

**U.G. 6th Semester Examination - 2020****ENVIRONMENTAL SCIENCE****Course Code : BENVDSHT5****Course Title : Environmental Engineering,****Modelling and Statistics**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any **ten** questions of the following:

1×10=10

- Define watershed.
- What do you mean by mean deviation?
- Define random sampling.
- What do you mean by "Secondary data"?
- Define hydraulic gradient.
- What do you mean by 'point source of pollution'?
- Define null hypothesis.
- What is type-I error?

- What do you mean by sampling survey?
- Define - waste water.
- Define-mode.
- What is statistical dispersion?
- What is meant by quota sampling?
- Define-probability of statistical data.
- What is histogram?

2. Answer any **five** questions of the following :

2×5=10

- Define class limit and class boundaries of statistical data.
- What do you mean by harvesting of rain water?
- Distinguish between discrete and continuous variable.
- Mention two importance of watershed management in India.
- Mention the relationship between mean, median, and mode.
- Mention two limitations of environmental modelling.
- Formulate the equation of GPM.
- What is standard error?

*[Turn Over]*

3. Answer any **two** questions of the following :  
5×2=10

a) Calculate Standard Deviation for the following distribution :

Profits (Rs.)	20-30	30-40	40-50	50-60
No. of Company	30	58	62	85
Profits (Rs.)	60-70	70-80	80-90	90-100
No. of Company	112	70	57	26

b) Enumerate the important reasons for municipal waste water treatment.

c) From the following data, derive the regression equation of x and y :

mean of x = 10      SD of x = 1.5

mean of y = 20      SD of y = 2

'r' between x and y = 0.6

d) How do you state the null and alternative hypothesis? Where do we use chi square test?  
3+2=5

4. Answer any **one** question of the following :  
10×1=10

a) Write an overview of the various applications of mathematical model in environmental studies. Mention the significance of  $\sigma_y$  and  $\sigma_z$  used in GPM equation. Write the assumptions and limitations of GPM.      5+2+3

b) Two coins are tossed at a time. Find the probability of getting (i) two head (ii) one head and one tail.

How can correlation and regression methods be used in ecological studies?

Find the median of the following :

25, 51, 49, 37, 20, 19, 58, 63, 34      4+4+2

c) i) Enumerate biomass technologies for the generation of energy from wastes.

ii) Discuss with examples how regression analysis is used to show significant correlation between environmental variables.      5+5