

AIPMT - 2015 BIOLOGY (CHAPTERWISE)

HUMAN PHYSIOLOGY

1. Which of these is **not** an important component of initiation of parturition in humans?
- Synthesis of prostaglandins
 - Release of oxytocin
 - Release of prolactin
 - Increase in estrogen and progesterone ratio

Ans. (c)

2. Sliding filament theory can be best explained as:
- Actin and Myosin filaments shorten and slide pass each other
 - Actin and Myosin filaments do not shorten but rather slide pass each other
 - When myofilaments slide pass each other, Myosin filaments shorten while Actin filaments do not shorten
 - When myofilaments slide pass each other Actin filaments shorten while Myosin filament do not shorten

Ans. (b)

3. A gymnast is able to balance his body upside down even in the total darkness because of:
- Vestibular apparatus
 - Tectorial membrane
 - Organ of corti
 - Cochlea

Ans. (a)

4. A man with blood group "A" marries a woman with blood group "B". What are all the possible blood groups of their offsprings?
- A, B and AB only
 - A, B, AB and O
 - O only
 - A and B only

Ans. (b)

5. Which of the following statements is **not correct**?
- Goblet cells are present in the mucosa of intestine and secrete mucus
 - Oxyntic cells are present in the mucosa of stomach and secrete HCl.
 - Acini are present in the pancreas and secrete carboxypeptidase
 - Brunner's glands are present in the submucosa of stomach and secrete pepsinogen

Ans. (d)

6. Which one of the following is **correct**?
- Serum = Blood + Fibrinogen
 - Lymph = Plasma + RBC + WBC
 - Blood = Plasma + RBC + WBC + Platelets
 - Plasma = Blood - Lymphocytes

Ans. (c)

7. Gastric juice of infants contains:
- Nuclease, pepsinogen, lipase
 - Pepsinogen, lipase, rennin
 - Amylase, rennin, pepsinogen
 - Maltase, pepsinogen, rennin

Ans. (b)

8. Capacitation refers to changes in the:
- Ovum before fertilization
 - Ovum after fertilization
 - Sperm after fertilization
 - Sperm before fertilization

Ans. (d)

9. Glenoid cavity articulates:
- scapula with acromion
 - clavicle with scapula
 - humerus with scapula
 - clavicle with acromion

Ans. (c)

10. Which of the following does **not** favour the formation of large quantities of dilute urine?
- Caffeine
 - Renin
 - Atrial-natriuretic factor
 - Alcohol

Ans. (b)

11. A chemical signal that has both endocrine and neural roles is:
- Calcitonin
 - Epinephrine
 - Cortisol
 - Melatonin

Ans. (b)

12. Hysterectomy is surgical removal of:
- Prostate gland
 - Vas-deference
 - Mammary glands
 - Uterus

Ans. (d)

13. Removal of proximal convoluted tubule from the nephron will result in:
- More concentrated urine
 - No change in quality and quantity of urine
 - No urine formation
 - More diluted urine

Ans. (d)

14. Which of the following cells during gametogenesis is normally diploid?

- a) Spermatid
- b) Spermatogonia
- c) Secondary polar body
- d) Primary polar body

Ans. (b)

15. Erythropoiesis starts in:

- a) Liver
- b) Spleen
- c) Red bone marrow
- d) Kidney

Ans. (a and b)

Hint: Erythropoiesis starts earliest in yolk sac which is not given in the options. After that both options (a) Liver and (b) spleen are correct.

Reference - Text Book of Medical Physiology by Guyton and Hall

"Production of Red Blood Cells - In the early few weeks of embryonic life, RBCs are produced in the yolk sac. During the middle trimester of gestation, liver is the main organ, although a reasonable number of RBCs are produced in the Spleen and Lymph nodes. Then during the last month or so of gestation and after birth, RBCs are produced exclusively in the Bone marrow."

16. Blood pressure in the mammalian aorta is maximum during

- a) Diastole of the right ventricle
- b) Systole of the left ventricle
- c) Diastole of the right atrium
- d) Systole of the left atrium

Ans. (b)

17. When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?

- a) Rising CO₂ concentration
- b) Falling CO₂ concentration
- c) Rising CO₂ and falling O₂ concentration
- d) Falling O₂ concentration

Ans. (a)

18. Which of the following regions of the brain is incorrectly paired with its function?

- a) Cerebellum - language comprehension
- b) Corpus callosum - communication between the left and right cerebral cortices
- c) Cerebrum - calculation & contemplation
- d) Medulla oblongata - homeostatic control

Ans. (a)

GENETICS

19. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?

- a) Six
- b) Eight
- c) Seven
- d) Five

Ans. (c)

20. In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are:

- a) G17%, A 16.5%, T 32.5%
- b) G 17%, A 33%, T 33%
- c) G 8.5%, A 50%, T 24.5%
- d) G 34%, A 24.5%, T 24.5%

Ans. (b)

21. The movement of a gene from one linkage group to another is called:

- a) Duplication
- b) Translocation
- c) Crossing over
- d) Inversion

Ans. (b)

22. Gene regulation governing lactose operon of E.coli that involves the lac I gene product is:

- a) negative and inducible because repressor protein prevents transcription
- b) negative and repressible because repressor protein prevents transcription
- c) feedback inhibition because excess of β -galactosidase can switch off transcription
- d) positive and inducible because it can be induced by lactose

Ans. (a)

23. Multiple alleles are present:

- a) At different loci on the same chromosome
- b) At the same locus of the chromosome
- c) On non-sister chromatids
- d) On different chromosomes

Ans. (b)

24. Alleles are:

- a) True breeding homozygotes
- b) Different molecular forms of a gene
- c) Heterozygotes
- d) Different phenotype

Ans. (b)

25. An abnormal human baby with 'XXX' sex chromosomes was born due to:

- a) Formation of abnormal ova in the mother
- b) Fusion of two ova and one sperm

- c) Fusion of two sperms and one ovum
d) Formation of abnormal sperms in the father

Ans. (a and d)

Hint: In this question both option (a) and (d) are correct. XXX condition in humans can originate due to Maternal defect in meiosis I or meiosis II or due to paternal defect in meiosis II. These defects can give rise to abnormal egg with XX or abnormal sperm with XX which if fuses with normal gamete of opposite sex will give rise to an abnormal zygote with XXX.

Reference - Harrison's Principles of Internal Medicine.

CYTOLOGY

26. Cytochromes are found in:
a) Outer wall of mitochondria
b) Cristae of mitochondria
c) Lysosomes
d) Matrix of mitochondria

Ans. (b)

27. DNA is not present in:
a) Ribosomes
b) Nucleus
c) Mitochondria
d) Chloroplast

Ans. (a)

28. Nuclear envelope is a derivative of:
a) Membrane of Golgi complex
b) Microtubules
c) Rough endoplasmic reticulum
d) Smooth endoplasmic reticulum

Ans. (c)

29. Select the **correct** option:

	I		II
A	Synapsis aligns homologous chromosomes	(i)	Anaphase-II
B	Synthesis of RNA and protein	(ii)	Zygotene
C	Action of enzyme recombinase	(iii)	G ₂ -phase
D	Centromeres do not separate but chromatids move towards opposite poles	(iv)	Anaphase-I
		(v)	Pachytene

- | | A | B | C | D |
|----|------|-------|-------|------|
| a) | (ii) | (iii) | (v) | (iv) |
| b) | (i) | (ii) | (v) | (iv) |
| c) | (ii) | (iii) | (iv) | (v) |
| d) | (ii) | (i) | (iii) | (iv) |

Ans. (a)

30. The structure that are formed by stacking of organized flattened membranous sacs in the chloroplasts are:

- a) Grana
b) Stroma lamellae
c) Stroma
d) Cristae

Ans. (a)

31. The chromosomes in which centromere is situated close to one end are:

- a) Acrocentric
b) Telocentric
c) Sub-metacentric
d) Metacentric

Ans. (a)

32. A somatic cell that has just completed the S phase of its cycle, as compared to gamete of the same species, has:

- a) Same number of chromosomes but twice the amount of DNA
b) Twice the number of chromosomes and four times the amount of DNA
c) Four times the number of chromosomes and twice the amount of DNA
d) Twice the number of chromosomes and twice the amount of DNA

Ans. (b)

33. Select the correct matching in the following pairs:

- | | |
|--------------|------------------------------|
| a) Smooth ER | - Synthesis of lipids |
| b) Rough ER | - Synthesis of glycogen |
| c) Rough ER | - Oxidation of fatty acids |
| d) Smooth ER | - Oxidation of Phospholipids |

Ans. (a)

34. Which one of the following statements is incorrect?

- a) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme
b) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex
c) The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate
d) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex

Ans. (c)

PLANT PHYSIOLOGY

35. Minerals known to be required in large amounts for plant growth include:
- calcium, magnesium, manganese, copper
 - potassium, phosphorus, selenium, boron
 - magnesium, sulphur, iron, zinc
 - phosphorus, potassium, sulphur, calcium

Ans. (d)

36. Which one gives the most valid and recent explanation for stomatal movements?

- Potassium influx and efflux
- Starch hydrolysis
- Guard cell photosynthesis
- Transpiration

Ans. (a)

37. Typical growth curve in plants is:

- Linear
- Stair-steps shaped
- Parabolic
- Sigmoid

Ans. (d)

38. Transmission tissue is characteristic feature of:

- Solid style
- Dry stigma
- Wet stigma
- Hollow style

Ans. (a)

39. What causes a green plant exposed to the light on only one side, to bend towards the source of light as it grows?

- Green plants seek light because they are phototropic
- Light stimulates plant cells on the lighted side to grow faster
- Auxin accumulates on the shaded side, stimulating greater cell elongation there
- Green plants need light to perform photosynthesis.

Ans. (c)

40. In a ring girdled plant:

- The root dies first
- The shoot and root die together
- Neither root nor shoot will die
- The shoot dies first

Ans. (a)

41. Which one of the following may require pollinators, but is genetically similar to autogamy?

- Xenogamy
- Apogamy
- Cleistogamy
- Geitonogamy

Ans. (d)

42. In ginger vegetative propagation occurs through:

- Offsets
- Bulbils
- Runners
- Rhizome

Ans. (d)

43. Which one of the following statements is not true?

- Pollen grains of some plants cause severe allergies and bronchial afflictions in some people
- The flowers pollinated by flies and bats secrete foul odour to attract them
- Honey is made by bees by digesting pollen collected from flowers
- Pollen grains are rich in nutrients and they are used in the form of tablets and syrups

Ans. (c)

44. The hilum is a scar on the

- Fruit, where it was attached to pedicel
- Fruit, where style was present
- Seed, where micropyle was present
- Seed, where funicle was attached

Ans. (d)

45. Which of the following are the important floral rewards to the animal pollinators?

- Nectar and pollen grains
- Floral fragrance and calcium crystals
- Protein pellicle and stigmatic exudates
- Colour and large size of flower

Ans. (a)

46. Transpiration and root pressure cause water to rise in plants by:

- Pulling and pushing it respectively
- Pushing it upward
- Pushing and pulling it, respectively
- Pulling it upward

Ans. (a)

PLANT MORPHOLOGY

47. Leaves become modified into spines in:

- Pea
- Onion
- Silk Cotton
- Opuntia

Ans. (d)

48. $\oplus \frac{\circ}{\text{f}} K_{(5)} C_{(5)} A_5 G_{(2)}$ is the floral formula of:

- Sesbania*
- Petunia*
- Brassica*
- Allium*

Ans. (b)

Hint: This is a floral formula of Solanaceae. *Sesbania* belongs to family Fabaceae, *Brassica* to Brassicaceae and *Allium* to Liliaceae.

49. Keel is the characteristic feature of flower of:

- a) *Indigofera* b) *Aloe*
c) Tomato d) Tulip

Ans. (a)

50. Perigynous flowers are found in:

- a) Cucumber b) China rose
c) Rose d) Guava

Ans. (c)

PLANT ANATOMY

51. A major characteristic of the monocot root is the presence of:

- a) Scattered vascular bundles
b) Vasculature without cambium
c) Cambium sandwiched between phloem and xylem along the radius
d) Open vascular bundles

Ans. (b)

52. Vascular bundles in monocotyledons are considered closed because:

- a) Cambium is absent
b) There are no vessels with perforations
c) Xylem is surrounded all around by phloem
d) A bundle sheath surrounds each bundle

Ans. (a)

MORPHOLOGY OF ANIMALS

53. The terga, sterna and pleura of cockroach body are joined by:

- a) Muscular tissue
b) Arthroal membrane
c) Cartilage
d) Cementing glue

Ans. (b)

EVOLUTION

54. Which of the following had the smallest brain capacity?

- a) *Homo sapiens*
b) *Homo neanderthalensis*
c) *Homo habilis*
d) *Homo erectus*

Ans. (c)

55. Which is the most common mechanism of genetic variation in the population of a sexually reproducing organism?

- a) Chromosomal aberrations
b) Genetic drift
c) Recombination
d) Transduction

Ans. (c)

56. A population will not exist in Hardy-Weinberg equilibrium if:

- a) There are no mutations
b) There is no migration
c) The population is large
d) Individuals mate selectively

Ans. (d)

BIOLOGY IN HUMAN WELFARE

57. Which of the following endoparasites of humans does show viviparity?

- a) *Enterobius vermicularis*
b) *Trichinella spiralis*
c) *Ascaris Lumbricoides*
d) *Ancylostoma duodenale*

Ans. (b)

58. Which of the following enhances or induces fusion of protoplasts?

- a) Polyethylene glycol and sodium nitrate
b) IAA and kinetin
c) IAA and gibberellins
d) Sodium chloride and potassium chloride

Ans. (a)

59. Which of the following is not a sexually transmitted disease?

- a) Acquired Immuno Deficiency Syndrome (AIDS)
b) Trichomoniasis
c) Encephalitis
d) Syphilis

Ans. (c)

60. A technique of micropropagation is:

- a) Somatic embryogenesis
b) Protoplast fusion
c) Embryo rescue
d) Somatic hybridization

Ans. (a)

61. HIV that causes AIDS, first starts destroying:

- a) Leucocytes
b) Helper T-Lymphocytes
c) Thrombocytes
d) B-Lymphocytes

Ans. (b)

62. The active form of *Entamoeba histolytica* feeds upon:

- a) mucosa and submucosa of colon only
- b) food in intestine
- c) blood only
- d) erythrocytes; mucosa and submucosa of colon

Ans. (d)

63. Which of the following viruses is not transferred through semen of an infected male?

- a) Human immunodeficiency virus
- b) Chikungunya virus
- c) Ebola virus
- d) Hepatitis B virus

Ans. (b)

64. Match each disease with its correct type of vaccine:

- | | |
|-------------------|------------------------|
| A) tuberculosis | (i) harmless virus |
| B) whooping cough | (ii) inactivated toxin |
| C) diphtheria | (iii) killed bacteria |
| D) polio | (iv) harmless bacteria |

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

Ans. (b)

BIOTECHNOLOGY

65. The crops engineered for glyphosate are resistant / tolerant to:

- a) Bacteria
- b) Insects
- c) Herbicides
- d) Fungi

Ans. (c)

66. In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to:

- a) Acidic pH of the insect gut
- b) Action of gut micro-organisms
- c) Presence of conversion factors in insect gut
- d) Alkaline pH of the insect gut

Ans. (d)

67. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services?

- a) Indian Council of Agricultural Research
- b) Genetic Engineering Approval Committee
- c) Research Committee on Genetic Manipulation

- d) Bio-safety committee

Ans. (b)

ECOLOGY

68. Cryopreservation of gametes of threatened species in viable and fertile condition can be referred to as:

- a) Advanced ex-situ conservation of biodiversity
- b) In situ conservation by sacred groves
- c) In situ cryo-conservation of biodiversity
- d) In situ conservation of biodiversity

Ans. (a)

69. High value of BOD (Biochemical Oxygen Demand) indicates that:

- a) water is highly polluted
- b) water is less polluted
- c) consumption of organic matter in the water is higher by the microbes
- d) water is pure

Ans. (a)

70. The UN Conference of Parties on climate change in the year 2011 was held in:

- a) South Africa
- b) Peru
- c) Qatar
- d) Poland

Ans. (a)

71. Rachel Carson's famous book "Silent Spring" is related to:

- a) Noise pollution
- b) Population explosion
- c) Ecosystem management
- d) Pesticide pollution

Ans. (d)

72. Which of the following is not one of the prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric ozone?

- a) Reduced Immune System
- b) Damage to eyes
- c) Increased liver cancer
- d) Increased skin cancer

Ans. (c)

73. Most animals are tree dwellers in a:

- a) thorn woodland
- b) temperate deciduous forest
- c) tropical rain forest
- d) coniferous forest

Ans. (c)

74. In which of the following both pairs have correct combination?

- a) *In situ* conservation: Cryopreservation

characters given in (d) are true for Mammalia as a class.

Second - If we consider that the examiner is asking about the exception in relation to an organism belonging to the particular Class then none of the given options is fully correct.

In option (b) and (c) one character each i.e., paired appendages and skin moist and glandular are incorrect respectively for Cyclostomata and Aves.

In option (a) Chondrichthyes, the organism which is an exception to the given characters is Chimera (has an Operculum). In option (d) Mammalia the Prototherians do not have Pinna.

Reference-Chordate Zoology by P.S. Dhama and J.K. Dhama; Text Book of Zoology, Vertebrates by Kotpal.

PLANT KINGDOM

83. In which of the following gametophyte is **not** independent free living?

- a) *Marchantia* b) *Pteris*
c) *Pinus* d) *Funaria*

Ans. (c)

84. Read the following five statements (A to E) and select the option with **all correct** statements:

- (A) Mosses and Lichens are the first organisms to colonise a bare rock.
(B) *Selaginella* is a homosporous pteridophyte.
(C) Coralloid roots in *Cycas* have VAM
(D) Main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic.
(E) In gymnosperms, male and female gametophytes are present within sporangia located on sporophyte.

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

Ans. (b)

85. Male gametes are flagellated in:

- a) *Anabaena* b) *Ectocarpus*
c) *Spirogyra* d) *Polysiphonia*

Ans. (b)

86. Which one of the following statements is wrong?

- a) Agar-agar is obtained from *Gelidium* and *Gracilaria*
b) *Chlorella* and *Spirulina* are used as space food
c) Mannitol is stored food in Rhodophyceae
d) Algin and carboxin are products of algae

Ans. (c)

Hint: Mannitol or laminarin is stored food in Phaeophyta (Brown algae).

MONERA

87. True nucleus is absent in:

- a) *Mucor* b) *Vaucheria*
c) *Volvox* d) *Anabaena*

Ans. (d)

88. Which one of the following is not an inclusion body found in prokaryotes?

- a) Cyanophycean granule
b) Glycogen granule
c) Polysome
d) Phosphate granule

Ans. (c)

89. The guts of cow and buffalo possess:

- a) *Chlorella* spp. b) Methanogens
c) Cyanobacteria d) *Fucus* spp.

Ans. (b)

FUNGI

90. Which one of the following matches is correct?

a)	<i>Alternaria</i>	Sexual reproduction absent	Deuteromycetes
b)	<i>Mucor</i>	Reproduction by	Ascomycetes
c)	<i>Agaricus</i>	Parasitic fungus	Basidiomycetes
d)	<i>Phytophthora</i>	Aseptate mycelium	Basidiomycetes

Ans. (a)