BIOLOGY

1. What is the function of Protein GLUT-4 ?
   (A) Acts as an enzyme.
   (B) Enables glucose transport into cells.
   (C) Fights infectious agents.
   (D) Functions as intercellular ground substance.

2. Cells in the quiescent stage (G_0)
   (A) always become cancerous
   (B) show indefinite proliferation.
   (C) remain metabolically inactive
   (D) remain metabolically active

3. 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 iii
   (B) i and ii
   (C) iii only
   (D) ii and iii

4. During chemiosmotic synthesis of ATP in photosynthesis :
   (A) The protons accumulate in the intermembrane space of chloroplast.
   (B) The proton gradient is not required.
   (C) The protons accumulate in the intermembrane space of mitochondrion.
   (D) The protons accumulate within the lumen of the thylakoids.

5. When tripalmitin is used as respiratory substrate in aerobic respiration, the process consumes 145 molecules of Oxygen and releases 102 molecules of CO_2, then RQ value would be
   (A) 0.5
   (B) 0.7
   (C) 1.4
   (D) 1.0

Space For Rough Work

6. Identify the incorrect statement with reference of Biocontrol agents :

(A) They do not show any negative impact on crop plants.

(B) They help to increase the use of synthetic pesticides.

(C) They are significant in treating ecologically sensitive area.

(D) They do not affect non-target pests.

7. 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) Spirulina

(B) Nostoc

(C) Chlorella

(D) Spirogyra

8. In cloning vectors, antibiotic resistant genes are helpful for

(A) Transfer of foreign gene to the host

(B) Selection of recombinants

(C) Making the host cells competent

(D) Cleaving of vector by REN

9. A student while extracting DNA from Aspergillus fungus requires _____ enzyme to break open the cell wall.

(A) Cellulase

(B) Lysozyme

(C) Pectinase

(D) Chitinase

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

(A) 5'TGCTTAAGTA3'
3'ACGAATTCAT5'

(B) 5'ACGAATTCAT3'
3'TGCTTAAGTA5'

(C) 5'TACTTAAGCA3'
3'ATGAATTCGT5'

(D) 3'ACGAATTCAT5'
5'TGCTTAAGTA3'

Space For Rough Work

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

(A) Valine

(B) Phenylalanine

(C) Tyrosine

(D) Tryptophan

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

(A) Rho factor

(B) Elongation factor

(C) Sigma factor

(D) Termination factor

13. 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) 2968 genes

(B) 242 genes

(C) 231 genes

(D) 2898 genes

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

(A) Skin Shreds

(B) Erythrocytes

(C) Semen Sample

(D) Hair Follicle

15. 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) 900

(B) 299

(C) 300

(D) 450

Space For Rough Work

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

(A) Desert

(B) Tropical deciduous forest

(C) Tropical rain forest

(D) Temperature evergreen forest

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

(A) 10 – 20% of PAR only

(B) 2 – 10% of PAR only

(C) 0 – 10% of PAR only

(D) 30 – 40% of PAR only

18. The historic convention related to conservation of biological diversity is also known as

(A) Earth Summit

(B) Kyoto Protocol

(C) World Summit

(D) Montreal Protocol

19. Which one of the following human activity has contributed to deforestation in north-eastern states of India ?

(A) Urbanisation

(B) Industrialisation

(C) Mono cropping

(D) Jhum cultivation

20. In an area where DDT has been used extensively, the population of birds declined significantly because –

(A) Birds became vulnerable to predators.

(B) Birds stopped laying eggs.

(C) Many of the eggs laid by birds showed pre-matured breaking.

(D) Earthworms in the area got eradicated.

21. The brain capacity of Homo habilis

(A) 1800 cc

(B) between 650 cc – 800 cc

(C) 900 cc

(D) 1400 cc

Space For Rough Work

22. In Bougainvillea and Cucurbita, the axillary bud is modified into thorn and tendril respectively. This is an example of

(A) Co-evolution

(B) Divergent Evolution

(C) Micro Evolution

(D) Convergent Evolution

23. Identify the incorrect statement.

(A) HIV is transmitted by mosquito bite.

(B) Pneumonia is a bacterial disease.

(C) Cancer is a non-infectious disease.

(D) Ringworm is a fungal disease.

24. 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) IgG

(B) IgE

(C) IgM

(D) IgA

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

(A) Morphine

(B) Lysergic Acid Diethylamides (LSD)

(C) Nicotine

(D) Heroin

Space For Rough Work

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

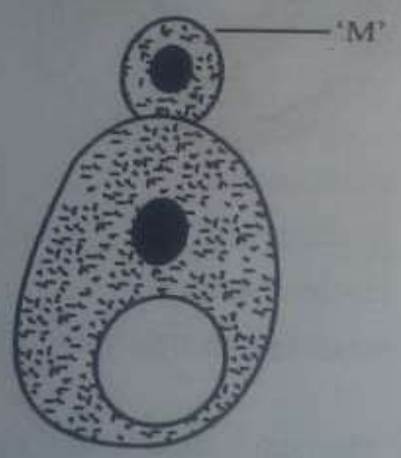
(A) They are gametophytes.

(B) Plant body is haploid.

(C) They are dioecious.

(D) Gametophyte is diploid.

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



(A) Zoospore

(B) Bud

(C) Gemmule

(D) Conidium

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

(A) it attracts pollinators.

(B) it facilitates self pollination.

(C) it prevents cross pollination.

(D) it facilitates cross pollination.

29. 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) Synthetic seeds

(B) Production of Apomictic seeds

(C) Conventional plant breeding

(D) Parthenocarpy

Space For Rough Work

30. Identify the correct order of steps involved in Artificial hybridization in plants :

(A) Artificial pollination → Emasculation → Rebagging → Bagging

(B) Rebagging → Artificial pollination → Bagging → Emasculation

(C) Emasculation → Bagging → Artificial pollination → Rebagging

(D) Bagging → Artificial pollination → Rebagging → Emasculation

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

(A) Plasmodium

(B) Entamoeba

(C) Leishmania

(D) Trypanosoma

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

(A) Annelida

(B) Porifera

(C) Aschelminthes

(D) Coelenterata

33. Testa and Tegmen of the seed coat represent

(A) Dried Integuments

(B) Dried Sepals

(C) Dried Tepals

(D) Dried Petals

Space For Rough Work

34. The trees growing in temperature regions show clear demarcation between spring wood and autumn wood. This is because

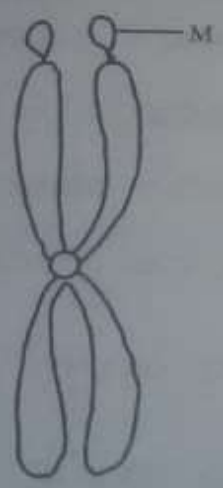
(A) The climatic conditions are uniform throughout the year.

(B) The water stress is more.

(C) The temperature is high.

(D) The climatic conditions are not uniform throughout the year.

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



(A) Chromatid

(B) Kinetochore

(C) Centromere

(D) Satellite

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

(A) Increases efficiency of mineral usage in plants.

(B) Reduces the reliance on chemical pesticides.

(C) Enhances the nutritional value of food.

(D) Increases the post harvest losses

37. 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) Biopatent

(B) Bioprospecting

(C) Biopiracy

(D) Bioremediation

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

(A) Partial Regulators

(B) Regulators

(C) Thermophiles

(D) Conformers

Space For Rough Work

39. **Assertion (A) :** The Monarch butterfly feeds on poisonous weeds during its Caterpillars stage.

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

(A) (A) is true, (R) is false.

(B) (A) is true and (R) is its correct explanation.

(C) Both (A) and (R) are false.

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

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

	++	−−	+O
(A)	Parasitism	Competition	Mutualism
(B)	Predation	Competition	Commensalism
(C)	Mutualism	Competition	Commensalism
(D)	Mutualism	Parasitism	Amensalism

41. The nourishing cells in the Seminiferous tubules are

(A) Follicular cells

(B) Leydig cells

(C) Sertoli cells

(D) Spermatogonial cells

42. If in a normal Menstruating woman, menses occur on 5th April, what will be the expected date of Ovulation ?

(A) 10th April

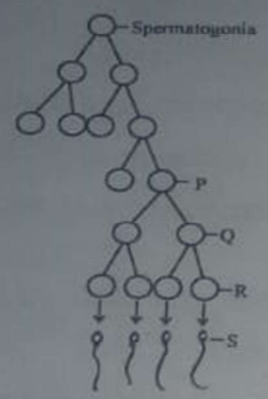
(B) 18th April

(C) 29th April

(D) 14th April

Space For Rough Work

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



(A) P – Spermatozoa
Q – Spermatids
R – Secondary Spermatocyte
S – Primary Spermatocyte

(B) P – Primary Spermatocyte
Q – Secondary Spermatocyte
R – Spermatids
S – Spermatozoa

(C) P – Secondary Spermatocyte
Q – Spermatids
R – Spermatozoa
S – Primary Spermatocyte

(D) P – Secondary Spermatocyte
Q – Primary Spermatocyte
R – Spermatozoa
S – Spermatids

44. The method of natural contraception which requires correct knowledge of Menstrual cycle is

(A) Periodic Abstinence

(B) Lactational Amenorrhoea

(C) IUDs – Intrauterine Devices

(D) Coitus interrupts

45. 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) Gamete Intra-Fallopian Transfer (GIFT)

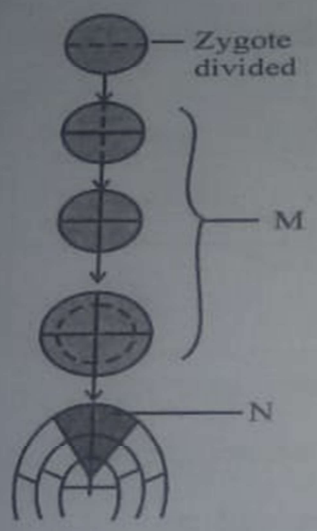
(B) Artificial Insemination (AI)

(C) Zygote Intra-Fallopian Transfer (ZIFT)

(D) In vitro Fertilisation (IVF)

Space For Rough Work

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



(A) M is geometric phase and N is arithmetic phase.

(B) Both M and N are arithmetic phases.

(C) M is arithmetic phase and N is geometric phase.

(D) Both M and N are geometric phases.

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

(A) Intestinal ulcers

(B) Under-secretion of saliva

(C) Inflammation of liver

(D) Under-secretion of amylopsin

48. Choose the correct statement from the following :

(A) Erythroblastosis foetalis may result when foetus is Rh^{-ve} and mother is Rh^{+ve}

(B) Histamine, Serotonin and Heparin are secreted by basophils.

(C) Atherosclerosis is often referred as anginapectoris.

(D) Person with blood group AB can donate blood to person with blood group A.

Space For Rough Work

49. In blind spot of the human eye

(A) Both cones and rods are absent.

(B) Only cones are absent.

(C) Both cones and rods are present.

(D) Only rods are absent.

50. 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.

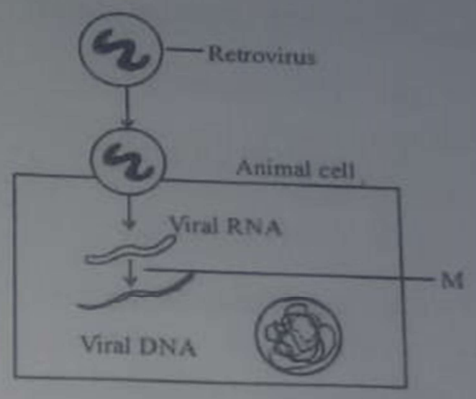
(A) Estrogen

(B) Testosterone

(C) Secretin

(D) Glucagon

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



(A) Reverse transcriptase

(B) RNA polymerase

(C) Recombinase

(D) DNA ligase

52. In animal breeding, the maximum genetic variations can be achieved through

(A) Inbreeding

(B) Outcrossing

(C) Interspecific hybridization

(D) Crossbreeding

Space For Rough Work

53. The oil content and quality of a groundnut variety was improved by plant breeding technique. This is an example of

(A) Bioremediation

(B) Biomagnification

(C) Biodegradation

(D) Biofortification

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

(A) their proteins are different from plant proteins.

(B) they give more biomass in less time.

(C) they have high fibre content.

(D) they are produced using synthetic fertilisers.

55. 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) iii and iv

(B) i and ii

(C) i and iv

(D) ii and iii

56. Identify the odd one among the following disorders :

(A) Haemophilia

(B) Sickle-cell Anaemia

(C) Phenyl Ketonuria

(D) Thalassemia

Space For Rough Work

57. From the Chromosomal Complements given below, identify the one which shows female heterogamety.

(A) XX – XO

(B) XX – XY

(C) XX – XXY

(D) ZZ – ZW

58. 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) 62.8%

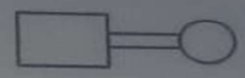
(B) 98.7%

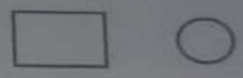
(C) 1.3%

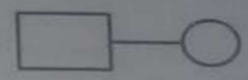
(D) 37.2%

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

(A)

(B) 

(C) 

(D) 

60. Which of the following Nitrogen bases is found only in DNA ?

(A) Cytosine

(B) Adenine

(C) Thymine

(D) Guanine

Space For Rough Work