DAY THIRTY SEVEN

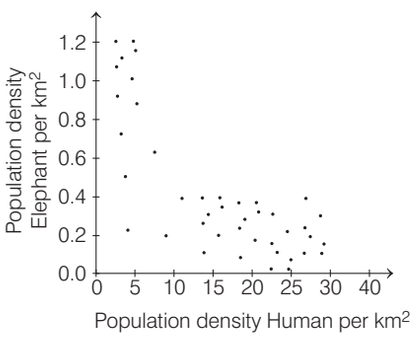
Unit Test 8

(Human Welfare, Biotechnology, Ecology and Environment)

1 A population that is growing exponentially in the absence of limiting factors is best illustrated by a/an
(a) curve that terminates in a plateau phase
(b) S-shaped curve
(c) J-shaped curve
(d) None of the above

2 Find the incorrect statement.
(a) Gene therapy is a genetic engineering technique used to treat disease at molecular level by replacing defective genes with normal genes
(b) Calcitonin is a medically useful recombinant product in the treatment of infertility
(c) *Bt* toxin is biodegradable insecticide obtained from *Bacillus*
(d) Totipotency is the potential ability of a cell to develop into a complete plant

3 A survey was carried out to investigate the relationship between the human population density and elephant population density in Zimbabwe. Twenty five sites were sampled, all within a 15000 km^2 area in the North of the country. Elephant populations were estimated by flying over the area and counting elephants seen from the air. The results are shown in the figure. Each point represents the results from one of the sites sampled.



Why elephant populations are very low in areas where human population density is high?
(a) Elephants occupy more grassland areas and this reduces the habitats available to human
(b) High human population causes an incline in elephant populations
(c) More humans are treat to elephants as they compete for land needed for the agriculture and settlement
(d) All of the above

4 Vinegar is produced from alcohol with the help of
(a) *Lactobacillus* (b) *Acetobacter*
(c) *Azotobacter* (d) *Rhizobium*

5 The impacts of loss of biodiversity may lead to
I. lowered resistance to environmental perturbation.
II. decrease in plant production.
III. increased variability in an ecosystem processes like water use, pest/disease cycle, plants productivity.
IV. increase in plant production.
Choose the correct option.
(a) I and II (b) I and IV
(c) I and III (d) I, II and III

6 A hybrid where the cytoplasm of two parent cells are fused by retaining only one parental nucleus is called
(a) asymmetric somatic hybrid
(b) cybrid
(c) an interbreed
(d) symmetric somatic hybrid

7 Members of which of the following are the major primary producers in the marine ecosystem?
(a) Yeasts
(b) Diatoms
(c) Sporozoans
(d) Sponges

8 I. Radiation from nuclear waste is ...*A*... at a very high rate.
II. At low doses, radiations cause ....*B*.... .

Complete the given statement by choosing appropriate option for A and B.

(a) *A* – lethal; *B* – cancer
(b) *A* – cancer; *B* – mutation
(c) *A* – mutation; *B* – Down syndrome
(d) *A* – Down syndrome; *B* – cancer

9 Fill up the blanks.

I. The products of ecosystem processes are called …*A*… .
II. …*B*… are the major source of ecosystem services.
III. …*C*… and his colleagues tried to put price tags on nature's life support services which, came up to US …*D*… a year.

Choose the correct option for *A, B, C* and *D*.

(a) *A* – ecosystem services, *B* – Plants, *C* – Robert Brown, *D* – 31 trillion
(b) *A* – ecological services, *B* – Plants, *C* – Robert Constanza, *D* – 32 trillion
(c) *A* – ecosystem services, *B* – Forests, *C* – Robert Constanza, *D* – 33 trillion
(d) *A* – ecological services, *B* – Ponds, *C* – Robert Brown, *D* – 34 trillion

10 Which one of the following pairs of organisms are exotic species introduced in India?

(a) *Ficus religiosa, Lantana camara*
(b) *Lantana camara, water* hyacinth
(c) Water hyacinth, *Prosopis cineraria*
(d) Nile perch, *Ficus religiosa*

11 Match the following columns.

Column I	Column II
A. Rice	1. Potato
B. Wheat	2. Padma, Jaya, Krishna
C. Late blight	3. Root-knot
D. Tomato	4. Citrus
	5. NP 165, NP 710

Codes

	A	B	C	D
(a)	2	5	1	3
(c)	4	5	2	3

	A	B	C	D
(b)	2	1	3	4
(d)	3	2	1	5

12 The quickest method of plant breeding is

(a) introduction (b) selection
(c) hybridisation (d) mutation breeding

13 Idri-idri occurred in

(a) India (b) Mauritius (c) Fizi (d) Madagascar

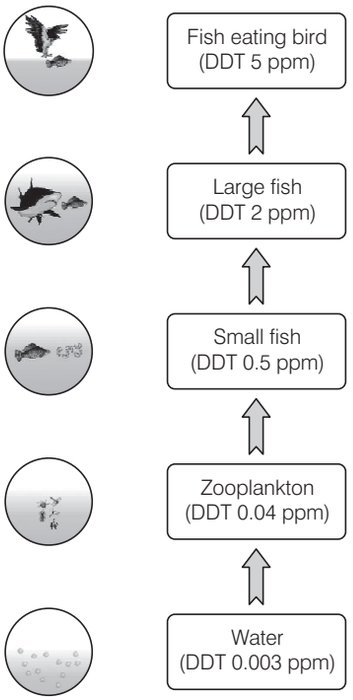
14 *Bt* toxin is obtained from

(a) prokaryotes (b) eukaryotes
(c) Both (a) and (b) (d) None of these

15 Habitat loss and fragmentation, overexploitation, alien species invasion and coextinction are causes for

(a) population explosion (b) migration
(c) biodiversity loss (d) pollution

16 The diagram given below shows the biomagnification of DDT in an aquatic food chain. Choose the correct statement regarding this.



I. Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.
II. High concentrations of DDT disturb calcium metabolism in birds, which causes thinning of egg shell and their premature breaking.
III. River water may have a very low concentration of DDT, but the carnivorous fish in that river may contain high concentration of DDT, which is still suitable for consumption by human beings.

Which of the statements given above are correct?

(a) I and II (b) I and III (c) II and III (d) All of these

17 The new varieties of plants are produced by

(a) selection and hybridisation
(b) mutation and selection
(c) introduction and mutation
(d) selection and introduction

18 Match the following columns.

Column I	Column II
A. Natural stimulants	1. Cow
B. Surti	2. Yeast
C. Gir	3. *Trichoderma*
D. Cyclosporin-A	4. Cocaine
	5. Buffalo

Codes

	A	B	C	D		A	B	C	D
(a)	1	2	4	5	(b)	5	4	2	1
(c)	4	5	1	3	(d)	2	3	4	5

19 In India, we find mangoes with different flavours, colours, fibre content, sugar content and even shelf-life. The large variation is an account of
(a) species diversity
(b) induced mutation
(c) genetic diversity
(d) hybridisation

20 In travelling from a forest ecosystem to a grassland, one notes that the trees gradually give way to prairie grasses. The critical factor governing this shift is usually the
(a) availability of carbon dioxide
(b) length of the growing season
(c) annual mean temperature
(d) availability of water

21 Permafrost is a characteristic of which biome?
(a) Temperate forest (b) Tropical forest
(c) Desert (d) Tundra

22 Hybridomas are the fusion product of
(a) normal antibody producing cell with myeloma
(b) abnormal antibody producing cell with myeloma
(c) sex cells with myeloma
(d) bone cells with myeloma

23 *E.coli* cloning vector pBR322 contains restriction sites (*Hin*d III, *Eco* RI, *Bam* HI, *Sal* I, *Pvu* II, *Pst* I, *Cla* I), *Ori,* amp^R, tet^R and *rop. rop* codes for the
(a) antibiotic resistance genes
(b) foreign DNA
(c) selection of recombinants from non-recombinants
(d) proteins involved in the replication of the plasmid

24 Biosphere reserve project was started in India during
(a) 1984 (b) 1985
(c) 1986 (d) 1989

25 If there was no CO_2 in the earth's atmosphere, the temperature of earth's surface would
(a) be as such
(b) be less than the present level
(c) increase from the present level
(d) be dependent upon oxygen amount of the environment

26 Which is genetically engineered antiviral protein?
(a) Humulin (b) Interferon
(c) Fumagillin (d) Griseofulvin

27 Tobacco smoke is rich in
(a) tar
(b) CO
(c) polycyclic aromatic compounds
(d) All of the above

28 Brow antlered deer is one of the rarest mammal found in India. It is found in
(a) Nanda Devi – Himachal Pradesh
(b) Keibul Lamjao National Park – Manipur
(c) Dudhwa National Park – Uttar Pradesh
(d) Periyar Wildlife Sanctuary – Kerala

29 All of the following statements concerning characteristics of predator-prey relationships are correct except
(a) a rise in the population of predators is followed by a decrease in the population of prey
(b) camouflage is an adaptation that protects prey
(c) the population of predators most often eliminates the population of prey
(d) the production of large number of offsprings within very short periods of time ensures the survival of some prey populations

30 In the year 1963, the two enzymes responsible for restricting the growth of bacteriophage in *E.coli* were isolated. One of these added methyl groups to DNA, while the other cut DNA. The latter was called
(a) restriction endonuclease (b) methylase
(c) ligases (d) plasmid

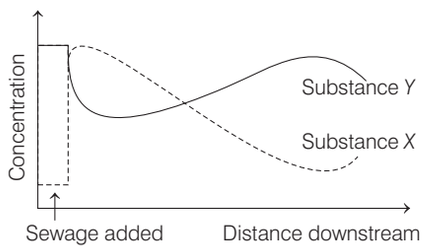
31 Aquatic fern, which is an excellent biofertiliser
(a) *Salvinia* (b) *Azolla*
(c) *Marsilea* (d) *Pteridium*

32 If one organism is closely associated with and survives at the expense of another, a relationship exists that is
(a) parasitic relation (b) commensalistic relation
(c) herbivore relation (d) mutualistic relation

33 'Hangul Project' was started by government to save Hangul (*Cervus elaphus hanglu*) in 1970. The sanctuary where it is started, is
(a) National Chambal Sanctuary
(b) Dachigam Sanctuary
(c) Corbett National Park
(d) Bandipur National Park

34 Initial stage of drug addiction is
(a) tolerance (b) habituation
(c) sleep (d) dependence

35 The diagram shows changes in the concentrations of two substances *X* and *Y* in the polluted sewage river.



What are the substances *X* and *Y*?

	X		*Y*
(a)	Carbon dioxide	–	Oxygen
(b)	Oxygen	–	Nitrogen compound
(c)	Carbon dioxide	–	Nitrogen compound
(d)	Nitrogen compound	–	Carbon dioxide

36 Breeding place of Flamingo (Hansawar) in India is
(a) Chilka lake (b) Sambhar lake
(c) Rann of Kutch (d) Ghana Vihar

37 The king of narcotics is
(a) opium (b) LSD (c) alcohol (d) cocaine

38 The endangered plant *Taxus baccata* belongs to
(a) angiosperms (b) monocytes
(c) gymnosperms (d) bryophytes

39 Greenhouse effect was discovered by
(a) Fourier (b) Tansley
(c) Clements (d) Einstein

40 Which of the following is used as a biological insecticide?
(a) Tiger beetle (b) Catterpillar
(c) Silk moth (d) Mazra poka

41 Which of the following would be a density dependent factor limiting population growth?
(a) Number of predators in the environment
(b) Wide fluctuations in temperature of the environment
(c) Accumulation of toxins in the environment
(d) The presence of disease

42 Cells obtained from cancerous tumours are known as
(a) hybridomas (b) myelomas
(c) lymphocytes (d) monoclonal cells

43 Discovery of new species has recently picked up due to project
(a) Species 2000
(b) Global Diversity and Information Facility
(c) Agenda 21
(d) Both (a) and (b)

44 I. ....*A*.... is the ability of a cell to take up foreign DNA.
II. The cell is treated with specific concentration of a divalent cation such as .....*B*.... to increase pore size in cell wall.
III. In .....*C*..... method recombinant DNA is directly injected into the nucleus of an animal cell.

The most appropriate option regarding *A*, *B* and *C* is
(a) *A* – Competency, *B* – calcium, *C* – gene gun method
(b) *A* – Transformation, *B* – sodium, *C* – microinjection method
(c) *A* – Competency, *B* – calcium, *C* – microinjection method
(d) *A* – Transformation, *B* – sodium, *C* – gene gun method

45 Which of the following is a difficulty in getting prokaryotic cells to express eukaryotic genes?
(a) The signals that control gene expression are different and prokaryotic promoter regions must be added to the vector
(b) The genetic code differs between the two because prokaryotes substitute the base uracil for thymine
(c) Prokaryotic cells cannot transcribe introns because their genes do not have them
(d) The ribosomes of prokaryotes are not large enough to handle long eukaryotic genes

46 In India, primitive flowering plants and primitive angiosperm families occur in
(a) North-East (b) North-West
(c) Western Ghats (d) Eastern Ghats

47 A trophic level represents a
(a) pyramid (b) chemical cycle
(c) consumer (d) feeding level

48 A protoplast without an active nucleus is known as
(a) cytoplast (b) plasmoplast
(c) nucleoplast (d) All of these

49 Organic farming is the technique of raising crops through the use of
(a) manures (b) resistant varieties
(c) biofertilisers (d) All of these

50 Agricultural use of DDT was banned in India during
(a) 1962 (b) 1972 (c) 1974 (d) 1985

51 By the use of biotechnology, in which bacteria production of vitamin-B_{12} has been increased to about 20,000 times?
(a) *Ashbya gossypii*
(b) *E.coli*
(c) *Pseudomonas denitrificans*
(d) *Propionibacterium shermanii*

52 Rate of replacement of species along the gradient of habitats/communities is called
(a) α-diversity (b) β-diversity (c) γ-diversity (d) ω-diversity

53 Which biogeochemical cycle has bacteria living in a symbiotic relationship with the roots or legumes?
(a) Water (b) Carbon
(c) Nitrogen (d) Phosphorus

54 Which raw material is used in fermentation processes of making beer?
(a) Starch in vegetables (b) Starch in cereals
(c) Sugar in fruits (d) Protein in pulses

55 According to IUCN red list, what is the status of red panda (*Athurus fulgens*)?
(a) Vulnerable species
(b) Critically endangered species
(c) Extinct species
(d) Endangered species

56 The table given below gives the population (in thousands) of ten species (A-J) in four areas (I-IV), consisting of the number of habitats given within the brackets against each. Study the table and answer the question which follows.

Area and Number of Habitats	Species and their Population (in thousands) in the Area									
	A	B	C	D	E	F	G	H	I	J
I (11)	23	1.2	0.52	6.0	-	3.1	1.1	9.0	-	10.3
I (11)	10.2	-	0.62	-	1.5	3.0	-	8.2	1.1	11.2
III (13)	11.3	0.9	0.48	2.4	1.4	4.2	0.8	8.4	2.2	4.1
IV (12)	3.2	10.2	11.1	4.8	0.4	3.3	0.8	7.3	11.3	2.1

Which area out of I to IV shows the maximum species diversity?
(a) II (b) III (c) IV (d) I

57 Etching of marble, limestone, jewellery, etc., is caused by pollutant
(a) CO_2 (b) CO (c) SO_2 (d) CH_4

58 Diversity of habitats over the total geographical area is
(a) alpha diversity (b) beta diversity
(c) gamma diversity (d) omega diversity

59 Resistance to antibiotics is a genetic trait that spreads naturally from one type of bacterium to
(a) almost any other type of bacterium
(b) another bacterium of the same strain
(c) eukaryotic cells of all types
(d) any other cell containing copy DNA

60 Silent valley is tropical evergreen forest located in
(a) Kerala (b) Karnataka
(c) Maharashtra (d) Odisha

61 Psilocybin, mescaline and LSD can be kept under
(a) hallucinogenic drug (b) opiate drug
(c) stimulants (d) All of these

62 Match the following columns.

	Column I		Column II
A.	Electrostatic precipitator	1.	Removes gases like SO_2
B.	Scrubber	2.	Reduces automobile emission
C.	Catalytic converter	3.	Removes particulate matter

Codes

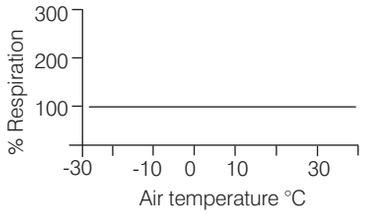
	A	B	C		A	B	C
(a)	3	2	1	(b)	1	2	3
(c)	3	1	2	(d)	1	3	2

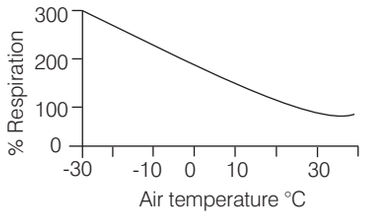
63 Bacteria utilised in gobar gas plants are
(a) methanogens (b) nitrifying
(c) ammonifying (d) denitrifying

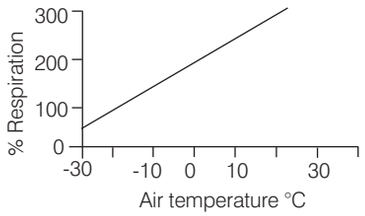
64 Medium used in culturing hybridoma cells is
(a) HAT (b) HAP (c) TAP (d) TAC

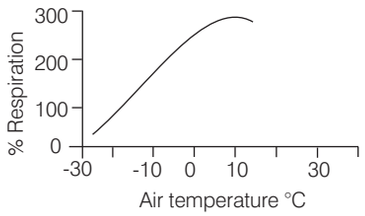
65 Which one of the following is the correct percentage of the two (out of the total of four) greenhouse gases that contribute to the global warming?
(a) CFCs 14%, CH_4, 20%
(b) CO_2 40%, CFCs 30%
(c) N_2O 6%, CO_2 86%
(d) CH_4 20%, N_2O 18%

66 Which of the following graphs correctly depicts the rate of respiration of a non-hibernating mammal living in cold climate?

(a)


(b)


(c)


(d)


67 Peculiar smell coming out of water is due to
(a) hydrogen sulphide (b) dimethyl sulphide
(c) dimethyl mercury (d) iron sulphide

68 All of the following are true about energy in an ecosystem except
(a) most of the energy transferred from the sun to organisms in ecosystems is lost as heat
(b) energy can be recycled within ecosystems as one organism consumes another
(c) energy flows in one direction from producers to primary consumers to secondary consumers, then to tertiary consumers
(d) heat generated by organisms represents a loss of energy in the ecosystem

69 Kohler and Milstein developed technique for the production of
(a) myelomas (b) steroid conversion
(c) monoclonal antibodies (d) immobilised enzymes

70 In 1984, the Bhopal gas tragedy took place because methyl isocyanate
(a) reacted with DDT (b) reacted with NH_3
(c) reacted with CO_2 (d) reacted with H_2O

71 Which one is odd combination of habitat and particular animal?
(a) Sunderban – Bengal tiger
(b) Periyar – Elephant
(c) Rann of Kutch – Wild ass
(d) Dachigam National Park – Snow leopard

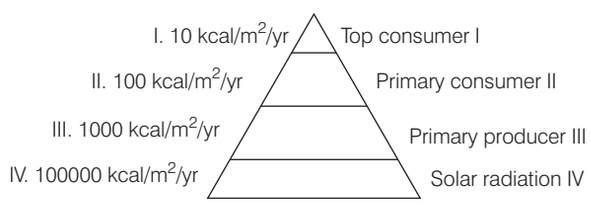
72 Consider the following statements.
I. In microinjection method, foreign DNA is directly injected into nucleus of animal cell or plant cell by using microneedles or micropipettes.
II. Microinjection method is used in oocytes, eggs and embryo.
III. Electroporation is the formation of temporary pores in the plasma membrane of host cell by using lysozyme or calcium chloride.
IV. In chemical mediated gene transfer method, certain chemicals such as Ca help foreign DNA to enter the host cell.

Which of the statements given above are correct?
(a) I and II (b) I, II and III
(c) II, III and IV (d) I, III and IV

73 Embryo culture is used for
(a) establishing suspension culture
(b) recovery of interspecific hybrids
(c) somatic hybridisation
(d) haploid production

74 Which of the following is not thought to be a possible consequence of rising CO_2 levels?
(a) C_4-crops, such as corn, being replaced by more C_3-plants such as wheat and soybean
(b) Rising global temperature
(c) Increased breakdown of atmospheric ozone
(d) Increased vegetative productivity

75 What is the rate of secondary production in the energy pyramid given below?



(a) Uncertain (b) 100 kcal / m^2 / yr
(c) 10 kcal / m^2 / yr (d) 110 kcal / m^2 / yr

76 Gene sequencing is used for the determination of base sequence of
(a) DNA (b) RNA (c) protein (d) All of these

77 Abiotic factors in an ecosystem include all of the following except
(a) amount of annual rainfall received
(b) types of decomposers living in an area
(c) amount of light an area receives
(d) types of rock found in an area

78 Single cell proteins are
(a) microorganisms (b) enzymes
(c) antibiotics (d) toxins

79 In an ecosystem, the ....*A*.... is always greater than the ....*B*.... .
(a) *A*–biomass of secondary consumers; *B*–biomass of primary producers
(b) *A*–number of primary producers; *B*–number of primary consumers
(c) *A*–energy used by primary consumers; *B*–energy used by primary producers
(d) *A*–energy used primary consumers; *B*–energy used by secondary consumers

80 In genetic engineering, the term vector is applied for
(a) plasmid (b) sources of DNA
(c) cell (d) virus

81 How have human activities increased the supply of fixed nitrogen available to the primary producers?
(a) Use of nitrogen fertilisers
(b) Increased cultivation of legumes
(c) Deliberate burning of fields
(d) All of the above

82 The slow ripening transgenic tomato was developed in USA by using
(a) antisense RNA technology
(b) ribozyme technology
(c) cosuppression approach
(d) transgene silencing approach

83 Osteoporosis will be caused by the pollutant
(a) chlorine (b) bromine
(c) fluorine (d) None of these

84 In bacteria, plasmid is a
(a) extrachromosomal material
(b) main DNA
(c) non-functional DNA
(d) repetitive gene

85 The nuclease enzyme, which begins its attack from free end of a polynucleotide is
(a) exonuclease
(b) kinase
(c) polymerase
(d) endonuclease

86 Charas is a product of
(a) *Cannabis indica* (b) *Cannabis sativa*
(c) *Cannabis capsarica* (d) None of these

87 Enzyme that is used in PCR technology is
(a) *Taq* polymerase (b) polymerase
(c) helicase (d) reverse transcriptase

88 By which process is carbon dioxide released from plants back into the atmosphere?
(a) Ammonification (b) Photosynthesis
(c) Respiration (d) Phosphorylation

89 The advancement in genetic engineering has been possible due to the discovery of
(a) exonucleases (b) endonucleases
(c) transposons (d) oncogenes

90 Mycorrhizae that grow on the roots of plants are representatives of what type of symbiotic relationship listed below?
(a) Mutualism
(b) Parasitism
(c) Interspecific competition
(d) Intraspecific competition

ANSWERS

1 (c)	**2** (b)	**3** (d)	**4** (b)	**5** (d)	**6** (b)	**7** (b)	**8** (a)	**9** (c)	**10** (b)
11 (a)	**12** (c)	**13** (d)	**14** (a)	**15** (c)	**16** (a)	**17** (b)	**18** (c)	**19** (c)	**20** (d)
21 (d)	**22** (a)	**23** (d)	**24** (c)	**25** (b)	**26** (b)	**27** (d)	**28** (b)	**29** (c)	**30** (a)
31 (b)	**32** (a)	**33** (b)	**34** (b)	**35** (b)	**36** (c)	**37** (a)	**38** (c)	**39** (a)	**40** (a)
41 (a)	**42** (b)	**43** (d)	**44** (c)	**45** (a)	**46** (a)	**47** (d)	**48** (a)	**49** (d)	**50** (d)
51 (a)	**52** (b)	**53** (c)	**54** (b)	**55** (d)	**56** (c)	**57** (c)	**58** (c)	**59** (a)	**60** (a)
61 (a)	**62** (c)	**63** (a)	**64** (a)	**65** (a)	**66** (d)	**67** (b)	**68** (b)	**69** (c)	**70** (d)
71 (d)	**72** (a)	**73** (b)	**74** (c)	**75** (b)	**76** (a)	**77** (b)	**78** (a)	**79** (d)	**80** (a)
81 (d)	**82** (a)	**83** (c)	**84** (a)	**85** (a)	**86** (b)	**87** (a)	**88** (c)	**89** (b)	**90** (a)