

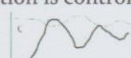
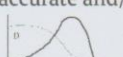


SECTION A

1. C
2. D
3. D
4. C
5. D
6. C
7. D
8. C
9. D
10. A
11. $CH_4 = \frac{200}{25} = 8kg$, $N_2O = \frac{600}{300} = 2kg$
12. Less vegetation, Impervious and sealed surfaces, Complex 3-D structure, Sources produce heat and pollutants
13. False
14. False
15. Global migration, Agriculture, Industrial revolution
16. Embodied
17. Carrying capacity, population growth
- 18.

- i)  This pattern occurs when there are no constraints to growth, or when innovation causes apparent limits to recede.
- ii)  This path is characteristic of a system with fixed constraints in which action is controlled by feedback based on a sense of the distance to the limits.
- iii)  These curves are typical of a system where feedback mechanisms are inaccurate and/or responses are slow.
- iv)  This behavior is like Type C except that the system is insufficiently robust, so corrections are insufficient and collapse occurs.

We may be following scenario (iii) because the system requires time to go through the feedback mechanism.

SECTION B

1.
 - A) Q and R as the residential areas should be near to CBD to shorten the transportation time
 - B) P, industries should be located far away from residential zones
 - C) R-CBD-Q-P, requires 34 minutes to travel which is the best path
 - D) No, it will increase the pollution to the heritage area
 - E) CBD-Airport, to decrease the travel time

2.
 - A) Total ban or curfew for entering city, alternate day entry
 - B) Floating platforms, land reclamation
 - C) Eco-driving, Hybrid Electric Vehicles
 - D) Full day bus lane, B-signals
 - E) Employment close to residence, teleworking

3.
 - A) Pocket park
 - B) Lifestyles
 - C) Satellite Town
 - D) Cycling
 - E) Demand

SECTION C

1. A
2. D
3. C
4. D
5. B

SECTION D

1. Agriculture, Aquaculture, Industry, Domestic, Recreational, Landscaping, Energy
2. In Dujiangyan slides

SECTION E

- i. Codes of Ethics
- ii. Professionalism
- iii. Social Contract Model
- iv. Engineering Societies
- v. Principle of Proportionate Care
- vi. The Intrinsic Purpose of Engineering
- vii. The Impact of Technology on Society

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