LIFE SCIENCE
(FINAL)

1. Which one of the following statements about the cortical reaction in sea urchins is correct?

(A) The entry of Ca^{2+} ions into the egg initiates development
(B) The exocytosed cortical granules during egg maturation contain the components of the zonapellucida
(C) The depolarization of the plasma membrane after sperm entry helps to block polyspermy
(D) The release of the cortical granules after sperm entry converts the vitelline membrane into the fertilization membrane which blocks polyspermy

2. Who conducted the experiment that proved "Mutations occur randomly"?

(A) Alfred Hershey and Martha Chase
(B) Matthew Meselson and Franklin Stahl
(C) Salvador Luria and Max DelbrUck
(D) Francois Jacob and Jacques Monad

3. How many amino acids are there in calcitonin, a hormone produced by the C-cells of the thyroid gland and lowers blood calcium level?

(A) 42
(B) 32
(C) 22
(D) 12

4. The nucleosome remodelers in eukaryotes

(A) methylate histone H3
(B) acetylate histone H3 and H4
(C) create DNase I hypersensitive sites
(D) degrade histone subunits

5. Which of the following claims about innate immunity in mammals is false?

(A) Pattern recognition receptors (PRRs) are a component of innate immunity
(B) Serum complement proteins are part of innate immunity
(C) Innate immunity has only a narrow range of specificity
(D) The outcome of innate immunity is the rapid recognition and phagocytosis or destruction of the pathogen

6. Both conditional and autonomous methods of cell specification are used by *Caenorhabditiselegans* to establish blastomere identity. In this context, which of the following statements is accurate?

(A) If the AB and P1 blastomeres are experimentally separated, the AB cell will generate all cells it would normally make
(B) When AB divides to form daughter cells,ABp becomes different from ABathrough its interaction with the P2 cell
(C) The specification of AB cell is determined by the presence of cytoplasmic determinants
(D) The P2 cell produces a morphogen for the determination of the ABp cell

7. Eukaryotic DNA replication is restricted to the S phase of the cell cycle because

(A) DNA polymerase is present only in the S phase of the cell cycle
(B) Origin recognition complex (ORC) recognizes origin only in the S phase
(C) MCM helicases get activated in the S phase of the cell cycle
(D) MCM helicases get activated in the G1 phase of the cell cycle

8. Which one of the below mentioned steps does nothappen during ribosome-associated quality control of damaged mRNA?

(A) mRNA degradation
(B) Nascent protein degradation
(C) Disengagement of ribosome from mRNA
(D) Ribosome-mRNA monosome degradation

9. In human EEG recordings,pontogeniculo-occipital (PGO) spikes are found

(A) immediately before and during REM sleep
(B) during Non-REM sleep stage 2
(C) during awake condition
(D) during Non-REM sleep stage 4

10. How many times do sound waves get amplified in the human middle ear?

(A) 16-18
(B) 6 - 8
(C) 9 - 12
(D) 2 -4

11. In which palaeontologytime did major events, like an increase in marine diversity, diversification of synapsids, and first mammal-like forms, occurred.

(A) Cretaceous
(B) Jurassic
(C) Triassic
(D) Carboniferous

12. Which metabolic activity is associated with Mitochondria-associated ER membranes (MAM)?

(A) Protein glycosylation
(B) ATP synthesis
(C) Phospholipid metabolism
(D) Iron-sulphur cluster assembly

13. The organelle provided only by the sperm to the oocyte, after fertilization in animals is

(A) Nucleolus
(B) Peroxisomes
(C) Mitochondria
(D) Centrioles

14. Which one is the correct match between the enzyme and its allostericactivator?

(A) Phosphofructokinase : Citrate
(B) Pyruvate dehydrogenase : NADH
(C) Pyruvate carboxylase : ADP
(D) Pyruvate kinase : Fructose-1 ,6-bisphosphate

15. Cystic fibrosis is autosomal recessive disorder. Roughly one out of every 500individuals (0.20%) have this disorder. What is thepercentage of individuals who are carriers using the Hardy-Weinberg equation?

(A) 10.2
(B) 1.0
(C) 15.2
(D) 7.6

16. The foot webbing genotype of a frog species is as follows:Non-webbed feet (W) is dominant allele and webbed feet (w) is recessive allele. In a population of 500 specimens, 320 specimens have the genotype WW, 160 specimens havethe heterozygous genotype of Ww, and 20 specimens have the genotype ww.

What are the frequencies of all the three genotypes and alleles in this population?

(A) Genotype frequencies: 0.04 WW, 0.32 Ww and 0.64 ww Allele Frequencies W - 0.5 and w - 0.5
(B) Genotype frequencies: 0.32 WW, 0.64 Ww and 0.04 ww Allele Frequencies W - 0.8 and w - 0.2
(C) Genotype frequencies: 0.64 WW, 0.32 Ww and 0.04 ww Allele Frequencies W - 0.8 and w - 0.2
(D) Genotype frequencies: 0.34 WW, 0.34 Ww and 0.32 ww Allele Frequencies W - 0.5 and w - 0.5

17. Which combination of the statements depicts the correct genetic relatedness between individuals of a monogamous, haplodiploid insect?

(a) A female is related to its son by 0.5
(b) A female is related to its brother by 0.5
(c) A male is related to its mother by 1
(d) A male is related to its daughter by 1

(A) a, b and c
(B) b, c and d
(C) a, b and d
(D) a, c and d

18. Which hormone is synthesized in different locations of the body?

(A) Thyrotropin releasing hormone
(B) Corticotropin releasing hormone
(C) Somatostatin
(D) Somatotropin

19. Weberianossicles can be best described as

(A) It is found in catfish and facilitates sound transmission from the swimbladder to the inner ear
(B) It is found in sea stars and help them in detecting surface vibrations
(C) It is found in anurans and contributes to transmitting sound waves fromthe eardrum
(D) It is found in snakes and contributes to receiving vibrations from thesurroundings

20. Which is the most commonly used barcoding marker for theidentification of animal species?

(A) Cytochrome oxidase I
(B) Microsatellites
(C) 28S
(D) MatK

21. The positive selection of T cells in mouse thymus is based on recognition of

(A) Foreign antigens in association with self-MHC molecules
(B) Self-antigens in association with foreign-MHC molecules
(C) Self-antigens in association with self-MHC molecules
(D) Foreign antigens in association with TLR ligands

22. Which is considered as a renal hormone?

(A) Megalin
(B) Cubilin
(C) Renalase
(D) Uroguanylin

23. Which among the following is not a principle of International Code of Zoological Nomenclature (ICZN)?

(A) Binomial and trinomial system of nomenclature should be adopted
(B) Name of the genus should start with capital letter followed by species with small letters
(C) The scientific name must be always written in italics or underlined only
(D) The scientific name must be derived from Italian language only

24. Glycolipids in the plasma membrane are located at

(A) Inner leaflet of the plasma membrane
(B) The outer leaflet of the plasma membrane
(C) Evenly distributed in the inner and outer leaflets
(D) It varies according to cell types

25. The fluidity of the plasma membrane increases with

(A) Increase in unsaturated fatty acids in the membrane
(B) Increase in saturated fatty acids in the membrane
(C) Increase in glycolipid content in the membrane
(D) Increase in phospholipid content in the membrane

26. Oxygen and carbon dioxide crosses the plasma membrane by the process of

(A) Active diffusion
(B) Facilitated diffusion
(C) Passive diffusion
(D) Random diffusion

27. Which of the following cell organelles is responsible for modifying, packaging and transporting of proteins and lipids?

(A) Mitochondria
(B) Endoplasmic Reticulum
(C) Golgi Complex
(D) DNA

28. The cell junction is abundant in

(A) Cardiac cells
(B) Prokaryotic cells
(C) Hepatic cells
(D) Epithelial cells

29. Sarcoplasmic reticulum is found in

(A) Muscle cells
(B) Liver cells
(C) Kidney cells
(D) Neurons

30. Cristae in mitochondria serve as sites for

(A) Oxidation reduction reaction
(B) Protein synthesis
(C) Flavoprotein phosphorylation
(D) Macromolecules breakdown

31. The nucleosome contains

(A) 5 types of histones

(B) 6 types of histones
(C) 8 types of histones
(D) 8 histones of four different types

32. Filaments that move the organelles in the cell

(A) Microtubules
(B) Intermediate filaments
(C) Actin filaments
(D) Actin and Microtubules

33. Flagella is made up of

(A) Dynein
(B) Nexin
(C) Dynein and Nexin
(D) Actin

34. The sperms inside the human female reproductive tract undergo changes called as

(A) Capacity
(B) Acrosome formation
(C) Capacitation
(D) Fertilization

35. Development in all the fertilized eggs occurs in a definite sequence. Which of these is the correct sequence?

(A) Zygote, cleavage, morula, blastula, gastrula
(B) Zygote, morula, blastula, cleavage, gastrula
(C) Zygote, blastula, morula, cleavage, gastrula
(D) Zygote, morula, blastula, gastrula, cleavage

36. Eye formation is induced by

(A) Retina
(B) Corona
(C) Lens
(D) Optic nerve

37. AER is important for formation of

(A) Dorsal Ventral axis of the limb
(B) Proximal Distal axis of the limb
(C) Anterior Posterior axis of the limb
(D) Limb bud and wing bud

38. Regeneration requires

(A) Injury, Deprogramming and Reprogramming
(B) Deprogramming and Reprogramming
(C) Injury and Reprogramming
(D) Injury and Deprogramming

39. …….. is an example of bilaterally symmetrical and triploblastic animal

(A) Cnidarians
(B) Roundworms
(C) Sponges
(D) Ctenophores

40. An important characteristic feature present only in phylum Coelenterata is

(A) Flame cells
(B) Nematocysts
(C) Hermaphroditism
(D) Polymorphism

41. *Periplaneta* belongs to the Phylum

(A) Arthropoda
(B) Mollusca
(C) Annelida
(D) Echinodermata

42. The earliest palaeontologyperiod is

(A) Cambrian
(B) Permian
(C) Jurassic
(D) Quaternary

43. Which among the following pairs is an example of homologous organs?

(A) The arm of a human, wing of a bird

(B) Wing of an insect, wing of a bird
(C) The arm of a human, wing of an insect
(D) Wing of an insect, leg of a horse

44. Which is the most common feature ofthe vertebrates?

(A) Presence of notochord
(B) Presence of triploblastic condition
(C) Presence of gill pouches
(D) Presence of coelom

45. Match the chordate group with its correct characteristic

Chordate Group			Characteristic
1.	Urochordata	a.	Notochord present throughout life
2.	Cephalochordata	b.	Cartilaginous or bony endoskeleton
3.	Vertebrata	c.	Marine organisms, notochord only in larval stage
4.	Amphibia	d.	Dual life, respiration through lungs and skin

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

46. Amphibian metamorphosis requires

(A) TRF, T3, T4
(B) TRF,TSH, T3, T4
(C) Juvenile hormone and TSH
(D) Juvenile hormone and Ecdysone

47. Which of the following is NOT a function of the peroxisome in an animal cell?

(A) Breakdown of fatty acids
(B) Detoxification of hydrogen peroxide
(C) ATP synthesis
(D) Metabolism of reactive oxygen species

48. If the sodium-potassium pump in an animal cell is inhibited, what will be the primary effect on the cell?

(A) The cell will shrink due to excessive water loss
(B) The cell will swell and may burst due to ion imbalance
(C) The mitochondria will stop producing ATP
(D) The nucleus will disintegrate

49. Which of the following eye muscle is absent in birds?

(A) Dorsal rectus
(B) Superior oblique
(C) Retractor bulbi
(D) Lateral rectus

50. How many pairs of spiracles are found in cockroach?

(A) 3 pairs in thorax and 10 pairs in abdomen
(B) 2 pairs in thorax and 8 pairs in abdomen
(C) 2 pairs in thorax and 6 pairs in abdomen
(D) 1 pair in thorax and 7 pairs in abdomen

51. Mast cells of connective tissue contain

(A) Vasopressin and relaxin
(B) Heparin and histamine
(C) Heparin and calcitonin
(D) Serotonin and melanin

52. ……is not a physiological change that occurs in animal body due to coccidiosis.

(A) Erosion of intestinal mucosa
(B) Intestinal haemorrhage
(C) Dysentery
(D) Brain stroke

53. Cellular actin levels can be as high as 100-400 μM. Of this, unpolymerized actin concentration can be as much as 50-200 μM. However, the critical concentration for actin polymerization in-vitro is about 0.2 μM. Some of the following proteins inhibit polymerization of actin in cells.

(a). Thymosin – β4 (b). Capping protein CapZ (c). Tropomodulin (d). XMAP215

Which one of the following options lists all inhibitors?

(A) (b), (c) and (d) only
(B) (a), (b) and (c) only
(C) (c), (d) and (a) only
(D) (d), (a) and (b) only

54. Which of the following modifications occurs to proteins in the Golgi apparatus?

(A) N-linked glycosylation of proteins
(B) Cleavage of signal peptides
(C) Addition of mannose-6-phosphate to lysosomal proteins
(D) Folding into tertiary structures

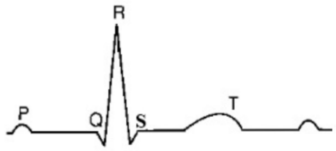
55. A mutation in which of the following proteins is most likely to prevent the G1-to-S phase transition?

(A) p53
(B) Cohesin
(C) CDK1
(D) Separase

56. The motor proteins responsible for the movement of chromosomes during anaphase function by

(A) polymerizing microtubules at the centrosome
(B) depolymerizing microtubules at the kinetochore
(C) sliding microtubules past each other in the spindle midzone
(D) anchoring chromosomes to spindle poles

57. The diagram given here is the standard ECG of a normal person. The P-wave represents the



(A) beginning of the systole
(B) initiation of the ventricular contraction
(C) contraction of both the atria
(D) end of systole

58. Match the parts of a kidney tubule with the function of each and select the correct one from the options given below.

a	Henle's Loop	i	Reabsorption
b	Glomerulus	ii	Maintenance of high osmolarity
c	Proximal Convoluted tubule	iii	Selective secretion and maintenance of pH
d	Distal Convoluted tubule	iv	Ultrafiltration of blood

(A) (a- iii), (b-i), (c- iv), (d-ii)
(B) (a-iv), (b-iii), (c-ii), (d-i)
(C) (a-i), (b-ii), (c-iii), (div)
(D) (a-ii), (b-iv), (c-i), (d-iii)

59. Which among the following types of arthritis is caused by an autoimmune reaction?

(A) Osteoarthritis
(B) Rheumatoid arthritis
(C) Gout
(D) Septic arthritis

60. Which of the following drugs is used for the acute treatment of gout?

(A) Allopurinol
(B) Febuxostat
(C) Colchicine
(D) Probenecid

61. Breathing rate in human is controlled by

(A) Cerebellum
(B) Hypothalamus
(C) Thalamus
(D) Medulla oblongata

62. Smokers have shorter breathe due to

(A) Arteriosclerosis
(B) Emphysema
(C) Hypertension
(D) Cough

63. Tidal volume in man is

(A) 500 ml
(B) 1200 ml
(C) 1500 ml
(D) 100 ml

64. Which metabolic sensor is crucial for linking energy status to reproductive function?

(A) AMPK
(B) mTOR
(C) Leptin
(D) SIRT 1

65. Which of the following gene-editing tools is being explored for correcting infertility-related genetic defects?

(A) ZEN
(B) CRISPR – Cas9
(C) TALEN
(D) All of the above

66. Which chromosomal disorder leads to severe intellectual disability and a cleft lip in affected individuals?

(A) Edward's syndrome
(B) Patau syndrome
(C) Down syndrome
(D) Cri-du-chat syndrome

67. Which of the following is NOT a function of the 3' untranslated region (3' UTR) in mRNA?

(A) Regulation of mRNA stability
(B) Translation inititation
(C) Regulation of translation efficiency
(D) Binding to regulatory proteins

68. In a population of 1000 individuals, the frequency of allele A is 0.6. What is the expected frequency of the homozygous genotype AA under Hardy-Weinberg equilibrium?

(A) 0.36
(B) 0.24
(C) 0.60
(D) 0.40

69. Which condition is caused by a pleiotropic gene in humans?

(A) Down syndrome
(B) Marfan syndrome
(C) Albinism
(D) Color blindness

70. Match the following.

a.	Allopatric speciation	1.	Evolution within the same geographic area
b.	Sympatric speciation	2.	Physical barrier separates populations
c.	Peripatric speciation	3.	Small population isolated at the periphery
d.	Parapatric speciation	4.	Speciation occurs due to a gradient in habitat

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

71. Which of the following is an example of an endangered species?

(A) Bengal Tiger
(B) House Mouse
(C) Monarch Butterfly
(D) Black Widow Spider

72. Sickle-cell anemia is an example of Single Nucleotide Polymorphism (SNP) of

(A) A to T mutation
(B) T to A mutation
(C) G to C mutation
(D) C to G mutation

73. The nucleotide sequence 5' AUG AGC CUỤC AGG UAA 3 would be translated in the nucleus and mitochondria of a mammalian cell as

(A) Met-Ser-Leu-Arg in both the nucleus and mitochondria
(B) Met-Ser-Leu in both the nucleus and mitochondria
(C) Met-Ser-Leu in the nucleus and Met-Ser-Leu-Arg in the mitochondria
(D) Met-Ser-Leu in the mitochondria and Met-Ser-Leu-Arg in the nucleus

74. A large part of the human genome has in the past been regarded as 'junk' DNA. Which of the following statements about 'junk' DNA is correct according to our current understanding?

(A) About 1.6% of the human genome has no known function and has been described as 'junk' DNA
(B) Bacteria have no junk DNA
(C) There are no genes in junk DNA
(D) MicroRNA genes do not code for proteins

75. The total biomass of photosynthetic autotrophs present in an ecosystem is known as

(A) gross primary productivity
(B) standing crop
(C) net primary productivity
(D) secondary productivity

76. Environmental filtering is shaping a community of woody plants. If there are 60 species in the regional species pool, what is the expected local species pool for this community?

(A) 100
(B) 80
(C) 120
(D) 30

77. When it comes to the long-distance phloem transfer of photo-assimilated carbon in plants, which of the following is the least suitable?

(A) Reducing sugars
(B) Mannitol
(C) Galactosyl-sucrose oligosaccharides
(D) Non-reducing sugars

78. Which combination of the four carbon intermediates produced by C4 plants during photosynthesis is correct?

(A) Malate and Aspartate
(B) Aspartate and Alanine
(C) Phosphoenolpyruvate and Oxaloacetate
(D) Alanine and Pyruvate

79. Which statement is *incorrect* regarding plasmodesmata in plant cells?

(A) They are specialized cell-to-cell junctions
(B) They are open channels that connect the cytosol of adjacent cells.
(C) The plasma membranes of the adjacent cells extend continuously through each plasmodesma
(D) Plasmodesmata are extensions of chloroplast that interconnects the cytosol of the adjacent cells

80. The following information is obtained by a scientist who counts the number of seeds generated by 10 distinct haploid '*Arabidopsis*' plants

0, 5, 15, 25, 100,150, 200, 600, 1500, 3000

Which central tendency measure is most appropriate for describing the above data?

(A) Mean
(B) Median
(C) Mode
(D) Standard deviation

81. Which theory from the list below best describes the co-evolution of hosts and parasites?

(A) Kin selection
(B) Red Queen hypothesis
(C) Runaway selection
(D) Handicap principle

82. Which of the following best describes the 'Dark Reversion' of phytochromes?

(A) Conversion of P_R to P_{FR}
(B) Conversion of P_{FR} to P_R
(C) Export of P_{FR} from cytosol to nucleus
(D) Export of P_R from cytosol to nucleus

83. It seems that tree stems compromise vessel diameter in order to maintain hydraulic conductivity with

(A) Strength of the stem

(B) Stem length
(C) Heartwood volume
(D) Vessel length

84. Andaman and Nicobar archipelago are part of …….biodiversity hotspots

(A) Andaman - lndo-Burma; Nicobar - Sundaland
(B) Andaman - Sundaland; Nicobar - lndo-Burma
(C) Andaman - lndo-Burma; Nicobar - lndo-Burma
(D) Andaman - Sundaland; Nicobar – Sundaland

85. Guild coevolution or diffuse coevolution is described as

(A) One species uses the other as a resource
(B) Two species coevolve reciprocally, but only to each other
(C) Several species are involved in coevolutionary interactions
(D) A species escapes association from a predator and diversifies. Later, a different predator adapts to the host and diversifies

86. The function of a GTPase activating protein (GAP) in the regulation of heterotrimeric G proteins in plants is:

(A) Activates G-protein
(B) Inactivates *Ga*protein
(C) Direct inhibition of ligand binding to GPCR
(D) Dissociation of Ga from Gβ/Gγ subunits

87. The correct combination of selfing or promote selfingin plant breeding systems is

(A) Autogamy and allogamy
(B) Cleistogamy and geitonogamy
(C) Geitonogamy and allogamy
(D) Autogamy and herkogamy

88. Which statement correctly defines the principles of linkage mapping in plants?

(A) Genetic markers would always show higher recombination frequencies when they are closer to each other than if they are far apart
(B) The genetic distance between two markers is a true representation of the physical distance between them
(C) An ideal mapping population for a self-pollinating species is

generated using polymorphic parents that are inbred lines

(D) An F2 mapping population would segregate in a 1:2:1 ratio for a dominant marker

89. Which are the major non-native plant invaders of Indian aquatic ecosystems?

(A) *Partheniumhysterophorus, Pontederiacrassipes, Lantana camara*
(B) *Salviniamolesta,ProsopisJuliflora , Mikaniamicrantha*
(C) *Nelumbonucifera, Pogostemon erectus, Hygrophilaserpyllum*
(D) *Pontederiacrassipes, Salviniamolesta, Alternantheraphiloxeroides*

90. The basis for phenetic classification is

(A) Dendrograms based on DNA characteristics
(B) The ancestral lineage of existing organisms
(C) Observable characteristics of existing entities
(D) Sexual characteristics

91. *Brassica juncea*have bisexual flowers.Thecytoplasmic male sterility (CMS) is caused by a mitochondrial mutation. A nuclear gene called the restorer of fertility gene (Rf)can restore CMS. One prevalent characteristic is the return of fertility. A homozygous Rf line is crossed with a CMS line. The resulting F1 offspring self-pollinates.What percentage of F2 progeny will be sterilemales?

(A) 0
(B) 25
(C) 75
(D) 100

92. There is more to an ecological community than the sum of the characteristics of the constituent species. Out of the following, which one does not describe ecological communities?

(A) Local extinction of a species caused by demographic stochasticity
(B) Logseries species abundance distributions
(C) Stability of a food web in the face of disturbance
(D) The limits to similarity of competing species

93. Which of the following choices encompasses all of the habitats found in the Indian subcontinent?

(A) Boreal forest, tropical rainforest, tropical deciduous forest, alluvialgrassland
(B) Temperate forest, alluvial grassland, dry thorn forest, subtropical montaneforest
(C) Scrub forest, Chapparal vegetation, dry grasslands, riparian forest
(D) Shola grasslands, alpine grasslands, tundra, warm broad-leaved forest

94. Which is the accurate order of increasing biological organisation?

(A) ecosystems < communities < biomes < populations
(B) populations < communities < ecosystems < biomes
(C) biomes < ecosystems < communities < populations
(D) populations < ecosystems < communities < biomes

95. 'Empty Forest' is described as:

(A) Absence of large trees
(B) Less species diversity due to natural reasons
(C) Habitat void of large mammals due to anthropogenic impacts
(D) Loss of habitat

96. Salicylic acid (SA) controls systemic acquired resistance (SAR) in the plant's distant tissues as well as hypersensitive response and effector-triggered immunity at the main infection site. Regarding the role of the Non-expressor of PR genes 1 (NPR1) in the distal tissue, which of the following statements is true?

(A) NPR1 exists as oligomers in the nucleus and activates hypersensitive response
(B) NPR1 degrades through its binding to NPR3 and leads to activation of SAR response
(C) NPR1 accumulates in the nucleus and leads to activation of SAR response
(D) Binding with NPR4 stabilizes NPR1 in the nucleus, which in turn activates the hypersensitive response

97. Which of the following is most likely to happen if the gene encoding the coffee plant enzyme phenylalanine ammonia-lyase (PAL) experiences a loss of function mutation?

(A) Increased levels of caffeine
(B) Decreased lignin in cell walls
(C) Increased lignin in cell walls
(D) Decreased levels of caffeine

98. Which hormone is mostly used for rooting in plants?

(A) 2,4, -D
(B) NAA
(C) 2,4,5 – T
(D) Cytokinin

99. Auxin transport is

(A) Non-polar

(B) Symplast
(C) Apoplast
(D) Polar

100. What is the drawback of the 'Engler and Prantl' classification system?

(A) Gymnosperms are placed between monocotyledons and dicotyledons
(B) Dicotyledons are placed after monocotyledons
(C) Dicotyledons are placed before monocotyledons
(D) Gymnosperms are placed among Dicotyledons

101. Which among the following dicotyledonous families, is the most phylogeneticallyevolved?

(A) Scrophulariaceae
(B) Acanthaceae
(C) Umbelliferae
(D) Compositae

102. ……plant species lack xylem vessels

(A) Rose
(B) Pinus
(C) Gnetum
(D) Mango tree

103. Which among the following is a characteristic of Xylem parenchyma?

(A) They have a prominent nucleus
(B) The cell wall is thick, made of chitin
(C) Only living cells of the xylem tissue
(D) Cells have large vacuoles and are colourless

104. ……is considered as the most advanced water-conducting element

(A) Multiple vessels
(B) Tracheids
(C) Annular tracheids
(D) Simple vessels

105. ……..is a type ofProsenchyma

(A) Chlorenchyma
(B) Collenchyma
(C) Sclerenchyma
(D) Parenchyma

106. The flesh of fruit is mostly made of

(A) Collenchyma
(B) Parenchyma
(C) Meristem
(D) Schlerids

107. Hydroponics is a technique for growing plants without using

(A) Water
(B) Air
(C) Soil
(D) Sunlight

108. Which of these conditions is not caused by a lack of mineral nutrition?

(A) Chlorosis
(B) Etiolation
(C) Necrosis
(D) Shortening internode

109. Match the plant group in column I with description in column II and find the correct option

Column I		Column II	
1.	Algae	(i)	First vascular plants
2.	Bryophytes	(ii)	Amphibians of the plant kingdom
3.	Pteridophytes	(iii)	Naked seed plants
4.	Gymnosperms	(iv)	Simple aquatic autotrophs
5.	Angiosperms	(v)	Enclosed seeds in fruits

(A) (1)- (iv), (2)- (ii), (3)- (i), (4)-(iii), (5)- (v)
(B) (1)- (i), (2)- (iii), (3)- (ii), (4)-(ii), (5)- (v)
(C) (1)- (v), (2)- (iv), (3)- (iii), (4)-(i), (5)- (ii)
(D) (1)- (ii), (2)- (i), (3)- (v), (4)-(iv), (5)- (iii)

110. When the margins of sepals or petals overlap one another without any particular direction, the condition is termed as

(A) Vexillary
(B) Twisted
(C) Imbricate
(D) Valvate

111. Perisperm differs from endosperm in

(A) being a haploid tissue

(B) having no reserve food
(C) being a diploid tissue
(D) its formation by fusion of secondary nucleus with several sperms

112. Which of the following statements is incorrect?

(A) Transpiration helps in the upward movement of water
(B) Facilitated diffusion requires ATP for transport
(C) Phloem transports food in both upward and downward directions
(D) Root pressure contributes to water movement in small plants

113. Which cells play a major role in phloem loading and unloading?

(A) Companion cells
(B) Vessel elements
(C) Guard cells
(D) Tracheids

114. *Frankia* is associated with nitrogen fixation in

(A) Wheat and rice
(B) Legumes like peas
(C) Non-leguminous plants like Casuarina
(D) Maize and sorghum

115. Plants having the C-4 cycle are mainly found in tropical and sub-tropical regions and are able to survive in environments with low concentration of

(A) O_2
(B) N_2
(C) CO_2
(D) Both O_2 and CO_2

116. Which pathway is involved in the fixation of CO_2 in photosynthesis through ribulosebisphosphate (RuBP)?

(A) Pentose phosphate pathway
(B) Glycolysis
(C) Citric acid cycle
(D) Uronic acid pathway

117. What are the three hormones involved in inducing cell enlargement?

(A) Auxin, Ethylene, Naphthyl acetic acid

(B) Indole-3-acetic acid, Gibberellins, Cytokinins
(C) Cytokinins, Indole-3-acetic acid, Naphthyl acetic acid
(D) Ethylene, Naphthyl acetic acid, Cytokinins

118. The hormone that induces formation more female flowers in plants is

(A) Cytokinins
(B) Naphthyl acetic acid
(C) Abscisic acid
(D) Ethylene

119. Identify the wrongly matched pair from the following:

(A) Gibberellin – Induces seed dormancy
(B) Auxin – Cell elongation and apical dominance
(C) Cytokinin – Promotes cell division
(D) Ethylene – Stimulates fruit ripening

120. In the light reaction of photosynthesis, the reducing power stored as a result of solar energy is called

(A) $NADP^+$
(B) $NADPH + H^+$
(C) ADP + Pi
(D) Glyceraldehyde-3-phosphate (G3P)

121. The following statements refer to mechanisms that may cause antibioticsresistance inbacteria

(a) Enzymes that can break down the antibiotic
(b) Efflux systems to pump out the antibiotic
(c) CRISPR-mediated defence against the antibiotic
(d) Antitoxins that can sequester the antibiotic
(e) Cell wall modification

Which combination of statements represents the correct antibiotic resistance mechanism?

(A) (a), (b) and (e)
(B) (a), (b) and (c)

(C) (a), (b), (c) and (d)
(D) (a), (b), (c) and (e)

122. Which of the following claims regarding bacterial operons is false?

(A) Operons can encode multiple proteins with linked biological activity
(B) An operon expresses multiple proteins from a single mRNA
(C) mRNAtranscript of an operon has only one Shine Dalgarno sequence upstream of the first open reading frame
(D) Operon expression is often tightly regulated

123. Which of these bacterial constituents has the lowest probability of containing antigens?

(A) Cell wall
(B) Flagella
(C) Ribosomes
(D) Capsule

124. Which of the following claims about gram staining is NOT true?

(A) *Mycobacterium tuberculosis* stains blue because of the thick lipid layer
(B) *Streptococcus pyogenes* stains blue because of a thick peptidoglycan layer
(C) *Escherichia coli* stains pink because of a thin peptidoglycan layer
(D) *Mycoplasma pneumoniae* is not visible in the Gram's stain because it has no cell wall

125. …….is a gram-positive eubacterium

(A) *Neisseria*
(B) *Rhizobium*
(C) *Legionella*
(D) *Clostridium*

126. ……..is diagnosed by serologic methods

(A) Actinomycosis
(B) Q-fever
(C) Pulmonary tuberculosis

(D) Gonorrhea

127. The genus of bacteria whose cell membrane contains sterols is

(A) *Vibrio*
(B) *Mycoplasma*
(C) *Escherichia*
(D) *Chlamydia*

128. …… infects other gram-negative bacteria

(A) *Proteus mirabilis*
(B) *Haemophilus influenza*
(C) *Bdellovibrio*
(D) *Pseudomonas putida*

129. Which phage is used for 'phage display' technique?

(A) T7
(B) M13
(C) ƛ-phage
(D) ϕ6

130. Given below are combinations showing name of disease, pathogen and its biological group.Which of these is incorrectly matched?

(A) Pneumonia - *Haemophilusinfluenzae* - Bacteria
(B) Typhoid - *Salmonella* - Bacteria
(C) Filariasis - *Microsporum* - Roundworm
(D) Chikungunya - ChikungunyaVirus – Virus

131. The larval form of *Taeniasolium* is called

(A) Cysticeruscellulosae
(B) Cysticercoid
(C) Cysticerusbovis
(D) Hydatid cyst

132. A common biocontrol agent for plant diseases is

(A) *Baculovirus*
(B) *Bacillus thuringiensis*
(C) *Glomus*
(D) *Trichoderma*

133. Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition?

(A) *Azotobacter*
(B) *Aspergillus*
(C) *Glomus*
(D) *Trichoderma*

134. Which of the following statements is *INCORRECT*regarding fermentation?

(A) Propionibacterium is used to ferment the cheese

(B) The puffed-up appearance of dough is due to the production of CO_2 gas
(C) Fermentation in muscle produces ethanol
(D) Toddy is made by fermenting sap from palms

135. If chimeric mouse embryos were generated using GFP (Green Fluorescent Protein) -expressing embryonic stem cells and RFP (Red Fluorescent Protein) - expressing induced pluripotent stem cells (iPSCs), which one of the following tissues from any resulting embryos will not express any fluorescent protein?

(A) Brain
(B) Heart
(C) Intestine
(D) Placenta

136. Only one X chromosome in the aneuploid females is a characteristic of individuals with

(A) Cri du Chat syndrome
(B) Klinefelter syndrome
(C) Down syndrome
(D) Turner syndrome

137. Which of the following cells in the renal corpuscles can influence glomerular filtration by its contraction?

(A) Podocytes
(B) Endothelial cells of glomerular capillaries
(C) Parietal epithelial cells of Bowman's capsules
(D) Mesangial cells

138. Least blood pressure is present in

(A) Vena Cava
(B) Aorta
(C) Capillary
(D) Vein

139. Apoenzyme is a

(A) Protein
(B) Carbohydrate
(C) Vitamin
(D) Amino acid

140. …… is the enzyme responsible for catalyzing the formation of peptide bonds during protein synthesis.

(A) Carbonic anhydrase
(B) Peptidase
(C) Carbohydrate
(D) Peptidyltransferase

141. Which of the following is a characteristic feature of Gram-positive bacteria?

(A) Thin peptidoglycan cell wall
(B) Presence of an outer membrane
(C) Teichoic acids in the cell wall
(D) Lipopolysaccharide layer

142. A short region of a vector containing a number of unique restriction sites into which DNA can be introduced is termed as

(A) Multiple cloning site
(B) Open reading frame
(C) Origin of replication
(D) Linker

143. From a fixed start point, each group of three bases in the coding region of the mRNA represents a

(A) codon
(B) nucleotide
(C) gene
(D) polynucleotide

144. In nucleic acids, the bases are covalently attached to the 1-position of a pentose sugar ring, to form a

(A) nucleotide
(B) DNA single strand
(C) Nucleoside
(D) Glycosidic bond

145. Enzymes that regulate the process of supercoiling are

(A) DNA helicases
(B) topoisomerases
(C) nucleases
(D) DNA polymerases

146. Which of the following is a 39-residue hormone of the anterior pituitary gland?

(A) Glucagon
(B) Bradykinin
(C) Corticotropin
(D) Insulin

147. Choose the correct intermediate series in fat metabolism.

(A) Fatty acyl-CoA → trans enoyl-CoA → hydroxy acyl-CoA → Keto acyl –CoA
(B) Fatty acyl-CoA → trans enoyl-CoA → Keto acyl –CoA → hydroxy acyl-CoA
(C) Fatty acyl-CoA → Keto acyl –CoA → hydroxy acyl-CoA → trans enoyl-CoA
(D) Fatty acyl-CoA → hydroxy acyl-CoA → Keto acyl –CoA → trans enoyl-CoA

148. Choose the correct answer. A – assertion, R – reason.

A: Bile juice helps in digestion of food in small intestine
R: Bile juice contains sodium salt

(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is the not the correct explanation of A
(C) A is true and R is false
(D) A is false and R is true

149. A is assertion and R is reason. Choose the correct answer:

Assertion: Enzyme substrate complex remains throughout the reaction.
Reason: The greater the affinity of the enzyme for a substrate, the higher is the catalytic activity.

(A) Both A and R are true. R is the correct explanation of A
(B) A is true but R is false
(C) A is false but R is true
(D) Both are false

150. G protein-coupled receptors (GPCRs) are used to detect and respond to many different types of signals, including neurotransmitters, hormones involved in glycogen and fat metabolism and even photons of light. Which one of the following statements regarding GPCR is INCORRECT?

(A) GPCRs are a large family with a common structure of seven membrane
- spanning α helices.
(B) GPCRs are coupled to trimeric G proteins comprising three subunits α, β and γ.
(C) The $G\alpha$ subunit is a GTPase switch protein that alternates between an active ('on') state with bound GTP and an inactive ('off') state with GDP.
(D) The 'on' form gets bound to β and γ subunits and activates a membrane bound effector like adenylyl cyclase, phospholipase C or ion channel.

ANSWER KEY

Subject Name:		LIFE SCIENCE							
SI No.	**Key**	**SI No.**	**Key**	**SI No.**	**Key**	**SI No.**	**Key**	**SI No.**	**Key**
1	D	31	D	61	D	91	B	121	D
2	C	32	D	62	B	92	A	122	C
3	B	33	C	63	A	93	B	123	C
4	C	34	C	64	C	94	B	124	A
5	C	35	A	65	D	95	C	125	D
6	B	36	C	66	B	96	C	126	B
7	C	37	B	67	B	97	B	127	B
8	D	38	A	68	A	98	B	128	C
9	A	39	B	69	B	99	D	129	B
10	A	40	B	70	A	100	B	130	C
11	C	41	A	71	A	101	D	131	A
12	C	42	A	72	A	102	B	132	D
13	D	43	A	73	C	103	B	133	C
14	D	44	A	74	D	104	D	134	C
15	D	45	A	75	B	105	D	135	D
16	C	46	B	76	D	106	B	136	D
17	D	47	C	77	A	107	C	137	D
18	C	48	B	78	A	108	B	138	A
19	A	49	C	79	D	109	A	139	A
20	A	50	B	80	B	110	C	140	D
21	C	51	B	81	B	111	C	141	C
22	C	52	D	82	B	112	B	142	A
23	D	53	B	83	A	113	A	143	A
24	B	54	C	84	A	114	C	144	C
25	A	55	A	85	C	115	C	145	B
26	C	56	B	86	B	116	A	146	C
27	C	57	C	87	B	117	B	147	A
28	D	58	D	88	C	118	D	148	A
29	A	59	B	89	D	119	A	149	C
30	A	60	C	90	C	120	B	150	D