

A.P. SET CODE

B

MT - X

Seat No.

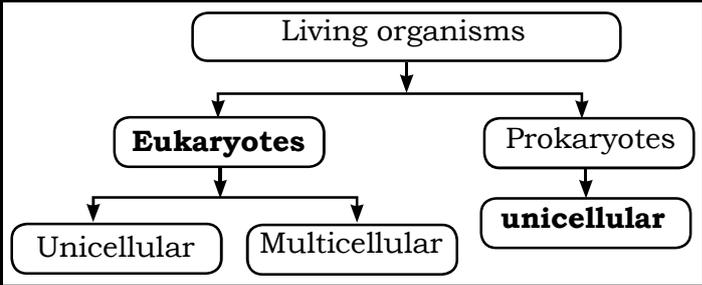
2018 ___ ___ 1100 - MT - x - SCIENCE & TECHNOLOGY - II (72) - PRELIM - I : Set - B

Time : 2 Hours

Preliminary Model Answer Paper

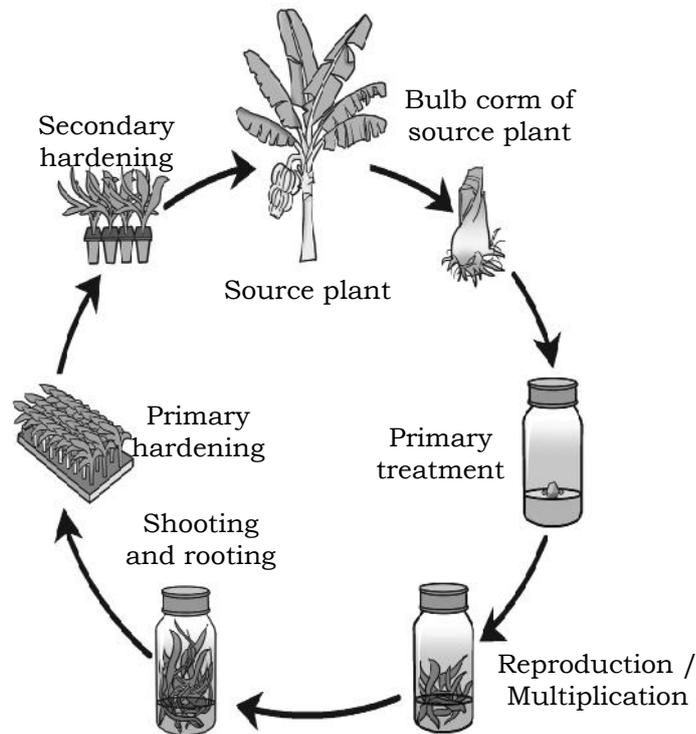
Max. Marks : 40

A.1.	(A) Solve the following questions :	1						
(1)	Match the columns :							
	<table border="1"><thead><tr><th data-bbox="308 790 632 831">Column A</th><th data-bbox="632 790 1002 831">Column B</th></tr></thead><tbody><tr><td data-bbox="308 831 632 871">(1) Xylitol</td><td data-bbox="632 831 1002 871">(b) To impart sweetness</td></tr><tr><td data-bbox="308 871 632 918">(2) Citric acid</td><td data-bbox="632 871 1002 918">(d) To impart acidity</td></tr></tbody></table>	Column A	Column B	(1) Xylitol	(b) To impart sweetness	(2) Citric acid	(d) To impart acidity	
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(2) Citric acid	(d) To impart acidity							
(2)	Thallophyta plants have soft and fibre like body.	1						
(3)	Monozygotic twins and dizygotic twins.	1						
(4)	False - Gene from <i>Bacillus thuringiensis</i> is introduced into cotton and brinjal.	1						
(5)	Phenol oxidising bacteria : sewage : : Hydrocarbonoclastic bacteria : Oil spills.	1						
A.1.	(B) Choose the correct alternative and rewrite the sentences :							
(1)	(c) Anaphase	1						
(2)	(d) Starfish	1						
(3)	(b) Lily	1						
(4)	(b) Acetic acid	1						
(5)	(b) Nitrogen fixation	1						
A.2.	Solve the following questions :							
(1)	Complete the following conceptual picture :	2						

(2)	<p>Mitosis and Meiosis :</p> <table border="1"> <thead> <tr> <th data-bbox="308 376 790 427">Mitosis</th> <th data-bbox="790 376 1295 427">Meiosis</th> </tr> </thead> <tbody> <tr> <td data-bbox="308 427 790 510">(i) The cell divides only once.</td> <td data-bbox="790 427 1295 510">(i) There are two cell divisions, Meiosis I and Meiosis II.</td> </tr> <tr> <td data-bbox="308 510 790 633">(ii) Mitosis takes place in the somatic cells and stem cells.</td> <td data-bbox="790 510 1295 633">(ii) Meiosis takes place in the germ cells.</td> </tr> <tr> <td data-bbox="308 633 790 757">(iii) Occurs in both sexually as well as asexually reproducing organisms.</td> <td data-bbox="790 633 1295 757">(iii) Occurs only in sexually reproducing organisms.</td> </tr> <tr> <td data-bbox="308 757 790 884">(iv) Chromosome number remains constant at the end of mitosis.</td> <td data-bbox="790 757 1295 884">(iv) Chromosomal number is reduced from diploid to haploid, at the end of meiosis.</td> </tr> </tbody> </table>	Mitosis	Meiosis	(i) The cell divides only once.	(i) There are two cell divisions, Meiosis I and Meiosis II.	(ii) Mitosis takes place in the somatic cells and stem cells.	(ii) Meiosis takes place in the germ cells.	(iii) Occurs in both sexually as well as asexually reproducing organisms.	(iii) Occurs only in sexually reproducing organisms.	(iv) Chromosome number remains constant at the end of mitosis.	(iv) Chromosomal number is reduced from diploid to haploid, at the end of meiosis.	2
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(3)	<p>Complete the following flow chart:</p>  <pre> graph TD A[Living organisms] --> B[Eukaryotes] A --> C[Prokaryotes] B --> D[Unicellular] B --> E[Multicellular] C --> F[unicellular] </pre>	2										
(4)	<p>(i) The organ labelled 'X' is appendix. It is a vestigial organ. (ii) Tail bone (coccyx) wisdom teeth, body hair, muscles of ear pinna.</p>	2										
(5)	<p>Glycolysis and TCA cycle :</p> <table border="1"> <thead> <tr> <th data-bbox="308 1429 790 1480">Glycolysis</th> <th data-bbox="790 1429 1295 1480">TCA cycle</th> </tr> </thead> <tbody> <tr> <td data-bbox="308 1480 790 1570">(i) Glycolysis occurs in the cytoplasm</td> <td data-bbox="790 1480 1295 1570">(i) TCA cycle occurs in the mitochondria</td> </tr> <tr> <td data-bbox="308 1570 790 1693">(ii) Two molecules each of pyruvic acid, ATP, NADH₂ and water are formed</td> <td data-bbox="790 1570 1295 1693">(ii) Molecules of CO₂, H₂O, NADH₂ and FADH₂ are formed.</td> </tr> <tr> <td data-bbox="308 1693 790 1780">(iii) It is also called as EMP pathway.</td> <td data-bbox="790 1693 1295 1780">(iii) It is also called as Kreb's cycle.</td> </tr> </tbody> </table>	Glycolysis	TCA cycle	(i) Glycolysis occurs in the cytoplasm	(i) TCA cycle occurs in the mitochondria	(ii) Two molecules each of pyruvic acid, ATP, NADH ₂ and water are formed	(ii) Molecules of CO ₂ , H ₂ O, NADH ₂ and FADH ₂ are formed.	(iii) It is also called as EMP pathway.	(iii) It is also called as Kreb's cycle.	2		
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(6)	Complete the flow chart. Complete the chart as per the objectives of first aid.	2
<pre> graph TD A[Objectives of First Aid] --> B[Remove the cause which resulted in damage] A --> C[Prevention of death] A --> D[Relieving the pains] A --> E[Cover the wound immediately] A --> F[Breathing should be brought back to normal] A --> G[Preventing deterioration of condition of victim of disaster] G --> H[Saving lives] F --> I[Attempt to improve the condition] </pre>		
(7)	(a) The modules of silicon solar cell connected in series are called strings.	1
	(b) The electric current is proportional to the area but the potential difference is independent of area. \therefore Area of 1 cm^2 can yield 30 mA current \therefore The current obtained from 100 cm^2 area $= 100 \times 30$ $= 3000 \text{ mA}$	1
	The potential difference will remain 0.5V.	
A.3.	Solve the following questions :	
(1)	(i) Dough for bread is formed by mixing of baker's yeast - <i>Saccharomyces cerevisiae</i> , water, salt and other necessary materials with flour. (ii) Due to fermentation of carbohydrates by yeast, sugar is converted into carbon-dioxide (CO_2) and ethanol ($\text{C}_2\text{H}_5\text{OH}$). (iii) Dough rises up due to CO_2 and the bread becomes spongy.	3
(2)	A group of cells having the same origin, same structure and same function is called tissue. Concept of tissue culture: (i) <i>Ex vivo</i> growth of cells or tissues in an aseptic and nutrient-rich medium is called tissue culture. (ii) Nowadays, a complete organism can be developed from a single cell or from tissue with the help of the tissue culture technique. (iii) A liquid, solid or gel-like medium prepared from agar, which supplies nutrients and energy necessary for tissue culture is used in this technique.	3

- (iv) Tissue culture can be used to grow plants on a large scale, which bear flowers, fruits of excellent quality, in shorter durations and are disease free.
- (v) The various processes involved in tissue culture are:



- (3) (i) Various physical problems like tiredness, headache, insomnia, forgetfulness, tinnitus, joint pains and problems in vision may arise due to radiations of cell phone.
- (ii) These radiations penetrate the bones of children more effectively than the bones of adults.
- (iii) Also, a person becomes solitary.
- (iv) Hence, I will make a conscious attempt to not spend more time in internet/mobile phones, games etc. I will cultivate some good hobby or play sports and concentrate on my studies. I will even meditate to get rid of internet addiction.

3

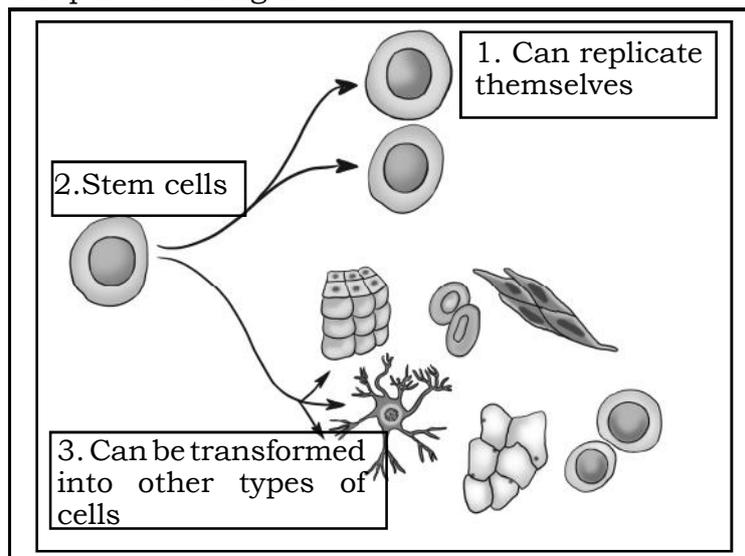
(4) Complete the following table :

Sr. No.	Animal	Organ for locomotion	Phylum/ Class
(1)	Earthworm	Setae	Annelida
(2)	Starfish	Tube feet	Echinodermata
(3)	Paramecium	Cilia	Protozoa

(5) Following are the factors affecting social health:

- (i) Satisfying basic needs of a person. Food, Clothing, Shelter, Medicines.
- (ii) Education.
- (iii) Financial status.
- (iv) Social and physical conditions of the surrounding.
- (v) Social environment of the surrounding.
- (vi) Education and job opportunities.
- (vii) Social safety.
- (viii) Social treatment.
- (ix) Political conditions (views).
- (x) Residential area.
- (xi) Water.
- (xii) Toilets.
- (xiii) Transport facilities.
- (xiv) Gardens.
- (xv) Play grounds.

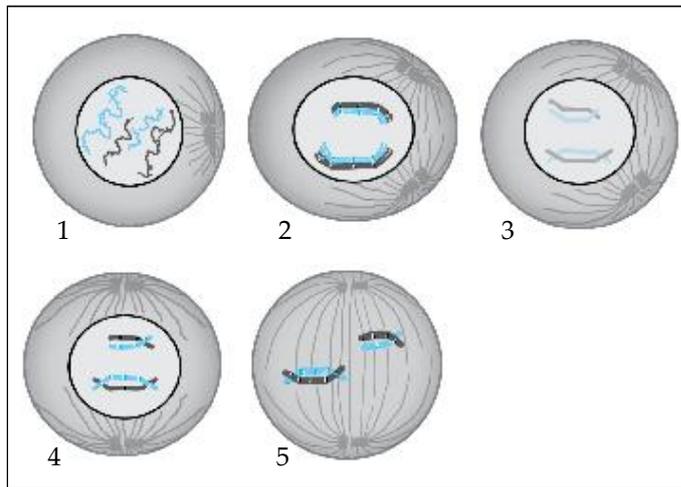
(6) Label and explain the diagram:



	<p>(i) Stem cell therapy.</p> <p>(ii) Stem cells are special cells present in the body of multicellular organisms, formed at the blastocyst stage of embryonic development. These cells give rise to all other types of cells.</p> <p>(iii) Stem cell gives rise to neurons, hepatocytes, (liver cells), Osteocytes (bone cells).</p>	
(7)	<p>(a) Complete the flowchart of hydroelectric power plant.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <pre> graph LR A[Potential energy in water] --> B[Kinetic energy in flowing water] B --> C[Kinetic energy in turbine] C --> D[Electrical energy] </pre> </div>	1
	<p>(b) (i) The back water due to storage of water in dam may submerge villages or towns in that area</p> <p>(ii) This leads to the problems of re-habilitation of the displaced population, Moreover this can also submerge forests as well as fertile land.</p> <p>(iii) The obstruction of the flow of river water may have adverse effects on living world in river.</p>	2
A.4.	<p>Solve the following questions :</p> <p>(1) Numerous species of animals and plants have become endangered due to activities of human beings. Here are the reasons:</p> <p>(i) Animals and plants are the sources of income for some people. Hence, poaching takes place which becomes a big threat to the existence of animal and plant life.</p> <p>(ii) Animal skin, flesh and bones are used for various purposes and thus they are killed.</p> <p>(iii) Wood, medicinal plants, gums, resins are the plant products which are useful, hence plants are brutally cut.</p> <p>(iv) Animals and plants have demand abroad for research and for medicines. Due to this, hunting takes place which resulted in making certain varieties endangered.</p> <p>(v) Because of all these reasons, certain animals and plants became endangered.</p> <p>(vi) We can save the remaining animal and plant life by so many ways. Environmental education, awareness programs, strict rules and regulations, implementing various environmental acts, and prohibiting poaching can prevent the loss of varieties of plants and animals.</p>	5

- (2) Prophase I is the most important stage of meiosis and differs considerably from the prophase of mitosis. It is divided into 5 stages leptotene, zygotene, pachytene, diplotene and diakinesis. It involves essentially the crossing over and recombination of genetic material between non sister chromatids.

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Phase - I - Leptotene : In this stage already replicated chromatin network condenses and start converting into long thin thread like chromosomes.

Phase - II - Zygotene : It this stage homologous chromosomes come closer to each other. This pairing is called 'Synapsis'.

Phase - III - Pachytene : Sister chromatids become visible in this stage. Crossing over occurs between non-sister chromatids of the homologous chromosomes. The crossing over is called as 'Chiasma or Chiasmata' and this leads to genetic recombination causing variations.

Phase - IV - Diplotene : In this stage, recombined sister chromatids start repelling. Nucleolus and nuclear membrane start disappearing.

Phase - V - Diakinesis : Chromosomes further condense and shorten. Nucleolus and nuclear membrane completely disappear, spindle fibres begin to appear.

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