

Code No.	T – 2124
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**Entrance Examination for Admission to the P.G. Courses in the
Teaching Departments, 2024**

CSS

CLIMATE CHANGE AND DISASTER MANAGEMENT

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General Instructions

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be (✓) 'tick marked' **only** in the "**Response Sheet**" provided.
3. **Negative marking** : **0.25 marks** will be deducted for each wrong answer .

Time : 2 Hours

Max. Marks : 100

To be filled in by the Candidate									
Register Number	in Figures								
	in words								

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Choose appropriate answer from the options in the questions.

(100 × 1 = 100 marks)

1. What is the angle of the Earth's axial tilt?
 - A. 0 degrees
 - B. 23.5 degrees
 - C. 45 degrees
 - D. 90 degrees

DO NOT WRITE HERE

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2. The phenomenon where one hemisphere experiences more daylight hours while the other experiences fewer is called
- A. The Coriolis effect
 - B. The greenhouse effect
 - C. The equinox
 - D. The solstice
3. What causes the Coriolis effect?
- A. The tilt of the Earth's axis
 - B. The Earth's rotation on its axis
 - C. The Earth's orbit around the Sun
 - D. The Moon's gravitational pull on the Earth

4. The term 'aphelion" refers to
 - A. The point in the Earth's orbit closest to the Sun
 - B. The point in the Earth's orbit farthest from the Sun
 - C. The moment of greatest axial tilt towards the Sun
 - D. The alignment of the Earth, Moon and Sun

5. How does the Earth's axial tilt affect the distribution of insolation throughout the year?
 - A. It causes the equator to receive less insolation
 - B. It leads to significant seasonal changes in insolation at mid and high latitudes
 - C. It results in the poles receiving constant insolation year-round
 - D. It does not affect insolation distribution

6. Which layer of the Earth's atmosphere contains the highest concentration of ozone?
 - A. Troposphere
 - B. Stratosphere
 - C. Mesosphere
 - D. Thermosphere

7. Nitric oxide radicals in the atmosphere are involved in
 - A. Directly increasing the greenhouse effect
 - B. The destruction of atmospheric methane
 - C. Forming acid rain when reacting with water vapor
 - D. Decreasing the amount of ultraviolet radiation reaching the Earth's surface

8. Which of the following particles, radicals and ions are commonly found in the Earth's atmosphere?
 - A. Sulfate aerosols, hydroxyl radicals and sodium ions
 - B. Neon gas, lithium ions and chlorine radicals
 - C. Argon particles, fluorine ions and helium radicals
 - D. Nitrogen gas, phosphate ions and argon radicals

9. Which layer of the atmosphere is closest to Earth and contains most of the atmosphere's mass?
- A. Stratosphere
 - B. Troposphere
 - C. Mesosphere
 - D. Thermosphere
10. The ozone layer, which absorbs harmful ultraviolet radiation from the Sun, is found in which layer of the atmosphere?
- A. Troposphere
 - B. Stratosphere
 - C. Mesosphere
 - D. Exosphere
11. Albedo refers to
- A. The absorption of ultraviolet radiation by the ozone layer
 - B. The fraction of solar energy reflected from the Earth back into space
 - C. The trapping of heat by greenhouse gases in the atmosphere
 - D. The conversion of solar radiation into infrared radiation
12. The process by which the atmosphere traps some of the Earth's outgoing infrared radiation to warm the planet is known as:
- A. Solar flaring
 - B. The greenhouse effect
 - C. Albedo effect
 - D. Cosmic warming
13. Which layer of the atmosphere is known for containing the majority of atmospheric ions and is influenced by solar and cosmic radiation?
- A. Stratosphere
 - B. Troposphere
 - C. Ionosphere
 - D. Exosphere
14. What meteorological parameter is defined as the amount of water vapor present in air expressed as a percentage of the amount needed for saturation at the same temperature?
- A. Dew point
 - B. Absolute humidity
 - C. Relative humidity
 - D. Saturation mixing ratio

15. Which of the following instruments is commonly used to measure atmospheric pressure?
- A. Anemometer
 - B. Barometer
 - C. Hygrometer
 - D. Pyranometer
16. What is the primary driving force behind wind movement?
- A. Temperature differences
 - B. Pressure gradients
 - C. Humidity levels
 - D. Radiation balances
17. The saturation mixing ratio is a measure of
- A. The maximum speed of wind in a given area
 - B. The maximum amount of water vapor air can hold at a given temperature and pressure
 - C. The actual amount of water vapor in the air
 - D. The temperature at which water vapor begins to condense
18. What is the adiabatic lapse rate?
- A. The rate at which atmospheric pressure decreases with an increase in altitude
 - B. The rate at which temperature decreases with an increase in altitude, without heat exchange
 - C. The rate at which humidity decreases with an increase in altitude
 - D. The rate at which wind speed increases with an increase in altitude
19. What does the environmental lapse rate describe?
- A. The change in temperature with height observed within the atmosphere
 - B. The theoretical change in temperature with height for a parcel of dry air
 - C. The constant temperature throughout the stratosphere
 - D. The temperature change with height during a temperature inversion

20. Wind Roses are used to show:
- A. The speed of wind at different altitudes
 - B. The frequency of wind coming from different directions
 - C. The temperature differences caused by wind
 - D. The humidity levels associated with different wind speeds
21. Which element is not directly related to weather?
- A. Precipitation
 - B. Temperature
 - C. Ocean currents
 - D. Wind speed
22. Humidity is defined as
- A. The speed of the wind
 - B. The atmospheric pressure
 - C. The amount of water vapor in the air
 - D. The temperature of the air
23. The term 'meteorology' refers to the study of
- A. Meteors and asteroids
 - B. Weather and atmospheric conditions
 - C. Ocean currents and tides
 - D. Earth's magnetic field
24. Which climate type is characterized by high temperatures and significant precipitation throughout the year according to the Köppen classification?
- A. Hot desert
 - B. Warm summer continental
 - C. Tropical rainforest
 - D. Mediterranean
25. Which of the following climate types is not recognized in the Thornthwaite climate classification system?
- A. Humid
 - B. Arid
 - C. Perhumid
 - D. Ice Cap

26. What is the key difference between genetic and empirical climate classifications?
- A. Genetic classifications are based on climate processes, while empirical classifications are based on observed climate data
 - B. Genetic classifications are based on observed climate data, while empirical classifications are based on climate processes
 - C. Genetic classifications focus on future climate predictions, while empirical classifications focus on current climate conditions
 - D. There is no significant difference between the two
27. Which of the following factors is not considered in the Köppen climate classification system?
- A. Precipitation
 - B. Temperature
 - C. Wind patterns
 - D. Vegetation
28. The primary energy source for hurricanes is
- A. Cold air masses from polar regions
 - B. Warm, moist air over tropical oceans
 - C. High-altitude jet streams
 - D. Land-sea temperature contrasts
29. Global ocean circulation, also known as the “global conveyor belt,” primarily functions to
- A. Distribute heat around the planet
 - B. Generate tidal waves and tsunamis
 - C. Control the Earth’s rotation
 - D. Produce marine life and biodiversity
30. Hurricanes are classified into how many categories on the Saffir-Simpson Hurricane Wind Scale?
- A. 3
 - B. 5
 - C. 7
 - D. 9

31. The Intertropical Convergence Zone (ITCZ) is:
- A. A high-pressure system located at the poles
 - B. A boundary where northern and southern air masses meet
 - C. A region of low pressure that encircles the Earth near the equator
 - D. The dividing line between warm and cold ocean currents
32. Which process is primarily responsible for the salinity-driven component of global ocean circulation?
- A. Thermohaline circulation
 - B. Eddy diffusion
 - C. Ekman transport
 - D. Wind-driven circulation
33. The term “eye” refers to which part of a hurricane?
- A. The most intense part of the storm with the highest wind speeds
 - B. The calm, low-pressure center of the storm
 - C. The outer edge where the storm begins to dissipate
 - D. The area just outside the calm center, known for heavy rains
34. What are trade winds?
- A. Winds that blow from the polar regions to the equator
 - B. Winds that blow from the equator to the polar regions
 - C. Predominantly easterly winds that blow towards the equator
 - D. Strong westerly winds found in the upper atmosphere
35. El Niño is characterized by:
- A. Cooling of surface ocean waters in the central and eastern Pacific
 - B. Warming of surface ocean waters in the central and eastern Pacific
 - C. Unchanged ocean temperature conditions in the Pacific
 - D. Increased hurricane activity in the Atlantic Ocean

36. What is the Indian Ocean Dipole?
- A. A cyclone formation phenomenon in the Indian Ocean
 - B. An irregular oscillation of sea-surface temperatures in which the western Indian Ocean becomes alternately warmer and then colder than the eastern part of the ocean
 - C. A monsoon rainfall pattern in the Indian Ocean
 - D. A regional wind pattern that affects the Indian Ocean exclusively
37. During an El Niño event, which region is most likely to experience increased rainfall?
- A. Western Pacific and Southeast Asia
 - B. Eastern Pacific and South America
 - C. Central Africa
 - D. Northern Europe
38. How does La Niña affect Atlantic hurricane activity?
- A. It decreases hurricane activity due to cooler Atlantic waters
 - B. It has no significant effect on hurricane activity
 - C. It increases hurricane activity due to warmer Atlantic waters
 - D. It shifts hurricane paths away from the United States
39. Which phenomenon is characterized by a periodic, typically biennial, reversal of wind and water currents in the Indian Ocean?
- A. Gulf Stream shift
 - B. ENSO
 - C. Indian Ocean Dipole
 - D. Monsoon reversal
40. Which of the following is not a natural driver of climate change?
- A. Volcanic eruptions
 - B. Solar irradiance
 - C. Urbanization
 - D. Orbital variations
41. Which international agreement aims to reduce the emission of gases that contribute to global warming and climate change?
- A. The Montreal Protocol
 - B. The Paris Agreement
 - C. The Kyoto Protocol
 - D. Both B and C

42. Land use changes such as urbanization can lead to:
- A. Lower local temperatures
 - B. Higher local humidity levels
 - C. The formation of urban heat islands
 - D. Increased global albedo
43. What role do aerosols play in cloud formation?
- A. They have no effect on cloud formation
 - B. They inhibit cloud formation
 - C. They serve as cloud condensation nuclei
 - D. They dissipate cloud formations
44. What impact does black carbon have on snow and ice?
- A. It has a cooling effect, increasing their reflectivity
 - B. It has no significant impact
 - C. It accelerates melting by absorbing sunlight
 - D. It increases ice formation
45. The Global Framework for Climate Services (GFCS) was initiated by which organization?
- A. United Nations Environment Programme (UNEP)
 - B. World Meteorological Organization (WMO)
 - C. Intergovernmental Panel on Climate Change (IPCC)
 - D. United Nations Development Programme (UNDP)
46. What is the main objective of the User Interface Platform (UIP) component of the GFCS?
- A. To facilitate the exchange of climate information between data providers and users
 - B. To develop new climate prediction models
 - C. To solely focus on improving satellite technology
 - D. To provide financial support to climate researchers

47. The Global Framework for Climate Services aims to improve the availability and use of climate information in which of the following sectors?
- A. Communication
 - B. Archeology
 - C. Disaster risk reduction
 - D. Space exploration
48. In the context of the European Commission's Roadmap for Climate Services, which of the following is a key area for action?
- A. Phase out all climate research by 2030
 - B. Increase public awareness and access to climate information
 - C. Limit climate services to governmental organizations
 - D. Discourage international cooperation on climate issues
49. What role does climate information play in the energy sector?
- A. It has no impact on the energy sector
 - B. It aids in optimizing renewable energy production and distribution
 - C. It discourages the use of solar and wind energy
 - D. It promotes the exclusive use of fossil fuels
50. The European Commission's Roadmap for Climate Services emphasizes the importance of:
- A. Collaboration between different sectors and disciplines of Climate Services
 - B. Isolating climate research from public and private sectors
 - C. Focusing exclusively on the negative impacts of climate change
 - D. Avoiding international collaboration on climate data sharing
51. Approximately how old is the Earth?
- A. 4.6 million years
 - B. 4.6 billion years
 - C. 14 billion years
 - D. 14 million years
52. Which gas was not present in significant amounts in Earth's early atmosphere?
- A. Nitrogen
 - B. Oxygen
 - C. Carbon dioxide
 - D. Water vapor

60. The San Andreas Fault is an example of a
- A. Convergent plate boundary
 - B. Divergent plate boundary
 - C. Transform plate boundary
 - D. Subduction zone
61. Which factor primarily influences ocean salinity?
- A. The depth of the ocean
 - B. The temperature of the ocean surface
 - C. The amount of evaporation and precipitation over the ocean
 - D. The movement of tectonic plates
62. What is the primary cause of tides?
- A. Wind patterns over the ocean
 - B. The rotation of the Earth
 - C. The gravitational pull of the moon and the sun
 - D. Changes in atmospheric pressure
63. Which of the following best describes the abyssal plain?
- A. A shallow, sunlit region near the coast
 - B. A deep, flat, and extensive region of the ocean floor
 - C. The continental slope connecting the shelf and the abyssal plain
 - D. Underwater volcanoes and mountain ranges
64. What is beach nourishment?
- A. Removing sand from the beach to build structures
 - B. Adding sand or sediment to a beach to combat erosion
 - C. Feeding marine life to keep them from eating coastal vegetation
 - D. The natural process of sand accumulation on beaches
65. What is the impact of constructing hard structures, such as sea walls, on adjacent beaches?
- A. They usually increase the amount of sand on adjacent beaches
 - B. They have no impact on adjacent beaches
 - C. They can lead to increased erosion on adjacent beaches
 - D. They improve the biodiversity of adjacent beaches

66. How can disaster vulnerability be reduced?
- A. By increasing the frequency of hazards
 - B. Through community education and preparedness plans
 - C. Ignoring risk assessments
 - D. By relocating hazards
67. What is the key difference between a hazard and a disaster?
- A. A hazard becomes a disaster when it significantly disrupts the functioning of a community or society
 - B. A disaster is a natural phenomenon, while a hazard is always man-made
 - C. Hazards are predictable, but disasters cannot be predicted
 - D. Disasters happen frequently, whereas hazards are rare events
68. A pandemic is an example of what type of disaster?
- A. Biological
 - B. Meteorological
 - C. Hydrological
 - D. Geophysical
69. A sudden-onset disaster is characterized by:
- A. Having a gradual impact that becomes apparent over years or decades
 - B. Occurring with little to no warning, causing immediate damage and impact
 - C. Being primarily caused by human activities
 - D. Affecting only a small, localized area
70. Desertification is considered a
- A. Sudden-onset disaster
 - B. Slow-onset disaster
 - C. Man-made disaster
 - D. Geophysical disaster
71. What is the scale used to measure the magnitude of earthquakes?
- A. Fujita Scale
 - B. Saffir-Simpson Scale
 - C. Richter Scale
 - D. Mercalli Scale

72. What type of volcanic eruption is characterized by highly viscous lava that can cause explosive eruptions?
- A. Shield
 - B. Cinder cone
 - C. Flood basalt
 - D. Stratovolcano
73. Landslides that involve a rotational movement of rock, earth, or debris are known as:
- A. Rockfalls
 - B. Mudflows
 - C. Slumps
 - D. Turbidity currents
74. Which scale is used to categorize the intensity of tropical cyclones?
- A. Richter Scale
 - B. Saffir-Simpson Hurricane Wind Scale
 - C. Fujita Scale
 - D. Beaufort Scale
75. Which type of flood occurs due to the overflow of rivers?
- A. Flash flood
 - B. Urban flood
 - C. Riverine flood
 - D. Coastal flood
76. Pyroclastic flows are associated with which natural disaster?
- A. Earthquakes
 - B. Volcanic eruptions
 - C. Landslides
 - D. Cyclones
77. Coastal erosion can be a secondary effect of which disaster?
- A. Earthquakes
 - B. Tsunamis
 - C. Cyclones
 - D. All of the above

78. Which disaster is specifically measured by the Moment Magnitude Scale?
- A. Earthquakes
 - B. Tsunamis
 - C. Volcanic eruptions
 - D. Cyclones
79. Which part of the electromagnetic spectrum is most commonly used for standard photographic remote sensing?
- A. Ultraviolet (UV)
 - B. Visible
 - C. Infrared (IR)
 - D. Microwave
80. What property of the electromagnetic spectrum does remote sensing utilize to detect and classify objects on Earth's surface?
- A. The color of objects as seen by the naked eye.
 - B. The ability of objects to absorb, emit and reflect different wavelengths.
 - C. The temperature of objects.
 - D. The sound emitted by objects.
81. Infrared remote sensing is particularly useful for:
- A. Measuring the speed of moving objects
 - B. Detecting temperature variations on the Earth's surface
 - C. Mapping the ocean floor
 - D. Measuring the chemical composition of the atmosphere
82. Which of the following wavelengths can penetrate clouds, making it useful for Earth observation even in cloudy conditions?
- A. Visible
 - B. Ultraviolet (UV)
 - C. Microwave
 - D. Infrared (IR)

83. The electromagnetic spectrum includes, in order from shortest to longest wavelength:
- A. Gamma rays, X-rays, UV, visible, IR, microwave, radio waves.
 - B. Radio waves, microwave, IR, visible, UV, X-rays, gamma rays.
 - C. Visible, UV, IR, microwave, radio waves, X-rays, gamma rays.
 - D. IR, visible, UV, X-ray, gamma rays, microwave, radio waves.
84. What is the main advantage of using satellite remote sensing over traditional ground-based observations?
- A. Lower cost
 - B. Ability to obtain data from inaccessible areas
 - C. Higher accuracy
 - D. Faster data processing
85. What term describes the part of the electromagnetic spectrum that can pass through the Earth's atmosphere without being absorbed significantly?
- A. Atmospheric opacity
 - B. Atmospheric windows
 - C. Electromagnetic reflection
 - D. Spectral absorption
86. In remote sensing, what does absorption refer to?
- A. The process by which electromagnetic radiation is retained by a material and converted into heat
 - B. The reflection of sunlight off the surface of water bodies
 - C. The emission of radiation from the Earth's surface back into space
 - D. The passing of electromagnetic waves through a medium
87. What is the primary reason some electromagnetic waves cannot reach the Earth's surface and are absorbed by the atmosphere?
- A. The presence of atmospheric windows
 - B. The composition of the Earth's atmosphere, including gases that absorb specific wavelengths
 - C. The angle of the sun
 - D. The Earth's magnetic field

88. Which phenomenon explains why water bodies appear dark in infrared remote sensing images?
- A. High reflection of infrared radiation
 - B. High absorption of infrared radiation
 - C. Emission of infrared radiation
 - D. Transmission of infrared radiation through water
89. Remote sensing contributes to disaster management by:
- A. Providing real-time data on disaster-stricken areas for efficient response
 - B. Creating detailed maps of urban areas only
 - C. Directly stopping natural disasters from occurring
 - D. Predicting earthquakes with absolute certainty
90. Which aspect of climate change can be studied using satellite observations of the Earth's radiation budget?
- A. The distribution of languages around the world
 - B. Atmospheric composition and global temperature changes
 - C. The depth of the ocean floor
 - D. The political boundaries between countries
91. Satellite imagery is crucial for disaster response because it:
- A. Provides a direct way to stop ongoing disasters
 - B. Can replace on-the-ground emergency services
 - C. Offers a bird's-eye view for assessing damage and planning logistics
 - D. Can predict future disasters with 100% accuracy

92. What is the primary advantage of using satellite meteorology for tracking cyclones?
- A. It can predict earthquakes that may trigger cyclones
 - B. It offers global coverage and real-time monitoring of weather systems
 - C. It can directly control the path of cyclones
 - D. It provides detailed underwater ocean currents data
93. Doppler radar is essential in hurricane monitoring because it can:
- A. Change the direction of hurricanes
 - B. Measure the speed and direction of wind within storms
 - C. Stop the formation of hurricanes
 - D. Predict the exact susceptible location in advance
94. How do tide gauges contribute to tsunami detection?
- A. By cooling ocean temperatures to prevent tsunamis
 - B. By measuring sea level changes indicative of a tsunami
 - C. By creating artificial waves to counteract tsunamis
 - D. By broadcasting warning messages to coastal communities
95. Wave and current recorders are vital for
- A. Generating electricity from ocean waves
 - B. Monitoring ocean conditions to forecast storm surges
 - C. Reducing the salinity of ocean water
 - D. Mapping the ocean floor
96. Pressure sensors deployed on the ocean floor are used in tsunami warning systems to detect
- A. Changes in water temperature
 - B. Changes in water pressure indicating a passing tsunami wave
 - C. The salinity of the water
 - D. The presence of marine life

97. The use of Doppler radar in storm tracking helps to
- A. Measure rainfall totals only
 - B. Analyze cloud patterns without assessing movement
 - C. Provide detailed information on storm intensity, movement and potential for severe weather
 - D. Focus solely on temperature variations within the storm
98. Why are satellites equipped with infrared sensors useful in tracking hurricanes?
- A. They can measure the temperature of clouds and surface waters, indicating the strength and development of hurricanes
 - B. They are primarily used for communication purposes only
 - C. They can directly measure the wind speed on the ocean surface
 - D. They are used to measure the depth of the ocean
99. In addition to tracking, how do modern meteorological technologies contribute to disaster preparedness for cyclones and hurricanes?
- A. By relocating populations away from coastlines
 - B. Through early warning systems that allow for timely evacuations and preparations
 - C. By changing weather patterns to divert storms
 - D. They have no contribution to disaster preparedness
100. How does integrating data from tide gauges, wave recorders and satellite observations enhance tsunami warning systems?
- A. By providing a comprehensive view of oceanic conditions, improving the accuracy of tsunami predictions and warnings
 - B. By providing a comprehensive information on tsunami hits
 - C. By physically stopping tsunamis from reaching the shore
 - D. They are unrelated technologies that do not enhance tsunami warning systems
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ANSWER SHEET

1	A	B	C	D	E	26	A	B	C	D	E	51	A	B	C	D	E	76	A	B	C	D	E
2	A	B	C	D	E	27	A	B	C	D	E	52	A	B	C	D	E	77	A	B	C	D	E
3	A	B	C	D	E	28	A	B	C	D	E	53	A	B	C	D	E	78	A	B	C	D	E
4	A	B	C	D	E	29	A	B	C	D	E	54	A	B	C	D	E	79	A	B	C	D	E
5	A	B	C	D	E	30	A	B	C	D	E	55	A	B	C	D	E	80	A	B	C	D	E
6	A	B	C	D	E	31	A	B	C	D	E	56	A	B	C	D	E	81	A	B	C	D	E
7	A	B	C	D	E	32	A	B	C	D	E	57	A	B	C	D	E	82	A	B	C	D	E
8	A	B	C	D	E	33	A	B	C	D	E	58	A	B	C	D	E	83	A	B	C	D	E
9	A	B	C	D	E	34	A	B	C	D	E	59	A	B	C	D	E	84	A	B	C	D	E
10	A	B	C	D	E	35	A	B	C	D	E	60	A	B	C	D	E	85	A	B	C	D	E
11	A	B	C	D	E	36	A	B	C	D	E	61	A	B	C	D	E	86	A	B	C	D	E
12	A	B	C	D	E	37	A	B	C	D	E	62	A	B	C	D	E	87	A	B	C	D	E
13	A	B	C	D	E	38	A	B	C	D	E	63	A	B	C	D	E	88	A	B	C	D	E
14	A	B	C	D	E	39	A	B	C	D	E	64	A	B	C	D	E	89	A	B	C	D	E
15	A	B	C	D	E	40	A	B	C	D	E	65	A	B	C	D	E	90	A	B	C	D	E
16	A	B	C	D	E	41	A	B	C	D	E	66	A	B	C	D	E	91	A	B	C	D	E
17	A	B	C	D	E	42	A	B	C	D	E	67	A	B	C	D	E	92	A	B	C	D	E
18	A	B	C	D	E	43	A	B	C	D	E	68	A	B	C	D	E	93	A	B	C	D	E
19	A	B	C	D	E	44	A	B	C	D	E	69	A	B	C	D	E	94	A	B	C	D	E
20	A	B	C	D	E	45	A	B	C	D	E	70	A	B	C	D	E	95	A	B	C	D	E
21	A	B	C	D	E	46	A	B	C	D	E	71	A	B	C	D	E	96	A	B	C	D	E
22	A	B	C	D	E	47	A	B	C	D	E	72	A	B	C	D	E	97	A	B	C	D	E
23	A	B	C	D	E	48	A	B	C	D	E	73	A	B	C	D	E	98	A	B	C	D	E
24	A	B	C	D	E	49	A	B	C	D	E	74	A	B	C	D	E	99	A	B	C	D	E
25	A	B	C	D	E	50	A	B	C	D	E	75	A	B	C	D	E	100	A	B	C	D	E

ROUGH WORK

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