INDIA METEOROLOGICAL DEPARTMENT

QUESTION BANK

OF

INTEGRATED MET. TRAINING COURSE (IMTC)

FINAL EXAMINATION

BASED ON 1-11 BATCHES (2013-2021)

PAPER-III: CLIMATOLOGY, STATISTICS, DBMS AND AGROMET

PART A,B,C AND D

PAPER –III : CLIMATOLOGY, STATISTICS, DBMS AND AGROMET

TIME; 1030-1330   **MAX. MARKS: 60**

PART A : CLIMATOLOGY   (**Maximum Marks: 20**)

Q 1. Fill in the blanks.

1. Cold wave at a place is considered when WCTn (Wind Chill Effective Minimum Temperature) is less that _____degree Celsius.

2. In pre-monsoon season the main convective system in East & NE India is _____.

3. The frequency of severe heat wave is highest in the month of _____.

4. Sub tropical Jet stream is appeared over North India during _____ season and Tropical Easterly Jet stream is appeared over South India during _____ season.

5. The monsoon trough normally extends vertically upto _____ hPa level.

6. Cold Wave should be declared irrespective of normal minimum temperature when _____ temperature is _____ or less.

7. Heat wave need not be considered till maximum temperature of a station reaches at least _____ for plains and at least_____ for hilly regions.

8. Duststorms over northwest region of India can be categorised into two types viz. _____ and _____.

9. Withdrawal of summer monsoon from extreme north-western parts of the country should not be attempted before the date _____; and after that, there should be cessation of rainfall activity over the area for continuous _____ days.

10. The principal rainy season for Tamil Nadu is _____ and that for Jammu & Kashmir is _____.

11. During Western depression, _____ closed isobars at the interval of 2 hPa can be drawn on the sea level chart.

12. _____ Waves generally move from west to east.

13. South Tamil Nadu and south Kerala experience rainfall due to the movement of _____ across south Peninsula

14. During onset of monsoon over Kerala, the INSAT derived Outgoing Long wave Radiation (**OLR**) value in the region bounded by latitude 5 ^{o}N to 10°N and longitudes 70°E to 78°E should be **less than** _____ .

15. During Premonsoon season, _____, which are raised dust in the air occur only in the plain.

16. Maximum frequency of heat waves over India is observed during the _____ season.

17. During Winter season, pressure gradient is stronger to the _____ of Himalayas and _____ over India.

18. STWJ over India has two maxima, one over the _____ and the other over the_____.

19. The monsoon trough normally extends vertically upto _____ hPa level.

20. In pre-monsoon season the main convective system in East & Northeast India is _____.

21. The principal rainy season for Tamil Nadu is ___ and that of Jammu Kashmir is ____.

22. The monsoon trough extends upto ____ hPa tilting ____ with heights

23. _____ fog occurs in the rear of WD.

24. During active monsoon period, the monsoon trough shifts towards _____from the normal position.

25. Duststorm/Sandstorm over NW India are locally known as_____.

26. Climate change will lead to higher maximum temperatures and more number of _____Waves.

27. Global _____ is one of the aspect of Climate Change.

28. Norwesters' in hot weather period refer to thunderstorm activities in _____ region/places.

29. In Monsoon Depression maximum convergence/rainfall activities are found in _____ sector of M.D.

30. The principal rainy season for Tamil Nadu is _____.

31. In post monsoon season, the maximum number of Cyclones (excluding depressions) develops during the month of _____.

32. The direction of wind is generally _____ over the Bay of Bengal, Peninsular India and the Arabian sea during the post monsoon period.

33. The monsoon trough over the India shifts _____ ward in post-monsoon season.

34. During break monsoon, good amount of rainfall is observed in the _____ region.

35. Duststorm/Sandstorm over NW India are locally known as_____.

36. _____help people know what types of conditions a region usually experiences through the year.

37. Monthly precipitation, Potential evapotranspiration and soil storage used as main criteria in _____ climate classification.

38. During break monsoon, good amount of rainfall is observed in the _____ region.

39. _____help people know what types of conditions a region usually experiences through the year.

40. Monthly precipitation, Potential evapotranspiration and soil storage used as main criteria in _____ climate classification.

41. Mean rainfall over India is maximum in the month of _____.

42. Normal onset date of Indian summer monsoon is _____ and the seasonal average mean rainfall over India is _____ cm.

43. The principal rainy season for Tamil Nadu is _____ and that for Jammu & Kashmir is _____.

44. Climate change will lead to higher maximum temperatures and a greater number of _____Waves.

45. When minimum temperature is less than or equal to _____ in plains it be declared Cold day

46. The average temperature of Earth is _____ which could have been otherwise _____.

47. Equinoxes occur on _____ and _____.

48. Climate change will lead to higher maximum temperatures and a greater number of _____Waves.

49. STWJ over India has two maxima, one over the _____ and other over the _____.

Q 2. True / False with reasoning.

1. After the passage of Western Disturbances, widespread Fog does not occur in North Indian States.

2. Monsoon Low / depression increase the rainfall activity in east & central India.

3. In north India clear weather & cold wave condition are appeared after passage of Western disturbances.

4. Bay of Bengal experiences more number of storms than the Arabian Sea.

5. Windward side of the mountain receives less precipitation than the leeward side.

6. Rainfall associated with the western disturbances is generally observed over the south peninsular India.

7. For the stations with normal minimum temperature is less than 10 °C, departure of actual minimum temperature from normal is -7 °C or less indicates Severe Cold Wave conditions.

8. The frequency of severe heat wave is highest in the month of March.

9. The heat low during summer monsoon over Pakistan and adjoining north-west India extends up to mid-tropospheric levels.

10. Arabian Sea experiences more number of storms than Bay of Bengal.

11. Significantly less rainfall occur over central India than over Northern India during break monsoon.

12. In tropics, the orographic precipitation increases with height up to the peak of mountain.

13. Most of global deserts like around 25° N/S.

14. The strongest zonal winds occur in winter hemisphere

15. Sea breeze occurs during day time

16. Monsoons are observed all over the globe.

17. Tropical cyclones do not generally develop during SW monsoon season.

18. Most of Tropical Cyclones in premonsoon season recurve NE-wards.

19. Stable atmosphere is required for the occurrence of radiation fog.

20. Induced low's during the winter season are not associated with WD's

21. STWJ is seen over Indian region during the summer monsoon season.

22. Strong vertical wind shear helps the formation of cyclonic storm.

23. The Mascarene high is having no relation with the southwest monsoon.

24. In October the number of Cyclonic and Severe Cyclonic storms is more than the number of Depressions.

25. Rajasthan, Haryana and Saurashtra & Kutch receives good amount of rainfall during post-monsoon season.

26. Strong or Active monsoon is observed when the monsoon trough is north of its normal position.

27. Cyclonic storms in pre-monsoon initially move NW or North and then recurve NE wards.

28. Rotation of winds is anticlockwise around a Low-Pressure area in Southern Hemispheres.

29. Because the stratosphere is stable, rising air that reaches the tropopause moves equatorward.

30. Warm air flows upslope along the valley sidewalls, this upslope wind is called katabatic wind.

31. In dissipating stage of thunderstorm updraft dominates over downdrafts.

Q 3. Answer the following.

1. Discuss the convective activity during pre-monsoon season.

2. Discuss the distribution of rainfall over India during active and break monsoon conditions. Explain any two components of monsoon that influences the seasonal rainfall.

3. Discuss Onset of North-East Monsoon and rainfall distribution during this season

4. Discuss Onset of South-West Monsoon and rainfall distribution during this season.

5. What are western disturbances? Discuss weather associated with Western Disturbances.

6. Describe semi-permanent components of summer monsoon. Discuss onset-advance phases of summer monsoon.

7. Discuss criteria for onset of monsoon over Kerala and further advancement of monsoon over the country.

8. What is monsoon depression ? Discuss its climatology with reference to 1) Area of formation, 2) Frequency and life span, 3) Movement, 4) Associated clouds and rainfall.

9. What are western disturbances? Discuss weather associated with Western Disturbances.

10. Discuss the convective activity during pre-monsoon season.

11. What is Monsoon depression? Discuss its climatology with reference to

     i. Area of formation

     ii. Frequency & life span

     iii. Movement

iv. Associated cloud and rain.

12. Discuss in brief the climatology of thunderstorm activities over central India.

13. Name semi-permanent components of summer monsoon.

14. Enlist Indicators of climate change (any five)

15. Enlist greenhouse gases (any three)

16. Write three points on rainfall distribution over India during post-monsoon season.

17. Write any three criteria for onset of Northeast monsoon.

18. Discuss in brief the climatology of thunderstorm activities over NW India.

19. What is Climate Change? What will be its impact.?

20. Discuss the horizontal and vertical structure of Tropical Cyclone.

21. Criteria for declaring Heat Wave.

22. Define Weather and climate, discuss the elements of weather and different climate controls.

23. Define Map Projections. Write down the names of different types of Map Projections.

24. Describe the similarities and differences between Köppen and Thornwaite Climate classification.

25. Define Jet Stream. Which are the Jet Streams found over India region?

26. Discuss the distribution of rainfall over India during active and break monsoon conditions. Explain any two components of monsoon that influences the seasonal rainfall.

Q 4. Write short note on the followings.

1. North-East Monsoon

2. Western Disturbance

3. Criteria of declaring Heat Wave.

4. Mascarene High and Low Level Jet.

5. Mid-Tropospheric Cyclone (MTC) and Monsoon Depression

6. Trough off West Coast and Off-Shore Vortices

7. Active and break phases of SW monsoon season.

8. Convective activity over NE and NW – India during premonsoon season.

9. Tropical easterly Jet Stream

10. Ramage's criteria for defining monsoon areas

11. Cold waves

12. Chief features of any two semi permanent components of summer monsoon.

13. Criteria for declaring cold wave.

14. Write a short note on findings of IPCC Report

15. Hadley Cell, Ferrel Cell & Polar Cell

27. Why is there a need for Climate classifications?

28. Hadley Cell, Ferrel Cell & Polar Cell

29. Explain the Hadley Cell and Intertropical Convergence Zone.

30. Why is there a need for Climate classifications?

31. Define Easterly Wave, in which sector of easterly wave intense thunderstorm occurs.

32. Distinguish between Climate Variability and Climate Change.

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PAPER –III : CLIMATOLOGY, STATISTICS, DBMS AND AGROMET

TIME; 1030-1330   MAX. MARKS:
                                                              60

PART B : STATISTICS   (Maximum Marks: 20)

Q 1. Fill in the blanks. (Any three)   (3 x 1=3)

1. A single number that represents an entire mass of data is called _____.

2. What is the area between (- 1.96, 1.96) under the standard normal curve _____.

3. _____ can be defined as the chance of happening of an event expressed as a ratio that varies between 0 and 1.

4. The long range forecasting of Indian monsoon rainfall has been attempted using _____methods only.

5. A. M of first seven natural numbers is --------

6. Sample space S when two coins are tossed simultaneously is ---------------------

7. When a die is thrown, the probability of the event of getting a number less than 3 is -----

8. With the help of ogives we can calculate ----------- graphically.

9. Mean ± 3 S.D. covers --------------- % of the items

10. In the regression equation $Y = a + bX$, b is called as -----------

11. If $\sum f_i X_i = 30$ & $\sum f_i = 6$ then the value of Mean is _____ .

12. Which of the following is not a measure of central tendency?

   a) Mean b) S.D. c) Mode d) Median

13. Kurtosis is the measure of _____ .

14. Probability can vary between _____ & _____ .

15. The normal distribution is based on two parameters viz._____ &_____ .

16. Midpoint of the class interval is the difference between _____ & _____.

17. Coefficient of variation (CV) is the ratio of _____ & _____, expressed in percentage

18. Variance is the square of _____.

19. In statistics a part or a small section selected from the population is called _____.

20. In a time series data interval (DI) for hourly temperature of a station is _____.

21. If $\sum f_i X_i = 28$ and $\sum f_i = 7$, then the value of mean ----------------

22. If $\sum f_i X_i = 50$ & $\sum f_i = 5$ then the value of Mean is _____ .

23. With the help of histogram we can calculate --- graphically.

24. Mode is that value of distribution which has --- frequency

25. Surface temperature of a station is an example of --- variable

26. Mean of a Binomial distribution with number of trial 'n' and probability of success 'p', is--------.

27. For comparing two means ----------- test is used.

28. If the tail is in the right hand side (RHS), the distribution is called _____ skewed.

29. If r is ____ x and y are positively related.

30. Mean ± 1 S.D. covers _____ of the items.

31. If $\Sigma f_i X_i = 30$ & $\Sigma f_i = 6$ then the value of Mean is _____ .

32. A single number that represents an entire mass of data is called Measure of _____.

33. Rainfall recorded in a station is an example _____ variable

34. _____refers to the flatness of the frequency curve.

35. The correlation coefficient always assumes _____ relationship.

36. Coefficient of variation is always expressed in _____ .

37. ---------------- correlation is also called as inverse correlation.

38. Mode is that value of distribution which has --- frequency

39. Mean of a Binomial distribution with number of trial 'n' and probability of success 'p', is--------.

Q 2. True / False with reasoning.

1. Two events which are mutually exclusive events are also complements of each other

2. ISMR and food production over India are positively correlated

3. Probability can be negative.

4. Good monsoon over the country and occurrence of drought are mutually exclusive events.

5. Can the product of two regression coefficients be negative? Justify your answer.

6. Probability can be negative.

7. Can the product of two regression coefficients be negative? Justify your answer.

8. Dew point and minimum temperature of a station are positively related.

9. Arithmetic mean is rigidly defined.

10. Occurrence of Rain and clear skies at a particular time over a particular station is mutually exclusive events.

11. Pressure and volume of a perfect gas are negatively correlated.

12. The Central Limit Theorem is not applicable when the sample is small, below 30 and the population is not normal.

13. Number of rainy days at a station is a continuous random variable.

14. If two events 'A' & 'B' are mutually independent, then $P(A|B) \neq P(A)$

15. Level of significance of a test is the probability of accepting a true null hypothesis

Q 3. Answer questions of the following

1. For certain frequency distribution Median = 156, Mode = 180. Compute the value of mean   (approximately).

2. Compute the coefficient of variability for the following station

3. Station A: S. D. = 10.0,   A. M. = 85.0,

4. Define positive and negative correlation.

5. If byx = -0.8 and b yx =   -1.2 , find r

6. If r= 0.7, n = 10 find 't' value and test the significance of correlation coefficient.
                            Given 't' at 5% level for 8 degrees of freedom is 2.306.

7. The values of Median and Mean are 100 & 101 respectively. Find the value of Mode.

8. Following is the frequency distribution with unknown frequencies

9. Class: 00- 20 20-40 40-60 60-80 80-100   Total

10. Frequency: 2   a   56   b   2   100

11. Find the frequencies (i) if a & b are equal (ii) If 3a = b.

12. State with explanation whether the following meteorological   event is mutually exclusive or not? Heavy rain and sunshine (same place, same time).

13. State with explanation whether the probability can be negative or positive?

14. Write down the relation between regression coefficient and correlation coefficient with its mathematical form.

15. Find the numbers whose Arithmetic Mean (A.M.) is 12.5 and Geometric Mean (G. M.) is 10.

16. If Variance = 4.0, A. M. =5.0, Find Coefficient of variability.

17. If r= 0.02, n = 10 find 't' value and test the significance of correlation coefficient. Given 't' at 5% level for 8 degrees of freedom is 2.306.

18. Write down the sample space S when two coins are tossed simultaneously.

19. Compute the coefficient of Skewness(CSK) for ISMR series if Mean= 891.5mm, median = 897.8mm and standard deviation = 85.6mm.

20. If variance = 9.0, A.M. = 10, Find co-efficient of variation.

21. Define positive and negative correlation.

22. For a certain frequency distribution Median = 150, Mode = 175, compute the value of mean (approximately)

23. Probability can not be negative – Justify your answer

24. Monsoon rainfall and food production over India are positively correlated – Justify

25. Compute the coefficient of variability for the following station

26. Station A: S. D. = 10.0,   A. M. = 85.0,

27. If r= 0.8, n = 10 find 't' value and test the significance of correlation coefficient. Given 't' at 5% level for 8 degrees of freedom is 2.306.

28. If for Station A, Variance = 4.0, A. M. =5.0,

29. for station B, S. D. = 2.4, A. M. = 8.3,

30. Find Coefficient of variability.

31. Define Skewness and Kurtosis with diagram

32. Product of regression coefficients of x on y and y on x is greater than 1.

33. If a random sample falls in the critical region, then the null hypothesis is accepted.

34. Probability or cumulative distribution function is a continuous function.

35. Define time series. Give three examples of time series. Explain the components of times series.

36. What is coefficient of variation (CV)? How is related to mean?

37. Name three favourable meteorological variables that are correlated in the study of nature of SW monsoon in India and also write whether they are positively or negatively correlated.

38. The correlation coefficient between SW monsoon rainfall and SST during 80 years period (1901-1980) is found to be -0.3752. Use t-test to determine whether the

correlation coefficient is significant at 1 % level. (Given t value at 1 % level for 78 degrees of freedom is 2.575).

39. For certain frequency distribution Median = 156, Mode = 180. Compute the value of mean (approximately).

40. Compute the coefficient of variability for the following station

41. Station A: S. D. = 10.0,   A. M. = 85.0,

42. Define positive and negative correlation.

43. If byx = -0.8 and b yx =   -1.2 , find r

44. If r= 0.7, n = 10 find 't' value and test the significance of correlation coefficient. Given't' at 5% level for 8 degrees of freedom is 2.306.

45. Construct the regression equation of Y on X from the data given below   and predict the value of Y when X=13

Given: Correlation coefficient between X & Y = 0.6, Standard Deviation of X - series = 1.5, Standard deviation of Y- series = 2.0, Mean of X – series = 10, Mean of Y – series = 20.

46. Compute the area weighted rainfall for three subdivisions from given data:

47.
Sub-div	A	B	C
Mean rainfall (cm)	85	95	105
Area (sq. Km)	10,000	12000	9000

48. The mean height obtained from a sample size of 100, taken randomly from a population is 64 inches. If the standard deviation of the height distribution of population is 3 inches, set up probable limits of the mean height of population.

49. Calculate trend value taking 5 yearly moving average from given data.

Year:	2001	2002	2003	2004	2005	2006	2007	2008	2009
RF in cm	23	26	28	32	20	12	12	10	09

50. The values of Median and Mean are 100 & 101 respectively. Find the value of Mode.

51. Following is the frequency distribution with unknown frequencies

Class:	00- 20	20-40	40-60	60-80	80-100	Total
Frequency:	2	a	56	b	2	100

52. Find the frequencies (i) if a & b are equal (ii) If 3a = b.

53. State with explanation whether the following meteorological   event is mutually exclusive or not? Heavy rain and sunshine (same place, same time).

54. Write down the relation between regression coefficient and correlation coefficient with its mathematical form.

55. A sample of 100 days was taken from meteorological records of a certain station and of them 10 are found to be foggy. What are the probable limits of the percentage of foggy days in the station?

56. Test the randomness of the series of length n= 108. If the lag one auto correlation coefficient is -0.12 and tg =1.96for 106 degrees of freedom at 5 % level.

57. Compute the value of S.D, C. V. and variance from the given data:

Class:	00- 10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency:	6	5	8	15	7	6	3

58. Construct the regression equation of Y on X and find the value of Y when X is 16 from the given data. A.M. of X series = 10, A.M. of y series =12, correlation coefficient between X & Y series is 0.81,

59. S.D. of X series= S.D. of y series =4. Find the numbers whose Arithmetic Mean (A.M.) is 12.5 and Geometric Mean (G. M.) is 10.

60. If Variance = 4.0, A. M. =5.0, Find Coefficient of variability.

61. Write down the sample space S when two coins are tossed simultaneously.

62. The following data give the 12 UTC dew point temperatures and the next day minimum temperature for the period 6-15 December for a station. Compute coefficient of correlation.

Date:	6	7	8	9	10	11	12	13	14	15
Dew point temp (oC):	16	15	13	09	07	05	03	01	07	
Minimum temp (oC):	16	13	11	10	06	05	05	06	08	

63. If the value of byx = 0.405 & bxy = 0.32 then find the value of r.

64. In a tri-variate distribution it is found that r12=0.7, r13=0.61, r23=0.4; Find the value of r23.1

65. The mean rainfall of the two large samples of sizes 500 & 1000 are 66.5 cm and 67.5 cm respectively. Can the sample be regarded as drawn from the same population of standard deviation 2.5 cm?

66. If variance = 9.0, A.M. = 10, Find co-efficient of variation.

67. For a certain frequency distribution Median = 150, Mode = 175, compute the value of mean (approximately)

68. Monsoon rainfall and food production over India are positively correlated – Justify

69. Construct the regression equation of Y on X and find the value of Y when X= 20 from the given data.

A.M of X series = 12, A.M of Y series = 16, correlation co-efficient between X and Y series is 0.8, S.D. of X series = S.D. of X series = 6

70. Compute the weighted rainfall for three sub-divisions from given data:

Sub-Division	A	B	C
Mean Rainfall (in cm)	80	90	95
Area (Sq. Km)	10,000	9,000	8,000

71. Compute the value of S.D., Coefficient of variation and variance from the given data:

Class:	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency:	3	5	4	7	8	6	2

72. If r= 0.8, n = 10, find t value and test the significance of correlation co-efficient. Given t at 5% level for 8 degree of freedom is 2.306

73. If for Station A,   Variance = 4.0, A. M. =5.0, for station B,   S. D. = 2.4,   A. M. = 8.3, Find Coefficient of variability.

74. If a random sample falls in the critical region, then the null hypothesis is accepted.

75. Probability or cumulative distribution function is a continuous function.

76. Construct the regression equation of Y on X from the data given below   and predict the value of Y when X=15

77. Given: Correlation coefficient between X & Y = 0.3, Standard Deviation of X - series = 1.5, Standard deviation of Y- series = 2.0, Mean of X – series = 5, Mean of Y – series = 10.

78. Probability of the event that 'June rain fall will not be normal' is 0.8 and probability that 'Seasonal rain fall as well as June rainfall both will be normal' is 0.16. What is the conditional probability that seasonal rainfall will be normal given that June rainfall is also normal.

79. If byx= -0.8 and byx = -1.2 , find r.

80. Difference between Correlation and Regression Analysis.

81. If Variance = 4.0, A. M. =5.0, Find Coefficient of variability.

82. If r= 0.8, n = 10 find 't' value and test the significance of correlation coefficient. Given's' at 5% level for 8 degrees of freedom is 2.306.

83. Define a random variable. Mention different types of random variables with specific examples in meteorology.

84. Define probability of an event. Write down additive and multiplicative laws of probability.

85. Define sampling and random sampling. Discuss about t-test for significance of correlation coefficient.

86. Mention any two probability distributions. Specify whether they are continuous or discrete. Write down the expressions of their probability mass or distribution function

87. What is Binomial Distribution and what are the criteria of binomial distributions? 2. What is Poisson Distribution and what are its Properties?

88. Write Short note on Scatter diagram

Q 5. Write short note on the followings

1. Binomial Distribution

2. Method of studying the correlation (any one)

3. Coefficient of variability & Variance.

4. Component of time series. Give the examples of time series

5. Normal distribution

6. Null Hypothesis

7. Cumulative frequencies (Ogives)
8. Poison distribution

9. Null & Alternative Hypothesis

10. Scatter Diagram

11. Difference between Correlation and Regression Analysis.

12. Karl Pearson's method of correlation Coefficient.

PAPER –III : CLIMATOLOGY, STATISTICS, DBMS AND AGROMET

TIME; 1030-1330   **MAX. MARKS: 60**

PART C : DATA BASE MANAGEMENT SYSTEM (DBMS)

Q 1. Fill in the blanks.

1. In Relational database management system, relationship between two tables or files can be specified at the time of _____.

2. In data definition language, _____ deletes objects from the database.

3. The term for collection of information that is organized so that it can be accessed, managed, and updated is _____.

4. Interaction between the data and the application program in DBMS is through --------

5. Data which is processed so as to increase the knowledge of the person who uses the data is known as _____.

6. A software system that is used to create, maintains, and provides controlled access to user databases is called _____.

7. _____ is to store description of all objects that interact with the database.

8. _____ deletes objects from the database.

9. A _____ is a collection of inter-related data and a set of programs to access those data.

10. _____ is a byword for the quality and the reliability of the data of a database system.

11. The _____ schema describes the database design at the physical level, while the _____ schema describes the database design at the logical level.

12. _____level of data abstraction describes what data are actually stored in the database, and the relationships that exists among data.

13. Data definition language _____ deletes objects from data base.

14. Bundle of actions done within a database to bring it from one consistent state to a new consistent state is known as _____.

15. In File processing system, _____ data is transformed into usable information

16. Data persistence means that in a _____ all data is maintained as long as it is not deleted explicitly.

17. An organized collection of logically related data is known as _____.

18. _____ is used to define and store data.

19. Data that describe the properties or characteristics of end-user data, & context of that data is known as _____.

20. A software system that is used to create, maintain, & provide controlled access to user databases is called as _____.

21. DDL for deleting objects from database is _____.

22. In File processing system, _____ data is transformed into usable information.

23. Data persistence means that in a _____ all data is maintained as long as it is not deleted explicitly.

24. _____ is used to define and store data.

25. A software system that is used to create, maintain, & provide controlled access to user databases is called as _____.

26. A characteristic feature of database is "All data is maintained as long as it is not deleted explicitly", is known as _____ (Transaction/Data Integrity/Data Persistence)

27. In Relational database management system, relationship between two tables or files can be specified at the time of _____.

28. In data definition language, _____ deletes objects from the database.

29. The term for collection of information that is organized so that it can be accessed, managed, and updated is _____.

30. Interaction between the data and the application program in DBMS is through --------

31. _____ is to store description of all objects that interact with the database.

32. _____ deletes objects from the database.

33. An organized collection of logically related data is known as _____.

34. _____ is used to define and store data.

35. Koppen's climate Classification is based on_____ and _____.

36. Dry land Farming area having rainfall _____ to _____.

37. The year is divided into _____ seasons for Agriculture purposes.

38. The most important remote sensing index used for monitoring crop growth and performance is _____.

39. ERDAS is a _____ processing software.

40. Data Dictionary is to store description of all objects that interact with the database.

41. DROP deletes objects from the database.

42. A DBMS is a collection of inter-related data and a set of programs to access those data.

43. Data Integrity is a byword for the quality and the reliability of the data of a database system.

44. The Physical schema describes the database design at the physical level, while the Conceptual schema describes the database design at the logical level

45. _____is a set of tables database uses to maintain information about its own databases.

46. Data Redundancy leads to _____ and _____.

Q2. State True or False with reasons

1. Data dictionary refers to a set of tables database uses to maintain information about its own database.

2. In a DBMS all data is maintained as long as it is not deleted explicitly.

Q 3. Answer the following

2. Data dictionary refers to a set of tables database uses to maintain information about its own database.

1. In a DBMS all data is maintained as long as it is not deleted explicitly.

2. Explain with the help of the example the concept of data abstraction.

3. What is Structured Query Language?

4. Give Full forms of the Abbreviations of the following (Any one)

   DDL

   SQL

5. "Data if processed so as to increase the knowledge of the person who uses the data is known as information" – comment and explain with an example.

6. Briefly explain disadvantages of File Processing System (FPS) and advantages of database approach.

7. Explain in brief three important characteristics of the database approach?

8. What is SQL? Give an example relevant to TB2 data i.e. surface day's summary data.

Q4. Write Short Answers.

1. Data Redundancy
2. File processing system
3. Characteristics of database
4. Data, information and knowledge
5. Structured Query Language
6. Metadata with example
7. DBMS Architecture and Data dependence
8. DBMS Architecture
9. Data Dictionary
10. Data Abstraction

INDIA METEOROLOGICAL DEPARTMENT
INTEGRATED MET. TRAINING COURSE (IMTC)
FINAL EXAMINATION

PAPER –III : CLIMATOLOGY, STATISTICS, DBMS AND AGROMET

TIME; 1030-1330   **MAX. MARKS: 60**

PART D : AGROMETEOROLOGY

Q 1. Fill in the blanks.

1. Agromet observations are recorded at _____ and _____ hrs.

2. Koppen's Classification uses _____ and _____as parameters.

3. Soil thermometer is mounted, with an inclination of -------------- with the ground.

4. Agroclimatic zones as demarcated by the Planning Commission (GOI) divides the entire country into ----------------------agroclimatic zones.

5. NDVI stands for _____.

6. Dry land Farming area having rainfall _____ to _____.

7. The year is divided into _____ seasons for Agriculture purposes.

8. The most important remote sensing index used for monitoring crop growth and performance is _____.

9. ERDAS is a _____ processing software.

10. In Potato complete inhibition of tuber formation occurs at _____ temperature.

11. In Sunflower crop high _____ has marked positive influence on crop growth.

12. Late season draught is also known as _____.

13. Graphic data is stored either in _____ and _____ format.

14. IMD provides biweekly MRF on _____ and _____ to the selected AMFU's.

15. Prolonged meteorological drought results in _____.

16. Optimum temperature requirement for rice is _____

17. Rabi season starts form _____ and end during _____ and known as _____.

18. Radiation spectrum useful for crops is ------------

19. ------- and --------- are principal weather parameters influencing crops.

20. No. of days of LGP required for monocropping is -------------

21. There are ---------- no. of agroclimatic zones in India as per ICAR and -------- no. of AMFUs under GKMS scheme.

22. Base temperature for wheat is ---- deg C.

23. Oil thermometer is mounted , with an inclination of _____ with the ground.

24. Grass Minimum Thermometer is used for _____.

25. Base temperature for rice is _____ deg C.

26. Agroclimatic classification by Hargreaves is based on _____.

27. The most important remote sensing index used for monitoring crop growth and performance is _____.

28. In Sunflower crop high _____ has marked positive influence on crop growth.

29. Late season draught is also known as _____.

30. Graphic data is stored either in _____ and _____ format.

31. _____ is often called the father of modern climatic classification.

32. Thornthwaite's classification uses _____ and _____ as parameters.

33. Soil thermometer is mercury in glass thermometer with a bend of_____ degrees in the stem just above the bulb.

34. _____ is used for recording continuously the relative humidity of the air.

35. Sunshine recorder is an instrument for obtaining daily duration of _____.

36. _____ is used to measurement of Evapotranspiration.

37. _____ is used as liquid in minimum thermometer.

38. For meteorological purposes _____ is defined as the longest horizontal distance at which a person with normal vision can see an object under normal day light condition.

39. _____is a land unit in terms of major climates, suitable for a certain range of crops and cultivars

40. The dew gauges are used for measuring _____.

41. An organized collection of logically related data is known as _____.

42. Data Redundancy leads to _____ and _____.

43. Soil thermometer when mounted, makes an inclination of _____ degree with the ground.

44. The chart in a thermograph has to be replaced at an interval of _____ hours.

45. Hargreaves introduced a climatic classification based on _____.

46. The cloud amount is reported in _____ unit.

47. In an Agromet observatory, wind direction is measured by _____.

48. According to Koppen's classification, 'A' climate means _____.

49. To solve the location specific agricultural problems, the ICAR has divided the country into _____ agroclimatic zones.

50. The liquid used in minimum thermometer is _____.

51. If range of Aridity Anomaly lies between 26-50 % then the category of agricultural drought is termed as _____.

Q 2. True / False with reasoning

1. In sun shine recorder long curved summer card (at bottom slot) from 13th April to 31st August.

2. In sun shine recorder Short curved winter card (at top slot) from 13th Oct to end of Feb.

3. In sun shine recorder Straight or equinoxial card (middle slot) from 1st March to 12th April and 1st September to 12th October.

4. The difference between the dry bulb and wet bulb thermometers reading is a measure of moisture content in the atmosphere.

5. Diurnal variation of temperature is the maximum at surface of the earth

6. Agricultural meteorology is not a multidisciplinary science.

7. Agrometeorological Field Units (AMFUs) are issuing Agro-advisory Bulletins.

8. Long curved cards are also called as "Summer cards".

9. Low pigment content results in higher reflectance in red region.

10. Rate off evaporation increases with a fall in the temperature

11. Today's climate is pleasant.

12. Stevenson screen is erected at 3 feet height from the ground.

13. Contingent draught is a feature of the semi arid areas.

14. The spectral reflectance of vegetation canopy varies with the wave length.
15. Rice does not require any optimum temperature for its growth.
16. A healthy plant gives more reflectance in infrared region and less reflectance in near infrared region.
17. Permanent draught is a feature of arid areas.
18. Agriculture meteorology is a multidisciplinary science.
19. Evaporimeter is one of the best and convenient method for obtaining ET data on a day-today basis.
20. Evaporimeter is used only for evaporation and not for evapotranspiration (ET).
21. Mercury is used as liquid minimum thermometer.
22. Alcohol is used in minimum thermometer
23. In NARP, the country was divided into 20 agro-climatic zones.
24. In NARP, the country was divided into 127 agro-climatic zones
25. For meteorological purposes visibility is defined as the shortest horizontal distance at which a person with normal vision can see an object under normal day light condition.
26. Thornthwaite is often called as the father of modern climatic classification.
27. Main criteria for Thornthwaite and Mather (1955) climate classification was Monthly precipitation, Potential evapotranspiration and soil storage
28. Hair hygrograph is used for recording continuously the specific humidity of the air.
29. Grass minimum thermometer is mercury in glass thermometer with a bend of 120 degrees in the stem just above the bulb.
30. In Northern hemisphere, the door opening of the Stevenson screen must be in south direction.
31. The difference between Humidity Index (Ih) and Aridity Index (Ia) is termed as Moisture Index (Im).
32. The mercury is used in the minimum thermometer as it is a poor conductor of heat.
33. Human hairs are sensitive to the variation of Relative Humidity.
34. The drought which is characterized by lack of sufficient moisture in the surface soil layers to support crop growth is called as Meteorological Drought.
35. The top portion of Pest Weather Calendar contains threshold values for different weather parameters for the outbreak of pests.

36. Self-recording rain gauges can be used for the measurement of rainfall intensity.

37. The standard exposure of anemometer in an agromet observatory should be 5 meters above ground.

38. Koppen's introduced the climatic classification based on annual and monthly means of temperature and precipitation.

39. In a Sunshine recorder short curved cards should be used from 13th April to 31st August.

40. The sensitive element of thermograph is a bimetallic strip.

Q 3. Write Short Answers

1. Various components of Crop Weather Calender.
2. Discuss ET and PET.
3. Characteristics of Agriculture seasons.
4. Influence and effect of high temperatures on major crop growth.
5. Describe different components of AAS bulletin. How is it disseminated?
6. Role of IMD in climatic classification of the country.
7. Write short notes on GIS for precision agriculture.
8. Describe different components of AAS bulletin. How is it disseminated?
9. Agro met advisory service
10. Write in detail about various component of operational AAS under GKMS scheme
11. Write in detail about role of IMD in agroclimatic classification
12. Discuss in short about Meteorological and Hydrological drought.
13. What is GDD and write formula.
14. What are the high temperature impact on crops?
15. Write in detail about site selection for agromet observatory, inspection and maintenance of agromet observatory.
16. How Relative Humidity is influencing crops?
17. Write short notes on Koppen's classification
18. Write some differences between agromet and surface observatories
19. Write short notes on high temperature effect on crops.
20. The semi arid climate has seven to four and half humid months.
21. Thornwaite introduced the concept of actual evapotranspiration.

22. Write formula for Ih, Ia and Im.

23. What are different scales of weather forecast used in GKMS.

24. What are the hours of agromet observations? Write some agromet specific instruments in the observatory

25. Various components of Crop Weather Calender.

26. Agromet Advisory Service

27. Discuss ET and PET.

28. Characteristics of Agriculture seasons.

29. Influence and effect of high temperatures on major crop growth.

30. Describe different components of AAS bulletin. How is it disseminated?

31. Role of IMD in climatic classification of the country.

32. Write short notes on GIS for precision agriculture.

33. Describe different components of AAS bulletin. How is it disseminated?

34. Agro met advisory service

35. Write in detail about role of IMD in agroclimatic classification

36. Discuss in short about Meteorological and Hydrological drought.

37. Why there is need to study Agricultural Meteorology?

38. What are the applications of weather forecast in Agriculture?

39. What are the components of Agromet Service Advisory bulletin

40. Self – recording rain gauge

41. Single Stevenson's screen Stevenson's screen

42. Agro-climatic zone

43. What point is to be considered during selection of a proper site for the observatory

44. What are the applications of weather forecast in agriculture?

45. Describe about the working principle and measurement of pan evaporation in an agromet observatory

46. Discuss about the role and importance of Agromet Advisory Services in India?

47. Define Drought and briefly discuss about types of drought