



**SHRI VIDHYABHARATHI MATRIC.HR.SEC.SCHOOL**  
**SAKKARAMPALAYAM , AGARAM (PO) ELACHIPALAYAM**  
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**COMMON QUARTERLY EXAMINATION - SEPTEMBER - 2019**

**TENTATIVE ANSWER KEY**

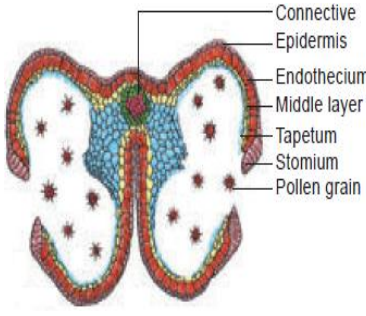
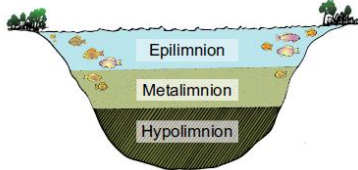
**STD: XII**

**DATE: 20.09.2019**

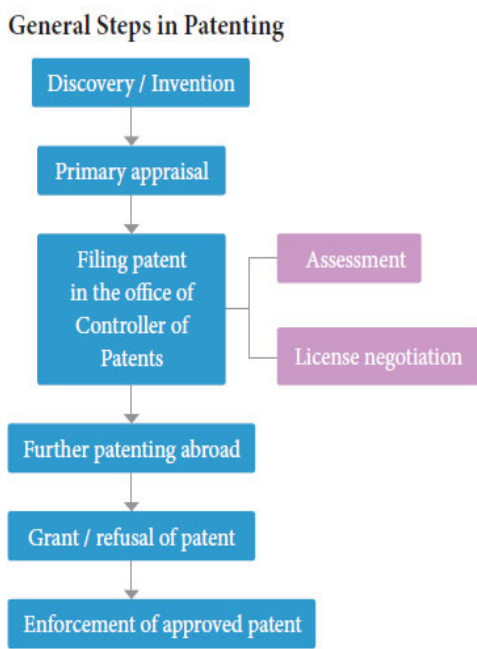
**SUBJECT: BIO-BOTANY**

**MARKS : 35**

Q. NO		MARKS
<b>SECTION - I</b>		
1.	b) Air	1
2.	c) Law of segregation	1
3.	i ii iii iv b) c d a b	1
4.	i ii iii iv d) c d a b	1
5.	c) (3) and (4)	1
6.	b) Callus undergoes differentiation and produces somatic embryoids.	
7.	d) Agar	
8.	c) Capillary Water	
<b>SECTION - B</b>		<b>4X2=8</b>
<b>II. ANSWER ANY FOUR QUESTIONS FROM THE FOLLOWING</b>		
9.	<b>Micropropagation:</b> The regeneration of a whole plant from single cell, tissue or small pieces of vegetative structures through tissue culture is called <b>micropropagation</b>	2
10.	<b>pleiotropy:</b> In Pleiotropy, the single gene affects multiple traits and alter the phenotype of the organism. The Pleiotropic gene influences a number of characters simultaneously and such genes are called pleiotropic gene.	2
11.	<b>Asymmetric cuts:</b> Some enzymes cut in a way producing protruding and recessed ends known as <b>sticky</b> or <b>cohesive end</b> . Such cut are called staggered or asymmetric cuts	2
12.	<b>Ever green forests:</b> <b>Evergreen forests</b> – Found where heavy rainfall occurs throughout the year.	2
13.	<b>How can we protect the cells or tissues from stress of freezing temperature in cryopreservation technique:</b> Protective agents like dimethyl sulphoxide, glycerol or sucrose are added before cryopreservation process. These protective agents are called cryoprotectants, since they protect the cells, or tissues from the stress of freezing temperature.	2

14.	<p><b>Any four ecologically important days :</b>          March 21 - World forest day          April 22 - Earth day          May 22 - World bio diversity day          June 05 - World environment day          July 07 - Van Mohostav day          September 16 - International Ozone day</p>	2
<p><b>Section - C</b>  <b>III. Answer any 3 questions:(Question No. 19 is Compulsory)</b></p>		3x3=9
15.	<p><b>T.s of mature anther:</b></p> 	<p>diagram-2</p> <p>parts- 1</p>
16.	<p><b>Types of crossing over:</b></p> <p>Depending upon the number of chiasmata formed crossing over may be classified into three types.</p> <ol style="list-style-type: none"> <li><b>1. Single cross over:</b> Formation of single chiasma and involves only two chromatids out of four.</li> <li><b>2. Double cross over:</b> Formation of two chiasmata and involves two or three or all four strands</li> <li><b>3. Multiple cross over:</b> Formation of more than two chiasmata and crossing over frequency is extremely low.</li> </ol>	<p>1</p> <p>2</p>
17.	<p><b>Materials used to grow microorganism like spirulina:</b>  <i>Spirulina</i> can be grown easily on materials like waste water from potato processing plants (containing starch), straw, molasses, animal manure and even sewage,</p>	3
18.	<p><b>Thermal stratification:</b>          It is usually found in aquatic habitat. The change in the temperature profile with increasing depth in a water body is called <b>thermal stratification</b>.</p> <ol style="list-style-type: none"> <li><b>1. Epilimniotn</b> - The upper layer of warmer water.</li> <li><b>2. Metalimnion</b> - The middle layer with a zone of gradual decrease in temperature.</li> <li><b>3. Hypolimnion</b> - The bottom layer of colder water</li> </ol> 	<p>2</p> <p>1</p>

19. **Three parts of patent:**  
 A patent consists of three parts: the grant, specifications and claims.  
 • **The grant** is filled at the patent office which is not published. It is a signed document, actually the agreement that grants patent right to the inventor.  
 • **The specification** and claims are published as a single document which is made public from the patent office. The specification part is narrative in which the subject matter of invention is described as how the invention was carried out.  
 • **The claim** specifically defines the scope of the invention to be protected by the patent which the others may not practice.  
**General steps in patenting:**



2

1

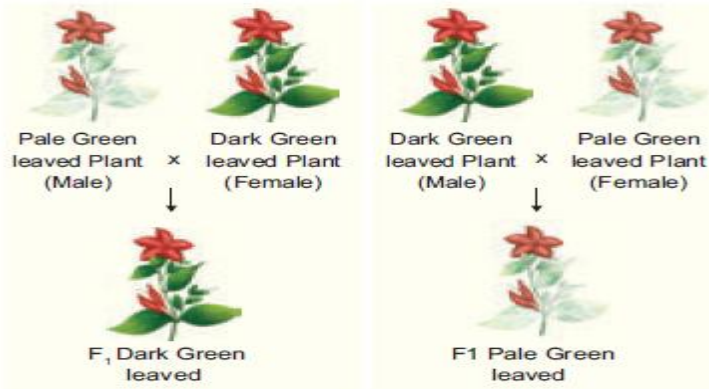
**SECTION -D**

**2x5=10**

**IV. Answer the following questions**

20. **Inheritance of chloroplast gene with an example:**  
 It is found in 4 O' Clock plant (*Mirabilis jalapa*). In this, there are two types of variegated leaves namely dark green leaved plants and pale green leaved plants. When the pollen of dark green leaved plant (male) is transferred to the stigma of pale green leaved plant (female) and pollen of pale green leaved plant is transferred to the stigma of dark green leaved plant, the F1 generation of both the crosses must be identical as per Mendelian inheritance. But in the reciprocal cross the F1 plant differs from each other. In each cross, the F1 plant reveals the character of the plant which is used as female plant.

4



1

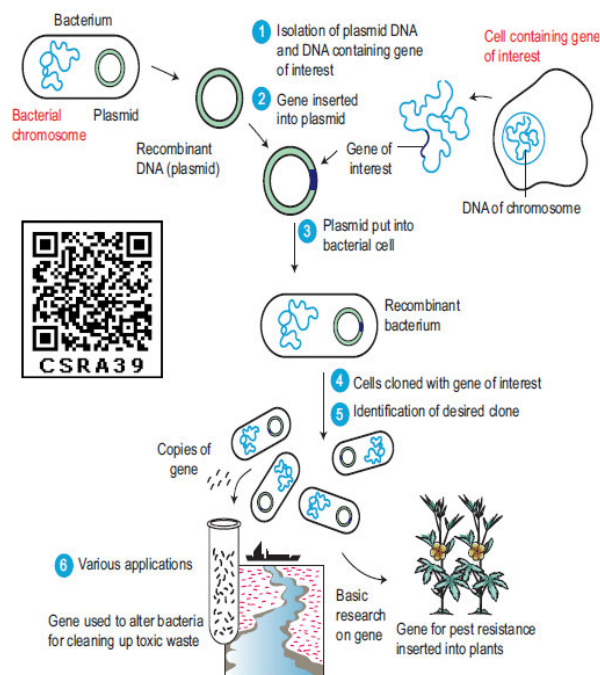
(OR)

**steps involved in recombinant DNA technology with diagram:**

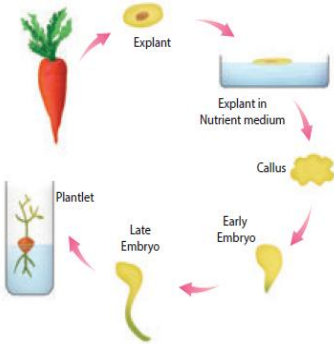
**The steps involved in recombinant DNA technology are:**

- Isolation of a DNA fragment containing a gene of interest that needs to be cloned. This is called an **insert**.
- Generation of recombinant DNA (rDNA) molecule by insertion of the DNA fragment into a carrier molecule called a **vector** that can self-replicate within the host cell.
- Selection of the transformed host cells that is carrying the rDNA and allowing them to multiply thereby multiplying the rDNA molecule  
The entire process thus generates either a large amount of rDNA or a large amount of protein expressed by the insert.
- Wherever vectors are not involved the desired gene is multiplied by PCR technique. The multiple copies are injected into the host cell protoplast or it is shot into the host cell protoplast by shot gun method.

3



2

21	<p><b>Concept involved in plant tissue culture:</b> Basic concepts of plant tissue culture are totipotency, differentiation, dedifferentiation and redifferentiation.</p> <p><b>Totipotency</b> The property of live plant cells that they have the genetic potential when cultured in nutrient medium to give rise to a complete individual plant.</p> <p><b>Differentiation</b> The process of biochemical and structural changes by which cells become specialized in form and function</p> <p><b>Redifferentiation</b> The further differentiation of already differentiated cell into another type of cell. For example, when the component cells of callus have the ability to form a whole plant in a nutrient medium, the phenomenon is called redifferentiation.</p> <p><b>Dedifferentiation</b> The phenomenon of the reversion of mature cells to the meristematic state leading to the formation of callus is called dedifferentiation. These two phenomena of redifferentiation and dedifferentiation are the inherent capacities of living plant cells or tissue. This is described as totipotency</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
		
(OR)		
	<p><b>i) Green algae are not likely to be found in the deepest strata the ocean. Give at least one reason:</b></p> <ul style="list-style-type: none"> <li>• Green algae not likely to be found in the deepest strata of the ocean because deep inside the sea presence of sufficient light for photosynthesis and brackish water are not available.</li> <li>• So green algae are not present at this level.</li> <li>• Instead algae inhabits littoral zone of water.</li> </ul> <p><b>ii) What is vivipary? Name a plant group which exhibits vivipary.</b></p> <ul style="list-style-type: none"> <li>• If seeds or embryos begin to develop before they detach from the parent. The Phenomenon is described as vivipary.</li> <li>• Seeds germinate in the fruits of mother plant itself. Halophytes exhibit vivipary</li> </ul>	<p>2</p> <p>2</p> <p>1</p>

**DEPARTMENT OF BOTANY**  
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