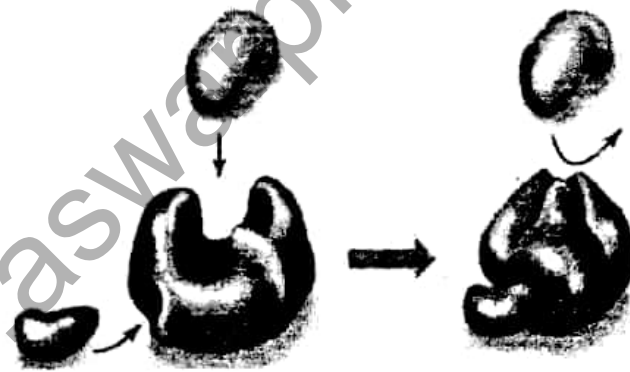
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Screening Test – 2020 (September)		Grade 13 Enu	
Biology I		Time: 2 hours	

- This questions paper consists of 50 questions.
- Answer all the questions.

- (1). Not a function of nucleotides in organisms, other than those found in nucleic acids
1. Acts as co enzymes
 2. Acts as electron carriers
 3. Acts as universal energy carrier
 4. Acts as oxidative agent in the Calvin cycle of photosynthesis
 5. Acts as oxidative agent in respiration
- (2). Select the **incorrect** statement about microscopes
1. Maximum magnification of light microscope is 1000 times
 2. Transmission EM can be used to study internal structures of cells
 3. Limitation of resolution power in light microscope is due to shorter wave length of light
 4. SEM is ideal to observe surface view in 3 dimensional appearance
 5. Specimen can be magnified 5×10^5 times by electron microscopes
- (3). Select the **correct** statement related for the diagram



1. Binding of specific substrate to the active site of enzyme
2. Binding of competitive inhibitor to the active site of enzyme
3. Binding of non competitive inhibitor to the enzyme
4. Binding of co factor for an enzyme
5. Binding of competitive inhibitor to the site other than active site

(4). Select the **incorrect** statements about respiratory substrates

1. Lipids converted into fatty acids and glycerol, then fatty acids are used as acetyl co A
2. Proteins are broken down into amino acids and directly used for pyruvate oxidation and TCA cycle
3. Sugars that are formed by breakdown of carbohydrates, enter the glycolysis
4. Glycerol that is resulted from the breakdown of fat, enters the glycolysis
5. Some amino acids are directly used for glycolysis

❖ Question number 5 and 6 are related with the following dichotomous key
(Sea Star, Spider, Jelly fish, Leech, Oyster, Skate, Tuna)

- | | |
|--------------------------------------|------------|
| 1. Presence of radial symmetry | - A |
| No radial symmetry | - 2 |
| 2. Presence of jointed appendages | - Spider |
| Absence of jointed appendages | - B |
| 3. Presence of nematocysts | - C |
| Absence of nematocysts | - Sea star |
| 4. Presence of shell | - Oyster |
| No shell | - D |
| 5. Presence of pharyngeal slits | - 6 |
| No pharyngeal slits | - E |
| 6. Presence of homocercal caudal fin | - Tuna |
| Absence of homocercal caudal fin | - Skate |

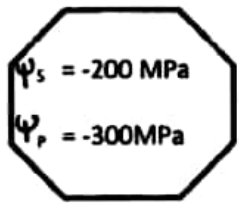
(5). Select the **correct** numbers that are represented by A and B

1. 4 and 5
2. 3 and 4
3. 5 and 6
4. 4 and 6
5. 3 and 5

(6). Select the **correct** animal or number that are represented by C, D and E

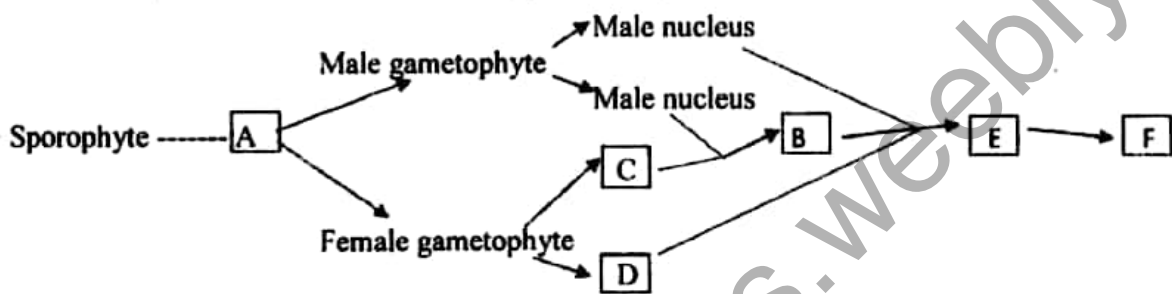
1. Jelly fish, 6, Spider
2. 4, 6, Jelly fish
3. Jelly fish, 5, Leech
4. 5, 6, Leech
5. Jelly fish, 6, Leech

(7). The event that takes place, when the following cell is immersed in pure water



1. Pressure potential lowers than -300 MPa
2. Pressure potential increases than -300 MPa
3. Pressure potential is 0 MPa
4. Pressure potential -200 MPa
5. Pressure potential lowers than -200 MPa

(8). This question is based on following plant life cycle. Select the correct statement



1. A represents the strobilus and B represents the zygote
2. This is the life cycle of *Selaginella*
3. This is the life cycle of gymnosperm with heterospory
4. Male and female gametophytes are independent in above life cycle
5. A represents the flower, B represents the zygote and E represents the seed

(9). Select the correct answer that shows the responsible photoreceptors for following events respectively

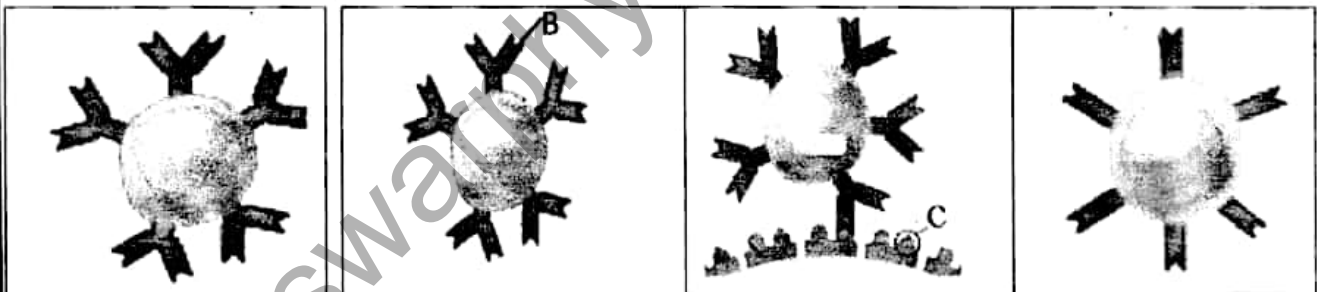
- (a) - Phototropism
- (b) - Seed germination
- (c) - Light induced stomatal opening
- (d) - Light induced slowing of hypocotyl elongation
- (e) - Shade avoidance

	(a)	(b)	(c)	(d)	(e)
1	Blue light photoreceptors	phytochrome	Blue light photoreceptors	phytochrome	phytochrome
2	Blue light photoreceptors	phytochrome	phytochrome	Blue light photoreceptors	phytochrome
3	phytochrome	Blue light photoreceptors	Blue light photoreceptors	phytochrome	Blue light photoreceptors
4	<input checked="" type="checkbox"/> Blue light photoreceptors	phytochrome	Blue light photoreceptors	Blue light photoreceptors	phytochrome
5	phytochrome	phytochrome	Blue light photoreceptors	Blue light photoreceptors	Blue light photoreceptors

- (10). Following table shows the plant growth regulators and their functions, Select the answer that shows the plant growth regulator and its function **correctly**

	Plant growth regulator	Function
a	Auxin	I. Stimulates the stem elongation
b	Gibberellin	II. Induce vascular tissue differentiation
c	Abscisic acid	III. Induce leaf senescence
d	Cytokinins	IV. Induce growth of roots and root hairs
e	Ethylene	V. Delay leaf senescence

1. a- II, c- IV, b- I 2. a-I, d-V, e-IV
 3. c-III, d-V, e-III 4. b-I, c-V, d-IV ☆ a-II, b-I, e-IV
- (11). Select the **incorrect** statement, about the absorption in human small intestine
- Fructose is absorbed by facilitated diffusion
 - Amino acids and vitamins are actively absorbed into epithelial cells
 - Recovery of water and ions mostly occur in small intestine
 - ☆ Fatty acids and monoglycerides are incorporated into chylomicrons within the cells
 - Chylomicrons transport via lacteals then enter the blood circulation
- (12). Select the **incorrect** relationship about the respiratory pigment and animals
- ☆ Haemocyanin - Earth worm
 - Haemoerythrin - Marine invertebrates
 - Hemoglobin - Leech
 - Myoglobin - Vertebrates
 - Chlorocruorin - Cockroach
- (13). Select the answer that names are given **correctly** for following A, B, C and D structures



A

B

C

D

	A	B	C	D
1	B lymphocyte	Antigen receptor	Antigen	T lymphocyte
2	T lymphocyte	Antibody	Epitope	B lymphocyte
3	☆ B lymphocyte	Antigen receptor	Epitope	T lymphocyte
4	B lymphocyte	Antibody	Antigen	B lymphocyte
5	T lymphocyte	Antigen receptor	Antigen	T lymphocyte

(14). Select the correct statement about human upper limb

1. Elbow joint can show flexion, extension, and also adduction and abduction
2. Both bones of fore arm are articulate with carpels at the wrist joint
3. Distal end of radius articulates with 3 distal carpal bones
4. At wrist joint, flexion, extension, abduction and adduction can be seen
5. Joints between metacarpals and phalanges permits precision grip

(15). Select the answer with correct words should be entered the following blanks in the table about hormones, their secretory sites and functions

Hormone	Secretory site	Function
TSH	Anterior pituitary	A
ADH	B	Stimulates water reabsorption
C	Adrenal cortex	Homeostatic regulation of glucose metabolism
Melatonin	Pineal body	D

	A	B	C	D
1	Stimulate the secretion of thyroid hormones	Posterior pituitary	Calcitonin	Maintain diurnal rhythms of many tissues
2	Stimulates the growth of thyroid gland	Anterior pituitary	Cortisol	Inhibition of growth of sex organs before puberty
3	Stimulates the protein synthesis	Posterior pituitary	Cortisol	Contraction of smooth muscles
4	Stimulates the secretion of T ₃ and T ₄ hormones	Hypo thalamus	Cortisol	Stimulates protein synthesis
5	Stimulates the growth of thyroid gland	Hypo thalamus	Cortisol	Maintain diurnal rhythms of many tissues

(16). In parthenogenesis

1. Complete diploid organism is formed
2. Most vertebrates form haploid organism
3. Fertile haploid male bees are formed
4. Sterile female workers are formed among bees
5. Fertile bee queen is formed

(17). Select the incorrect structural-functional relationship

1. Spermatids - differentiation into haploid sperms
2. Leydig cells - secretion of androgens
3. Sertoli cells - contribute to reduce the FSH secretion
4. 1st polar body - remove additional chromosomes that are found in 2nd oocyte
5. Follicular cells - secretion of estradiol

(18). Select the **incorrect** statement about human placenta

- 1. Disc shaped structure which is shed after its function
- 2. This provides nutrients to embryo and fetus from implantation up to parturition
- 3. Acts as an endocrine gland
- 4. It contains both fetal and maternal tissues
- 5. Oxygen poor blood from the fetus travels to the placenta through the two arteries

(19). **Not** a component of colostrum

- 1. Lactose
- 2. Fat
- 3. Amino acids
- 4. Antibodies
- 5. Water

(20). Select the **facial bone** of skull with sinuses

- 1. Sphenoid bone
- 2. Ethmoid bone
- 3. Maxilla
- 4. Frontal bone
- 5. Palatine bone

(21). Select the **correct** answer with bone, its process and function of process

	Bone	Process	Function
1	Mandible	Mastoid	Provide surfaces for muscle attachment
2	Zygomatic bone	Zygomatic	Contribute to form Zygomatic arch
3	Mandible	Coronoid process	Articulates with the temporal bone
4	Temporary bone	styloid	Provide surfaces for ligament attachment
<input checked="" type="checkbox"/>	Mandible	Condylod	Contribute to form movable joint

(22). Select the **bones** of axial skeleton, that join the appendicular skeleton with axial skeleton

- 1. Pectoral and pelvic girdles
- 2. Scapula and pelvic girdle
- 3. Sternum and pectoral girdle
- 4. Clavicle and sacrum
- 5. Sternum and sacrum

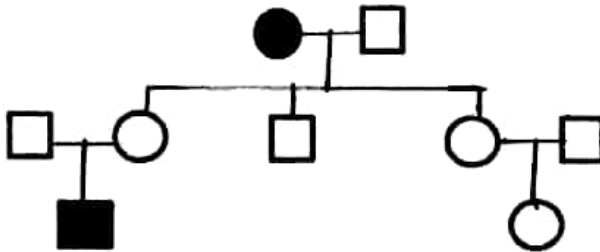
(23). **Incorrect** statement about the action of actin and myosin in skeleton muscle contraction

- 1. ATP hydrolysis is needed to attach of myosin head with actin, and also detaches from actin
- 2. Cross bridges are formed between myosin head and actin binding sites
- 3. Head of the myosin binds with an ATP molecule when its 'low energy state'
- 4. Myosin head enters into the low energy state while releasing ADP and inorganic phosphate
- 5. Actin filaments pull toward the centre of the sarcomere

(24). Not a character of epigenetics

1. Inheritance
2. Irreversibility
3. Unchanged DNA sequence
4. Can be methylation of DNA
5. Same DNA sequence can be expressed in 2 ways in identical twins

(25). Following pedigree chart represents the inheritance of non sex linked character which is expressed only under recessive condition, the man who was married with the elder daughter of the second generation should be,



- a) Homozygous recessive person
- b) Heterozygote
- c) Homozygous dominant person
- d) A carrier for that character

Correct statement/s is /are

1. Only a
 2. Only a and d
 3. Only b
 4. Only b and d
 5. Only c
- (26). Select the correct answer, that shows the ratio of parental phenotypes among F_2 individuals, that is resulted from the cross of F_1 generation, F_1 is resulted from the cross of 2 homozygotes for A and B blood groups
1. 1:1
 2. 1:2
 3. 3:1
 4. 13:3
 5. 9:7
- (27). Red and white flowers found in a population under HW equilibrium. Total number of plants is 200. 72 are white flowers. Select the correct answer for the dominant allele frequency
1. 0.2
 2. 0.4
 3. 0.56
 4. 0.25
 5. 0.6

(28). Select the incorrect statement about bacterial plasmids

1. They are double stranded DNA found as extra chromosomal genetic elements
2. When it has Ori site, many copies can be formed
3. They are linear DNA, which are coiled and supercoiled
4. The protein molecules cause their coiling
5. They can be used to insert the gene of interest to a host cell

(29). Select the incorrect relationship between the structures in eukaryotic chromosome packaging, and their diameter

	Structure	Diameter
1	Sister chromatid with compacted radial loops	700 nm
2	Metaphase chromosome	1400 nm
3	Radial looped domains on protein scaffold	350 nm
4	Chromatin fiber	30 nm
5	Nucleosome	10 nm

- (30). Select the main significance of DNA repairing
- Reduce the risk of accumulation of mutations
 2. Reduce the risk of forming cancers
 3. Minimize the formation of disadvantageous phenotypes
 4. Reduce the risk of forming harmful phenotypes among progeny
- (31). Select the disorder, that is resulted from trisomy of an autosome
- Down syndrome
 2. Turner syndrome
 3. Klinefelter syndrome
 4. Sickle cell anemia
 5. Alzheimer's disease
- (32). **Incorrect** statement about ecological pyramids
1. A graphical representation of the trophic structure of an ecosystem
 2. All ecological pyramids begin at the bottom with primary producers
 3. Always pyramid of energy is upright
 4. Pyramid of number can be inverted when numerous consumers are depend on few autotrophs
 - Pyramids of biomass are always upright when considering the dry weight of each trophic level
- (33). **Not** an adaptation of Chaparral plants
- Succulent plant body
 2. Seed germination occurring after a hot fire
 3. Bearing fire resistant roots
 4. Storage of food in fire resistant roots
 5. Evergreen leaves in woody plants
- (34). **Not** a wetland according to Ramsar convention
1. Inland fresh water lands
 2. Natural or artificial wet land
 3. Static fresh water wet land
 - Marine water the depth of which at low tide exceed 6 meters
 5. Marine water containing land
- (35). Select the **Keystone** species
1. Tilapia in a tank, that carryout inland fisheries
 2. Lantana is marsh land
 - Planktons of a pond
 4. Migratory Suduredi hora
 5. Tuatara found in an island

- (36). Select the **incorrect** statement about receptors in man
1. Merkel disc is sensitive to fine touch
 2. Pacinian corpuscles are located near the surface of skin, and responsible for deep pressure
 3. Hair cells of vestibule, perceive position with respect to gravity
 4. Meissner corpuscles are sensitive to light pressure
 5. Ruffini corpuscles detect warmth
- (37). Select the **correct** statement about the life cycle of bacteriophage
1. First step is the injection of its DNA into the bacterial cell
 2. During maturation and assembly, DNA and capsids are assembled
 3. Biosynthesis is happened after the maturation and assembly
 4. Bacteria induces the break down of bacterial cell itself
 5. During the attachment, injection of bacteriophage DNA into the bacterial cell is happened
- (38). Select the **correct** relationship between antibiotic and function
1. Erythromycin - disrupting plasma membrane
 2. Rifampin - inhibition of protein synthesis
 3. Daptomycin - inhibition of synthesis of plasma membrane
 4. Tetracycline - inhibition of DNA synthesis
 5. Penicillin - inhibition of cell wall synthesis
- (39). An organism, that produce endotoxin
1. *Clostridium tetani*
 2. *Vibrio cholerae*
 3. *Salmonella typhi*
 4. *Corynebacterium diptheriae*
 5. *Clostridium botulinum*
- (40). **Incorrect** relationship between the organism and its applied industry
1. *S. cerevisiae* - vinegar production
 2. *Lactobacillus bulgaricus* - yoghurt production
 3. *Streptococcus* - lactic acid production
 4. *Aspergillus niger* - citric acid production
 5. *Thioacillus ferrooxidans* - metal extraction

❖ The responses for questions 41 to 50 should be chosen as follows. One or more responses could be correct.

- 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 responses is correct - 5

1	2	3	4	5
A,B and D are correct	A,C and D are correct	A and B are correct	C and D are correct	any other response or combination of responses is correct

(41). Select the **correct** answer/s with simple cuboidal and stratified epithelia respectively

1. A. Thyroid gland and anus
2. B. Salivary gland and intestinal lining
3. C. Kidney tubules and vagina
4. D. Salivary gland and oral cavity
5. E. Bladder wall and outer skin

(42). Select the vitamins & minerals that leads for disorders in nervous system at their deficiency

1. A. Vitamin A, Niacin, Cl
2. B. Vitamin B₅, Thiamin, S
3. C. Vitamin E, Biotin, Mg
4. D. Vitamin B₇, cobalamin, I
5. E. Vitamin B₉, pyridoxin, Na

- (43). Select the **correct** statement/s
- A. Calvin cycle should proceed for 3 times for the net synthesis of one G3P molecule
 - ★ B. CO_2 is reduced in calvin cycle using ATP and NADPH
 - C. 3-PGA is reduced into G3P by using enzyme catalyzed reaction
 - D. Chlorophyll become reduced due to accepting light
 - E. Electrons that are released from PS I, are used to oxidize the NADP^+
- (44). Select the **correct** factors/s that increases the stomatal transpiration
- ★ A. Low temperature
 - B. High wind
 - ★ C. High light intensity
 - D. Dry soil
 - E. High humidity
- (45). Select the **incorrect** statement/s
- A. Functional residual capacity is the remaining volume after deep expiration
 - ★ B. Vital capacity of female is about 4800 ml
 - C. Additional volume of air that can be removed after tidal expiration is the expiratory reserve volume
 - D. Total lung capacity is about 5600 ml
 - E. Anatomical dead space never contribute for the gas exchange in alveoli
- (46). Select the **difference/s** of IVF method from ICSI method of assistant reproduction
- A. Due to fertilization is carried in the laboratory conditions in vitro
 - ★ B. Due to insertion of fertilized egg into uterus for implantation
 - C. Due to need of thousands of sperms
 - D. Due to non injection of sperm into cytoplasm of egg
 - E. Due to usage of selected sperm
- (47). Select the **component/s** in human genome, that codes for polypeptides
- ★ A. Exons
 - B. Introns
 - C. Intergenic area
 - D. Small Tandem Repeats
 - E. Gene
- (48). Select the **correct** statement/s about DNA probes
- A. Single stranded DNA molecule
 - B. Can be used to identify complementary nucleotide sequence
 - ★ C. A DNA molecule that should be denatured
 - D. A sequence that can be having radioactive isotopes
 - E. Modified DNA strand
- (49). Select the **correct** answer/s given wetland grass lands in Sri Lanka
- ★ A. Dry Patana
 - B. Wet Patana
 - C. Savanna
 - D. Talawa
 - E. Damana
- (50). Select the **correct** statement/s about bio diversity conservation
- A. This ensure the continued reproduction and survival of a particular species
 - ★ B. Species that are in danger of extinction should be only protected
 - C. Fair and equitable sharing of benefits of genetic resources should be done
 - D. Fauna and flora protection ordinance is used in Sri Lanka for this
 - E. Long term survival cannot be ensured by ex-situ conservation

