Reg. No. : .....

FME-26

Name : .....

FIRST YEAR HIGHER SECONDARY MODEL EXAMINATION, FEBRUARY 2020

Part – III
BIOLOGY
(Botany & Zoology)
Maximum : 60 Scores

Time : 2 Hours
Cool-off time : 20 Minutes
Preparatory Time : 5 Minutes

General Instructions to Candidates :

- There is a 'Cool-off time' of 10 minutes each for Botany and Zoology in addition to the writing time of 1 hour each. Further there is a '5 minutes' 'Preparatory Time' at the end of the Botany Examination and before the commencement of Zoology Examination.
- Use the 'Cool-off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not allowed in the Examination Hall.

വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ :

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ ബോട്ടണിയ്ക്കും സുവോളജിയ്ക്കും 10 മിനിറ്റ് വീതം 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും. കൂടാതെ ബോട്ടണി പരീക്ഷയ്ക്കുശേഷം സുവോളജി പരീക്ഷ തുടങ്ങുന്നതിനുമുമ്പ് '5 മിനിറ്റ്' തയ്യാറെടുപ്പുകൾ നടത്തുന്നതിനായി നല്കുന്നതാണ്. ഈ വേളകളിൽ ചോദ്യങ്ങൾക്ക് ഉത്തരം എഴുതാനോ, മറ്റുള്ളവരുമായി ആശയ വിനിമയം നടത്താനോ പാടില്ല.
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- നിർദ്ദേശങ്ങൾ മുഴുവനും ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നല്കിയിട്ടുണ്ട്.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

PART – A
BOTANY

(Maximum : 30 Scores) **Time : 1 Hour**

Cool-off time : 10 Minutes

I. Answer any 3 questions from 1 to 5. Each carries 1 score. **(3 × 1 = 3)**

1. Which among the following produce biogas from the dung of ruminant animals ?
   (a) Thermoacidophiles (b) Cyanobacteria
   (c) Methanogens (d) Halophiles

2. The stage between Meiosis I and Meiosis II is called _____.
   (a) Diakinesis (b) Interkinesis
   (c) Pachytene (d) Diplotene

3. Choose the only one growth inhibiting plant hormone among the following options :
   (a) ABA (b) NAA
   (c) IAA (d) 2, 4-D

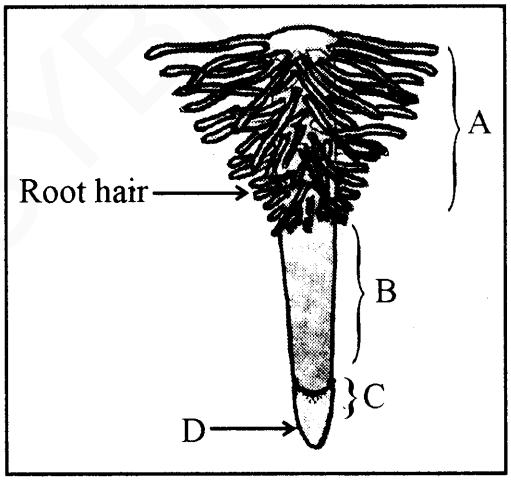
4. The process of conversion of molecular nitrogen to ammonia is termed as _____.

5. Observe the relation, and fill up the blank
   Trypanosoma : Flagellated Protozoan
   _____ : Ciliated protozoan

II. Answer any 9 questions from 6 to 16. Each carries 2 scores. **(9 × 2 = 18)**

6. Write any two economic uses of bryophytes.

7. Observe the diagram and label the parts noted as A, B, C and D.

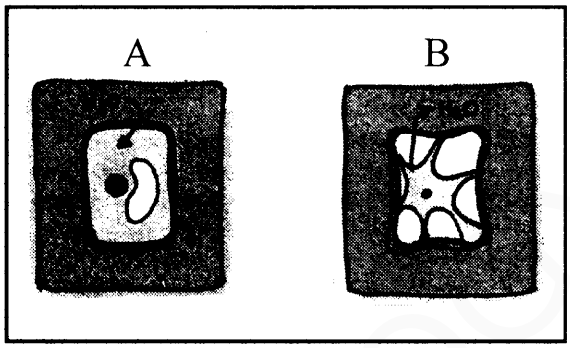


8. What is the role of fungus in mycorrhiza ?

9. Column A represents chromosomal behaviour during different sub-stages of Prophase I of Meiosis I. Fill up the blanks in Column B.

Chromosomal behaviour (A)	Sub-stages (B)
(a) Crossing over occurs	(i) _____
(b) Formation of Chiasmata	(ii) _____
(c) Pairing of homologous chromosomes	(iii) _____
(d) Chromosomes visible under light microscope	(iv) Leptotene
(e) Terminalisation of Chiasmata	(v) _____

10. The behaviour of plant cells with regard to water movement depends on the surrounding solution. Explain the changes occur in cells A and B.



11. Plants that are adapted to dry tropical regions have the C_4 pathway. Write any two advantages of C_4 plants :

12. Differentiate lactic acid fermentation from alcohol fermentation.

13. Ethylene is one of the most widely used Plant Growth Regulator in Agriculture. Write any two agricultural applications of ethylene.

14. In glycolysis, ATP is utilized at two steps only. Write down these two steps.

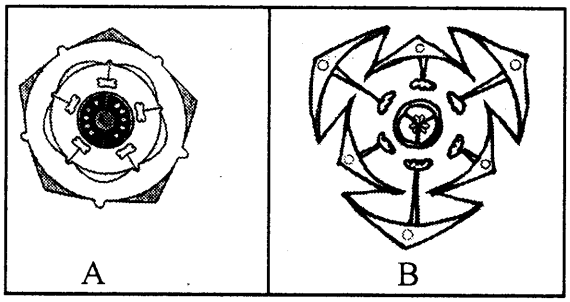
15. Define "The law of limiting factors". Write any two external factors which directly affect the rate of photosynthesis.

16. What is the difference between nitrification and denitrification in Nitrogen cycle ?

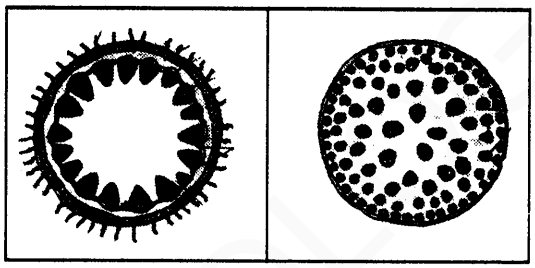
III. Answer any 3 questions from 17 to 20. Each carries 3 scores. **(3 × 3 = 9)**

17. C_4 plants have large cells around the vascular bundles of leaves called bundle sheath cells.
    (a) What is this anatomy called ?
    (b) Write any two features of bundle sheath cells.

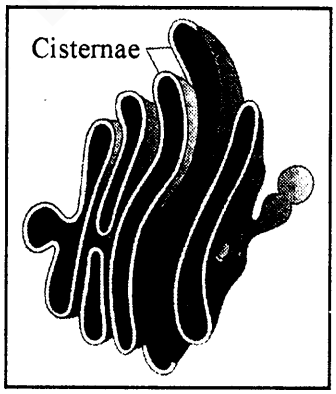
18. A and B are floral diagrams of two angiosperm families.
    (a) Identify the families of A and B.
    (b) Write the characters of gynoecium of A and B.



19. Following are the diagrams showing primary structure of dicot stem (A) and monocot stem (B). Write any three differences between them.



20. Given below is the diagram of a cell organelle.
    (a) Identify the organelle.
    (b) Write any two functions of this organelle.



PART – B
ZOOLOGY

(Maximum : 30 Scores) **Time : 1 Hour**

Cool-off time : 10 Minutes

I. Answer any 3 questions from 1 to 5. Each carries 1 score. **(3 × 1 = 3)**

1. The taxonomic aid used for identification of plants and animals based on the similarities and dissimilarities.

   (a) Manuals (b) Monograph

   (c) Key (d) Flora

2. Identify the given word pair relationship and fill in the blanks.

   [Cockroach – Malpighian Tubules
   Amphioxus – _____]

   [Nephridia, Antennal glands, Green glands, Protonephridia]

3. In a protein molecule amino acids are linked by _____.

   (a) Glycosidic bond (b) Hydrogen bond

   (c) Peptide bond (d) Diester bond

4. In human being the sound is produced by

   (a) Pharynx (b) Larynx

   (c) Trachea (d) Bronchi

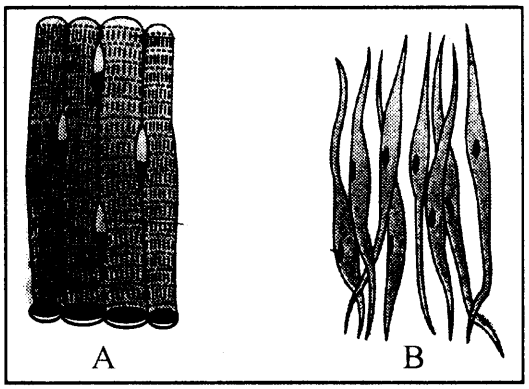
5. Pick the odd one out :

   (a) Pila (b) Nereis

   (c) Sepia (d) Loligo

II. Answer any 9 questions from 6 to 16. Each carries 2 scores. **(9 × 2 = 18)**

6. Observe the picture A and B.



(a) Identify the tissues A and B.
(b) Write any two features of A and B.

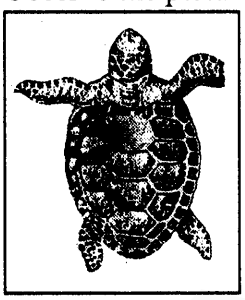
7. In an epithelium specialized junctions provide both structural and functional links between its individual cells. Identify any two types of cell junctions and their functions.

8. The mucus and bicarbonates present in gastric juice plays an important role in the protection of mucosal epithelium. Explain.

9. Differentiate between

(a)	Apoenzyme and Coenzyme
(b)	Lyases and Ligases

10. Observe the picture.



(a) Name the class to which this animal belongs.
(b) Write any two characteristic features of this class.

11. (a) Write any two enzymes present in succus entericus.
(b) Write the functions of these enzymes.

12. (a) What is normal respiratory rate ?
(b) Name an instrument used for measuring volume of air.
(c) Mention its clinical significance.

13. Identify two wrong statements among the following and correct it.
    (a) Plasma without the clotting factors is called serum.
    (b) RBC is multinucleated in Human.
    (c) Neutrophils, Lymphocytes and Basophils are granulocytes.
    (d) Neutrophils and Monocytes are phagocytic cells.

14. (a) Name any two synovial joints in our body.
    (b) Where is it located ?

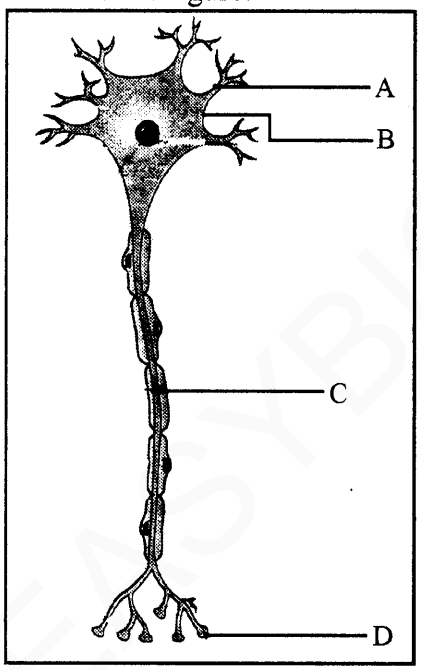
15. Fill up the table using appropriate terms.

Glands	Hormones	Disease
Pituitary gland	(a) _____	Diabetes insipidus
Pancreas	Insulin	(b) _____
(c) _____	Thyroxin	Cretinism
(d) _____	Growth Hormone	Dwarfism

16. ANF is a regulatory mechanism in kidney functioning.
    (a) Expand-ANF
    (b) Which part of the body secrete ANF ?
    (c) Explain the regulatory mechanism.

III. Answer any 3 questions from 17 to 20. Each carries 3 scores. **(3 × 3 = 9)**

17. Observe the figure.



    (a) Identify the picture.
    (b) Label the parts A, B and C.
    (c) Write the function of D.

18. This condition can be avoided by administering anti Rh antibodies to the mother immediately after the delivery of the first child.

(a) Identify this condition.

(b) Write the reason for this condition.

(c) Write the symptoms of the foetus born in this condition.

19. "Metagenesis" is the characteristic Phenomenon of this phylum.

(a) Identify the phylum.

(b) Write any four other characteristics of this phylum.

(c) Give one example of this phylum.

20. Match the following :

A	B
(a) Tendon	(i) Store fat
(b) Columnar epithelium	(ii) Fluid connective tissue
(c) Bone	(iii) Attach muscle to bone
(d) Adipose Tissue	(iv) Helps in secretion
(e) Ligament	(v) Support
(f) Blood	(vi) Attach bone to bone
	(vii) Secrete hormones
	(viii) Conduct impulses

FIRST YEAR HIGHER SECONDARY MODEL EXAMINATION, FEBRUARY 2020

SCORING KEY

BOTANY

MAXIMUM SCORE 30

Qn No		Value Points	Split Score	Total Score
I. Any 3 from 1 to 5				
1		c) Methanogens	1	1
2		b) Interkinesis	1	1
3		a) ABA	1	1
4		Nitrogen Fixation	1	1
5		Paramoecium	1	1
II. Any 9 from 6 to 16				
6		Provide food for herbaceous mammals, birds and other animals/Provides Peat that have long been used as fuel/Used as Packing material for transshipment of living materials/Alongwith lichen help to decompose rocks/Reduce impact of falling rain and prevent soil erosion (any 2)	1+1	2
7		A) Region of Maturation	½	2
		B) Region of Elongation	½	
		C) Region of meristematic activity	½	
		D) Root cap	½	
8		Fungal filaments form a network around the young root or they penetrate the root cells.The hyphae have a very large surface area that absorb mineral ions and water from a large volume of soil. Pinus seeds cannot germinate and establish without the presence of micorrhizae. (any 2)	1+1	2
9		**A** / **B**		
		(a) Crossing over occurs / (i) Pachytene	½	2
		(b) Formation of Chiasmata / (ii) Diplotene	½	
		(c) Pairing of homologous chromosomes / (iii) Zygotene	½	
		(e) Terminalisation of Chiasmata / (v) Diakinesis	½	
10		A) Cell become turgid - in a hypotonic solution water diffuses into the cell causing the cytoplasm to build up turgor pressure agaist the cell wall	1	2
		B) Cell is Plasmolysed - in a hypertonic solution water moves out of the cell and the cell membrane shrinks away from its cell wall	1	
11		Lacks Photorespiration/Productivity and yield are more/Tolerance to high temperature (any 2)	1+1	2
12		**Lactic acid fermentation** / **Alcohol fermentation**		
		Lactic acid is formed / Ethanol and CO_2 are formed	1+1	2
		Lactate dehydrogenase is the enzyme involved / Pyruvic acid decarboxylase and alcohol dehydrogenase are the enzymes involved		
		Occurs in bacteria and in some animal cells / Occurs in yeast (any 2)		
13		Initiate flowering and synchronize fruit set in Pineapple/Induce flowering in mango/Hastens fruit ripening in tomatoes and apples/acceleration of abscission of flowers and fruits/thinning of cotton/promotes female flower formation in cucumber (any 2)	1+1	2
14		Glucose $\longrightarrow$ Glucose 6 phosphate	1	2
		Fructose 6 phosphate $\longrightarrow$ Fructose 1,6 biphosphate	1	
15		If a chemical process is affected by more than one factor, then its rate will be determined by the factor which is nearest to its minimal value	1	2
		Light/Temperature/Water/CO_2 Concentration (any 2)	1	
16		Nitrification is the formation of Nitrates from Ammonia by Nitrifying bacteria like Nitrosomonas and Nitrobacter	1	2
		Denitrification is conversion of Nitrate in the soil to Nitrogen by denitrifying baceria like Pseudomonas and Thiobacillus	1	

Qn No		Value Points	Split Score	Total Score
17	a	Kranz anatomy	1	3
	b	Large cells/Arranged in several layers around vascular tissue/Large number of chloroplasts are present/Thick cell walls impervious to gases/No intercellular space (any 2)	1+1	
18	a	A) Solanaceae, B) Liliaceae	1	3
	b	A) Bicarpellary/Syncarpous/Superior ovary/Bilocular/Placenta swollen/Axile placentation (any 2)	½+½	
		B) Tricarpellary/Syncarpous/Superior ovary/Trilocular/Axile placentation (any 2)	½+½	
19		**A.Dicot Stem** / **B.Monocot Stem**	(any 3) 1+1+1	3
		Ground tissue differentiated into cortex, endodermis, pericycle and pith / Undifferentiated Ground tissue		
		Collenchymatous hypodermis / Schlerenchymatous hypodermis		
		Vascular bundles arelimited in number arranged in the form of a ring / Large number of scattered vascular bundles		
		Bundle sheath absent, Schlerenchymatous bundle cap present / Schlerenchymatous bundlesheath		
		Vascular bundles conjoined and open / Vascular bundles conjoined and closed		
		Vascular bundles similar in size / Peripheral bundles are smaller		
		Phloem parenchyma absent / Phloem parenchyma absent		
		Water containing cavities absent in vascular bundles / Water containing cavities in vascular bundles		
20	a	Golgi apparatus	1	3
	b	Packaging of materials. Important site of production of Glycoproteins and Glycolipids	1+1	

HIGHER SECONDARY

MODEL EXAMINATION FEBRUARY-2020

BIOLOGY

<table>
<tr><th>QN</th><th>Answer KEY</th><th>Score</th></tr>
<tr><td colspan="3">Answer any 3 questions from 1-5. Each carries 1 Score</td></tr>
<tr><td>1</td><td>c)Key</td><td>1</td></tr>
<tr><td>2</td><td>Protonephridia</td><td>1</td></tr>
<tr><td>3</td><td>c)Peptide bond</td><td>1</td></tr>
<tr><td>4</td><td>b)Larynx</td><td>1</td></tr>
<tr><td>5</td><td>b)Nereis</td><td>1</td></tr>
<tr><td colspan="3">Answer any 9 questions from 6-16. Each carries 2 Score</td></tr>
<tr><td>6</td><td>a) A-Skeletal muscle/striated muscle
B-Smooth muscle/Non striated muscle/Visceral muscle
b)
<table>
<tr><th>Skeletal muscle</th><th>Smooth muscle</th></tr>
<tr><td>They are closely associated with the skeletal components of the body</td><td>They are located in the inner wall of hollow visceral organs of the body</td></tr>
<tr><td>They have striated /striped appearance under microscope</td><td>They are smooth in appearance</td></tr>
<tr><td>They are voluntary muscle</td><td>They are involuntary muscles</td></tr>
<tr><td>This muscles helps in locomotory action and change in body posture</td><td>This muscles helps in transport of food through digestive tract and gamete through genital tract</td></tr>
<tr><td colspan="2">(Any two features)</td></tr>
</table></td><td>0.5
0.5

0.5

0.5</td></tr>
<tr><td>7</td><td>Tight junction, Gap junction ,Adhering junction (Any two)
<u>Tight junction</u> : Tight junctions help to stop substances from leaking across a tissue.
<u>Gap junction</u> : it facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for rapid transfer of ions, small molecules and sometimes big molecules
<u>Adhering junction :</u> it perform cementing to keep neighboring cells together. (any two)</td><td>1
0.5
0.5</td></tr>
<tr><td>8</td><td>The mucus and bicarbonates present in gastric juice protect the stomach wall from the excoriation of HCl</td><td>2</td></tr>
<tr><td>9</td><td>a) Apo enzyme : Protein part of the enzyme
Co Enzyme : Non protein part of the
b) Lyase : Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis leaving double bonds
Ligase : Enzymes catalysing the linking together of 2 compounds, e.g., enzymes which catalyse joining of C-O, C-S, C-N, P-O etc. bonds.</td><td>0.5
0.5
0.5
0.5</td></tr>
<tr><td>10</td><td>a)Class: Reptilia
b)any two characters</td><td>1
1</td></tr>
<tr><td>11</td><td><u>a)</u>Maltase,Dipeptidase,Lactase,sucrose,Nucleotidase,Nucleosidase,Lipase (Any two)
function</td><td>1
1</td></tr>
<tr><td>12</td><td>a)12-16 times/minute
b) Spirometer
c)Clinical assessment of pulmonary function</td><td>0.5
0.5
1</td></tr>
<tr><td>13</td><td>b)RBC is Anucleated
c)Neutrophils, Eosiniphils, Basophils are granulocytes</td><td>1
1</td></tr>
<tr><td>14</td><td>• Ball and socket joint (between humerus and pectoral girdle),
• hinge joint (knee joint),
• pivot joint (between atlas and axis),
Gliding joint (between the carpals)
saddle joint (between carpal and metacarpal of thumb (any two joints and its location</td><td>1+1=2</td></tr>
</table>

15	**a)ADH/Vasopressin** **b)Diabetes mellitus** **c)Thyroid gland** **d)Pituitary gland**	**0.5** **0.5** **0.5** **0.5**
16	a)Atrial Natriuretic factor b)Atrial wall-Heart c) An increase in blood flow to the atria of the heart can cause the release of Atrial Natriuretic Factor (ANF). ANF can cause vasodilation (dilation of blood vessels) and thereby decrease the blood pressure. ANF mechanism, acts as a check on the renin-angiotensin mechanism	**0.5** **0.5** **1**
	Answer any 3 questions from 17-20. Each carries 3 Score	
17	**a)** **Neuron** **b)** **A-Dendrite** **B-**Cell body C-Axon **c)** Synaptic knob contains synaptic vesicles. Neurotransmitter in the synaptic vesicles helps to transmit impulse from one neuron to another across synaptic cleft.	**0.5** **1.5** **1**
18	**a)Erythroblastosis foetalis** **b)** This case is observed between the Rh-ve blood of a pregnant mother with Rh+ve blood of the foetus. Rh antigens of the foetus do not get exposed to the Rh-ve blood of the mother in the first pregnancy as the two bloods are well separated by the placenta. However, during the delivery of the first child, there is a possibility of exposure of the maternal blood to small amounts of the Rh+ve blood from the foetus. In such cases, the mother starts preparing antibodies (Rh antibodies) against Rh antigen in her blood. In case of her subsequent pregnancies, the Rh antibodies from the mother (Rh-ve) can leak into the blood of the foetus (Rh+ve) and destroy the foetal RBCs. This could be fatal to the foetus or could cause severe anaemia and jaundice to the baby. This condition is called erythroblastosis foetalis. This can be avoided by administering anti-Rh antibodies to the mother immediately after the delivery of the first child. c)Severe jaundice and Anaemia	**1** **1** **1**
19	**a)Phylum cnideria/Coelenterates** **b)Any characters of this phylum** **c)** Physalia (Portuguese man-of-war), Adamsia (Sea anemone), Pennatula (Sea-pen), Gorgonia (Sea-fan) and Meandrina (Brain coral). (Any one example)	**0.5** **2** **0.5**
20		**0.5**

A	B	
a)Tendon	**vi)Attach muscle to bone**	**0.5**
b)Columnar epithelium	**iv)Helps in secretion**	**0.5**
c)Bone	**V)Support**	**0.5**
d)Adipose tissue	**i)Store fat**	**0.5**
e)Ligament	**vi)Attach bone to bone**	**0.5**
f)Blood	**ii)Fluid connective tissue**	