

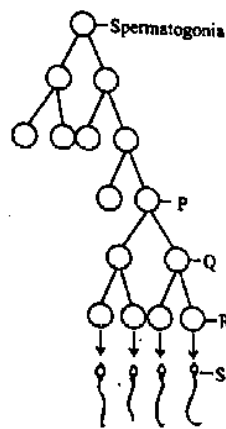
1. The nourishing cells in the Seminiferous tubules are
- (a) Leydig cells (b) Follicular cells
(c) Spermatogonial cells (d) Sertoli cells

Key: (d)

2. If in a normal Menstruating woman, menses occur on 5th April, what will be the expected date of Ovulation?
- (a) 18th April (b) 10th April (c) 14th April (d) 29th April

Key: (a)

3. Identify the cells represents as P, Q, R and S in the given schematic representation of spermatogenesis.



- (a) P - Primary Spermatocyte
Q - Secondary Spermatocyte
R - Spermatids
S - Spermatozoa
- (b) P - Spermatozoa
Q - Spermatids
R - Secondary Spermatocyte
S - Primary Spermatocyte
- (c) P - Secondary Spermatocyte
Q - Primary Spermatocyte
R - Spermatozoa
S - Spermatids
- (d) P - Secondary Spermatocyte
Q - Spermatids
R - Spermatozoa
S - Primary Spermatocyte

Key: (a)

4. The method of natural contraception which requires correct knowledge of Menstrual cycle is
- (a) Lactational Amenorrhoea (b) Periodic Abstinence
(c) Coitus interrupts (d) IUDs – Intrauterine Devices

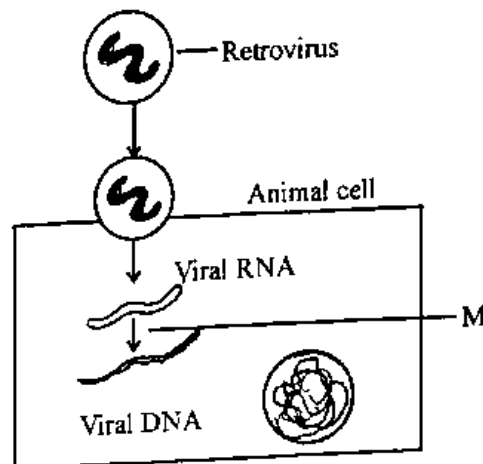
Key: (b)

5. A childless couple visit Assisted Reproductive Technologies (ARTs) centre to get assistance to have a child. On diagnosis, it was noticed that there was low sperm count in the male partner. Which of the following strategy of ART is most suitable in this case?

- (a) Artificial Insemination (AI)
(b) Gamete Intra-Fallopian Transfer (GIFT)
(c) In vitro Fertilisation (IVF)
(d) Zygote Intra-Fallopian Transfer (ZIFT)

Key: (a)

6. Identify the enzyme that catalyses the step labelled as 'M' in the given Schematic representation of Replication of retrovirus



- (a) RNA polymerase (b) Reverse transcriptase
(c) DNA ligase (d) Recombinase

Key: (b)

7. In animal breeding, the maximum genetic variations can be achieved through
- (a) Outcrossing (b) Inbreeding
(c) Crossbreeding (d) Interspecific hybridization

Key: (d)

8. The oil content and quality of a groundnut variety was improved by plant breeding technique.

This is an example of

- (a) Biomagnification (b) Bioremediation
(c) Biofortification (d) Biodegradation

Key: (c)

9. Microbes like Spirulina can be good alternate to the conventional sources of proteins for human nutrition, because ...

- (a) they give more biomass in less time
(b) their proteins are different from plant proteins
(c) they are produced using synthetic fertilisers
(d) they have high fibre content

Key: (a)

10. Consider the following morphological, biochemical or physiological characteristics of plants.

- (i) Presence of hairy leaves
(ii) Production of more nectar in flower
(iii) High sugar content in plant parts
(iv) Presence of higher aspartic acid concentration

Choose the correct combination of statements which give natural resistance to plants against insect pests:

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

Key: (d)

11. Which of these is not an advantages in Genetically modified crops?

- (a) Reduces the reliance on chemical pesticides
(b) Increases efficiency of mineral usage in plants
(c) Increases the post-harvest losses
(d) Enhances the nutritional value of food

Key: (c)

12. Some multinational companies have exploited the traditional knowledge of the indigenous people to produce commercially important bio products, without their consent. This is an example for

- (a) Bioprospecting (b) Biopatent (c) Biomediation (d) Biopiracy

Key: (d)

13. In Amphibians and reptiles, the body temperature changes corresponding to external temperature. The organisms which show this kind of response is termed as -

- (a) Regulators (b) Partial Regulators (c) Conformers (d) Thermophiles

Key: (c)

14. Assertion (A): The Monarch butterfly feeds on poisonous weeds during its Caterpillar stage.

Reason (R): It helps butterfly to become distasteful to its predator.

- (a) (A) is true and (R) is its correct explanation
- (b) (A) is true, (R) is false
- (c) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- (d) Both (A) and (R) are false

Key: (a)

15. From the given options, identify the correct combination of population interactions that correspond to the symbols given here

- | | ++ | -- | +O |
|-----|------------|-------------|--------------|
| (a) | Predation | Competition | Commensalism |
| (b) | Parasitism | Competition | Mutualism |
| (c) | Mutualism | Parasitism | Amensalism |
| (d) | Mutualism | Competition | Commensalism |

Key: (d)

16. Identify the odd one among the following disorders:

- (a) Sickle - cell Anaemia
- (b) Haemophilia
- (c) Thalassaemia
- (d) Phenyl Ketonuria

Key: (b)

17. From the chromosomal complements given below, identify the one which shows female heterogamety

- (a) XX - XY
- (b) XX - XO
- (c) ZZ - ZW
- (d) XX - XXY

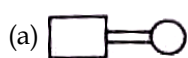
Key: (c)

18. In Morgan's experiment with *Drosophila*, when yellow bodied white eyed female was crossed with brown bodied red eyed male and their F_1 progeny were intercrossed. What was the percentage of recombinants in F_2 generation?

- (a) 98.7%
- (b) 62.8%
- (c) 37.2%
- (d) 1.3%

Key: (d)

19. In the following symbols, used in human pedigree analysis, identify the symbol that denotes consanguineous mating.

- (a) 
- (b) 
- (c) 
- (d) 

Key: (a)

20. Which of the following Nitrogen bases is found only DNA?
(a) Adenine (b) Cytosine (c) Guanine (d) Thymine

Key: (d)

21. What is the function of protein GLUT-4?
(a) Enables glucose transport into cells (b) Acts as an enzyme
(c) Functions as intercellular ground substance (d) Fights infectious agents

Key: (a)

22. Cells in the quiescent stage (G_0)
(a) show indefinite proliferation (b) always become cancerous
(c) remain metabolically active (d) remain metabolically inactive

Key: (d)

23. Consider the following statements i, ii and iii regarding criteria for essentiality of the nutrients in plants:

- i. The presence of elements is must for plants to complete their life cycle
- ii. The role of the element can be replaced by another element.
- iii. the element must be directly involved in the metabolism of the plant

Choose the correct statement/s:

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

Key: (b)

24. During chemiosmotic synthesis of ATP in photosynthesis:
(a) The proton gradient is not required
(b) The protons accumulate in the intermembrane space of chloroplast
(c) The protons accumulate within the lumen of the thylakoids
(d) The protons accumulate in the intermembrane space of mitochondrion

Key: (c)

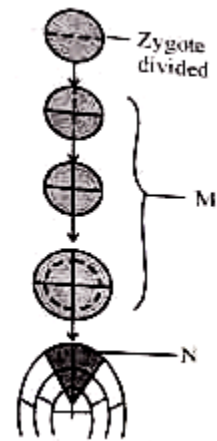
25. When tripalmitin is used as respiration substrate in aerobic respiration, the process consumes 145 molecules of Oxygen and release 102 molecules CO_2 , then RQ value would be

- (a) 0.7 (b) 0.5 (c) 1.0 (d) 1.4

Key: (a)

26. In the following diagrammatic representation showing stages of embryonic development, identify the type of growth phase labelled as M and N:

- (a) Both M and N are arithmetic phases
- (b) M is geometric phase and N is arithmetic phase
- (c) Both M and N are geometric
- (d) M is arithmetic phase and N is geometric phase



Key: (b)

27. Indigestion of fats in humans may be an indication of

- (a) Under-secretion of saliva
- (b) Intestinal ulcers
- (c) Under-secretion of amylase
- (d) Inflammation of liver

Key: (d)

28. Choose the correct statement from the following

- (a) Histamine, serotonin and heparin are secreted by basophils
- (b) Erythroblastosis foetalis may result when foetus is Rh^{-ve} and mother is Rh^{+ve}
- (c) Person with blood group AB can donate blood to person with blood group A
- (d) Atherosclerosis is often referred to as angina pectoris

Key: (a)

29. In blind spot of the human eye

- (a) only cones are absent
- (b) both cones and rods are absent
- (c) only rods are absent
- (d) both cones and rods are present

Key: (b)

30. A boy after attaining sexual maturity shows muscular growth, growth of facial and axillary hair, aggressiveness and low pitch of voice. These changes are attributed to _____ hormone

- (a) Testosterone
- (b) Estrogen
- (c) glucagon
- (d) secretin

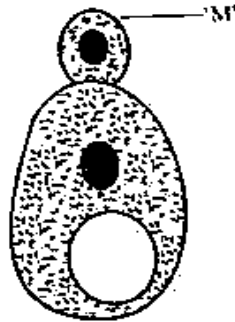
Key: (a)

31. Plants like Marchantia and Funaria produce gametes by mitosis, because

- (a) plant body is haploid
- (b) They are gametophytes
- (c) Gametophyte is diploid
- (d) They are dioecious.

Key: (a)

32. Identify the asexual reproductive structure 'M' in the following diagram:



- (a) Bud (b) Zoospore (c) Conidium (d) Gemmule

Key: (a)

33. In some plants, stigma and anther mature at different times because

- (a) is facilitates self-pollination (b) it attracts pollinators
(c) it facilitates cross pollination (d) it prevents cross pollination

Key: (c)

34. Now a days agricultural practice is expensive to the farmers as they need to purchase hybrid seeds every year. Which of the following strategies can be employed to overcome this problem?

- (a) Production of Apomictic seeds (b) Synthetic seed
(c) Parthenocarpy (d) Conventional plant breeding

Key: (a)

35. Identify the correct order of steps involved in Artificial hybridization in plants;

- (a) Rebagging → Artificial pollination → Bagging → Emasculation
(b) Artificial pollination → Emasculation → Rebagging → Bagging
(c) Bagging → Artificial pollination → Rebagging → Emasculation
(d) Emasculation → Bagging → Artificial pollination → Rebagging

Key: (d)

36. Which one of the following ecosystem has the highest annual net primary productivity?

- (a) Tropical deciduous forest (b) Desert
(c) Temperate evergreen forest (d) Tropical rain forest

Key: (d)

37. Of the total incident solar radiation the percentage photosynthetically Active Radiation (PAR) captured by the plants

- (a) 2 - 10% of PAR only (b) 10 - 20% of PAR only
(c) 30 - 40% of PAR only (d) 0 to 10% PAR only

Key: (a)

38. The historic convention related to conservation of biological diversity is also known as
- (a) Kyoto Protocol (b) Earth Summit
(c) Montreal protocol (d) World Summit
- Key: (b)
39. Which one of the following human activity has contributed to deforestation in north-eastern states of India?
- (a) Industrialisation (b) Urbanisation
(c) Jhum cultivation (d) Monocropping
- Key: (c)
40. In an area where DDT has been used extensively, the population of birds declined significantly because -
- (a) Birds stopped laying eggs
(b) Birds became vulnerable to predators
(c) Earthworms in the area got eradicated
(d) Many of the eggs laid by birds showed pre-matured breaking
- Key: (d)
41. Identify the incorrect statement with reference of Biocontrol agents:
- (a) They help to increase the use of synthetic pesticides
(b) They do not show any negative impact on crop plants
(c) They do not affect non-target pests
(d) They are significant in treating ecologically sensitive area
- Key: (a)
42. A Farmer has applied chemical fertilisers in his crop field for many successive seasons. In the next season, the crop growth was poor as soil lost its fertility. Suggest the suitable micro-organism that replenishes the fertility of soil in his field.
- (a) Nostoc (b) Spirulin (c) Spirogyra (d) Chlorella
- Key: (a)
43. In cloning vectors, antibiotic resistant genes are helpful for
- (a) Selection of recombinants (b) Transfer of foreign gene to the host
(c) Cleaving of vector by REN (d) Making the host cells competent
- Key: (a)
44. A student while extracting DNA from *Aspergillus* fungus requires _____ enzyme to break open the cell wall.
- (a) Lysozyme (b) Cellulase (c) Chitinase (d) Pectinase
- Key: (c)

45. Identify the DNA sequence which can be cut using EcoRI.

- (a) 5' ACGAATTCAT3'
3' TGCTTAAGTA5'
- (b) 5' TGCTTAAGTA3'
3' ACGAATTCAT5'
- (c) 3' ACGAATTCAT5'
5' TGCTTAAGTA3'
- (d) 5' TGCTTAAGCA3'
3' ATGAATTCGT5'

Key: (a)

46. Which of the following amino acids is coded by Single Codon?

- (a) Phenylalanine (b) Valine (c) Tryptophan (d) Tyrosine

Key: (c)

47. In Prokaryotes, the transcription of DNA is initiated with the help of

- (a) Elongation factor (b) Rho factor (c) Termination factor (d) Sigma factor

Key: (d)

48. According to Human Genome Project (HGP), the total number of genes in human genome is estimated at 30,000, the number of genes present on Y-chromosome are

- (a) 242 genes (b) 2968 genes (c) 2898 genes (d) 231 genes

Key: (d)

49. In a crime investigation, the investigating officer collects different biological samples from the crime spot of DNA Finger-Printing Analysis. Which of the following samples is not helpful in this analysis?

- (a) Erythrocytes (b) Skin Shreds
- (c) Hair Follicle (d) Semen Sample

Key: (a)

50. A mature mRNA consists of 900 bases without any stop codon in between. Calculate the number of amino acids coded by this mRNA during translation.

- (a) 299 (b) 900 (c) 450 (d) 300

Key: (a)

51. The brain capacity of Homo habilis

- (a) between 650 cc-800 cc (b) 1800 cc
- (c) 1400 cc (d) 900 cc

Key: (a)

52. In Bougainvillea and Cucurbita, the axillary bud is modified into thorn and tendril respectively.

This is an example of

- (a) Divergent Evolution (b) Co-evolution
(c) Convergent Evolution (d) Micro Evolution

Key: (a)

53. Identify the incorrect statement

- (a) Pneumonia is a bacterial disease (b) HIV is transmitted by mosquito bite
(c) Ringworm is a fungal disease (d) Cancer is a non-infectious disease

Key: (b)

54. A person shows symptoms like Sneezing. Watery eyes, running nose and difficulty in breathing, on exposure to certain substances in air. Which type of antibody is produced during such condition?

- (a) IgE (b) IgG (c) IgA (d) IgM

Key: (a)

55. A man was suffering from mental illness like depression and insomnia. Identify the drug which is normally used as medicine in such cases

- (a) Lysergic Acid Diethylamides (LSD) (b) Morphine
(c) Heroin (d) Nicotine

Key: (a)

56. Which of the following protozoan parasites causes sleeping sickness?

- (a) Entamoeba (b) Plasmodium (c) Trypanosoma (d) Leishmania

Key: (c)

57. Which of the following phyla possess body cavity as shown in the diagram below?



- (a) Porifera (b) Annelida
(c) Coelenterata (d) Aschelminthes

Key: (d)

58. Testa and Tegmen of the seed coat represent

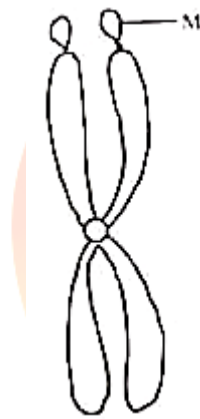
- (a) Dried Sepals (b) Dried Integuments (c) Dried Petals (d) Dried Tepals

Key: (b)

59. The trees growing in temperate regions show clear demarcation between spring wood and autumn wood. This is because
- (a) The water stress is more
 - (b) The climatic conditions are uniform throughout the year
 - (c) The climatic conditions are not uniform throughout the year
 - (d) The temperature is high

Key: (c)

60. Identify the part labelled as 'M' in the diagram given below



- (a) Kinetochore
 - (b) Chromatid
 - (c) Satellite
 - (d) Centromete
- Key: (c)

Key Answers:

1. d	2. a	3. a	4. b	5. a	6. b	7. d	8. c	9. a	10. d
11. c	12. d	13. c	14. a	15. d	16. b	17. c	18. d	19. a	20. d
21. a	22. d	23. b	24. c	25. a	26. b	27. d	28. a	29. b	30. a
31. a	32. a	33. c	34. a	35. d	36. d	37. a	38. b	39. c	40. d
41. a	42. a	43. a	44. c	45. a	46. c	47. d	48. d	49. a	50. a
51. a	52. a	53. b	54. a	55. a	56. c	57. d	58. b	59. c	60. c

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