KATHMANDU UNIVERSITY
End Semester Examination [C]
July, 2017

Marks scored:

Level : B. Tech.
Year : IV
Course : ENVS 404
Semester : I

Exam Roll No. :
Time: 30 mins.
F. M. : 20

Registration No.:
Date JUL 0 5 2017

SECTION "A"
[20 Q. × 1 = 20 marks]

Select the correct answer from the given choices. Attempt *ALL* the questions.

1. The type of output from a box model is:
   (a) quantitative and stochastic (b) qualitative and stochastic
   (c) quantitative and deterministic (d) qualitative and deterministic

2. The type of input to the TOP MODEL is:
   (a) static (b) dynamic (c) functional (d) predictive

3. The type of scope of the plume model is:
   (a) predictive (b) mechanistic (c) descriptive (d) stochastic

4. The type of application of the kinematic wave model is:
   (a) stochastic (b) descriptive (c) mechanistic (d) functional

5. To find the spatially and temporally distributed concentration profile of a pollutant in a city, which one of the following models will you use?
   (a) Eulerian 3D model(b) puff model (c) plume model (d) one box model

6. Which of the following is the most suitable vertical coordinate system for meteorological models?
   (a) terrain-following (b) pressure-based (c) altitude-based (d) polar

7. Which one of the following is important in city-scale pollution of the atmosphere?
   (a) N_2O (b) CO_2 (c) NO (d) CFCs

8. Which one of following will give you the information regarding the error in a model having replicate measurements?
   (a) lack of fit (b) relative error (c) mean bias (d) mean square error

9. What type of distribution in a hydrologic model is useful in a mountainous region?
   (a) tanks in series (b) topographical (c) statistical (d) box in series

10. When the rate of biogenic VOC emissions is high, the condition is:
    (a) VOC-sensitive (b) NO_x-sensitive (c) low ozone (d) low PM

11. The model that can be used to simulate the overland flow is:
    (a) tank model (b) land-surface model
    (c) kinematic-wave model (d) Richard's model

12. Which model can mechanistically model the water flow in porous media?
    (a) Richard's equation (b) Fick's law
    (c) Saint-Venant's model (d) Penman-Monteith model

13. Which one of the following models will be the most useful to predict the biological emissions in a paddy field?
(a) multimedia model (b) puff model
(c) Streeter-Phelps model (d) Monod's kinetic model

14. Which method is used to understand the transport of pollutants by river flow?
(a) logistic model (b) Streeter-Phelps model
(c) linear-reservoir model (d) multimedia model

15. What command will you use to visualize the plume concentration at surface?
(a) meshgrid (b) linspace (c) contour (d) figure

16. What kind of method is nesting in atmospheric modeling?
(a) dynamical downscaling (b) dynamical upscaling
(c) statistical upscaling (d) statistical downscaling

17. What kind of computational grid is used in Eulerian models?
(a) fixed coordinate (b) 1-D series of boxes
(c) single box (d) moving coordinate

18. In a multimedia model, the quantity of a toxic pollutant in a soil compartment was investigated. The volume of the soil was found to be 33440 m^3. The fugacity at equilibrium was estimated as 0.0234 Pa and the fugacity capacity of the medium was found to be 14.92 mol/m^3 Pa. Find the moles of the toxic pollutant in the soil medium.
(a) 0.00001044 (b) 0.0016 (c) 52.45 (d) 11675

19. If the seepage velocity in a porous medium is 35 cm/h and Darcy velocity is 20 cm/h, what is the porosity of the medium?
(a) 0.0175 (b) 0.15 (c) 0.57 (d) 700.0

20. Which Matlab command is used to initialize the concentrations of pollutants?
(a) ones (b) zeros (c) sparse (d) init