

- The male sex accessory ducts include,
 - Rete testis, vasa efferentia, seminal vesicle and vas deferens
 - Rete testis, vasa efferentia, epididymis and vas deferens
 - Rete testis, vasa efferentia, epididymis and seminal vesicle
 - Rete testis, urethra, epididymis and vas deferens

- With reference to human sperm, match the List-I with List-II

List I		List II	
(1)	Head	(p)	Filled with enzyme
(2)	Acrosome	(q)	Contains mitochondria
(3)	Middle piece	(r)	Sperm motility
(4)	Tail	(s)	Contains haploid nucleus

Choose the correct option from the following:

- (A) 1-q, 2-s, 3-r, 4-p (B) 1-r, 2-q, 3-s, 4-p (C) 1-s, 2-p, 3-q, 4-r (D) 1-s, 2-r, 3-p, 4-q
- Which pair of the following cells in the embryo sac are destined to change their ploidy after fertilization?
 - Central cell and antipodals
 - Egg cell and central cell
 - Antipodals and synergids
 - Synergids and egg cell
 - In the female reproductive system, a tiny finger like structure which lies at the upper junction of the two labia minora above the urethral opening is called
 - Clitoris
 - Vagina
 - Hymen
 - Mons pubis
 - Consider the following statements with reference to female reproduction system :

Statement 1: The presence or absence of hymen is not a reliable indicator of virginity or sexual experience.

Statement 2: The sex of the foetus is determined by the father and not by the mother.

Choose the correct option from the following :

- Statement 1 is wrong and Statement 2 is correct.
 - Both the Statement 1 and Statement 2 are wrong.
 - Statement 1 is correct and Statement 2 is wrong.
 - Both the Statement 1 and Statement 2 are correct.
- MTPs are considered relatively safe during
 - 180 days of pregnancy
 - First trimester
 - Second trimester
 - 24 weeks of pregnancy
 - Which of the following statements is correct ?
 - Sickle cell anaemia is a quantitative problem
 - Female carrier for haemophilia may transmit the disease to sons
 - Thalassemia is a qualitative problem
 - Change in whole set of chromosomes is called aneuploidy

8. 'Gene-mapping' technology was developed by
 (A) Sturtvent (B) Mendel (C) Tschermak (D) Correns
9. Find the correct statement.
 (1) Generally a gene regulates a trait, but sometimes one gene has effect on multiple traits.
 (2) The trait AB-blood group of man is regulated by one dominant allele and another recessive allele.
 Hence it is co-dominant
 (A) Both Statements (1) and (2) are correct.
 (B) Both the Statements are wrong.
 (C) Statement (1) is correct
 (D) Statement (2) is correct.
10. From the following table, select the option that correctly characterizes various phases of menstrual cycle:
- | | Menstruation phase | Follicular phase | Luteal phase |
|-----|-----------------------------|-----------------------------|-----------------------------|
| (A) | Menses | L.H. Surge | Regeneration of endometrium |
| (B) | Regeneration of endometrium | High level of progesterone | Developing corpus luteum |
| (C) | Matured follicle | Regression of corpus luteum | Ovulation |
| (D) | Menses | Developing corpus luteum | Follicle maturation |
11. Which of the following is abbreviated as ZIFT ?
 (A) Zygote Intra Fallopian Tube (B) Zygote Inter Fallopian Tube
 (C) Zygote Intra Fallopian Transfer (D) Zygote Inter Fallopian Transfer
12. An example for hormone releasing IUD is
 (A) Lippes loop (B) Implant (C) LNG-20 (D) Multiload 375
13. Eukaryotic genes are monocistronic but they are split genes because
 (A) Exons are interrupted by Introns. (B) Introns are interrupted with Mutons.
 (C) they contain Exons only. (D) they contain Introns only.
14. The Lac-Operon model was elucidated by
 (A) Hershey and Chase (B) Jacob and Crick
 (C) Watson and Crick (D) Francois Jacob and Jaques Monad
15. Which of these is NOT an example for Adaptive radiation?
 (A) Placental mammals (B) Long-necked Giraffe
 (C) Darwin's finches (D) Australian marsupials
16. In a population of 800 rabbits showing Hardy-Weinberg equilibrium, the frequency of recessive individuals was 0.16 . What is the frequency of heterozygous individuals ?
 (A) 0.84 (B) 0.36 (C) 0.4 (D) 0.48
17. In male heterogametic type of sex determination
 (A) Male parent produces dissimilar gametes. (B) Males do not produce gametes.
 (C) Male parent produces similar gametes. (D) Female parent produces dissimilar gametes.

18. In one of the hybridisation experiments, a homozygous dominant parent and a homozygous recessive parent are crossed for a trait. (Plant shows Mendelian inheritance pattern)
- (A) Dominant parent trait appears in F_1 generation and recessive parent trait appears in F_1 and F_2 generations.
 (B) Dominant parent trait appears in F_2 generation and recessive parent trait appears only in F_1 generation.
 (C) Dominant parent trait appears in F_1 generation and recessive parent trait appears in F_2 generation.
 (D) Dominant parent trait appears in both F_1 & F_2 generations, recessive parent trait appears in only F_2 generation.
19. Histone proteins are positively charged because they are rich in basic amino acid residues
- (A) Arginine and Phenylalanine (B) Arginine and Proline
 (C) Arginine and Alanine (D) Arginine and Lysine
20. With respect to Inbreeding, which among the following is not true ?
- (A) It helps in elimination of less desirable genes.
 (B) It helps to evolve a pure line in an animal.
 (C) Inbreeding decreases homozygosity.
 (D) It helps in accumulation of superior genes.
21. Identify from the following a pair of better yielding semi dwarf varieties of rice developed in India.
- (A) Jaya and Kalyan Sona (B) Kalyan Sona and Sonalika
 (C) Jaya and Ratna (D) Sonalika and Ratna
22. In MOET technique fertilized eggs are transferred into surrogate mother in which of the following stage?
- (A) 8–32 celled stage (B) 16-32 celled stage
 (C) 2-4 celled stage (D) 8-16 celled stage
23. Roquefort cheese is ripened by
- (A) Virus (B) Yeast (C) Bacterium (D) Fungi
24. Four students were assigned a science project to find out the pollution levels of lakes in their surrounding. After analysing the quality of water samples, the BOD values were found as follows :
 Which among the following water samples is highly polluted ?
- (A) 6mg /L (B) 0.16mg /L (C) 0.6mg /L (D) 0.06mg /L
25. The toxic substance 'haemozoin' responsible for high fever and chill, is released in which of the following diseases ?
- (A) Malaria (B) Typhoid (C) Dengue (D) Pneumonia
26. Identify the symptoms of pneumonia.
- (A) Constipation, Abdominal pain, cramps, blood clots
 (B) High fever, weakness, stomach pain, loss of appetite
 (C) Difficulty in breathing, fever, chills, cough, headache
 (D) Nasal congestion and discharge, cough, sore throat, headache

27. The variety of Okra, *Pusa Sawani* is resistant to which of the following insect pests?
 (A) Shoot & Fruit borer (B) Cereal leaf beetle (C) Aphids (D) Jassids
28. Choose the incorrect statement with reference to Kangaroo rat.
 (A) uses minimal water to remove excretory products.
 (B) eliminates dilute urine.
 (C) found in North American desert.
 (D) meets its water requirements through internal fat oxidation.
29. Generally, bears avoid winter by undergoing
 (A) Aestivation
 (B) Migration
 (C) Diapause
 (D) Hibernation
30. Match Column-I with Column-II. Select the option with correct combination.

Column I		Column II	
(1)	Standing state	(p)	Mass of living material at a given time
(2)	Pioneer species	(q)	Amount of nutrients in the soil at a given time
(3)	Detritivores	(r)	Species that invade a bare area
(4)	Standing crop	(s)	Breakdown detritus into smaller particles

- (A) 1-q, 2-r, 3-s, 4-p (B) 1-p, 2-s, 3-r, 4-q (C) 1-q, 2-r, 3-p, 4-s (D) 1-p, 2-r, 3-s, 4-q
31. *PCR* is used for
 (A) DNA digestion (B) DNA amplification (C) DNA isolation (D) DNA ligation
32. Which of these is NOT a method to make host cells 'competent' to take up DNA ?
 (A) Biolistics (B) Use of disarmed pathogen vectors
 (C) Micro-injection (D) Elution
33. Select the correct statement from the following :
 (A) The first step in PCR is heating which is used to separate both the strands of gene of interest.
 (B) DNA from one organism will not band to DNA from other organism.
 (C) Genetic engineering works only on animals and not yet successfully used on plants.
 (D) There are no risk factors associated with r-DNA technology.
34. A flower has 10 stamens each having bilobed ditheous anther. If each microsporangium has 5 pollen mother cells, how many pollen grains would be produced by the flower ?
 (A) 800 (B) 1600 (C) 200 (D) 400

35. During transcription the DNA strand with 3' → 5' polarity of the structural gene always acts as a template because
- (A) Enzyme DNA dependent RNA polymerase always catalyse polymerisation in both the directions.
 (B) Nucleotides of DNA strand with 5' → 3' are transferred to mRNA.
 (C) Enzyme DNA dependent RNA polymerase always catalyse the polymerisation in 5' → 3' direction.
 (D) Enzyme DNA dependent RNA polymerase always catalyse the polymerisation in 3' → 5' direction.
36. According to David Tilman's long term ecosystem experiments, the total biomass in plots with more species shows,
- (A) Average variation from year-to-year. (B) No variation from year-to-year.
 (C) Less variation from year-to-year. (D) High variation from year-to-year.
37. The toxic heavy metals from various industries which cause water pollution, normally have a density
- (A) more than 7.5g / cm³ (B) more than 12.5g / cm³
 (C) more than 5g / cm³ (D) more than 15g / cm³
38. Identify the correct option showing the relative contribution of different green house gases to the total global warming.
- (A) CFC – 6%, CO₂ – 60% , Methane-20%, N₂O – 14% .
 (B) CFC – 14%, CO₂ – 60% , Methane- 6%, N₂O – 20% .
 (C) CFC – 14%, CO₂ – 60% , Methane- 20%, N₂O – 6% .
 (D) CFC – 20%, CO₂ – 60% , Methane- 14%, N₂O – 6% .

39. Match the following columns and choose the correct option:

Column I		Column II	
(1)	<i>Haemophilus influenzae</i>	(p)	Malignant malaria
(2)	<i>Entamoeba histolytica</i>	(q)	Elephantiasis
(3)	<i>Plasmodium falciparum</i>	(r)	Pneumonia
(4)	<i>Wuchereria bancrofti</i>	(s)	Amoebiasis

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

40. From the following tools/techniques of genetic engineering, identify those which are required for cloning a bacterial gene in animal cells and choose the correct option
- I. Endonuclease II. Ligase III. A. tumefaciens IV. Microinjection
 V. Gene gun VI. Lysozyme VII. Cellulase VIII. Electrophoresis
- (A) I, III, IV, V, VII (B) II, III, IV, VI, VII, VIII
 (C) II, III, V, VII, VIII (D) I, II, IV, VI, VIII

41. Identify the incorrect statement regarding the flow of energy between various components of the food chain.

- (A) Green plants capture about 10% of the solar energy that falls on leaves.
- (B) Each trophic level loses some energy as heat to the environment.
- (C) The amount of energy available at each trophic level is 10% of previous trophic level.
- (D) Energy flow is unidirectional.

42. Find out the correct match

	Disease	Pathogen	Main Organ affected
(A)	Filariasis	Common round worm	Small intestine
(B)	Dysentery	Protozoa	Liver
(C)	Ringworm	Fungus	Skin
(D)	Typhoid	Bacteria	Lungs

43. Identify the floral formula of plant belonging to potato family.

- (A) $\text{♀} \cdot P_{3+3}, A_{3+3}, G_{(3)}$ (B) $\text{♀} \cdot K_{(5)}, C_5, A_{(9)+1}, G_1$
- (C) $\text{♀} \cdot K_{(5)}, \overbrace{C_{(5)}}, A_5, \underline{G}_{(2)}$ (D) $\text{♂} \cdot K_{10}, C_{10}, A_{10}, \overline{G}_2$

44. When the vascular cambium is present between the *xylem* and phloem, then the vascular bundle is called,

- (A) Endarch (B) Closed (C) Exarch (D) Open

45. The function of Typhlosole in earthworm is

- (A) Transportation
- (B) Increasing the effective area of absorption in the intestine
- (C) Grinding of soil particles
- (D) Grinding of decaying leaves

46. Select the correctly matched pair of organisms with their order.

- (A) Homo, sapiens : Poales (B) Mangifera, indica : Primata
- (C) Triticum, aestivum : Sapindales (D) Musa, domestica : Diptera

47. Match the column-I with column-II and choose the correct option from the following:

Column I (Plant groups)		Column II (Examples)	
(1)	Bryophyta	(p)	Pinus
(2)	Gymnosperm	(q)	Adiantum
(3)	Algae	(r)	Sphagnum
(4)	Pteridophyta	(s)	Ectocarpus

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

48. Flame cells present in the members of platyhelminthes are specialized to perform,
 (A) Respiration and Excretion (B) Respiration and Osmoregulation
 (C) Osmoregulation and Circulation (D) Osmoregulation and Excretion
49. Match column-I with column-II. Select the option with correct combination.

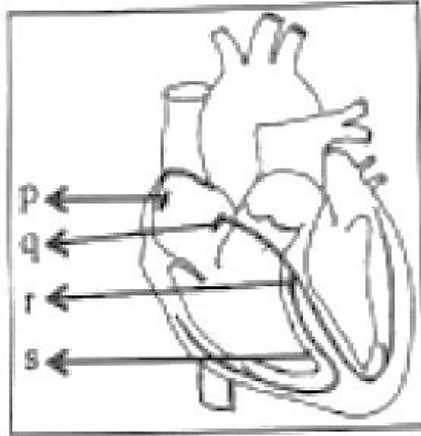
Column I		Column II	
(1)	Hypertonic	(p)	Two molecules move in the same direction across the membrane
(2)	Capillarity	(q)	External solution is more concentrated than cell sap
(3)	Symport	(r)	Water loss in the form of droplets
(4)	Guttation	(s)	Ability of water to rise in thin tubes

- (A) 1-q, 2-p, 3-s, 4-r (B) 1-q, 2-s, 3-p, 4-r (C) 1-q, 2-s, 3-r, 4-p (D) 1-q, 2-r, 3-p, 4-s
50. Toxicity of which micronutrient induces deficiency of iron, magnesium and calcium ?
 (A) Manganese (B) Boron (C) Zinc (D) Molybdenum
51. Considering the stroke volume of an adult healthy human being is 70mL , identify the cardiac output in one hour from the following :
 (A) 302.4Lit/hour (B) 50.40Lit/hour (C) 504.0Lit/hour (D) 30.24 Lit/hour
52. Function of contractile vacuole in Amoeba is
 (A) Osmoregulation and movements (B) Digestion and excretion
 (C) Excretion and osmoregulation (D) Digestion and respiration
53. Match List-I and List-II with respect to proteins and their functions and select the correct option.

List I		List II	
(1)	Collagen	(p)	Fights infectious agents
(2)	Trypsin	(q)	Hormone
(3)	Insulin	(r)	Enzyme
(4)	Antibody	(s)	Intercellular ground substance

- (A) 1-s, 2-r, 3-q, 4-p (B) 1-s, 2-p, 3-r, 4-p (C) 1-q, 2-r, 3-p, 4-s (D) 1-s, 2-q, 3-r, 4-p
54. The complex formed by a pair of synapsed homologous chromosomes is called,
 (A) Bivalent (B) Univalent (C) Pentavalent (D) Triad
55. Bamboo species flowers
 (A) Once in lifetime . (B) Twice in 50-100 years
 (C) Every year (D) Once in 12 years
56. In Bryophyllum, the adventitious buds arise from
 (A) Shoot apex (B) Leaf base
 (C) Leaf axil (D) Notches in the leaf margin
57. Primary endosperm nucleus is formed by fusion of
 (A) One polar nucleus and male gamete (B) Two polar nuclei and two male gametes
 (C) Two polar nuclei and one male gamete . (D) Ovum and male gamete

58. Identify the option showing the correct labelling for p, q, r and s with reference to the conducting system of the human heart.



- (A) p-Bundle of His, q-SAN, r-Interventricular septum, s-AVN
 (B) p-Interventricular septum, q-AVN, r-Bundle of His, s-SAN
 (C) p-SAN, q-AVN, r-Bundle of His, s-Interventricular septum
 (D) p-AVN, q-SAN, r-Interventricular septum, s-Bundle of His
59. Atrial Natriuretic Factor (ANF) acts as a
- (A) Vasoconstrictor (B) Hypertension inducer
 (C) Check on Renin-Angiotensin mechanism . (D) Promoter on Renin-Angiotensin mechanism
60. The vibrations from the ear drum are transmitted through ear ossicles to
- (A) Tectorial membrane (B) Auditory nerves (C) Cochlea (D) Oval window