8. ----- conditions are critical in determining the climate forecast anomaly.
9. ----- doesn't have any frontogenetical effect.
10. ----- is an example of cumulus convective parametrization scheme.
11. ----- forecast is useful for forecasting active/break period of southwest monsoon.
12. ----- model provide the forecast as well as the probability.
13. ----- models used for short range forecasts.

14. A _____ thunderstorm is a long-lived (greater than 1 hour) and highly organized storm feeding off an updraft (a rising current of air) that is tilted and rotating.
15. A cut-off low is a _____ low and cut-off high is a _____ high.
16. A group of Norwegian scientists analyzed a large number of extratropical cyclones by the aid of surface observations from a large network station and published a theory known as _____ theory.
17. Active – break cycle of southwest monsoon is monitored utilizing ----- over the monsoon trough zone.
18. Air masses are classified according to the _____ of the source region, the _____ of the surface in the area of origin and _____ characteristics relative to the surface.
19. An ideal air mass must meet two essential criteria, first, it must be an extensive and physically _____ area, and the second is that the area be characterized by a general _____ of the atmospheric circulation.
20. Annual frequency of occurrence of tropical cyclones over North Indian Ocean is _____.
21. Areas in which air masses originate are termed _____.
22. Arabian Sea is _____(Warmer/colder) than Bay of Bengal.
23. As a front move _____ slows the advance of the surface position of the front more so than its position aloft so that the frontal surface separating these air masses acquires a small -----.
24. Atmospheric Jet Streams are a strong narrow current of air concentrated along a quasi-horizontal axis, usually in the upper troposphere characterized by strong _____ shear of the order of _____ knots per kilometer and _____ shears of about _____ knots per hundred nautical miles and featuring one or more velocity maxima exceeding 30 m/sec.
25. Brier's skill score is_____
- i) CAPE kills -----
26. Cold fronts generally move _____ than the warm fronts.
27. Continental polar air mass is _____.
28. Clod front is _____ than warm front
29. Cyclone becomes warm core due to ----- and compression of airmass over the cyclone centre.

30. City forecast for 7 days comes under _____ range forecast.
31. During summer we find maritime Arctic (*mA*) air masses in the _____ region and the continental Equatorial (*cE*) air masses in the _____ region.
32. During the winter season cold air advection and subsidence over northwest India indicates ----- in temperatures.
33. During strong zonal index, core STWJ shifts to_____.
34. Ensemble based track forecasts provide ----- probability.
35. Extended range forecast in IMD is issued for _____ weeks.
36. For extended range forecast, the multi-model ensemble comprises CFS and GFSbc at horizontal resolution of T126 and _____ with _____ members each.
37. For extended range forecast, the multi-model ensemble comprises CFS and GFSbc at horizontal resolution of T126 and _____ with _____ members each.
38. Forecast valid for 10-30 days is categorized as _____ range forecast whereas forecast valid for 1-7 months is categorized as _____ range forecast.
39. Forecast verification of an event will happen or will not happen is done through the use of _____
40. GFS model operational at IMD is adopted from _____.
41. Give the name of any one stability index (other than CAPE) which may be used for Thunderstorm forecasting_____.
42. Hailstone size is enhanced by ----- wind shear.
43. Hailstorm activity associated with western disturbance not related to 0°C ----- in mid & lower levels.
44. High values of CAPE often indicate that conditions exist for strong _____.
45. If a cold front catches up to and overtakes a warm front, the frontal boundary created between the two air masses is called an _____ front.
46. In long range forecast generated by IMD, the criteria used for probabilistic negative Dipole Mode Index (DMI) forecast is \leq _____ and for positive DMI is \geq _____.

47. In order to infer warm / cold air advection at a specific level, the forecaster need to notice ----- & ----- patterns in the forecast field.
48. In verification of dichotomous forecast, the Performance Diagram exploits the geometric relationship between four measures of performance: -----, -----, ----- and -----.
49. In verification of probabilistic forecasts, ----- score denotes RMSE.
50. Low geopotential heights compared to the surrounding locations will indicate the presence of ----- or ----- at that particular level of the atmosphere.
51. Maximum sustained wind for cyclonic storm is _____ Kmph.
52. Maximum validity of Nowcast is up to _____ hours.
53. NCMRWF Ensemble system has _____ members.
54. Positive _____ indicates counter-clock wise rotation of the winds.
55. Presence of Jet stream aloft could ----- the chances of Hailstorms.
56. Pressure – wind adjustment is ---- over the tropical belt.
57. Peterson's development theory is based on _____.
58. Quantitative district level weather forecast for the agricultural purpose is generated from the outputs of _____,
59. Relatively high geopotential height compared to surroundings at 500 hPa indicate ----- (Please state which synoptic feature here) and ----- weather.
60. Relatively low Geopotential height compared to surroundings at 500 hPa indicates _____. (Please state which synoptic feature).
61. Relatively low geopotential height compared to surroundings at 500 hPa
62. Right -----of a jet stream most favourable for thunderstorm activity.
63. Shear zone at 700 hPa over peninsular India during onset phase of monsoon divides the wind flow in -----.
64. Short and medium range NWP forecasts are strongly sensitive to _____ conditions.
65. Small differences in temperature and humidity from one point to another at the same level in the air mass are expected, still, the region under the influence of air mass will probably experience generally constant weather conditions, it is called ____ weather.

66. Strong ----- at upper levels are usually associated with some sort of severe weather / heavy rainfall.
67. Terminal Aerodrome Forecast (TAF) issued by Aerodrome Meteorological Offices comes under _____ category of forecast.
68. The average forecast error is called -----.
69. The classification of air masses depends on the _____ of the source region indicating the _____ conditions of the air mass.
70. The Extended range predictions of IITM-IMD are based on _____ data.
71. The Extreme Forecast Index indicates unusual weather to be likely when the values are in the range _____ to _____.
72. The Global Ensemble Forecast System (GEFS) runs at a horizontal resolution of _____ km with _____ ensemble members.
73. The maxima of rainfall lie to the _____ of the Monsoon Trough.
74. The maximum sustained wind is the highest _____ minutes average surface wind occurring within the circulation of the system.
75. The measure of correspondence between the observations and forecasts is ---- -----.
76. The model _____ represent the initial state for the integration of the various forecast models.
77. The model analysis (00 hr forecast) is nothing but the ----- that the model run will forecast from.
78. The multi-model ensemble forecasts of IMD are based on the data from _____.
79. The relative accuracy of the forecast over some reference forecast is referred as _____
80. The stability of air mass _____ if heated from below
81. The strength of linear relationship between forecasts and observations is generally measured by _____
82. The strength of the zonal circulation in the extra-tropical latitudes is conveniently measured by the mean _____ difference between two latitudes _____ and _____.
83. The tropical easterly jet is located in the _____ branch of the reversed Hadley cell and subtropical jet stream in the _____ branch of the Hadley cell while the polar front jet stream is located in the _____ branch of the polar cell

84. The weather situation in a strong zonal index situation of over 8 hPa shows strong _____ winds in the temperate latitudes with the Jet stream and the westerlies lie _____ of their mean position.
85. The Zonal Index expresses numerically the strength of the temperate latitude _____ winds at sea level and is conveniently measured by the sea level mean pressure difference between latitudes _____ and _____.
86. To comprehensively analyze the huge amount of information available with the forecaster now-a-days, ----- are highly useful.
87. Tropical cyclone strike probability is obtained from _____ members.
88. Tropical cyclone are called_____ over Atlantic ocean.
89. Three-dimensional models of the general circulation of the atmosphere and ocean are known as _____.
90. Under Indo-US joint collaborative programme, IMD adapted _____ for cyclone intensity and track prediction.
91. When a _____ front catches up to and overtakes a _____ front, the frontal boundary created between the two air masses is called an _____ front.
92. When we get many outputs from ensemble, it help us to give_____ forecast.
93. Wind speed increases as the spacing between isobars _____.

Q.2. State whether the following statements are true or false. If true give reason why? and if false give the correct answer with reason

1. A cold front moves faster than the warm front.
2. A coupled model is necessary for a long-range forecast and it cannot be generated with only an atmospheric model.
3. A cyclonic storm weakens over sea area due to decrease of wind shear.
4. A plume diagram is useful in understanding the probability of a threshold being met.
5. A probabilistic forecast is better than a deterministic forecast as it accounts for the uncertainty in the initial conditions and approximations in the models.
6. Advection of cold and dry air over a layer of warm and moist air can trigger rapid convective

7. An airmass can be known as warm or cold air mass depending upon whether the surface.
8. An extratropical cyclone dissipates when the warm sector occludes terminating the energy release mechanism.
9. An ideal air mass must meet two essential criteria; first, it must be an extensive and physically uniform area and second the area must be an area of moving cyclone.
10. Atmospheric models need to be coupled with ocean models for the prediction beyond 10 days.
11. Atmospheric models coupled with land models are only useful for climate predictions.
12. As air races through the sinuous jet-stream pattern, the air tends to *converge* and the convergence of air within the jet stream tends to force air downward beneath the jet stream, increasing the total weight of air above the earth's surface in those areas, which implies lower pressure at the earth's surface below.
13. As the magnitude of the anticyclonic vorticity increases and approaches that of the Coriolis parameter, no further increase in the anticyclone vorticity is possible.
14. As the magnitude of the anticyclonic vorticity increases and approaches that of the Coriolis parameter, no further increase in the anticyclone vorticity is possible.
15. Bias is the correspondence between the mean forecast and mean observation.
16. Considered as circulation systems, the anticyclones never attain intensities comparable with those of mature cyclones.
17. Cold front moves at a slower rate than a warm front.
18. Dry air at the mid-tropospheric levels aid in lowering the freezing level.
19. Diabatic heating results in surface anticyclone development.
20. During Indian southwest monsoon the sub-tropical westerly jet stream intensifies and flows across India along latitudinal belt 25°N to 30°N .
21. During southwest monsoon, monsoon trough shift to the foot hills of Himalayas, cause reduction in rainfall over Central India.
22. During the break phase of southwest monsoon, easterly winds prevail over the northern plains

23. Energy for the mid-latitude storm is derived from several sources viz., as the air masses try to retain equilibrium, warm air rises and cold air sinks, transforming kinetic energy into potential energy and condensation supplies energy in the form of latent heat and as the surface converges towards the low-pressure centre, wind speed may increase producing an increase in potential energy.
24. Explain the difference between methods adopted in short-range, medium-range, extended-range and seasonal prediction using dynamical models, with focus on boundary conditions?
25. Explain the ROC and Reliability Diagrams used in PQPF verification.
26. Familiarity with the NWP model's strengths and weaknesses on the forecaster's part is very important.
27. Forecasting weather over the tropical regions is much easier as compared to extra tropical.
28. Frequency of occurrence of Tropical Cyclones is more over Bay of Bengal as compared to Arabian Sea.
29. Governing equations of a Numerical Weather Prediction Model are nonlinear partial.
30. Generally, global models have better resolution than regional models.
31. High values of CAPE always indicate favourable conditions for strong thunderstorms.
32. High wind speeds are favorable for Radiation fog.
33. High resolution models always give more accurate forecast.
34. If moisture is available, large negative values of vertical velocity correspond to areas of heavy rainfall.
35. In an ensemble forecast, a 50% probability of occurrence of 20 mm/day rainfall means an amount of 10 mm/day rainfall will occur.
36. In an ensemble prediction system, all the ensemble members have identical initial conditions.
37. ITCZ is a preferred air-mass source region.
38. Intra seasonal variabilities of Indian Summer monsoon, (eg Madden Julian Oscillation) are well captured in Long Range Forecast.
39. IMD WRF is an example of Global Model.
40. Jet streams all over the globe blow from west to east.

41. Large negative values of vertical velocity / upward vertical velocity over an area always will be indicative of heavy rainfall over that region.
42. Low geopotential thickness between two pressure levels often indicates cold air.
43. Low values of thickness between two pressure levels means relatively cold air.
44. Lower-level inversion is not an essential criterion for fog formation.
45. *mAw* maritime warm air mass is found over the Arctic region in summer.
46. Medium range forecast is very useful for agriculture purposes.
47. Mid-level inversion is not a favourable criterion for severe thunderstorm.
48. Model output statistics (MOS) relates predictands (weather elements) to predictors (appropriate variables) using a dynamical modelling approach.
49. Maximum meridional exchange of physical properties take place during weak zonal index.
50. Numerical models which are coarser in resolution are more suitable to prepare a detailed forecast depicting finer aspects of weather.
51. Over which the airmass is found at the time is warmer or colder than the air mass.
52. Probability forecasts are possible from a single run of a Numerical Weather Prediction (NWP) model.
53. Radar is very useful tool for issuing Short range forecasts
54. Strong divergence at upper levels usually indicates strong vertical velocities in the middle troposphere and heavy rainfall.
55. Storm surge is the most devastating phenomena associated with Tropical Cyclone.
56. The forecast of evolution of El Nino Southern Oscillation (ENSO) helps in predicting the extended range forecast of Indian Summer monsoon.
57. The forecast process should start with the micro scale and then the meso and synoptic scales.
58. The Freezing Level over a station is an important factor in Hailstorm prognosis.
59. The main diagonal in a reliability diagram represents the perfectly reliable forecasting system

60. The maritime arctic warm (*mAw*) air mass originates in the Arctic region during summer
61. The position of monsoon trough axis is an important factor in the monsoon activity over the Indian sub-continent.
62. Tropical cyclones generally do not occur during monsoon season.
63. Tropical cyclone is cold core system.
64. Upper-level divergence usually causes subsidence of air underneath.
65. When cold dry *cPk* air moves from the cold continent to the warm ocean in winter, evaporation from the underlying warmer ocean surface rapidly transfers large quantities of moistures to the dry continental air leading to stability of the air mass.

Q.3. Answer any two of the following: (5 & 7 mark question)

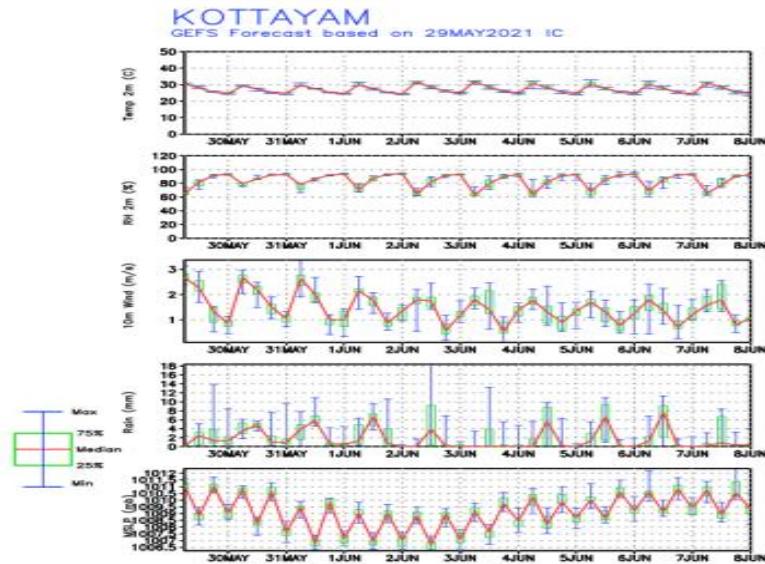
1. Air mass types and modification
2. Can the error in prescribing the initial state of atmosphere grow with time?
3. Classification of different Numerical Weather prediction Models.
4. Classification of weather forecasts in terms of their validity period.
5. Comparison of NWP models and climate models.
6. Deduce the Margule's equation for the slope of a frontal surface.
7. Define frontogenesis/frontolysis. Define frontogenetical function. Discuss the role of Diabatic heating and deformation on frontogenesis/frontolysis.
8. Define and explain role of monsoon trough in active/break monsoon.
9. Define are the short, medium and long-range forecasts.
10. Derive the Margule's equation for the slope of the frontal surface.
11. Different types of fronts and associated weather.
12. Describe any two important products of an ensemble model for tropical cyclone forecasting.
13. Describe briefly the life cycle of an extra-tropical cyclone
14. Describe different methods of spatial forecast verification.
15. Describe in detail synoptic conditions of WD and associated weather.
16. Describe the criteria of cold wave and heat wave over India.
17. Describe the importance of initial conditions and lateral boundary conditions in NWP.

18. Describe the role of human interpretation in the forecast process.
19. Describe the large scale as well as regional scale atmospheric circulation features and indices as seen from dynamical model outputs which aid a forecaster to conclude an imminent break monsoon situation.
20. Describe the life cycle of a mid-latitude cyclone. Why it is also named as wave cyclone
21. Describe the process of frontogenesis and frontolysis in the formation and dissipation of Fronts.
22. Describe the semi-permanent synoptic features of southwest monsoon.
23. Describe the Socio-economic impact / aspects of weather forecasting.
24. Describe the various steps involved in the process of weather forecasting.
25. Describe with the help of diagram Bjerknes' Cyclone Model.
26. Describe with the help of diagram the lifecycle of an extra-tropical cyclone.
27. Discuss essential criteria of thunderstorms formation and NWP products which may be used for their forecasting.
28. Discuss Hailstorm Prognosis.
29. Discuss how to interpret different atmospheric fields from an NWP output to prepare short & medium range weather forecasts.
30. Do the mean and spread charts of an ensemble prediction system show the entire range of member solutions?
31. Do we predict details of everyday weather in Extended Range Weather Prediction?
32. Does a Brier score value 1 (one) indicate perfect deterministic forecast?
33. Easterly – westerly interaction and associated weather.
34. Enlist and describe a set of near real time data products which would enable the forecaster to fine tune the model outputs while generating a short-range weather forecast.
35. Enlist and elaborate the environmental conditions favourable for the development of a Hailstorm.
36. Ensemble Meteogram or EPSgram.
37. Ensemble prediction for operational use.
38. Ensemble prediction system.
39. Essential criteria of thunderstorm, severe thunderstorm and associated weather.

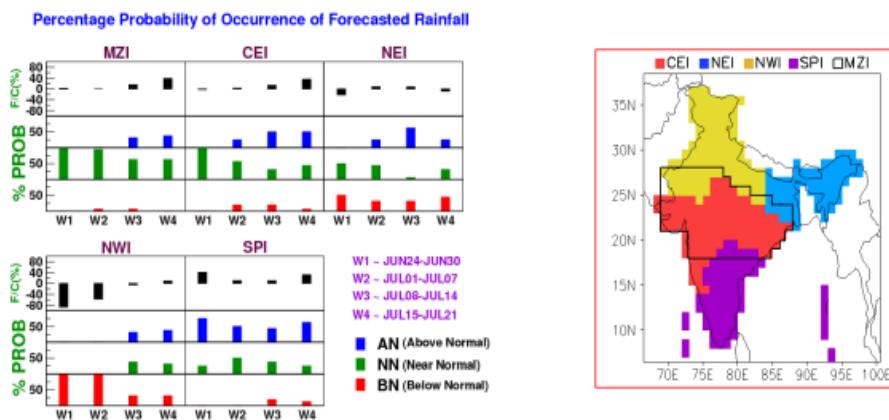
40. Essential dynamic and thermodynamic conditions for genesis of cyclone and describe the different stages of cyclone over north Indian Ocean.
41. Explain need of numerical model downscaling with the types of downscaling.
42. Explain the difference between dynamical and statistical downscaling.
43. Explain the difference between methods adopted in short-range, medium-range, extended-range and seasonal prediction using dynamical models, with focus on boundary conditions?
44. Explain the ROC and Reliability Diagrams used in PQPF verification.
45. Explain why the anticyclones never attain intensities comparable with those of mature cyclones. Name the different classes of anticyclones (Highs).
46. False Alarm Ration (FAR).
47. From the following contingency table calculate
48. Give at least three reasons for heavy rains over Kerala during August 2018.
49. Is Numerical Weather Prediction an initial value problem?
50. List and describe role of prime ingredients in fog formation.
51. List the important reasons for uncertainty in the initial conditions of an NWP model.
52. Major characteristics associated with a super cell thunderstorm.
53. Name the models used in IMD for forecasts up to three days and forecasts up to 10days.
54. Outline the necessity of human intervention in numerical model-based weather forecasting.
55. POD Score or the Hit Rate(H),
56. Rank Histogram
57. Requirement of a Man-Machine mix approach in weather forecasting.
58. Seasonal Forecasting using Dynamical models.
59. Various inputs available to a forecaster for formulating the weather forecast & warning Bulletins.
60. What is ensemble forecasting and what is its use?
61. What is frontogenesis and frontolysis? Explain with the help of diagram how the front generates and dissipate under these processes.
62. What is frontogenesis? Describe the process of formation of front.
63. What is the main purpose of Ensemble model forecasts?

64. What is zonal index? Discuss in detail different stages of zonal index cycle.
65. What is forecast verification? Mention different attributes or aspects of a good forecast, as described by Murphy (1993)
66. While all the jet streams flow from west to east there is exception in the case of one jet stream which blows from east to west. Name the jet stream and explain why it flows from east to west?
67. Why a moving front makes a slope with height? Describe with help of diagram, the sequence of clouds that will be seen for an approaching stable and unstable warm front.
68. Why is it difficult to establish a standard set of rules & procedures for the day-to-day weather forecast & warning decision making?
69. Why there is a need for statistical guidance in numerical weather forecasting?
70. Write a short note on cut-off lows.
71. Write a note on weather associated with tropical cyclones.
72. What is the difference between monsoon depression and depression forming in pre-monsoon season and post-monsoon season?
73. What is monsoon low level jet? How does it influence the monsoon rainfall over Indian region?
74. Write short note on Contiguous Rain Areas Method.
75. Write short notes on ensemble forecast.
76. Write short notes on medium range weather forecast.
77. Write down Sutcliff's development equation. Discuss, in brief, the role of thermal advection of thermal vorticity.

- Q 4 What is the below diagram known as? Explain the diagram. Approximate the amount of forecasted rainfall with 75% probability of occurrence on 2nd June from the diagram.

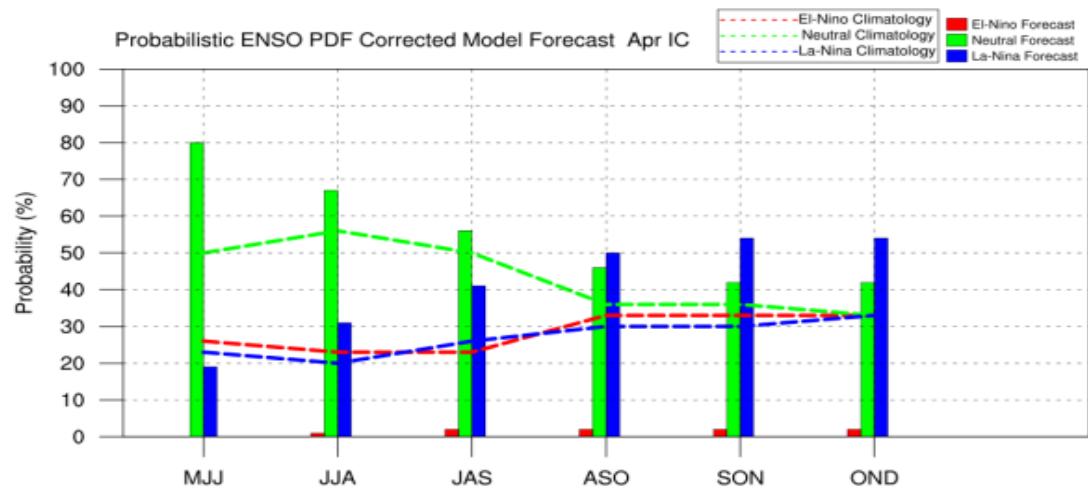


- Q 5 Below is the area averaged rainfall over homogenous regions obtained from extended range forecast based on 23 June 2021 initial condition (IC). Explain the week 1 to week 4 forecast for Monsoon Zone (MZI) and Northwest India (NWI).



Q 6 Explain the graph of probabilistic ENSO forecast obtained from the long-range forecast based on April IC shown below. What does the forecast valid for July-August-September (JAS) indicate?

- c) Explain the graph of probabilistic ENSO forecast obtained from the long range forecast based on April IC shown below. What does the forecast valid for July-August-September (JAS) indicate?



Q 7 From the following contingency table calculate

- (i) BIAS (Frequency bias) score, (ii) POD Score or the Hit Rate(H), (iii) False Alarm Ration (FAR), (iv) Threat score (or critical success index)

		Observed (r)		Total
		Yes	No	
Forecast (f)	Yes	720	320	1040
	No	500	800	1300
Total		1220	1120	2340

Q8 Answer Yes/No for the following

1. Is Numerical Weather Prediction an initial value problem?
2. Do we predict details of everyday weather in Extended Range Weather Prediction?
3. Does a Brier score value 1 (one) indicate perfect deterministic forecast?

4. Do the mean and spread charts of an ensemble prediction system show the entire range of member solutions?
5. Can the error in prescribing the initial state of atmosphere grow with time?

PART-B : Advanced Aviation Meteorology

Q. 1. Fill in the blanks:

1. _____ is the instrument that provides R.V.R.
2. _____ data is the main source of information on volcanic ash clouds.
3. _____ is the instrument that provides M.O.R.
4. is the instrument that provides runway visual range.
5. AAIB, an agency under Ministry of Civil Aviation stands for.....
6. AD WRNG for strong surface wind shall be issued if the expected wind speed is
7. All points of the area getting affected by severe weather mentioned in SIGMET are separated by
8. An airfield warning for small aircraft, gliders and helicopters which are parked or moored is issued when expected wind speed is ---- or more.
9. De-briefing is shared by _____ to the Met duty officer at the termination of a flight journey.
10. Detailed Aircraft accident report is to be signed by.....
11. Domestic SIGWX charts in India are issued by_____.
12. Documentation shall be provided in Met.T-3 form for flights upto____NM.
13. FL270 are _____.
14. FL280 are _____.
15. High level SIGWX used for flight level _____ to _____.
16. If multiple Cumulonimbus cells covering more than 75% area within an FIR expected, then
17. In the take-off data, the forecast issued for pressure is _____.
18. Maximum validity period for Aerodrome Warning shall be
19. OLBS service is provided in India from _____ and _____.
20. Routine aviation Meteorological Messages are transmitted under ____ priority.

21. SIGMET shall be issued for the weather phenomena _____.
22. SIGMET shall be issued for tropical cyclone up tohours prior to the commencement of its validity.
23. Standards and Recommended Practices pertaining to aircraft accident and incident investigations are contained in ICAO Annex No
24. The tropical cyclone advisory centre in India is located at _____.
25. The two advisory centers set up by ICAO to give expert advice on Tropical Cyclone and Volcanic Ash are called and
26. The validity period for a SIGMET issued for Frequent Thunderstorm shall not exceed _____ hrs.
27. The wind/temperature forecast charts that shall be provided for a flight at cruising level.
28. Tropical Cyclone Advisory Centre (TCAC) located at _____ has the operational responsibility of issuing warning for cyclones over Bay of Bengal and Arabian sea.
29. Validity of a WV or WC SIGMET shall be _____.
30. The WC SIGMET message should be issued on the basis of _____.
31. VOLMET Broadcast in India is made from _____ and _____.
32. WAFC stands for _____.
33. Warning information about meteorological phenomena for enroute flights is called ----.
34. Wind Shear Warning is being issued in India based on
35. World Area Forecast Centre London updates SIGWX global forecasts charts every ---- hours in a day.

Q. 2. State True or False with proper justifications

1. A special current weather observation shall be recorded if aircraft accident occurred at or in the vicinity of the local aerodrome and more than 10 minutes have elapsed since the recording of the previous routine/ special/ additional report at the station.
2. AD WRNG can be issued for poor visibility associated with fog.

3. AD WRNG for an Aerodrome shall be issued by the station itself for a tropical cyclone when it is just observed over the deep sea.
4. ADWRNG shall be issued for visibility.
5. Aerodrome warning cannot be issued for forecasted phenomena.
6. Aerodrome warning is issued for cyclone.
7. Aerodrome warning once issued shall not be cancelled.
8. Aerodrome Warning shall be issued by all AMOs for its own and its associated AMS.
9. CAR stands for civil aviation requirement
10. Ceilometer provides height of the base of the single lowest layer.
11. Detailed report of an Aircraft accident shall be prepared and signed by station-in-charge.
12. Detailed report on aircraft accident shall be signed by AMO in-charge.
13. Domestic SIGWX charts for SWM and SWH are issued by MWO, Chennai in India.
14. First Information Report regarding the aircraft accident together with available details including weather should be communicated to next higher office through an ordinary post.
15. ICAO provides GRIB2 data for extended aviation Met. Products such as TURB, Icing, Horizontal extent CB.
16. Indian region has to use WAFS products from WAFC, Washington.
17. Light aircraft warning shall be issued when expected wind speed more than 25 Knots.
18. Meteogram of an Aerodrome is an important tool for issue of TAF.
19. Only area of expected Turbulence and Icing are shown in SIGWX chart.
20. Severe Weather SIGMET is issued by all AMOs.
21. SIGMET is issued by MWO for their respective AMS station.
22. SIGMET issued by MWO Delhi is included in VOLMET Bulletin of Mumbai.
23. SIGMET once issued shall never be cancelled.
24. SIGMET shall be transmitted under GG priority.
25. Surface wind shall also be measured in an airport at a height of 11 Meters.
26. Surface wind shall be measured in an airport at a height of 10 ± 1 Metre.
27. Surface wind shall be measured in an airport at a height of 9 Meters representing ATC tower height.

28. SWH forecasts cover the entire globe.
29. SWM forecasts issued for MID / MEA region, covers Indian region.
30. TCAC has the responsibility to issue the updated Tropical Cyclone Advisory (TCA) bulletin to MWOs at least at every 12 hrs.
31. The aerodrome warning cannot be issued 3 hours in advance for expected occurrence of weather phenomena at aerodrome.
32. The validity of WS SIGMET message should be more than 6 hours.
33. VOLMET broadcast in India is done from all MWOs in India.
34. Warning for Light Aircraft shall be appended to local forecast local forecasts issued earlier may be amended to include this.

Q.3. Write Short Notes: (5 & 7 marks)

1. Action to be initiated by an AMS to provide a non-scheduled low-level briefing.
2. Aerodrome Warnings: objective and its elements.
3. Describe high level significant weather chart.
4. Describe the procedure to be followed in case of accident of aircraft.
5. Essential airport Met. instrumentation and their siting.
6. Explain the WS SIGMET issued by MWO Kolkata:
 VECF SIGMET 1 VALID 190600/191200 VECC-VECF KOLKATA FIR TC
 AMPHAN OBS AT 0000Z N1536 E08642 CB TOP FL 520 WI 200NM OF
 CENTRE MOV NNE12KT NC FCST 1200Z TC CENTRE N1724 E 08706=
7. Give the name of any 5 registers used in Aviation Met Offices?
8. How many types of SIGMETs are issued by office known as MWO?
9. In significant prognostic chart the term observed “OCNL CB”. Explain it.
10. Local forecast for an aerodrome.
11. List the products to be included in the briefing folder for a flight from Mumbai (VABB) (ETD 0610 IST) to Kolkata (VECC) (ETA 0850 IST) flying at FL 390 with the destination alternates aerodrome as Bhubaneshwar (VEBS).
 Briefing is at 0510hrs IST.
12. On Line aviation meteorological Briefing System (OLBS).
13. Siting of airport instrumentation.
14. TCAC and its functions.

15. The eight critical elements that ICAO considers essential for a State to establish, implement and maintain in order to have an effective safety oversight system.
16. The performance criteria of Aeronautical Meteorological forecaster.
17. Tools for the issue of weather SIGMET.
18. VAAC and its functions.
19. VOLMET broadcast in India is made by?
20. Write Short notes on VIDP, VABB, VOMM and VECC .
21. Validity and time of issue of SIGMET. Pl spell out at least 5 severe weather phenomena which warrants issue of SIGMETs.
22. What are the criteria for issuing special for temperature?
23. What difference between synoptic and aerodrome observatory?
24. What do you understand by term moderate wind shear/turbulence?
25. What is AMSS and its function?
26. What are Ceilometers?
27. What is importance of Airport Met Instruments? What are the sensors used in airport instrument system?
28. What is NOTAM?
29. What is ROBEX?
30. What is RSMC and what is its role in dealing with aviation meteorological services in India?
31. What is RVR? What is the procedure for reporting manual RVR?
32. What is the procedure / action is to be followed at AMO during VVIP flights?
33. What is the purpose of Met briefing in Aviation?
34. What is VOLMET? What information it broadcast?
35. What is VVIP briefing? What is the procedure is to be followed during VVIP flights?
36. What is WAFC and how many WAFC's are present?
37. What is WAFC? What is the aviation meteorological products are available in WAFC?
38. What is wind shear?
39. What MWO stands for?
40. What is OLBS and what products are available on OLBS.
41. Who are considered as VVIP?

42. World Area Forecast System (WAFS)
43. Write an essay on Aerodrome warning.
44. Write an essay on Aircraft Accident investigation procedure.
45. Write an essay on Aircraft accident procedure.
46. Write an essay on SIGMET.
47. Write in detail about World Area Forecast System.