Biology

1. Which of the following hormones also produces anti-inflamatory reactions in man and suppresses the immune response in addition to its primary functions?

(1) Thyrocalcitonin
(2) Cortisol
(3) Erythropoietin
(4)Thymosin

2. Match the microbial products listed under column I with the related microbes given under column-II; choose the appropriate option from the given choices

Column I		Column II	
(A)	Citric acid	(p)	Methanobacterium
(B)	Cyclosporin A	(q)	Monaco purpureus
(C)	Statin	(r)	Aspergillus niger
(D)	Gobar gas	(s)	Trichoderma polysporum
		(t)	Clostridium butylicum

(1) A-.q, B-s, C-t, D-r.
(2) A-r, B-s, C-q, D-p
(3) A-r, B-s, C-q,D-t.
(4) A-t, B-q, C-s, D-r.

3. *Marchantia* is considered as a heterothallic plant because it is

(1) Monoecious
(2) Heterogametic
(3) Dioecious
(4) Bisexual

4. Identify the set of characteristics related to plants belonging to family Fabaceae from the following

(1) Papilionaceous corolla, axile placentation and leguminuos fruit
(2) Actinomorphic flower, syncarpus ovary and marginal placentation
(3) Vexillary aestivation of corolla, diadelphous stamens and monocarpellary, unilocular ovary
(4) Persistent calyx, cpipetalous stamens and leguminous fruit

5. One of the following statements is incorrect with reference to biodiversity, identify it.

(1) The richest reservoirs of animal and plant life (species richness) with few or no threatened species are called 'biodiversity hotspots'
(2) If the successful conditions are localized or remain only for a short duration, an organism either migrates or suspends itself.
(3) Low atmospheric pressure in higher altitudes results in altitude sickness
(4) Mammals from colder climates have shorter ears and limbs to minimize heat loss

6. In castor and maize plants,
(1) male and female flowers are borne by different plants
(2) autogamy is prevented but not geitonogamy
(3) the anthers and stigma are placed at different positions to encourage cross pollination
(4) both autogamy and geitonogamsy are prevented

7. In garden pea, round shape of seeds in dominant over wrinkled shape. A pea plant heterozygous for round shape of seed is selfed and 160 seeds produced during the cross are subsequently germinated. How many seedlings would have the parental phenotype?
(1) 400
(2) 1600
(3) 1200
(4) 800

8. Which of the following events would occur in 'Lac-operon of E.coli when the growth medium has high concentration of lactose?
(1) The repressor protein attaches to the promoter sequence and dereprosses the operator
(2) The structural genes fail to produce polycistronic RNA
(3) The inducer molecule binds to repressor protein and RNA polymerase binds to promoter sequence
(4) The repressor protein binds to RNA polymerase and prevents translation

9. The mature infective stages of malarial parasite which are transferred from mosquito to man are
(1) Trophozoites
(2) sporozoites
(3) Gametocytes
(4) Merozoites

10. One of the following refers to Allen's rule
(1) An organism can move from a stressful habitat to a more hospitable area and return when the stressful period is over
(2) If the stressful conditions are localized or remain only for a short duration, an organism either migrates or suspends itself
(3) Low atmospheric pressure in higher altitudes results in altitude sickness.
(4) Mammals from colder climates have shorter cars and limbs to minimize heat loss.

11. Identify the DNA segment which is not a palindromic sequence.

(1) 5'GGATCC 3'
3' GGTACC 5'

(2) 5' GAATTC 3'
5' CTTAAG 4'

(3) 5' GCGGCCGC 3'
3' CGCCGGCG 3'

(4) 5' CCCGGC 3'
3' GGGCCC 5'

12. During somatic hybridization plants,

(1) the cell walls and the lamella are digested before fusing the cells
(2) somaclones are produced in large numbers
(3) crop plants with higher levels of vitamins, proteins and minerals are hybridised
(4) the apical meristems are cultured to get virus-free plants

13. Statement A: The secretion of collaterial gland forms the egg case in cockraoch.
Statement B: The development in cockroach is hemimetabolous

(1) Statement A is correct and statement B is wrong
(2) Both the statement A and B are correct and B is the reason for A
(3) Statement B is correct and statement A is wrong
(4) Both the statement A and B are correct and B is not the reason for A.

14. If a plant produces flowers when exposed only to alternating periods of 5 hours light and 3 hours dark in a 24 hour cycle, then the plant should be a

(1) Short long day plant
(2) Short day plant
(3) Day neutral plant
(4) Long day plant

15. If there was no carbon dioxide in the earth's atmosphere, the temperature of the earth's surface

(1) less than the present level
(2) same as the present level
(3) dependent on the oxygen content in the atmosphere
(4) more than the present level

16. One of the following is incorrect about cancer cells
(1) They exhibit mass proliferation
(2) They exhibit the property of contact inhibitation
(3) They are produced when cellular oncogenes of normal cells are activated
(4) They are metastatic

17. The centrosome duplicates during the
(1) G-phase of cell eyele
(2) S-phase of cell cycle
(3) Praphase of cell cycle
(4) G1-phase of cell cycle

18. Match the items listed under column I with those given under column-II; choose the appropriate option from the given choices

Column I		Column II	
A	Residual volume (RV)	P	400 ml - 4600 ml
B	Inspiratory Reserve Volume (IRV)	Q	1100 ml 1200 ml
C	Vital Capacity (VC)	R	1000 ml-1100 ml
D	Expiratory Reserve Volume (ERV)	S	3000 ml -3500 ml
E	Inspiratory Capacity (IC)	T	2500 ml - 0000 ml

	A	B	C	D	E
1	T	Q	S	E	P
2	Q	R	S	T	P
3	Q	T	P	R	S
4	R	T	P	Q	S

19. Which of the following statement is correct?
(1) The core of cilium or flagellum is the basal body
(2) Elaioplasts store starch whereas aleuroplasts store proteins
(3) Membranous extensions into the cytoplasm in cyanobacateria which contain pigments are called chromatophores
(4) Acrocentric chromosomes have only one arm.

20. Sickle cell anemia is caused to the substitution of
(1) Valine at the 6th position of beta globin chain by glutamine
(2) Valine at the 6th position of alpha globin chain by glutamic acid
(3) Glycine at the 6 position of alpha group chain by glutamic acid
(4) Glutamic acid at the 6th position of beta group chain by valine

21. Statement A: The primary transcript produced in eukarytes is translated without undergoing any modification or processing
Statement B. The hnRNA in humans has exons and introns

(1) Statement B is correct and statement A is wrong
(2) Both the statement A and B are correct
(3) Statement A is correct and statement B is wrong
(1) (4 Both the statement A and B are wrong

22. Knee joint is an example for

(1) Pivot joint
(2) Ball and socket joint
(3) Gliding joint
(4) Hinge joint

23. Carefully read the following reactions carried out by nitrogen fixing bacteria. Identify the statement about these equations which is not true
$2\ NH_3 + 302 \rightarrow +2\ NO_2 + 2H^+ + 2H_2O$...(A)
$2NO_2^- + 02 \rightarrow 2NO_3^-$...(B)

(1) Both the steps (A) and (B) can be called nitrification
(2) Steps (A) is carried out by Nitrosomanas or Nitrococcus
(3) Both the steps occur only in photoautotrophs
(4) Step (B) is carried out by Nitrobacter

24. Match the vegetative propagules listed under column-1 with the plants given under column-II.
choose the appropriate option from the given choices.

Column 1	Column II
(A) Rhizone	(p) Agave
(B) Offset	(q) Brophyllum
(C)Sucker	(r) Ginger
(D) Leaf buds	(s) Chrysanthemum
	(t) Eichhornia

(1) A-r, B-t, C-s, D-q
(2) A-r, B-s, C-p, D-q
(3) A-q, B-p, C-t, D-s
(4) A-s, B-t, C-q, D-r

25. One of the following causes population explosion

(1) Decrease in infant mortality rate and increase in death rate
(2) Decrease in death rate, maternal mortality rate and infant mortality rate
(3) Decrease in infant mortality rate and decreases in the number of people in reproductive age
(4) Decrease in death rate and increase in maternal mortality rate

26. _____are the most abundant proteins in the living world

(1) PEPease of plants and keratin of animals
(2) Ribozyme of plants and collagen of animals
(3) C) Alcohol dehydrogenase of plans and melanin of animals
(4) RUBisCO of plants and collagen of animals

27. One of the chief reasons among the following for the depletion in the number of species making it endangered is

(1) Over hunting and poaching
(2) Greenhouse effect
(3) Competition and predation
(4) Habitat destruction

28. Is humans, what is the ratio of number of gametes produced from one male primary sex cell to the number of gametes produced from one female primary sex cell ?

(1) 1:4
(2) 1:1
(3) 4:1
(4) 1:3

29. Which of the following nitrogen bases is found only in DNA

(1)Guanine

(2)Thymine

(3)Adenine

(4)Cytosine

30. Match the organic compounds listed oder Column-1 with the explanation given oder Column
II, choose the appropriate option from the given choices.

ColumnI	Column II
(A) Phospheonol pyruvate (PEP)	(p) 6-carbon compound
(B) Ribulose bipbosphate (RuBP)	(q) 2- carbon compound
(C) Oxalo acetic acid (OAA)	(r) 4-carbon compound
(D) Acetyl -co-enzyme-A	(s) 5-carbon compound
	(t) 3-carbon compound

(1) A-t, B-s, C-r, D-q
(2) A-r, B-s, C-t, D-p
(3) A-t, B-p.C-q, D-r
(4) A-q, B-r, C-s, D-t

31. Down's syndrome is an example for_____
(1) Syndrome caused due to gene mutation
(2) Aneuploidy of sex chromosome
(3) Loss of one sex - chromosome from the diploid set
(4) Aneuploidy of autosome

32. The interaction between the organisms of one of the following pairs an example for comensalem
(1) Cattle or sheep and grass
(2) Wasps and fig tree
(3) Orchid and mango tree
(4) Cuckoo and crow

33. The germ pores in the pollen grain are the regions_____
(1) Which are made up of lignin and suberin
(2) That can withstand high temperature and strong acids and alkalies
(3) Which lack sporopollenin
(4) Through which sperms are released into the female gametophyte

34. Heroin is_____
(1) Commonly called "coke or crack
(2) A cannabinoid
(3) Used to treat mental illnesses like depression and insomnia
(4) Diacetylmorphine (chemically)

35. Thorns of *Bougainvillea* and tendrils of *Cucurbita* are examples for
(1) Adaptive radiation
(2) Convergent evolution
(3) Co-evolution
(4) Divergent evolution

36. Some of the steps of DNA fingerprinting are given below. Identify the correct sequence from the options given
A. Electrophoresis of DNA fragments
B. Hybridisation with DNA probe
C. Digestion of DNA by RENS
D. Autoradiography
E. Blotting of DNA fragments to nitrocellulose membrane
(1) C-A-E-B-D
(2) A -C-E-D-B
(3) C-A-B-E-D
(4) A-E-C-B-D

37. 'Floc's is
(1) A mesh-like structure formed by the association of bacterial and fungal filaments in sewage treatment
(2) The primary sludge produced in sewage treatment
(3) The effluent in primary treatment tank obtained during sewage treatment
(4) A type of biofortified food

38. ADA deficiency results in
(1) Chromosomal disorders
(2) Increased risk of infertility
(3) Decrease in the yield of crop plants
(4) Inability of the immune system to function normally

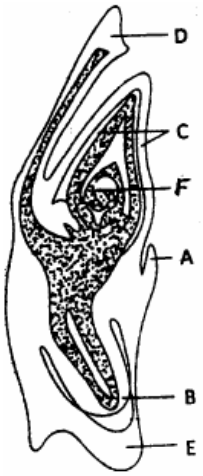
39. Parbhani kranti, a variety of bhindi (lady's finger), is resistant to
(1) Black rot
(2) Bacterial blight
(3) Leaf curl
(4) Yellow mosaic virus

40. The globular head of myosin contains
(1) ATPase enzyme
(2) Calcium ions in large quantities
(3) ATP
(4) Troponin

41. EcoRI is
(1) used to join two DNA fragments
(2) a restriction enzyme
(3) the abbreviation for bacterium *Escherichia coli*
(4) a plasmid

42. Roquefort cheese' is ripened by using a
(1) Bacterium
(2) Type of yeast
(3) Cyanobacteria
(4) Fungus

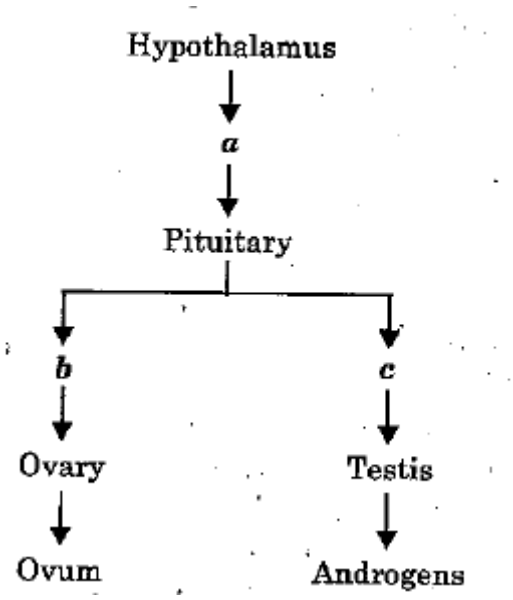
43. In this diagram showing the Ls, of an embryo of grass, identify the answer having the correct combination of alphabets with the right part:



(1) A-Epiblast, B - Scutellum, C- Coleoptile, D-Radicle, E-Colcorhiza, F - Shoot apex
(2) A - Root cap, B - Coleoptile, C - Scutellum, D - Coleorhiza, E- Epiblast, F - Shoot apex
(3) A-Epiblast, B-Radicle, C- Coleoptile, D - Scutellum, E-Colcorhiza, F - Shoot apex
(4) A-Shoot apex, B - Epiblast, C - Colcorhiza, D - Scutellum, E-Coleoptile, E-Radicle

44. Making of two varieties of a cattle breed like Red Dane which have no Common ancestors on either sides of their pedigree up to 4 – 6 generations is an example for
(1) Out crossing
(2) Inbreeding
(4) Cross breeding
(3) Inter-specific hybridization

45. Identify the hormones, 'A', 'B' and 'C' that are labelled in the given flow chart:



(1) A-GnRH, B-PRL, C - ICSH
(2) A-GnRH, B - ICSH, C - FSH
(3) A-GnRH, B - FSH, C-LH
(4) A-GH, B - FSH, C-LH

46. Statement (A): Photorecitation decreases photosynthetic output
Statement (R): In phonorespiratory pathway, neither ATP or NADPH is produced
(1) Statement (A) is correct and statement (B) is wrong
(2) Both the statements A and B are correct
(3) Statement (B) is correct and statement (A) is wrong
(4) Both the statements A and B are wrong

48. The result of the following reaction/experiment carried out by Avery et. Al. on Streptococcus
pneumoniac has proved conclusively that DNA is the genetic material:
(1) Live 'R' strain + DNA from 'S' strain +RNAase
(2) Live 'R' strain + DNA from 'S' strain + DNAase
(3) Live 'R' strain + Denatured DNA of 'S' strain + protease
(4) Heat killed 'R' strain + DNA from 'S' strain + DNAase

49. Match the storage products listed under Column - I with the organisms given under Column - II,
choose the appropriate option from the given choices.

Column 1	Column II
(A) Glycogen	*(p) Saragassum*
(B) Pyrenoids	*(q) Nostoc*
(C) Laminarin and mannitol	*(r)Polysiphonia*
(D) Floridean starch	*(s) Spirogyra*
	(t) Agaricus

(1) (A)-(t); (B)-(s); (C)-(p); (D)-(r)
(2) (A)-(r); (B) - (s): (C)-(p); (D)-(t)
(3) (A)-(q); (B)-(p): (C)-(s): (D)-(r)
(4) (A) -(s): (B)-(r): (C)-(t); (D) -(q)

50. Identify the desirable characteristics for a plasmid used in rDNA technology from the following:
A. Ability to multiply and express outside the host in a bioreactor
B. A highly active promoter
C. A site at which replication can be initiated
D. One or more identifiable marker genes
E. One or more unique restriction sites
(1) A, C, D and E only
(2) A, C and E only
(3) B, C, D and E only
(4) B, C and E only

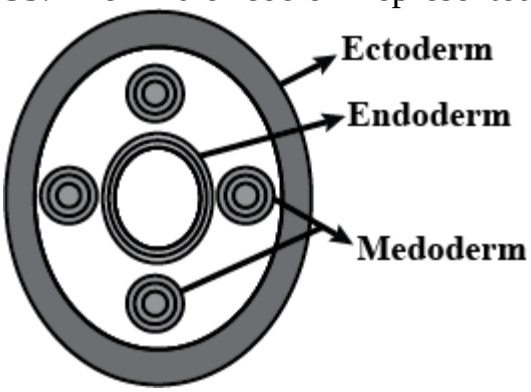
51. Which compounds were used by Miller in his experiment for obtaining amino acids and other
(1) Ammonia, methane, hydrogen and water vapour
(2) Carbon dioxide, water vapour and methane
(3) Ammonia, methane and carbon dioxide
(4) Methane, ammonia, water vapour and hydrogen cyanide

52. Which of the following is true for cutrophicated water body?
(1) Rich species diversity
(2) high mineral contect
(3) Low organic content
(4) high oxygen content

53. IUDs which are used by females
(1) are implanted under the skin and they release progestogen and estrogen
(2) act as spermicidal jellies
(3) release copper ions in the uterus that increase phagocytosis of sperms
(4) block the entry of sperms into vagina

54. Which of the following hormones are secreted in large quantities during pregnancy in women?
(1) LH, estrogen and estradiol
(2) hCG, progesterone, estradiol and FSH
(3) hCG and hPL
(4) hCG, HPL, progesterone, estrogen and LH

55. The kind of coelom represented in the diagram given below is characteristic of:



(1) Round worm
(2) Earthworm
(3) Tape worm
(4) Cockroach

56. With respect to angiosperms, identify the incorrect pair from the following:
(1) Primary endosperm nucleus - 3n
(2) Antipodals - 2n
(3) Cells of nucellus of ovule - 2n
(4) Vegetative cell of male gametophyte - n

57. Statement A: For a particular character in an individual, each gamete gets only one allele.
Statement B: Chromatids of a chromosome split (separate) and move towards opposite pole during anaphase of mitosis.
(1) Statement (A) is correct and statement (B) is wrong
(2) Both the statements are correct and B is the reason for A.
(3) Statement (B) is correct and statement (A) is wrong
(4) Both the statements are correct and B is not the reason for A.

58. Internal bleeding, muscular pain, blockage of the intestinal passage and anemia are some of the symptoms caused due to infection by
(1) *Ascaris*
(2) Wuchereria
(3) Plasmodium
(4) Trichophyton

59. RNA interference which is employed in making tobacco plant resistant to *Meloidegyne incognita* is essentially involved in
(1) preventing the process of replication of DNA
(2) preventing the process of translation of mRNA
(3) preventing the process of splicing of hnRNA
(4) preventing the process of transcription

60. The success of mammals on earth is largely because :
(1) They have the ability to maintain constant body temperature,
(2) They can conform to the changes in the environment.
(3) They can take care of their young ones as they have mammary glands to suckle them.
(4) They can reduce metabolic activity and go into a state of dormancy during unfavourable conditions in the environment,