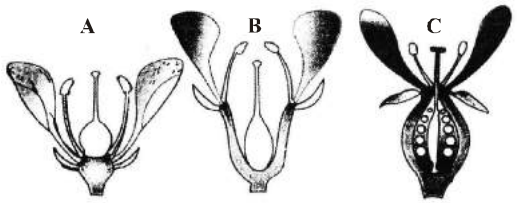
Mock Test Full Syllabus Biology

SECTION 1 - BOTANY

1. A taxon is
   (a) a group of related families
   (b) a group of related species
   (c) a type of living organisms
   (d) a taxonomic group of any ranking
2. Peat moss is another name of
   (a) *Sphagnum* (b) *Marchantia*
   (c) *Riccia* (d) *Dryopteris*
3. In fern, spores are formed in
   (a) sporangium (b) oogonium
   (c) archegonium (d) stomium
4. Which one of the following is a true fruit?
   (a) Apple (b) Pear
   (c) Cashew nut (d) Coconut
5. The cork cambium, cork and secondary cortex are collectively called
   (a) phelloderm (b) phellogen
   (c) periderm (d) phellem
6. Which of the following algae are suitable for human consumption?
   (a) *Laminaria* and *Fucus*
   (b) *Gracilaria* and *Chondrus*
   (c) *Porphyra* and *Spirogyra*
   (d) *Rhodymania* and *Porphyra*
7. Choose the correct option.
   (i) Lysosomes are double membranous vesicles budded off from Golgi apparatus and contain digestive enzymes.
   (ii) Endoplasmic reticulum consists of a network of membranous tubule and helps in transport, synthesis and secretion.
   (iii) Leucoplasts are bound by two membranes, lack pigment but contain their own DNA and protein synthesising machinery.
   (iv) Sphaerosomes are single membrane bound organelle which are associated with synthesis and storage of lipids.
   (a) (i) only (b) (i) and (ii)
   (c) (ii), (iii) and (iv) (d) All of these
8. Chosse the correct combinations.



   I. Hypogynous flower
   II. Perigynous flower
   III. Epigynous flower
   (a) A - I, B - II, C - III (b) A - I, B - III, C - II
   (c) A - III, B - II, C - I (d) A - III, B - I, C - II
9. Which one of the following is not a method of vegetative propagation?
   (a) Budding (b) Layering
   (c) Sowing (d) Tissue culture
10. Entry of pollen tube through micropyle is
   (a) Chalazogamy (b) Mesogamy
   (c) Porogamy (d) Pseudogamy
11. Competition for light, nutrients and space is most severe between
   (a) closely related organism growing in different habitats
   (b) closely related organisms growing in the same habitat
   (c) distantly related organisms growing in the same habitat
   (d) distantly related organisms growing in different habitats
12. In oogamy, fertilization involves
   (a) a small non-motile female gamete and a large motile male gamete
   (b) a large non-motile female gamete and a small motile male gamete
   (c) a large non-motile female gamete and a small nonmotile male gamete
   (d) a large motile female gamete and a small nonmotile male gamete

13. Photochemical smog formed in congested metropolitan cities mainly consists of
(a) Ozone, peroxyacetyl nitrate and NO_X
(b) Smoke, peroxyacetyl nitrate and SO_2
(c) Hydrocarbon, SO_2 and CO_2
(d) Hydrocarbon, ozone and SO_X

14. The electrostatic precipitator is used for removing particulate matter from
(a) Exhaust of the thermal power plant
(b) Exhaust from the automobiles
(c) Industrial effluents
(d) Kitchen waste

15. Keystone species in an ecosystem are those
(a) present in maximum number
(b) that are most frequent
(c) attaining a large biomass
(d) contributing to ecosystem properties

16. Initiation codon of protein synthesis (in eukaryotes) is
(a) GUA (b) GCA
(c) CCA (d) AUG

17. What is the best pH of soil for cultivation of plants ?
(a) 3.4 – 5.4 (b) 6.5 – 7.5
(c) 4.5 – 8.5 (d) 5.6 – 6.5

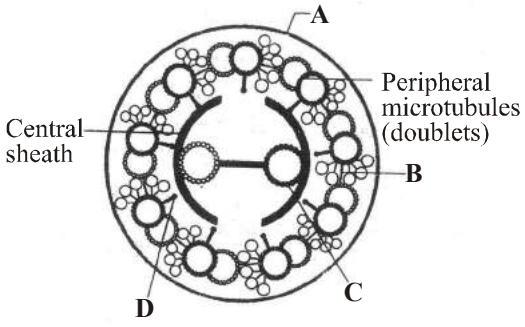
18. Telomerase is an enzyme which is a
(a) simple protein (b) RNA
(c) ribonucleoprotein (d) repetitive DNA

19. Mass of living matter at a trophic level in an area at any time is called
(a) standing crop (b) deteritus
(c) humus (d) standing state

20. The *Triticale* is an intergeneric hybrid between :
(a) wheat and maize (b) maize and rye
(c) wheat and rye (d) bajra and wheat

21. Which one is a neem product used as insect repellent?
(a) Azadirachtin (b) Rotenone
(c) Parathione (d) Endrin

22. Choose the correct option.



(a) A – Plasma membrane, B – Interdoublet bridge, C – Central microtubule, D – Radial spoke
(b) A – Plasma membrane, B – Arm, C – Central microtubule, D – Radial spoke
(c) A – Plasma membrane, B – Interdoublet bridge, C – Hub, D – Radial spoke
(d) A – Plasma membrane, B – Interdoublet bridge, C – Hub, D – Arm

23. An ecosystem which can be easily damaged but can recover after some time if damaging effect stops will be having
(a) low stability and high resilience
(b) high stability and low resilience
(c) low stability and low resilience
(d) high stability and high resilience

24. The mode of catching insects in *Drosera* plants is by means of
(a) sensitive glandular hairs which secrete a sweet, viscous, shining substance.
(b) specially sensitive trigger hairs.
(c) leaves which are modified into pitcher.
(d) leaf segments modified into bladder.

25. Quantasomes are present in
(a) chloroplast (b) mitochondria
(c) golgi body (d) lysosome

26. The water potential and osmotic potential of pure water are
(a) zero and zero (b) 100 and 100
(c) zero and 100 (d) 100 and zero

27. Photorespiration is favoured by
(a) high O_2 and low CO_2
(b) low light and high O_2
(c) low temperature and high O_2
(d) low O_2 and high CO_2

28. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern *Azolla* is
(a) *Tolypothrix* (b) *Chlorella*
(c) *Nostoc* (d) *Anabaena*

29. Hydroponics is
(a) nutrient less culture
(b) water less culture
(c) soilless culture
(d) None of these

30. Krebs cycle occurs in
(a) mitochondria (b) cytoplasm
(c) chloroplasts (d) ribosomes

31. Most abundant organic compound on earth is
(a) Protein (b) Cellulose
(c) Lipids (d) Steroids

32. Terminal cytochrome of respiratory chain which donates electrons to oxygen is
(a) Cyt. b (b) Cyt. c
(c) Cyt. a_1 (d) Cyt. a_3

33. To avoid excessive water loss during severe drought stress, the closure of stomata is signalled by the production of
(a) IAA (b) NAA
(c) ABA (d) IBA

34. In short day plants, flowering is induced by
(a) photoperiod less than 12 hours.
(b) photoperiod below a critical length and uninterrupted long night.
(c) long night.
(d) short photoperiod and interrupted long night.

35. The major reason that glycolysis is not as energy productive as respiration is that
(a) NAD^+ is regenerated by alcohol or lactate production, without the high-energy electrons passing through the electron transport chain.
(b) it is the pathway common to fermentation and respiration.
(c) it does not take place in a specialized membrane-bound organelle.
(d) pyruvate is more reduced than CO_2; it still contains much of the energy from glucose.

36. The catalytic efficiency of two different enzymes can be compared by the
(a) formation of the product
(b) pH optimum value
(c) K_m value
(d) molecular size of the enzyme

37. Biodiversity Act of India was passed by the parliament in the year
(a) 1992 (b) 1996
(c) 2000 (d) 2002

38. 'Axenic culture' is
(a) culture of tissue
(b) growing of shrubs
(c) growing of tall trees
(d) culture of tissue free from contamination

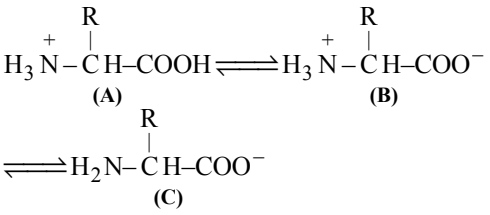
39. Which one thing is not true about antibiotics?
(a) The term "antibiotic" was coined by Selman Waksman in 1942
(b) First antibiotic was discovered by Alexander Flemming
(c) Each antibiotic is effective only against one particular kind of germ
(d) Some persons can be allergic to a particular antibiotic

40. Main objective of production/use of herbicide resistant GM crops is to
(a) eliminate weeds from the field without the use of manual labour
(b) eliminate weeds from the field without the use of herbicides
(c) encourage eco-friendly herbicides
(d) reduce herbicide accumulation in food articles for health safety

41. The common nitrogen fixer in paddy fields is
(a) *Rhizobium* (b) *Azospirillum*
(c) *Oscillatoria* (d) *Frankia*

42. In order to obtain virus- free plants through tissue culture, the best method is
(a) protoplast culture (b) embryo rescue
(c) anther culture (d) meristem culture

43. Which one of the following is a wrong matching?
(a) Somatic hybridization - Fusion of two diverse cells
(b) Vector DNA -Site for t-RNA synthesis
(c) Micropropagation - *in vitro* production of plants in large numbers
(d) Callus - Unorganised mass of cell produced in tissue culture

44. 

Which of the above is Zwitterionic form?
(a) A (b) C
(c) B (d) All of these

45. Restriction endonucleases are enzymes which
(a) make cuts at specific positions within the DNA molecule
(b) recognize a specific nucleotide sequence for binding of DNA ligase
(c) restrict the action of the enzyme DNA polymerase
(d) remove nucleotides from the ends of the DNA molecule

SECTION 2 - ZOOLOGY

46. Sex factor in bacteria is
(a) Chromosomal replicon
(b) F-replicon
(c) RNA
(d) Sex-pilus

47. Animals/organisms floating on the surface of water are
(a) plankton (b) pelagic
(c) benthos (d) neritic

48. The cell junctions called tight, adhering and gap junctions are found in
(a) connective tissue (b) epithelial tissue
(c) neural tissue (d) muscular tissue

49. Spleen is referred to as
(a) temporary endocrine gland
(b) graveyard of RBC
(c) largest gland
(d) store house of WBC

50. Given below are four matchings of an animal and its kind of respiratory organ :
(i) Silver fish – trachea
(ii) Scorpion – book lung
(iii) Sea squirt – pharyngeal gills
(iv) Dolphin – skin
The correct matchings are
(a) (iii) and (iv) (b) (i) and (iv)
(c) (i), (ii) and (iii) (d) (ii) and (iv)

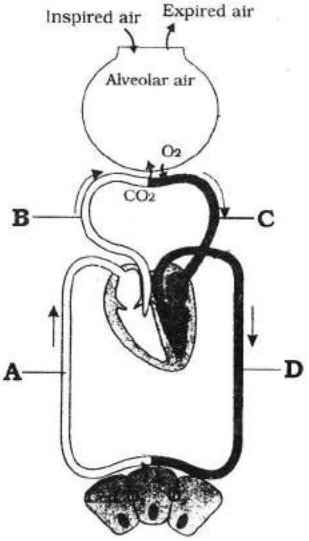
51. In the mouthparts of the cockroach, the organ of mastication is
(a) labium (b) maxillae
(c) mandibles (d) labrum

52. Which one of the following characters is not typical of the class Mammalia?
(a) Thecodont dentition
(b) Alveolar lungs
(c) Ten pairs of cranial nerves
(d) Seven cervical vertebrae

53. Natural parthenogenesis occurs in:
(a) Protozoans (b) Earthworm
(c) All insects (d) Honeybee

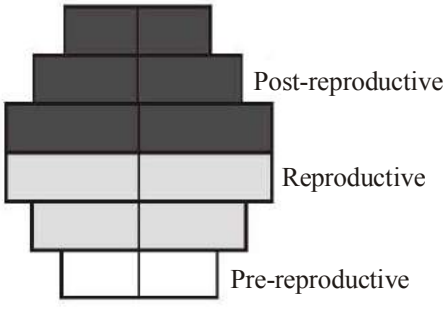
54. Consider the statements given below regarding contraception and answer as directed thereafter:
(i) Medical Termination of Pregnancy (MTP) during first trimester is generally safe
(ii) Generally chances of conception are nil until mother breast-feeds the infant upto two years
(iii) Intrauterine devices like copper-T are effective contraceptives
(iv) Contraception pills may be taken upto one week after coitus to prevent conception
Which two of the above statements are correct?
(a) ii and iii (b) iii and iv
(c) i and iii (d) i and ii

55. Identify the blood vessels A to D.



(a) A- Systemic vein, B-Pulmonary artery, C-Pulmonary vein, D-Systemic artery
(b) A-Systemic artery, B-Pulmonary artery, C- Pulmonary vein, D- Systemic vein
(c) A-Pulmonary artery, B-Systemic vein, C-Pulmonary vein, D- Systemic artery
(d) A-Systemic vein, B-Pulmonary vein, C- Pulmonary artery, D- Systemic artery

56. Which pathway of the male reproductive system is correct for the sperms transportation?
    (a) Vas efferentia→Vas deferens→Epididymis
    (b) Vas deferens→Epididymis→Seminal vesicle
    (c) Epididymis→Vas deferens→Urethra
    (d) Rete testis→Epididymis→Vas efferentia
57. The second maturation division of the mammalian ovum occurs:
    (a) in the Graafian follicle following the first maturation division
    (b) Shortly after ovulation before the ovum makes entry into the fallopian tube
    (c) Until after the ovum has been penetrated by a sperm
    (d) Until the nucleus of the sperm has fused with that of the ovum
58. A force acting against achievement of highest possible level of population growth is
    (a) Carrying capacity
    (b) Environment resistance
    (c) Population pressure
    (d) Saturation level
59. The phase of menstrual cycle in humans that lasts for 7-8 days, is
    (a) follicular phase (b) ovulatory phase
    (c) luteal phase (d) menstruation
60. What type of human population is represented by the following age pyramid?



    (a) Vanishing population
    (b) Stable population
    (c) Declining population
    (d) Expanding population
61. The 'Mule' is the result of
    (a) Inbreeding depression
    (b) Out breeding
    (c) Cross breeding
    (d) Inter-specific hybridization
62. Haemophilia is more common in males because it is a
    (a) Recessive character carried by Y–chromosome
    (b) Dominant character carried by Y-chromosome
    (c) Dominant trait carried by X-chromosome
    (d) Recessive trait carried by X-chromosome
63. Theory of inheritance of acquired characters was given by
    (a) Wallace (b) Lamarck
    (c) Darwin (d) De Vries
64. The animal husbandry deals with the care, breeding and management of
    (a) Domesticated animals
    (b) Fishes
    (c) Honey bees and silk worms
    (d) All of these
65. 'Inland fishery' refers to
    (a) Culturing fish in fresh water
    (b) Trapping and capturing fishes from sea coast
    (c) Deep sea fishing
    (d) Extraction of oil from fishes
66. The most popular breed of fowl in India is
    (a) White leg horn (b) Aseel
    (c) Plymouth (d) Langshan
67. Which of following teeth are lophodont?
    (a) Incisor and canine
    (b) Premolar and molar
    (c) Canine and premolar
    (d) Premolar and incisor
68. Pacemaker of heart is
    (a) AV node (b) Bundle of His
    (c) SA node (d) Purkinje fibres
69. Uricotelism is found in
    (a) Frogs and toads
    (b) Mammals and birds
    (c) Birds, reptiles and insects
    (d) Fishes and fresh water protozoans
70. A large proportion of oxygen is left unused in the human blood even after its uptake by the body tissues. This O_2
    (a) acts as a reserve during muscular exercise
    (b) raise the pCO_2 of blood to 75 mm of Hg.
    (c) is enough to keep oxyhaemoglobin saturation at 96%
    (d) helps in releasing more O_2 to the epithelial tissues.

71. The basic functional unit of the human kidney is
(a) nephron (b) nephridia
(c) pyramid (d) Henle's loop

72. Urea from the blood can be removed by
(a) Uremia (b) Diuresis
(c) Dialysis (d) Micturition

73. Which one of the following correctly explains the function of a specific part of a human nephron ?
(a) Podocytes : create minute spaces (slite pores) for the filtration of blood into the Bowman's capsule.
(b) Henle's loop : most reabsorption of the major substances from the glomerular filtrate.
(c) Distal convoluted tubule : reabsorption of K^+ ions into the surrounding blood capillaries.
(d) Afferent arteriole : carries the blood away from the glomerular towards renal vein.

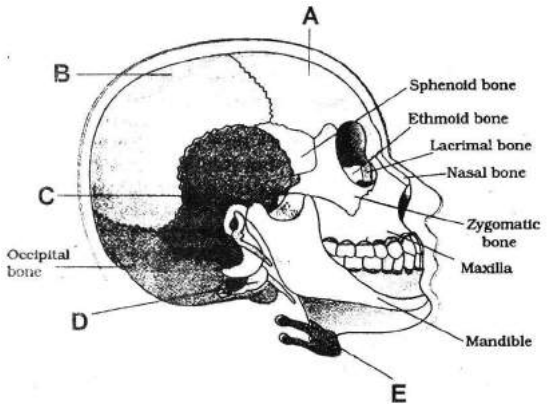
74. The nerve centres which control the body temperature and the urge for eating are contained in:
(a) hypothalamus (b) pons
(c) cerebellum (d) thalamus

75. Rods and cones of eyes are modified
(a) multipolar neuron
(b) unipolar neuron
(c) bipolar neuron
(d) None of these

76. Which of the following is both exocrine and endocrine gland ?
(a) Liver (b) Pancreas
(c) Thyroid (d) Adrenal

77. The sensation of fatigue in the muscles after prolonged strenuous physical work, is caused by
(a) a decrease in the supply of oxygen
(b) minor wear and tear of muscle fibres
(c) the depletion of glucose
(d) the accumulation of lactic acid

78. Consider the diagram given below



Identify the labelled parts as A, B, C, D and E respectively.
(a) Frontal bone, Parietal bone, Temporal bone, Occipital condyle and Hyoid bone
(b) Frontal bone, Temporal bone, Parietal bone, Occipital condyle and Hyoid bone
(c) Frontal bone, Parietal bone, Temporal bone, Hyoid bone and Occipital condyle
(d) Parietal bone, Frontal bone, Temporal bone, Occipital condyle and Hyoid bone

79. Which one of the following statements is incorrect ?
(a) The presence of non-respiratory air sacs, increases the efficiency of respiration in birds.
(b) In insects, circulating body fluids serve to distribute oxygen to tissues.
(c) The principle of countercurrent flow facilitates efficient respiration in gills of fishes.
(d) The residual air in lungs slightly decreases the efficiency of respriration in mammals.

80. Which one of the following does not act as a neurotransmitter ?
(a) Epinephrine (b) Norepinephrine
(c) Cortisone (d) Acetylcholine

81. Which one of the following statements is correct?
(a) Neurons regulate endocrine activity, but not *vice versa*.
(b) Endocrine glands regulate neural activity and nervous system regulates endocrine glands.
(c) Neither hormones control neural activity nor the neurons control endocrine activity.
(d) Endocrine glands regulate neural activity but not *vice versa*.

82. 'Cloning' is meant for/to
(a) production of hGH gene in *E. coli*
(b) preserve the genotype of organism
(c) replace the original gene
(d) All of the above

83. A cell coded protein formed in response to infection with most animal viruses is
(a) Antigen (b) Antibody
(c) Interferon (d) Histone

84. Which one of the following is not used in organic farming?
(a) *Glomus* (b) Earthworm
(c) *Oscillatoria* (d) Snail

85. ELISA is used to detect viruses where the key reagent is
(a) RNase
(b) alkaline phosphatase
(c) catalase
(d) DNA probe

86. Vitamin B_{12} is formed during fermentation of
(a) *Ashloya gossipii*
(b) *Rhizopus stolonifer*
(c) *Propionibacteria*
(d) *Saccharomyces cerevisiae*

87. Which one is a correctly match sexually transmitted disease with its pathogen?
(a) Syphilis – *Leishmania donovani*
(b) AIDS – *Bacillus anthracis*
(c) Urethritis – *Entamoeba gingivalis*
(d) Gonorrhoea – *Neisseria gonorrhoeae*

88. Which one of the following depresses brain activity and produced feelings of calmness, relaxation and drowsiness?
(a) Morphine (b) Valium
(c) Amphetamines (d) Hashish

89. Which one of the following is correctly matched pair of the given secretion and its primary role in human physiology?
(a) Sebum — Sexual attraction
(b) Sweat — Thermoregulation
(c) Saliva — Tasting food
(d) Tears — Excretion of salts

90. Consider the following four statements (i-iv) and select the option which includes all the correct ones only.
(i) Single cell *Spirulina* can produce large quantities of food rich in protein, minerals, vitamins etc.
(ii) Body weight-wise the micro-organism *Methylophilus methylotrophus* may be able to produce several times more proteins than the cows per day.
(iii) Common button mushrooms are a very rich source of vitamin C.
(iv) A rice variety has been developed which is very rich in calcium.
(a) Statements (ii) and (iv)
(b) Statements (i), (iii) and (iv)
(c) Statements (ii), (iii) and (iv)
(d) Statements (i) and (ii)

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

HINTS & SOLUTIONS

SECTION 1 - BOTANY

2. (a) Peat moss is another name for *Sphagnum*. It is also known as famine food in China.

4. (d) The fruit is a mature or ripened ovary. When a fruit develops exclusively from the ovary, it is said to be true fruit. When in addition to the ovary, some other floral part also participates in the formation of fruits, then it is known as false fruit. Apple, pear, cashewnut, mulberry etc. are all false fruits.

5. (c) Phellem, phellogen and phelloderm are collectively called periderm.

10. (c) In porogamy the tip of pollen tube enters the micropyle, pushes through the nucellar tissue & finally pierces the egg-apparatus end of the embryo sac. If pollen tube enters through chalazal side it is called chalazogamy & if it enters laterally it is called mesogamy.

11. (b) Competition is most severe between the members of a population belonging to same habitat.

12. (b) In oogamy male and female gametes are morphologically as well as physiologically different. Female gametes are large and non-motile. Male gametes are small but motile.

15. (d) The keystone species in an ecosystem are those who are the main contributors to the ecosystem.

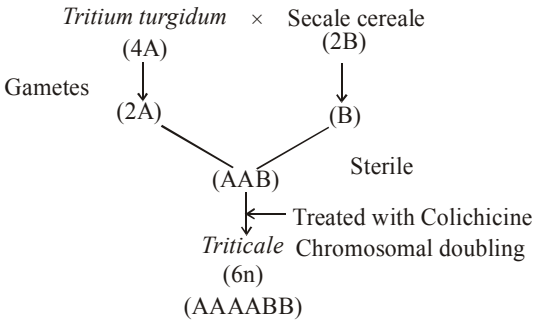
16. (d) The initiation codon is the codon which initiates the protein synthesis. They are AUG for methionine and GUG for valine.

17. (b) The best pH of soil for cultivation of plants is 6.5 – 7.5.

18. (c) Telomerase is a ribonucleoprotein which synthesize the rich strand of telomers in DNA. **Telomerase** is an enzyme that adds specific DNA sequence repeats ("TTAGGG" in all vertebrates) to the 3' ("three prime") end of DNA strands in the telomere regions, which are found at the ends of eukaryotic chromosomes. The telomeres contain condensed DNA material, giving stability to the chromosomes. The enzyme is a reverse transcriptase that carries its own RNA molecule, which is used as a template when it elongates telomeres, which are shortened after each replication cycle. Telomerase was discovered by Carol W. Greider in 1984.

19. (a) A standing crop is the quantity or total weight or energy content of the organism, which are in a particular location at a particular time.

20. (c) *Triticale* is a man made hexaploid inter genetic hybrid.



21. (a) Azadirachtin is a chemical compound belonging to the limonoids. It is a secondary metabolite present in the neem tree seeds. The molecular formula is $C_{35}H_{44}O_{16}$. Azadirachtin is a highly oxidised tetranortriterpenoid which boasts a plethora of oxygen functionality, comprising an enol ether, acetal, hemiacetal, and tetra-substituted oxirane as well as a variety of carboxylic esters. It is classified among the plant secondary metabolites.

23. (a) An ecosystem having low stability can be easily damaged. An ecosystem having high resilience will take less time to recover.

26. (a) Osmotic potential is the potential of a solution to cause water movement into it across a semi- permeable membrane. Water potential is the tendency of water to leave a system.

27. (a) Photorespiratory loss of CO_2 occurs when RuBisCo starts functioning as an oxygenase instead of carboxylase under conditions of high O_2 and low CO_2. It involves three organelles chloroplast, mitochondria and peroxisomes. Half of the photosynthetically fixed carbon (in the form of RuBP) may be lost into the atmosphere through this process and no ATP formation occurs.

29. (c) Cultivation of plants by placing the roots in the nutrient solution without any soil is called hydroponics. It is also known as soilless culture/ water culture/ solution culture. It is used to determine which elements are essential for plant growth and what symptoms are produced by the absence or deficiency of essential elements.

30. (a) The enzyme involved in Krebs cycle are localized in the mitochondrial matrix.

31. (b) Cellulose is the most abundant organic compound, most abundant polysaccharide and most abundant biopolymer found on earth.

32. (d) Terminal cytochorome is cyt a_3. cyt a_3 posseses two copper centers. It helps in transfer of electrons to oxygen.

36. (c) K_m (Michealis Menten constant) is defined as that substrate concentration at which under optimum conditions the rate of an enzyme catalysed reaction reaches half the maximum rate. K_m is inversely proportional to affinity of enzyme for its substrate.

37. (d) Biodiversity Act of India was passed by the parliament in the year 2002.

38. (d) Axenic is a method of culture of isolated plant cells, tissues or organs in an artificial, nutritive medium.

39. (c) 'Each antibiotic is effective only against one particular kind of germ' is not correct.

40. (d) Main objective of production/use of herbicide resistant GM crops is to reduce herbicide accumulation in food articles for health safety. GM plants has been useful in many ways. Genetic modifications has made crops more tolerant to abiotic stresses, reduced reliance on chemical pesticides, enhanced nutritional value of food.

41. (b) The common nitrogen fixer in paddy field is *Azospirillum.* It is an anaerobic bacteria that forms loose association with roots of paddy crops.

42. (d) In order to obtain virus-free plants through tissue culture, the best method is meristem culture. Meristem tip culture is used successfully to remove viruses, bacteria, in order to produce the greatest number of plants. Meristem culture is used to produce

healthy propagation stock for crops and ornamentals.

43. (b) Vector DNA are the DNA molecules that can carry a foreign DNA segment and replicate inside the host cells. Vector DNA may be plasmids, a bacteriophage, cosmids, yeast artificial chromosomes.

45. (a) Restriction endonucleases are enzymes that makes cuts at specific positions within the DNA molecule. They acts as molecular scissors. They recognise specific base sequence at palindrome sites in DNA duplex and cut its strands.

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46. (b) Sex-factor or F-factor in bacteria results in high frequency conjugation. It allows bacteria to produce sex pilus necessary for conjugation.

47. (a) Organisms passively floating on the surface of water are planktons. If floating organisms are animals then it is zooplanktons and if plants– phytoplanktons.

48. (b) The cell junctions called tight, adhering and gap junctions are found in epithelial tissue. Epithelial tissue covers the whole surface of the body. It is made up of cells closely packed and ranged in one or more layers.

50. (c) Dolphin is an aquatic mammal and breathes through lungs.

52. (c) Mammals have 12 pairs of cranial nerves.

54. (c) Statements i and iii are correct.

- Medical Termination of Pregnancy (MTP) during first trimester is generally safe.

- Intrauterine device like copper-T are effective contraceptives.

56. (c) Epididymis lies between vas efferens and vas deferens.

59. (b) In menstrual cycle, menstrual phase lasts for 4 days, proliferating/ovulating phase for about 10 days and secretory phase for 14 days.

60. (c) This age pyramid represents the declining population of any organism. Population decline is the reduction over time in region's census. It can be caused for several reasons that includes heavy immigration disease, famine or sub-replacement fertility.

62. (d) Haemophilia is a sex linked recessive trait carried by X chromosome (also known as bleeder's disease).

63. (b) One of the first attempts to explain the mechanism of evolution was made by Jean Baptiste de Lamarck. His theory was Inheritance of Acquired Characters. The theory states that the characters acquired during life time are passed on to the progeny and then to subsequent generations and new species are produced.

66. (a) White leg horn is a mediterranean breed.

67. (b) Premolar and molar are lophodont teeth. Lophodont teeth with the cusps elongated to form narrow ridges. The molars in elephants and horses have cusps fused by means of intermediate masses of dentine to form ridges or lophs.

68. (c) Sino-Auricular node (S A node) present in the walls of right auricle has a myogenic initiation of heartbeat in a regular fashion and controls the pace of heartbeat called pacemaker.

70. (a) A large portion of oxygen is left unused in the human blood even after its uptake by the body tissues. This O_2 acts as a reserve during muscular exercise.

73. (a) Glome podocytes are highly specialized cells with a complex cytoarchitecture plays a major role in establishing the selective permeability of glomerular filtration barrier.

74. (a) Hypothalamus contains important nerve centres that controls the body temperature, thirst, hunger and eating, water balance and sexual function.

76. (b) Pancreas is a gland which is both exocrine and endorine. Cells of acini are exocrine which secrete enzymes and islet of Langerhans part is endocrine which

secretes hormones like insulin, glucagon, *etc.*

77. (d) The sensation of fatigue in the muscles after prolonged strenuous physical work is caused by the accumulation of lactic acid.

80. (c) Epinephrine or adrenaline, norepinephrine or noradrenaline and acetylchloline are the neurotransmitters. These are released by the nerve fibres to transmit the impulse to the next neuron. Cortisone is not the neurotransmitter.

81. (a) Neurons regulate endocrine activity, but not *vice-versa*.Neurons in the hypothalamus secrete thyroid releasing hormone (TRH), which stimulates cells in the anterior pituitary to secrete thyroid-stimulating hormone (TSH).

82. (b) Cloning is the production of an organism with exactly similar genetic make up as in the mother individual. Cloning is done to preserve genotype of an individual. This is achieved by cell culture, tissue culture or genetic engineering.

83. (c) A special defence system works specially against viral infection. It has no effect on micro-organism. Cells invaded by a virus produce an antiviral protein called interferon (IFN). The latter is released from the infected cell and on reaching the nearby non-infected cells it makes them resistant to the virus infection.

84. (d) Organic farming involves use of organic wastes and other biological material along with beneficial microbes to release nutrients to crop to increase the soil fertility in an ecofriendly, and pollution free environment. *Glomus,* earthworm and *Oscillatoria* can be used in organic farming while snail cannot.

85. (b) ELISA test is a technique which can detect any amount of an antibody or antigen with the help of an enzyme. The commonly used enzymes are alkaline phosphatase and peroxidase.

87. (d) AIDS is caused by HIV virus and Gonorrhoea is caused by *Neisseria gonorrhoea*. Urethritis is inflammed of the urethra by bacteria. Syphilis is caused by *Treponema pallidum*.

88. (b) Amphetamines bring about increased alertness and sleeplessness. Hashish is a hallucinogen. Valium is a tranquilizer. Valium depresses brain activity and produces feeling of calmness, relaxation and drowsiness. Morphine is an opiate narcotic.

89. (b) Thermoregulation is the ability of an organism to keep its body temperature within certain boundaries, even when temperature surrounding is very different. In humans, sweating is primarily a means of thermoregulation.

90. (d) *Spirulina* is SCP rich in protein, vitamins & minerals. 250 gram biomass of *Methylophilus methylotrophus* produces 25tonn protein/day while cow of 250 kg. produces only 200 gm. protein/day.

Common button mushrooms are a very rich source of vitamin D. A rice variety has been developed which is very rich in iron content.