



## INDIAN SCHOOL AL WADI AL KABIR



<b>Class: XII</b>	<b>Department: SCIENCE 2022 – 23</b> <b>SUBJECT: BIOLOGY</b>	<b>Date of submission:</b> <b>13.11.2022</b>
<b>Worksheet No: 10</b> <b>with answers</b>	<b>UNIT: ECOLOGY</b> <b>Chapter: ECOSYSTEM</b>	<b>Note:</b> <b>A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

### MULTIPLE CHOICE QUESTIONS

1. Approximately how much of the solar energy that falls on the leaves of a plant is converted to chemical energy by photosynthesis?  
a. Less than 1%      b. 2-10%      c. 30%      d. 50%
2. Which of the following is not a producer?  
a. *Spirogyra*      b. *Agaricus*      c. *Volvox*      d. *Nostoc*
3. Productivity is the rate of production of biomass, expressed in terms of:  
i.  $(\text{kcal m}^{-3}) \text{ yr}^{-1}$   
ii.  $\text{g}^{-2} \text{ yr}^{-1}$   
iii.  $\text{g}^{-1} \text{ yr}^{-1}$   
iv.  $(\text{kcal m}^{-2}) \text{ yr}^{-1}$   
a. ii      b. iii      c. ii and iv      d. i and iii
4. The process of mineralisation by microorganisms helps in the release of:  
a. inorganic nutrients from humus  
b. both organic and inorganic nutrients from detritus  
c. organic nutrients from humus  
d. inorganic nutrients from detritus and formation of humus.
5. An inverted pyramid of biomass can be found in which ecosystem?  
a. Forest  
b. Marine  
c. Grass land  
d. Tundra

6. Which of the following ecosystems is most productive in terms of net primary production?
- Deserts
  - Tropical rain forests
  - Oceans
  - Estuaries
7. Among the following, where do you think the process of decomposition would be the fastest?
- Tropical rain forest
  - Antarctic
  - Dry arid region
  - Desert
8. If the carbon atoms fixed by producers already have passed through three species, the trophic level of the last species would be.
- First trophic level
  - Second trophic level
  - Third trophic level
  - Fourth trophic level

### **TWO MARK QUESTIONS**

9. Expand PAR, how much PAR is used in gross primary productivity?
10. Give account of factors affecting the rate of decomposition.
11. Why is the length of a food chain in an ecosystem generally limited to 3-4 trophic levels?
12. Which ecosystem has maximum stratification? Justify.
13. Construct a grazing food chain using the following with five links.  
(Earth worm, bird, snake, vulture, grass, grasshopper, frog, decaying plant matter)

### **THREE MARK QUESTIONS**

14. What are ecological pyramids? Mention its limitations
15. Briefly describe the process of decomposition
16. Construct a pyramid of biomass starting with phytoplankton. Label 3 trophic levels. Is the pyramid upright or inverted? Why?

### **FIVE MARK QUESTIONS**

17. (a) Draw the ideal pyramid of energy up to four trophic levels where 10,000 J are available from sun light to the primary producer. Indicate the amount of end product available at each trophic level.

- (b) Why is pyramid of energy always upright? Explain.  
 (c) Mention the limitations of an ecological pyramid.
18. (a) Give an example for a pyramid where small standing crop of phytoplankton supports large standing crop of zooplankton. Draw the pyramid.  
 (b) How does pyramid of biomass of forest ecosystem is different from that of lake ecosystem?

### HINTS/SOLUTION

<b>MULTIPLE CHOICE QUESTIONS</b>		
<b>1</b>	b. 2-10%	<b>1</b>
<b>2</b>	b. <i>Agaricus</i>	<b>1</b>
<b>3</b>	c. ii and iv	<b>1</b>
<b>4</b>	a. inorganic nutrients from humus	<b>1</b>
<b>5</b>	b. Marine	<b>1</b>
<b>6</b>	b. Tropical rain forests	<b>1</b>
<b>7</b>	a. Tropical rain forest	<b>1</b>
<b>8</b>	d. Fourth trophic level	<b>1</b>
<b>TWO MARKS QUESTIONS</b>		
<b>9</b>	Photosynthetically Active Radiation, 2-10%	<b>2</b>
<b>10</b>	Environmental factors and chemical nature of detritus	<b>2</b>
<b>11</b>	It is due to law of 10%	<b>2</b>
<b>12</b>	Tropical rain forest, vertical distribution of different layers	<b>2</b>
<b>13</b>	Any one food chain – with 5 trophic levels	<b>2</b>
<b>THREE MARKS QUESTIONS</b>		
<b>14</b>	Graphical representation of food chain, Limitations – only food chain but not food web, decomposers are not represented, organism belonging to two or more trophic levels cannot be represented	<b>3</b>
<b>15</b>	Explanation of – fragmentation, leaching, catabolism, humification and mineralization	<b>3</b>
<b>16</b>	Inverted pyramid – construction, biomass of phytoplankton will be less	<b>3</b>
<b>FIVE MARKS QUESTIONS</b>		
<b>17</b>	Construction of pyramid, energy level based on law of 10%, upright pyramid, limitations	<b>5</b>
<b>18</b>	(a) Pyramid of biomass – inverted (b) Forest – upright and inverted in lake ecosystem	<b>5</b>

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