

13 fY%aKsh

GRADE 13

E

meh 02

02Hours

I

**f;jk jdr mÍCIKh - 2020**

**Second Term Examination - 2020**

cSj úoHdj - »

**BIOLOGY – I**

09

**Instruction**

 **Answer all questions.**

 **In each of the questions 1 to 50, pick one of the alternatives from 1,2,3,4,5 which is correct or most appropriate and mark your response on the answer sheet with a cross (x) on the number of the correct option.**

01. Select the correct combination regarding cell organelles.

i. They are sub-cellular components suspended in the cytosol of eukaryotic cells.

ii. Nucleus is the prominent cell organelle in all animal cells.

iii. RER consits of flattened sacs which synthesized proteins in cells.

iv. Trans face of the Golgi apparatus give rise to secretory vesicles.

v. Matrix of mitochondria consist of phosphate granules and lipid droplets.

02. Which of the following statement is incorrect regarding lipids?

i. The proportion between the number of hydrogen atoms and number of oxygen atoms in

a molecule is grater than 2:1

ii. Act as a structural component of cell wall in some plant cell.

iii. Act as a storeage material of endosperm in casta seeds.

iv. Large biological molecules but not considered as polymer.

v. Volume of CO2 released is higher than the volume of O2 absorbed, when are used as

respiratory substrate.

03. Select the correct statement regarding cell cycle,

i. Interphase covers about 80% of the cell cycle.

ii. Chromosomes duplicated during S phase.

iii. Microtubules attach to the kinetochore of the chromosomes in prometa phase.

iv. Nuclear envelope fragments during prophase.

v. Cell elongation take place at telophase.

04. Some statements regarding enzymes are given below.

A - Enzymes are acts only in living cells.

B - Substrate may be act as an activator for the regulatory mechanism of an enzyme.

C - Optimum temperature of the enzymes in some prokaryotes could be higher than 60oC

D - Primary structure of the enzyme breakdown during denaturation.

Correct statements are,

i. A and B ii. B and C iii. C and D

iv. A and C v. B and D

05. Which of the following process doesn’t occur in cyclic electron flow?

i. Oxidation of chorophyll a molecules.

ii. Photophosphorylation

iii. Hydrolysis of water

iv. Nutralization of excited pigments in PSI.

v. Passing of electrons through an electron transport chain.

06. Select the correct combination.

i. Appearance of first unicellular eukaryotic organism - 1.8 billion years ago

ii. Appearance of ancestors of arthropods - 680 million years ago

iii. Origin of first photosynthetic organism - 2.6 billion years ago

iv. Origin of amphibians - 360 million years ago

v. Appearance of first terrestrial vascular plant - 500 million years ago

07. Select incorrect combination regarding an organism and their structural feature.

**Organism** **Structural Feature**

i. *Euglena* eye spot

ii. *Chytridium* coenocytic hypae

iii. *Aspergillus* uninucleated septic filaments

iv. *Paramecium* oral groove

v. *Amoeba* food vacuoles

08. What is the unique feature found only in seed bearing plants of kingdom plantae?

i. Presence of Heterospory

ii. No need of water for fertilization of gameters

iii. Presence of microscopic gametophyte

iv. Presence of endosperm

v. Possess double fertilization

09. The combination which shows the sequential order of the animal’s having endoskeleton,

segmented body and sackers is,

i. Squid, round worm, leach ii. Sand dollar, *Nereis*, Octopus

iii. Frog, millipede, mussel iv. Sea anemone, butterfly, star fish

v. Shark, snail, *Taenia*

10. Correct statement regarding the primary structure of dicot plant,

i. Pericycle is a single cell layer which has meristamatic ability.

ii. Distinict pith is present in root.

iii. Sclerenchyma cylinder is present inner to the epidermis in stem.

iv. Closed co-lateral vascular bundles are present in stem.

v. Epidermis in the stem is multilayered.

11. Which of the following combination is incorrect regarding cells of plant tissues?

i. Trachieds - thin lignified secondary cell wall

ii. Collenchyma cells - elongated cell with unevenly thickened primary cell wall.

iii. Vessel elements - cross walls carry perforation plates.

iv. Sieve tube elements - living cells but lack nucleus

v. Sclereids - irregular shaped cells contain branched pits.

12. Select the incorrect statement regarding material transportation occur in plant body.

i. Free water moleculas in soil solution absorbed into the root hair cells by osmosis and

diffusion.

ii. Adhesion and cohesion facilitate transportation of water by bulk flow.

iii. Pressure is reduced by unloading of sugar at the sugar sink.

iv. Pholem loading is occur at sugar source via symplact route in some plant species.

v. Active transport only occur in the transport of solutes via transmembrane route.

13. Select the incorrect combination regarding element, the form of intake and the function.

**Element** **Form of intake** **Function**

i. *Mg* Activates many enzymes

ii. *N* Components of co-enzymes

iii. *B* cofactor in chlorophyll synthesis

iv. *Mo* Nitrogen metabolism

v. *Fe* N2 fixation

14. Which of the following statement is incorrect regarding life cycles of all terrestrial plants?

i. Exhibit heteromorphic alteration of generation.

ii. Carryout internal fertilization.

iii. Have multicellular reporoductive organs which are protected by sterile cell layers.

iv. Female gamete is retained in the archegonium.

v. Male gametes are released from the antheridium.

15. Select the incorrect relationship regarding the disorders in the alternatary canal of human.

i. Malnutrition - Occur due to failare of obtain an adequate nutrition.

ii. Constipation - Occur due to excess reabsorption of water from feces in the

small interetine.

iii. Obesity - Occurs when body mass index is at 30 or over.

iv. Cancers in colon - May occur due to inadequate fibers in the diet.

v. Gastritis - Causes damaged to the mucosa in stomach wall due to excess

secretion of HCl

16. Select incorrect combination regarding deficiency symptoms of vitamins.

i. Cobalamin - Anemia

ii. Pyridoxine - Loss of balance

iii. Retinol - Immunity impairment

iv. Niacin - Pellagra

v. Riboflavin - Cracks at corners of mouth.

17. Select the correct statement regarding cardiac cycle.

i. During a single contraction the amount of blood pumped by the left ventricle into the

aorta is called stroke volume.

ii. During atrial systole semilunar valves are opened.

iii. At rest the healthy adult heart is likely to beat at a rate of 70-80 beats per minute.

iv. During complete cardiac diastole the pressure of the atria is less than the pressure of the

ventricels.

v. During ventricular systole SA node triggers the impulses which spread to the ventricalr

muscles via perkinje fibers.

18. Select correct statement regarding blood groups of human.

i. The surface of the red blood cells carries antigens called agglutinin.

ii. A person with a specific antigen in red blood cells does possess the corresponding

antibody in the plasma.

iii. A person with the blood group O+ is known as a universal donor.

iv. A person who are Rh- do not have anti-Rhesus antibodies always in their plasma.

v. When a Rh- mother bearing Rh+ children, all of them can suffer destruction of their red

blood cells.

19. Select the incorrect statement regarding homeostatic control of breathing.

i. During normal breathing signal are sent to external intercostal muscles and diaphragm

from medulla oblongata.

ii. During inhalation, sensors in the lung tissues send inhibitory nerve impulses to the

medulla.

iii. High CO2 concentration results low pH value in blood and cerebrospinal fluid.

iv. Low pH level in blood can detected by the sensors in the walls of carotid arteries and

aorta.

v. Pons varoli located in the hind brain can detects decrease pH of cerebrospinal fluid.

20. Select the incorrect statement regarding desorders regarding immune system of human.

i. Antigen that induce hypersensitive reactions in some person called allergens.

ii. In type I Diabetes mellitus, T cells attack the insulin producing pancreatic betacells.

iii. Few allergens stimulate production of plasma cells.

iv. An inborn immunodeficiency results from a genetic.

v. Many autoimmune diseases affect femals than males.

21. Select the correct statement regarding the human nephron.

i. Consists of a single multicellular long tubule.

ii. The nephron is supplied with blood from the efferent arteriole.

iii. Outer layer of the Bowman’s capsule composed of podocytes.

iv. Proximal convoluted tubule is longer and wider than the distal convoluted tubule.

v. Lining of the desending limb of the loop of henle is permeable to Na+

22. Select the incorrect combination regarding structures of human brain and function.

i. Cerebrum - Perception of smell.

ii. Cerebellum - Initiate voluntary muscular movements.

iii. Hypothalamus - Plays a role in sexual behaviour

iv. Pons varoli - Cordinates large scale body movements.

v. Medulla oblongata - Controts blood vessel activities.

23. Select the correct sequence regarding hearing process of human.

A - Basilar membrane vibrates.

B - Vibrations are transmitted to cochlear canal.

C - Sensory hairs contact with tectorial membrane.

D - Vibrations pass through middle ear.

E - Nerve impulses are generated.

F - Vibrations are transmitted to tympanic duct.

i. D, B, A, C, E, F ii. D, B, F, C, E, A iii. D, B, C, A, F, E iv. D, F, A, C, E, B v. D, F, C, A, B, E

24. Which of the following is a function of Thyroid hormones?

i. Needed for normal growth and development especially muscle system.

ii. Decrease the basal metabolic rate.

iii. Regulate digestive and reproductive functions.

iv. Increase blood pressure.

v. Regulate the metabolism of nucleic acids.

25. Select the incorrect statement regarding hormonal control of the male reproductive system.

i. LH stimulates Leydig cells to produce testosterone.

ii. FSH stimulates sertoli cells to nourish the developing sperm.

iii. Testosteron promotes the development of secondary sexual characteristic in males.

iv. Two negative feedback mechanisms control sex hormone production in males.

v. Inhibin produced by sertoil cells, inhibits GnRH, FSH and LH in blood.

26. Select the incorrect statement regarding Oognesis in human.

i. Oognesis begins in the female embryo with the mitotic division of primodial germ

cells.

ii. Primary oocytes begin meiosis but stop at prahase I before birth.

iii. About 500 primary oocytes fully mature between the puberty and the menopause.

iv. Secondary oocyte arrested in metaphase of mriosis II is released at ovulation.

v. Primary oocyte can produced only one mature ovum in each month.

27. Select the correct statement regarding human development process.

i. Human development process normally ends in 40 weeks after the fertilization.

ii. The first 12 weeks of human development is called the embryonic period.

iii. Morula is form due to continuous cleavage and reaches the uterus about 4-5 days after

fertilization.

iv. Morula gets nutrition by endometrial secretions before the implantation.

v. During implantation three germ layes are formed in the developing embryo.

28. Select the incorrect statement.

i. hCG passes from the maternal blood to the urine ten days after the fertilization.

ii. High progesterone level in maternal blood facilitates the growth of maternal side of the

placenta.

iii. By the second trimester, the level of hCG in maternal blood is declines.

iv. In first trimester, mucus in the cervix of the mother forms a plug.

v. In the third trimester, may lead to digestive blockage.

29. Select the correct statement regarding the process of parturition.

i. During last week of pregnancy estradiol and progesterone level rises.

ii. The second stage of parturition is the thining and dialation of the cervix.

iii. Oxytocin stimulate placenta to produce more and more prostaglandin.

iv. The first signal for parturition come from the mother.

v. Delivery of the baby is the final stage of parturition.

30. Select the correct statement regarding human skull.

i. Human skull consists of 22 bones.

ii. All sinuses are lined by ciliated mucus membrane.

iii. All the bones in the skull connected together by ossified joints called sutures.

iv. Two occipital condyles which are concave in shape found on either side of the foramen

magnum.

v. Zygomatic process in the zygomatic bone forms a part of the zygomatic arch.

31. Select the correct statement regarding types of vertebrae,

i. All cervical vertebrae contain foramens in transverse processes

ii. All thoracic vertebrae has facets on centrum and transverse processes.

iii. Some lumbar vertebrae contain large kidney shaped centrum.

iv. All cervical vertebrae contain bifid spinous process.

v. 4 pairs of processes found in all lumbar vertebrae.

32. Select the incorrect statement regarding carvatures of human vertebral column

i. Only one curvature is present in foetus.

ii. Secondary carvatures are concave anteriorly.

iii. Child can hold head upright after formation of cervical curvature.

iv. Thorasic & sacral curves remain as primary curvature after the development of

secondary curvature.

v. Child can gain ability to keep the body upright about 7-8 months after birth.

33. Select the correct statement regarding upper and lower limbs of the appendicular skeleton

of human.

i. Head of the humerus forms an incomplete ball and socket joint in glenoid cavity of the

clavical.

ii. Wrist joint is present between the distal end of radius and two proximal carpal bones.

iii. There are two transverse arches and one longitudinal arch in the foot.

iv. Distal ends of both tibia and fibata articulate with talus to form the ankle joint.

v. The joint present at the base of first metacarpal bone and the first digit in thumb leads

to opposable nature.

34. D allete is responsible for the purple coloured stem and it is dominant over the allele d

responsible for green coloured stem. H is responsible for the presence of hair in the stem and

it is dominate over the h responsible for non-hair stem. 320 offsprings were resulted in a

crossing between DdHh x ddHh. How many purple coloured and hair plants will be obtained

from this corss.

i. 120 ii. 160 iii. 80 iv. 40 v. 20

35. Example for polygenic inheritance & polyallelism in human are represent respectively,

i. Height and skin colour

ii. Inheritance of blood groups and colour of the eye.

iii. Intelligence and Inheritance of blood groups.

iv. Polydactyly and skin colour.

v. Weight and Polydactyly.

36. If a plant of genotype AaBbCCDd was self pollinated. Find the ratio between the numbers of phenotypes to genotypes among the progeny.

i. 16 : 81 ii. 81 : 16 iii. 87 : 8 iv. 8 : 27 v. 4 : 9

37. Presence of attached or deattached ear lobe is a common Mendalian character. Assume that a

occarance of attached ear lobe occurs in human population at a frequency of one in 2500. Find

the dominant allele frequency and the percentage of individuals in the population who are

heterozygous with regard to this character.

i. 0.06 & 5.98% ii. 0.02 & 59.8% iii. 0.08 & 3.98% iv. 0.02 & 3.98% v. 0.08 & 3.98%

38. Which of the following factor not affect for the Hardy Weinberg equilibrium?

i. Mutation ii. Random mating iii. Natural selection

iv. Gene flow v. Small population

39. Select the incorrect statement regarding breeding techniques.

i. A new uniform crop variety with desired characteristic is produced by successive

artificial selection.

ii. Selective breeding can effectively removed undesirable traits in some plants and

animals.

iii. Inbreeding is used in agriculture to help accumulation of superior genes.

iv. Hybrid vigour is continuously increase during the crossing of hybrids.

v. Offsprings resulted due to interspecific breeding may be fertile.

40. Select the correct statement regarding architecture of chromosomes in an organisms.

i. This is the way the DNA molecules arranged in the nucleus of eukaryotic cells.

ii. Chromosomes are present only in eukaryotes.

iii. Packaging of DNA in prokaryotes is facilitated by the proteins associated with the DNA

molecule.

iv. Tightly packed chromatin in eukaryotic nucleus called euchromatin.

v. Heterochromatin consists nucleotide sequences which are mostly active.

 **For each of the questions 41 to 50, one or more of the responses is/are correct. Decide**

**which response/responses is/are correct and then select the correct number.**

**If only A, B and D are correct ……………………………………………… 1**

**If only A, C and D are correct ……………………………………………… 2**

**If only A, and B are correct ……………………………………………… 3**

**If only C and D are correct ……………………………………………… 4**

**If any other response or combination of response is correct ……………... 5**

41. In which of the following event/s that meiosis takes place?

i. Production of microspores in megasporangium of *Selaginella*

ii. Production of ascospores in ascus of *Aspergillus*

iii. Production of egg cell in embryo sac of Anthophytes

iv. Production of pollen grains in microsporangium of *Cycas*

v. Production of biflagalated sperm in antheridium of *Pogonatum*

42. Select correct combination regarding plant growth regulators and function.

**Plant growth regulators** **Function**

i. Auxin Promotes vascular differentiation

ii. Gibberellins Stimulate seed development

iii. Cytokinins Enhances apical dominance

iv. Abscisic acid Promotes stomata clousure

v. Ethylene Promotes leaf senescence

43. Select the similar structural characteristics of cardiac muscle and skeletal muscles.

i. Uninucleated cells ii. Branched cells

iii. Cylindrical shaped cells iv. Consists of myofribrils

v. Extensible cells

44. Which of the following process/es is/are involved in producing a clear image on the retina of

human eye.

i. Refraction of light rays. ii. Convergence

iii. Changing the size of the pupil iv. Accommodation

v. Presence of rods & cones on retina

45. Select the correct statement/s regarding human semen.

i. Usually a normal ejaculate contains about 2-5ml of semen.

ii. Main fraction of the semen is made up of sperm and secretions from seminal vesicles

and the prostate gland.

iii. Fructose in seminal fluid provides most of the sperm’s energy.

iv. Prostate gland secretion contain citrate which is a sperm nutrient.

v. Secretion of bulbourethral gland is a milky alkaline fluid.

46. Select the incorrect combination regarding birth control method and its affect.

**Birth control method** **Affect**

i. Oral pills Prevents ovalation

ii. Depo – provera Prevents sperm entry

iii. IUD Thickens cervical mucous

iv. Condoms Prevents release of sperm

v. Oral pills Prevents implantation

47. Which of the following is/are risk factor/s for osteoarthritis?

i. Obesity ii. Hormonal inbalances

iii. Increasing age iv. Heredity

v. Environmantal factors

48. A cross between homozygous dominat purple flowered plants and homozygous recessive

white flowered plant produced 100% purple coloured flower plants. Interbreeding of F1 plants

produced F2 generation with 630 purple flowered plant and 420 white flowered plants. Select

the correct explantations regarding above cross.

i. Two genes are resposible for the determination of flower colour.

ii. Complementary gene interaction is occur.

iii. It is an example for dominant epistasis.

iv. Genotypic ratio is deviated from Mendle’s laws.

v. Inhibitory gene interaction is occur.

49. Select the correct statement/s regarding polyploidy,

i. Presence of more than two complete setes of homologous chromosomes per cell

nucleus leads to polyploidy.

ii. Polyploidy can be induced artificially by colchicine.

iii. polyploidy plants have higher growth rate compaire d to diploid plants.

iv. Produce fruits with large number of seeds.

v. polyploidy plants show high fertility.

50. Select the correct statement/s regarding DNA replication,

i. DNA replication always produce two identical DNA molecules.

ii. DNA relication totally controlled and coordinated only by numbers of enzymes.

iii. The separation of double helix occurs at the origin of replication.

iv. One of the new strand called lagging strand, will be synthesized as small fragments.

v. Leading strand continuously synthesized in 31 to 51 direction.