

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S) Examinations April 2026 (2019 Scheme)

Course Code: CET448

Course Name: HYDROCLIMATOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | Explain how vapour pressure and humidity are related. | (3) |
| 2 | List different forms of precipitation. | (3) |
| 3 | Explain the Diurnal temperature range. | (3) |
| 4 | Explain temperature extremes and heat waves. | (3) |
| 5 | Enlist the types of droughts. | (3) |
| 6 | Explain the causes of floods. | (3) |
| 7 | What are the main applications of regional climate models | (3) |
| 8 | Enlist the methods of statistical downscaling. | (3) |
| 9 | Explain change point in hydro-climatic series. | (3) |
| 10 | Differentiate between stationary and non-stationary series. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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|----|---|-----|
| 11 | a) Explain different types of precipitation | (6) |
| | b) Explain the formation of clouds and the classification of clouds based on physical form. | (8) |

OR

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|----|---|-----|
| 12 | a) Illustrate how El Nino and La Nina affect Earth's weather patterns with relevant sketches. | (8) |
| | b) State the features of the Indian Summer monsoon. | (6) |

Module II

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|----|---|-----|
| 13 | a) Explain the vertical structure of the atmosphere with a relevant sketch. | (8) |
| | b) Explain temporal variation of air temperature. | (6) |

OR

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| 14 | a) Explain the general circulation of the atmosphere. Describe the triple cell general circulation model with the help of neat diagrams. | (10) |
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- b) Explain the different Laws of radiation. (4)

Module III

- 15 a) Explain flood modelling. (8)
b) A one-day rainfall of 20 cm at a place X was found to have a period of 100 years. Calculate the probability that one-day rainfall of magnitude equal to or larger than 20 cm: (6)
(a) Will not occur at station X during the next 50 years.
(b) Will occur in the next year.

OR

- 16 a) Explain the methods of flood control. (6)
b) Analysis of the annual flood series of a river yielded a sample mean of 1000 cumecs and a standard deviation of 500 cumecs. Estimate the design flood of a structure on this river to provide 90% assurance that the structure will not fall in the next 50 years. Use Gumbel's method and assume the sample size to be very large. (8)

Module IV

- 17 a) Explain how IPCC assessment reports help in the determination of climate scenarios. (8)
b) How are regional climate models different from general circulation models? (6)

OR

- 18 a) Explain the impact of climate change on water resources. (14)

Module V

- 19 a) Explain Principal component analysis. What is its significance in climate change studies? (14)

OR

- 20 a) Explain trend analysis and different methods for trend analysis. (14)
