

NATIONAL STANDARD EXAMINATION IN BIOLOGY (NSEB) 2016-17

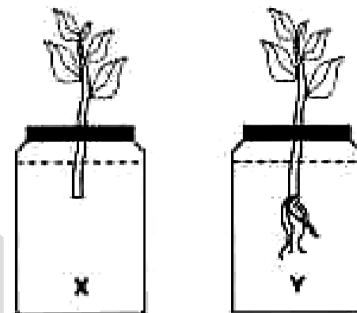
Date of Examination : 27TH November, 2016

Q. Paper Code : B222

1. The cut stem of two identical branches of the same mother plant were inserted in bottles containing liquids X and Y for a week to show the result as seen in the accompanying diagram. The liquid 'X' and 'Y' may be

- (a) Water and physiologically balanced solution
- (b) Water and weak solution of abscisic acid
- (c) Water and weak solution of auxin
- (d) Weak salt solution and weak solution of ethylene

Ans. (c)



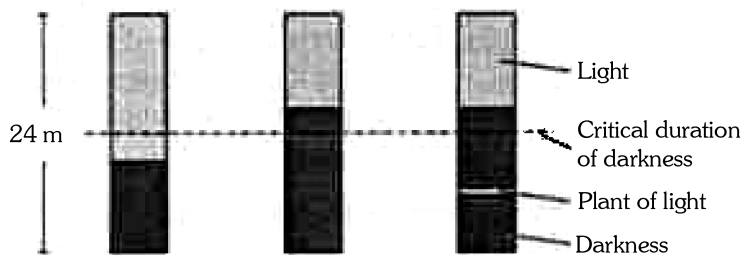
2. Which of the extra-embryonic membranes is/are involved in the gaseous exchange of the embryo?

- (i) Amnion
- (ii) Chorion
- (iii) Allantois
- (iv) Yolk sac

- (a) (i), (ii) and (iii)
- (b) (i), (iii) and (iv)
- (c) Only (i) and (iii)
- (d) Only (ii) and (iii)

Ans. (d)

3. In the accompanying figure the exposure of plant to cycles of light and darkness along with the following responses has been shown. The plant must be a :

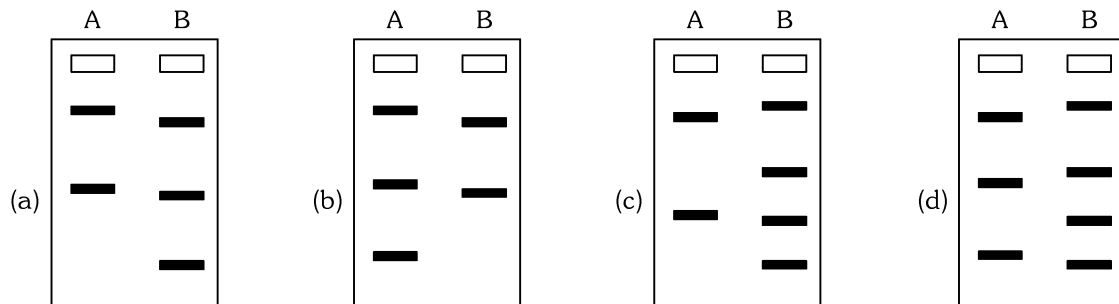


- (a) Long day plant
- (c) Day neutral plant

- (b) Short day plant
- (d) Gibberellins treated plant

Ans. (b)

4. PBR₃₂₂ (A) is a plasmid having two restriction sites for EcoRI while T4 phage DNA(B) has three restriction sites for it. These two DNA were treated with EcoRI and allowed to run on agarose gel. Which of the following correctly depicts the EcoRI digested gel pattern?

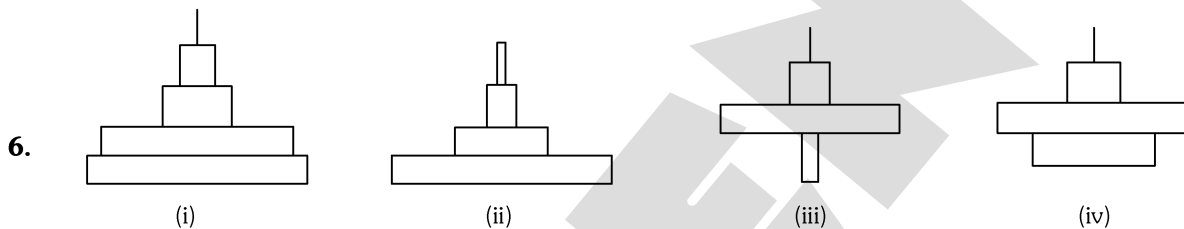


Ans. (c)

5. Starvation proteins are synthesized by the bacteria at the onset of carbon starvation. These are produced by a bacteria during which of the following stages of growth curve ?

(a) Lag phase (b) Exponential phase (c) Stationary phase (d) Death phase

Ans. (c)



6.

The pyramid of numbers for marine ecosystems, tropical deciduous forest, grassland and temperate forest are depicted above. Arrange the pyramids in the order of ecosystems mentioned above :

(a) (ii), (iv), (i), (iii) (b) (iii), (ii), (iv), (i) (c) (i), (iii), (iv), (ii) (d) (iv), (ii), (i), (iii)

Ans. (a)

7. Stratified squamous epithelium is found in the lining of :

(a) nasal passage (b) urethra (c) oesophagus (d) blood vessels

Ans. (c)

8. Fires play critical roles in development of grasslands. Fire selects against plants with

(a) Basal meristems not easily destroyed by fire / grazers
 (b) Permanent above ground parts
 (c) Structures for vegetative propagation
 (d) Underground storage organs

Ans. (b)

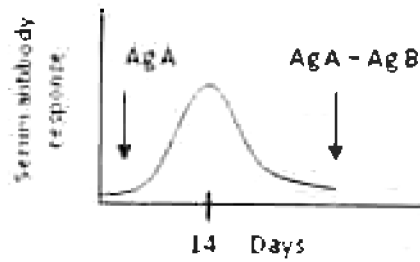
9. In which of the following, hydrogen bonding is involved ?

(i) Water molecule and other polar molecule
 (ii) DNA and RNA (during transcription)
 (iii) Metal ion and chelating agent
 (iv) Amino acid residues in α helix of a polypeptide
 (v) Electron deficient and electron surplus atoms

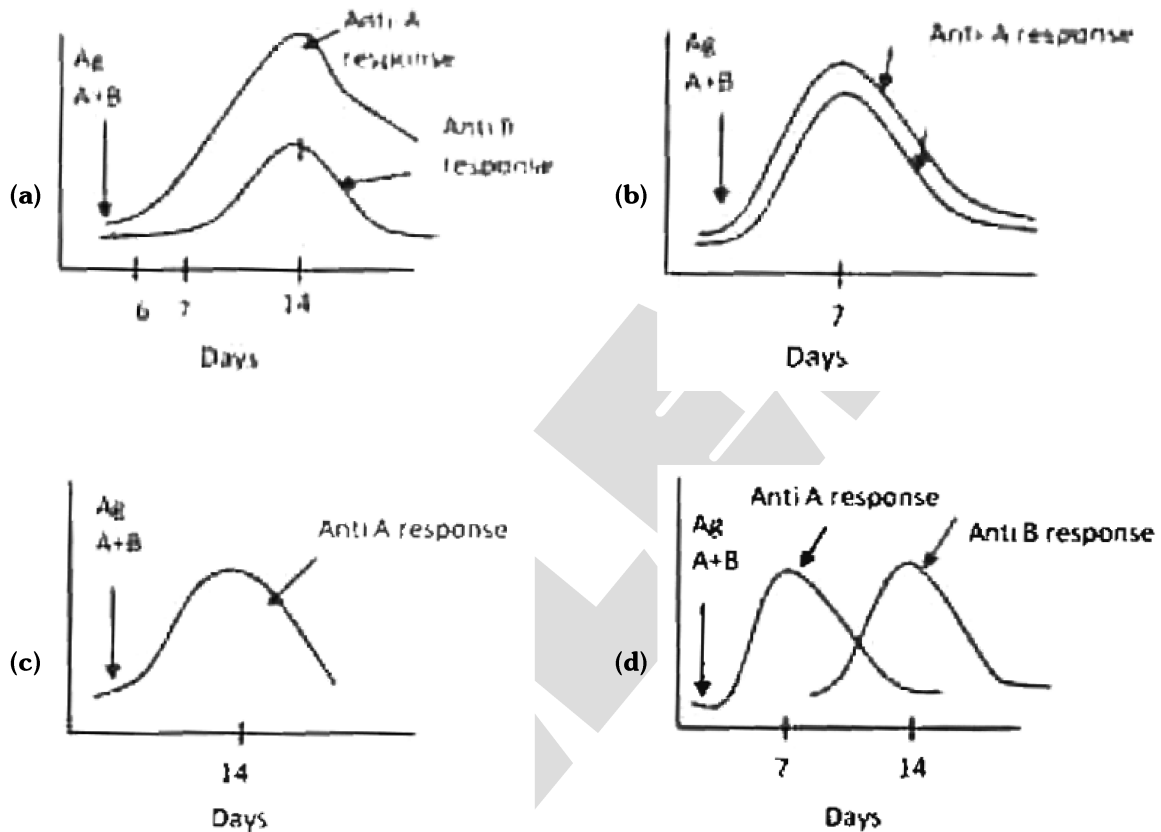
(a) (i), (ii), (iii) & (iv) (b) (i), (iii), (iv) & (v) (c) only (i), (iv) & (v) (d) only (i), (ii) & (iv)

Ans. (d)

10. When an animal is injected with an antigen A, it produces antibody response as shown:



If the same animal is now injected with a mixture of antigen A and B (shown by arrow) the expected response following the injection would be :



Ans. (a)

11. Though the earliest evolved life forms were anaerobic, there was an eventual predominance of aerobes on earth. Which of the following is the most likely reason for it?

- (a) Evolution of mitochondria and eukaryotic organization
- (b) Evolution of photosynthetic organisms
- (c) Evolution of heterotrophic organisms
- (d) Evolution of terrestrial organisms.

Ans. (b)

12. Colonization of land by plants was associated with the evolution of structures to obtain water and to minimize water loss. Which of the following adaptations are associated with the latter?

- i. Development of epidermis with waxy cuticle.
- ii. Development of stomata with elaborate opening and closing mechanism.
- iii. Development of bark on old stem and roots.

- (a) i and ii only
- (b) i only
- (c) ii and iii only
- (d) i, ii and iii

Ans. (a)

13. Fats and oils are the most preferred reserved foods. Choose the correct combination of statements given below to support this:

- i. They have density lower than most other molecules in a cell.
- ii. Their complete oxidation release energy than other organic polymers.
- iii. Being hydrophobic they get clustered and use lesser space for storage.
- iv. Being heteropolymeric they are most convenient storage foods.

(i) ii and iii (b) i and ii (c) i and iv (d) iii and iv

Ans. (a)

14. The secondary structure of proteins mainly owes to the amino acids the have:

- (a) sulfhydryl group (b) aromatic group (c) alkaline side chain (d) acidic side chain

Ans. (d)

15. Which combination of statements correctly relates to the stress exerted by excess of sodium chloride in the soil on the plants?

- i. Salt lowers the water potential of soil.
- ii. Salt lowers the pH of soil.
- iii. Excess sodium ions exert a toxic influence.
- iv. Root hair cells impede the uptake of harmful ions, in turn reducing the uptake of water.
- v. Organic contents of root hair cells make the water potential less negative than that of soil.

(a) i, iii and v (b) ii, iv and v (c) i, iii and iv (d) ii, iii and iv

Ans. (a)

16. A male English Robin attacks a bundle of red feathers placed in its territory but ignores a stuffed non-red juvenile. This is an example of:

- i. fixed action pattern
- ii. Learned behaviour
- iii. Learned behaviour
- iv. Reflex action pattern
- v. Cognitive behavior

(a) i only (b) i and ii only (c) i and iv only (d) only iii

Ans. (c)

17. A few examples of transport across cell membranes are listed below. Which of them occurs by direct passive diffusion?

- (a) Movement of oxygen molecules into cells
- (b) Movement of sodium ions against its concentration gradient
- (c) Uptake of cholesterol by cells
- (d) Secretion of mucus by cells

Ans. (a)

18. The interaction between actin and myosin generates the force for all of the following except:

- (a) Cytoplasmic streaming in a cell of Chara (b) Wriggling movement of an earthworm
- (c) Closure of leaflets of "touch-me-not" plant (d) Swallowing of food in man

Ans. (c)

19. Which of the cellular organelles mentioned below have to import all the proteins they contain?

- (a) Nucleus (b) Lysosomes (c) Chloroplast (d) Mitochondria

Ans. (b)

20. "Nitrogen bend" is avoided by diving mammals like whales because.

- (a) their blood has low partial pressure of Nitrogen at all times
- (b) their lungs are filled with nitrogenous air before diving
- (c) Peripheral circulation is minimal while diving
- (d) they have very low metabolic rate while diving

Ans. (a)

21. A frog's egg is centrifuged to disturb its contents. Which of the following is correct?
 (a) abnormal development may occur since the animal pole and vegetal pole are reversed
 (b) abnormal development may occur since the gradient of egg contents is disturbed
 (c) abnormal development may occur since the grey crescent is shifted horizontally
 (d) abnormal development may occur since the heavier proteins are shifted to the vegetal pole

Ans. (c)

22. The predator population in a habitat is an indicator of its health because :
 (a) predators keep a check on the population of tertiary consumers
 (b) predators control the consumption of primary consumers
 (c) predators selectively hunt the weaker members of consumers
 (d) predation enhances population of decomposers

Ans. (b)

23. The key events in embryo development are given below. Which is the correct order of sequences ?
 (i) Organogenesis (ii) Fertilization (iii) Gastrulation (iv) Neurulation
 (v) Cleavage

(a) v → ii → iv → i → iii (b) ii → iii → v → i → iv (c) iii → iv → ii → i → v (d) ii → v → iii → iv → i

Ans. (d)

24. The molecules absorbed and secreted in the lumen by the cells of Malpighian bodies of cockroach are respectively:
 (a) sodium urate and urea (b) purines and ammonia (c) urea and uric acid (d) ammonia and uric acid

Ans. (d)

25. The least percentage of water is encountered in the :
 (a) fluid in convoluted tubule (b) filtrate in Bowman's capsule
 (c) blood plasma in glomerulus (d) filtrate in renal capsule

Ans. (a)

26. Some animals have adapted to specific niche. In this specialization, some organs become well developed at the expense of others that becomes vestigial.

No.	Specialized	Vestigial organ
I	Wings	Leg muscles
II	Well developed nose	Eyes
III	Elongated muscular body	Legs
IV	Legs	Wings

Select the correct match of the animals.

- (a) I – Bat, II – python, III – mole, IV – ostrich (b) I – Bat, II – mole, III – python, IV – ostrich
 (c) I – Ostrich, II – python, III – mole, IV – bat (d) I – Ostrich, II – mole, III – python, IV – bat

Ans. (b)

27. Which of the following statements is incorrect ?
 (a) cDNA is synthesized from mRNA
 (b) cDNA lacks introns
 (c) cDNA cannot be expressed outside a eukaryotic cell
 (d) Size of cDNA is shorter than the original DNA in a eukaryotic cell

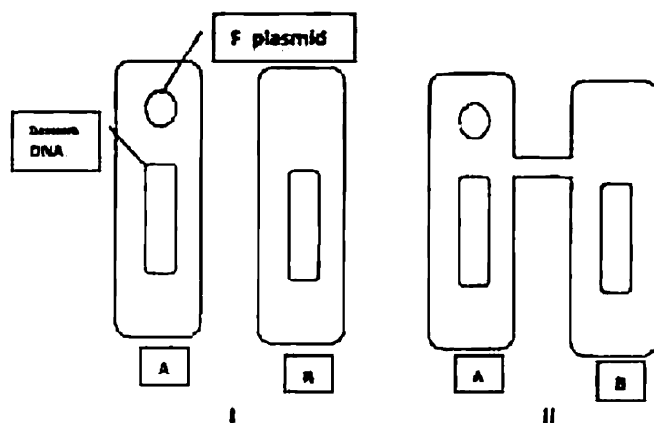
Ans. (c)

28. The K_m value of an enzyme-substrate reaction is a measure of affinity of the enzyme for its substrate. In presence of a competitive inhibitor, which of the following is true?

- (a) the K_m and V_{max} will increase
 (b) the K_m will increase but V_{max} will remain unaltered
 (c) the K_m will remain same but V_{max} will increase
 (d) the K_m will remain same but V_{max} will decrease

Ans. (b)

29. Two initial stage (I and II) of conjugation between bacteria 'A' and 'B' are depicted below.



Which of the events will follow ?

- (a) Both strands of F plasmid will be transferred from A to B with A becoming F-negative and B becoming F-positive
- (b) Only one strand of F plasmid will be transferred from A to B and complementary strands will be synthesized making both cells F-positive.
- (c) Genomic DNA will be transferred from A to B and A remains F-positive while B remains F-negative.
- (d) Both genomic DNA and F plasmid will be transferred from A to B. Consequently, cell A dies.

Ans. (b)

30. If one arginine has molecular weight of 174 Daltons, then what would be the molecular weight (Daltons) of a linear polymer of 30 arginines?

- (a) 5760
- (b) 5220
- (c) 4698
- (d) 4680

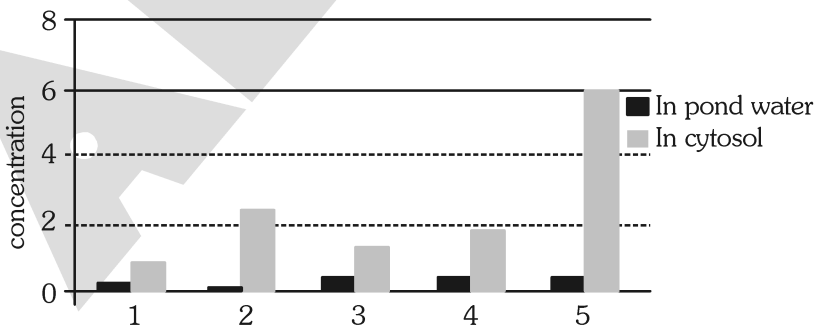
Ans. (c)

31. A few cells and associated entities are listed. Which of them represents the correct ascending order of the size relative to each other ?

- (a) Mitochondrion < Paramecium < Human erythrocyte < E.coli
- (b) Protein < Virus < Mitochondrion < Paramecium
- (c) Chloroplast < protein < human sperm < frog egg
- (d) Nucleus < protein < Paramecium < Chloroplast

Ans. (b)

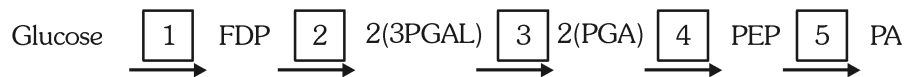
32. In the accompanying figure, relative concentrations of certain ions in water and in cytosol of the green alga *Nitella* and been has been shown. If 5 represents Cl^- , which of the numbered bars in the figure represent Ca^{+2} , Mg^{+2} , Na^+ and K^+ respectively?



- (a) 2, 3, 4 and 1
- (b) 1, 2, 3 and 4
- (c) 3, 2, 1 and 4
- (d) 3, 4, 1 and 2

Ans. (d)

33. The chemical transformations occurring in glycolysis can be summarized as follows :



If NAD^+ is not available, the pathway will be blocked at the reaction represented by:

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Ans. (b)

- 34.** In the accompanying diagram a single set of chromosomes is found in:
 i. Germinal cell
 ii. Spermatogonium
 iii. Primary Spermatocyte
 iv. Secondary spermatocyte
 v. Spermatid
 (a) i, iii, iv and v (b) i, iii, iv and v (c) Only iv and v (d) Only v
Ans. (c)
- 35.** Which of the following structures is not found in a prokaryotic cell
 (i) Plasma membrane (ii) Ribosomes (iii) Endoplasmic reticulum (iv) Golgi bodies
 (a) i and ii (b) ii only (c) iii only (d) iii and iv
Ans. (d)
- 36.** Which of the following is the key compound in the intermediary metabolism of carbohydrates, lipids and proteins?
 (a) PEP (b) PGA (c) Acetyl CoA (d) α -ketoglutarate
Ans. (c)
- 37.** Denudation of habitats by which of the following events leads to the fastest secondary succession?
 (a) Flood (b) Fire (c) Earthquake (d) Volcanic eruption
Ans. (b)
- 38.** Absence of oxygen will arrest which of the following?
 (i) EMP Pathway (ii) TCA cycle
 (iii) Chemiosmosis coupling (iv) Lactate fermentation
 (a) i, ii, and iii (b) ii, iii and iv (c) Only i and iii (d) Only ii and iii
Ans. (d)
- 39.** A researcher working with nucleic acids found out that the cytosine content in a mRNA molecule was 30%. What will be the content of Adenine?
 (a) 20% (b) 30% (c) 40% (d) Can be deduced
Ans. (d)
- 40.** A retrovirus with a Reverse transcriptase enzyme infects a eukaryotic cell and forms a protein whose RNA reads as 5'AUCGACGAUACGAAAGCCGUACGCUAU 3'?
 What will be the corresponding sequence in its original genome?
 (a) 5' TAGCTGCTATGCTTTCGGCATGCGATA 3'
 (b) 5' AUCGACGAUACGAAAGCCGUACGCUAU 3'
 (c) 5' UAGCUGCUAUGC UUUGCCGAUGCGAUA 3'
 (d) 5' ATCGACGATACGAAAGCCGTACGCTAT 3'
Ans. (b)
- 41.** Transcriptional activity of genes is regulated by promoter & enhancer sequences. Which of the following descriptions is correct?
 (i) Promoter sequences are always *cis* acting while enhancer sequences can be *trans* acting
 (ii) Both are located upstream from the structural gene that they regulate
 (iii) TATA box is one type of promoter sequence
 (iv) of promoter sequence is controlled by transcription factors which are small RNA sequences
 (a) i & ii only (b) Only iii & iv (c) i & iv only (d) iii only
Ans. (d)
- 42.** Consider an ecosystem where diatoms, copepods and small fish coexist. Which of the following statements is/are correct?
 (i) The biomass pyramid of this ecosystem is likely to be inverted.
 (ii) The number pyramid of this ecosystem is likely to be upright.
 (iii) The energy pyramid of this ecosystem can be inverted depending on the season of the year.
 (a) i only (b) ii & iii only (c) ii only (d) iii only
Ans. (a)

43. Which of the following defenses of the body against foreign particles constitute innate immunity?
 (i) Antimicrobial proteins (ii) Mucous membrane (iii) Antibodies
 (iv) Phagocytic cells (v) Inflammatory response (vi) Cytotoxic lymphocytes
 (a) i, iii, iv and v (b) ii, iv, v and vi (c) iii, iv, v and vi (d) i, ii, iv and v

Ans. (d)

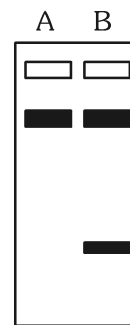
44. Arrange the following biomolecules in an increasing order of rate of passing through plasma membrane :
 (i) Triglycerides (ii) Fructose (iii) Na^+ (iv) Urea
 (a) ii < iv < i < iii (b) iii < ii < iv < i (c) i < ii < iv < iii (d) ii < iii < iv < i

Ans. (c)

45. Gel electrophoresis of DNA of two bacterial strains A & B is done. It showed band pattern as follows. What could be the probable reason/s for two DNA bands in strain B :

- (i) DNA in strain B is fragmented while extraction.
 (ii) DNA in strain B is duplicated.
 (iii) Strain B is harboring plasmid DNA.

- (a) i, ii & iii
 (b) i & iii
 (c) only i
 (d) only iii



Ans. (b)

46. A botanist collected leaf specimen from two different plants (I and II). He then took transverse sections of both the specimens, stained and observed them under the microscope. The observations are tabulated below.

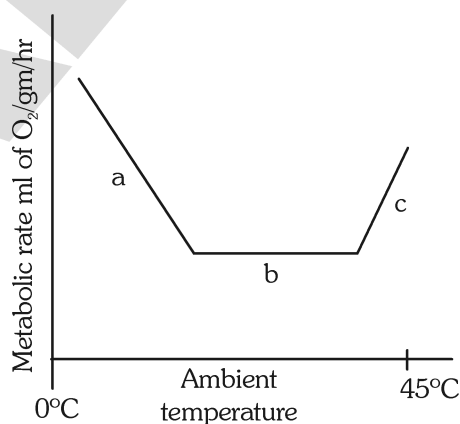
Leaf from plant	Stomata on		Cuticle		Air spaces
	Upper epidermis	Lower epidermis	Upper epidermis	Lower epidermis	
I	Present	Absence	Present	Absent	Present
II	Absent	Present	Present	Present	Absent

The plant I and II could respectively represent—

- (a) Xerophyte and mesophyte (b) Xerophyte and Floating hydrophyte
 (c) Mesophyte and Submerged hydrophyte (d) Floating hydrophyte and Xerophyte

Ans. (d)

47. Temperature related metabolic response of an animal is shown in the accompanying graph. Which of the following is the correct description of regions a, b or c—



- (a) Energy expended to lose excess heat : b + c
 (b) Energy required to maintain body temperature : a
 (c) Endothermy : b and ectothermy : a
 (d) Heterothermy : a, b and c

Ans. (d)

48. For an unclothed man, following are the skin and rectal temperature when ambient temperature is 30°C.

$$t_a : 30^\circ\text{C} \quad t_{\text{skin}} : 37^\circ\text{C} \quad t_{\text{rectal}} : 37.1^\circ\text{C}$$

What will be the temperatures when ambient temperature is 20°C and 40°C respectively?

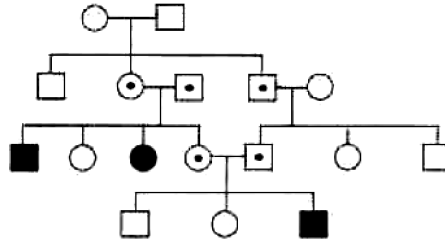
- (a) $t_{\text{skin}} : 32^\circ\text{C}$ $t_{\text{rectal}} : 37.1^\circ\text{C}$ and $t_{\text{skin}} : 36^\circ$ $t_{\text{rectal}} : 37.2^\circ\text{C}$
 (b) $t_{\text{skin}} : 32^\circ\text{C}$ $t_{\text{rectal}} : 35.1^\circ\text{C}$ and $t_{\text{skin}} : 36^\circ$ $t_{\text{rectal}} : 39.1^\circ\text{C}$
 (c) $t_{\text{skin}} : 20^\circ\text{C}$ $t_{\text{rectal}} : 35^\circ\text{C}$ and $t_{\text{skin}} : 40^\circ$ $t_{\text{rectal}} : 39^\circ\text{C}$
 (d) $t_{\text{skin}} : 34^\circ\text{C}$ $t_{\text{rectal}} : 37.1^\circ\text{C}$ and $t_{\text{skin}} : 34^\circ$ $t_{\text{rectal}} : 37.1^\circ\text{C}$

Ans. (d)

49. A pedigree depicting the inheritance of a trait in a family is shown.

The in a family is shown.

The trait represented is—



- (a) Autosomal dominant (b) Autosomal recessive
 (c) X-linked recessive (d) Y-linked

Ans. (b)

50. Separation of DNA fragments using agarose gel electrophoresis occurs due to—

- (a) Difference in the sequence of the fragments
 (b) Presence of different charges on the fragments
 (c) Difference in the staining properties of the fragments
 (d) Difference in the sizes of the fragments

Ans. (d)

51. In temperate ponds many short-lived zooplanktonic species show morphological variations in successive generations.

These are referred to as the ecotypes of the respective species. They are the reflections of—

- (a) Directional mutations (b) Adaptations to physical environment
 (c) Population fluctuations (d) Gene flow

Ans. (b)

52. Which of the following processes are involved in sympatric speciation?

- i. Reduced interactions between populations.
 ii. Niche separation
 iii. Divergent evolution
 iv. Convergent evolution

- (a) ii and iii only (b) i and iv only (c) ii and iv only (d) i, ii and iii only

Ans. (d)

53. The fresh extract of leaves of *Bryophyllum* dissolves calcium carbonate. What is the ideal time to collect the leaves to be most effective?

- (a) Before daybreak (b) Early hours of day (c) At sunset (d) Late evening

Ans. (a)

54. When the fruit of a specific plant species were collected they exhibited a variation in weight. The weight categories were 20, 25, 30, 35 and 40 grams. If it is a polygene inheritance, how many gene lock are involved?

- (a) 2 (b) 3 (c) 4 (d) 5

Ans. (a)

55. The excessive CO_2 being released in the atmosphere through the combustion of fuels is largely absorbed by seas and oceans thus restricting the green house effect and global warming. Choose the appropriate combination of the biological processes that help in minimizing global warming.

- i. Photosynthesis by phytoplanktonic species
- ii. Deposition of marl and compaction into limestone
- iii. Diagenesis of organic sediment into mineral oils
- iv. Formation of exoskeleton by marine organisms

(a) i, ii and iv (b) i, ii and iii (c) Only i and ii (d) Only i and iv

Ans. (a)

56. An alga with cells lacking centrioles, flagella and having Floridian starch as reserved food has to be a

(a) Green alga (b) Blue green alga (c) Red alga (d) Brown alga

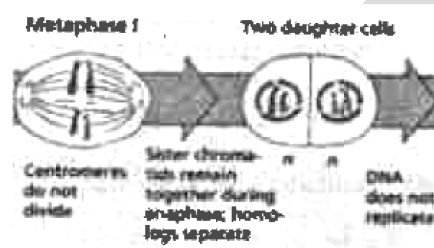
Ans. (c)

57. Reclamation of which of the following habitats by dumping debris is sure to increase global warming?

(a) Seas (b) Peat lands (c) Temporary ponds (d) Streams

Ans. (a)

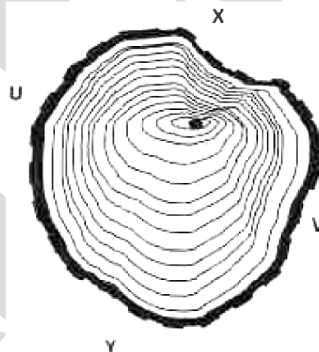
58. Study the given illustration of a cell division. In which organ of the human body would this process take place?



(a) Liver (b) Spleen (c) Bone marrow (d) Gonad

Ans. (d)

59. From the T.S of trunk shown in the diagram it can be predicted that the corresponding branch must be



(a) Bent in the direction of 'X' (b) Bent in the direction of 'Y'

(c) Twisted through U → V axis (d) Bearing the beating of wind and rain in Y → X direction

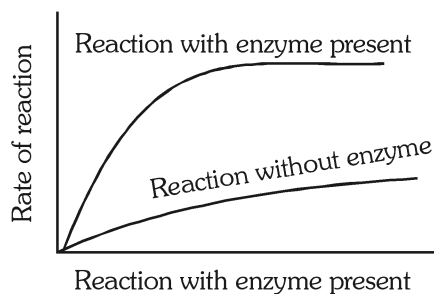
Ans. (b)

60. The role of luteinizing hormone (LH) in human male is:

- (a) blocking the release of GnRH from pituitary.
- (b) stimulating Sertoli cells to promote spermatogenesis.
- (c) stimulating Leydig's cells to produce testosterone.
- (d) modifying the signal produced by FSH in seminiferous tubule

Ans. (c)

61. The graph below explains the correlation between the rate of reaction and concentration of substrate during any enzymatic reaction. It can be seen that enzyme catalyses the reaction to significant extent but after certain increase in substrate concentration, rate of reaction remains constant. This must be because:



- (a) At high substrate concentration, enzyme activity gets suppressed.
 (b) Enzymes activity is directly proportionate to the concentration of substrate.
 (c) There are no enough enzyme molecules to bind to substrate for catalyzing the reaction at higher concentration.
 (d) Higher concentration of substrate can degrade the enzyme.

Ans. (c)

62. A student could make out that a specimen he found in a lake was an arthropod but could not assign it to a class. The organism had two pairs of antennae and compound eyes on stalk. It must belong to the class:

- (a) Crustacea (b) Arachnida (c) Insecta (d) Myriapoda

Ans. (a)

63. Following are the biotic components of an ecosystem:

- (i) Primary producers (ii) Primary consumers (iii) Secondary consumers (iv) Tertiary consumers
 (v) Decomposers

The component/s without which an ecosystem cannot exist is/are:

- (a) i, ii, iii, iv and v (b) i & v only (c) i & ii only (d) i only

Ans. (b)

64. Assuming same body size, which of the following animals will have largest stomach?

- (a) Dolphin (b) Llama (c) Leopard (d) Vulture

Ans. (b)

65. Choose the correct combination of the animals 1 and 2 with the feature that differentiates them:

	Animal 1	Animal 2	Feature
(a)	Lizard	Tiger	Amniotic egg
(b)	Shark	Frog	Lungs
(c)	Tiger	Gorilla	Hair
(d)	Gorilla	Human	Loss of tail

Ans. (b)

66. If the frequency of a dominant phenotype in a stable population is 75%, the frequency of recessive allele in that population would be,

- (a) 0.375 (b) 0.25 (c) 0.75 (d) 0.50

Ans. (d)

67. During a field trip, a zoology students collected some specimens. They tried identifying one of the specimens. To do this they observed and listed the following characteristics: Absence of special sense organs such as eyes, ability to withstand low oxygen levels and poorly developed nervous system. The specimen could most likely be:

- (a) A free-living flatworm such as Planaria. (b) An ectoparasite like flea.
 (c) A filter feeder like mollusk (d) An endoparasite like liver fluke.

Ans. (d)

68. Which one of the following genetic disorders can be detected by karyotyping?
 (a) Down syndrome (b) Phenylketonuria (c) Hemophilia (d) Huntington's disease

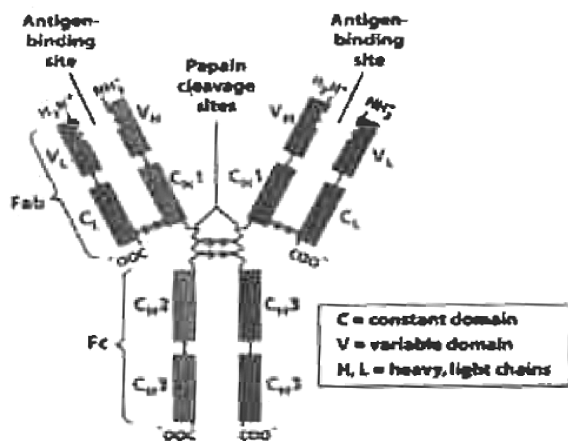
Ans. (a)

69. In a test cross F1 generation having a genotype AaBb, following progeny were obtained;
 AaBb (450), aabb (450), Aabb (50), aaBb (50)
 How far in centimorgans (cM) are the a and b genes?

- (a) 100 (b) 90 (c) 10 (d) 1

Ans. (c)

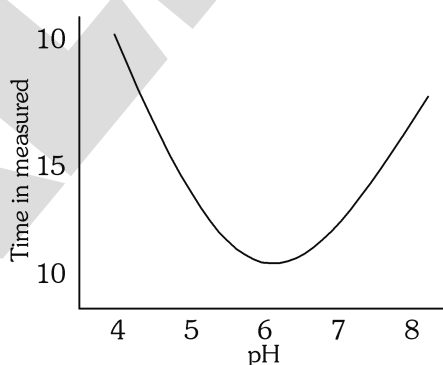
70. Immunoglobulin G molecule is shown in the accompanying diagram. If it is treated with mercaptoethanol (reducing agent),
 Result will be the production of:



- (a) Single peptide molecule without affinity for antigen
 (b) Total of four polypeptide chains
 (c) Two polypeptide chains one with Fab portion and another with Fc
 (d) Six fragments with each with either Fc or Fab region

Ans. (b)

71. While studying enzyme activity, Neeta added 1 cm^3 of catalase enzyme to fixed volume of hydrogen peroxide solution at different pH values. The time taken to collect 10 cm^3 of oxygen was measured. The results are plotted on the graph as shown below.



From the graph it can be concluded that:

- (a) pH of the solution and time taken for collection of gas are inversely proportional
 (b) The rate of reaction is highest at pH 4 and 8
 (c) If the rate of reaction is plotted against pH, the graph will look similar
 (d) The pattern of graph will remain same if quantity of catalase is doubled

Ans. (d)

- 72.** Curling or straightening hair using various physical and chemical processes is common for reshaping the hair. Which of the following is true?
 (a) Curling the straight hair requires to form new SH bonds in hair keratin
 (b) Straightened hair has fewer SH bonds than their natural counterpart
 (c) Both curling and straightening requires breaking and making of SH bonds
 (d) Hydrogen peroxide treatment on hair helps in breaking and making of SH bonds

Ans. (b)

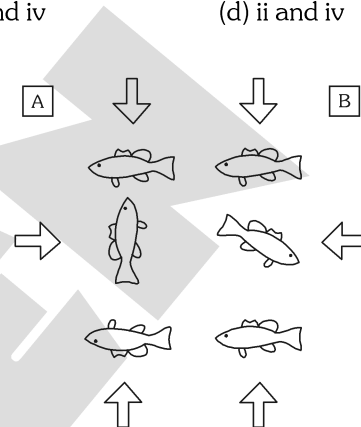
- 73.** Which of the following may result in allopatric speciation?
 (a) Rising sea levels submerging islands
 (b) Polluted waters destroying coral reefs
 (c) Torrential rains changing course of wide rivers
 (d) Uncontrolled logging destroying forests

Ans. (c)

- 74.** Hydrophobic interaction influence protein structure at which of the following level/s?
 i. Primary structure
 ii. Secondary structure
 iii. Tertiary structure
 iv. Quaternary structure
 (a) i and ii
 (b) ii and iii
 (c) iii and iv
 (d) ii and iv

Ans. (c)

- 75.** Fish normally swim with dorsal surface towards light. Two fish A and B showed following response to light. Mark correct interpretation. (Arrow indicates light source.)
 (a) B is normal fish & A with gravity sensor removed.
 (b) B is normal fish & A with one eye removed.
 (c) B is normal fish & A with photoreceptor dysfunction (unequal stimulation).
 (d) A has gravity sensor dominant over light sensor & B light sensor dominant over gravity sensor.



Ans. (a)

- 76.** In a cloning experiment, DNA ligase used shows optimum activity at 37°C and a segment of DNA that needs to be ligated shows 18°C as its T_m (melting temperature). Which of the following conditions will give best results of the ligation experiment?
 (a) Experiment performed between 18°C and 37°C
 (b) Experiment quickly performed at 18°C
 (c) Experiment performed at temp above 18°C but less than 37°C
 (d) Experiment performed at 8-10°C temp over a prolonged period

Ans. (d)

- 77.** The difference between excitatory and inhibitory response across a synapse is mainly due to :
 i. Intensity of voltage through synaptic space
 ii. Type of neurotransmitter
 iii. Type of gated channel opened in response to neurotransmitter
 (a) i, ii and iii
 (b) i and ii only
 (c) i and iii only
 (d) ii and iii only

Ans. (d)

- 78.** If a fluorescing protein is attached to many free ribosomes in a cell and the cell is photographed after a time interval, the colour will appear :
 (a) in cytoplasm only
 (b) in cytoplasm and along rough endoplasmic reticulum
 (c) in cytoplasm, along rough endoplasmic reticulum and along wall of nucleus
 (d) in cytoplasm, along rough endoplasmic reticulum, along wall of nucleus and in the matrix of mitochondria

Ans. (c)

- 79.** Choose the statements that represent the effect of adrenal activation through sympathetic stimulation due to stress.
- i. Glycogenolysis is resulting in increased blood glucose
 - ii. Breakdown of proteins and lipids leading to gluconeogenesis
 - iii. Increased breathing rate
 - iv. Retention of sodium and water by kidneys
 - v. Increased metabolic rate

(a) i, ii, iv and v (b) i, iii, iv and v (c) Only iii and v (d) Only i and iii

Ans. (d)

- 80.** When a plant cell undergoes expansive growth, the increase in volume is caused mostly by :

(a) uptake of minerals (b) uptake of water (c) synthesis of cellulose (d) synthesis of proteins

Ans. (b)

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