

A.P. SET CODE

D

MT - Z

Seat No.

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

Time : 2 Hours

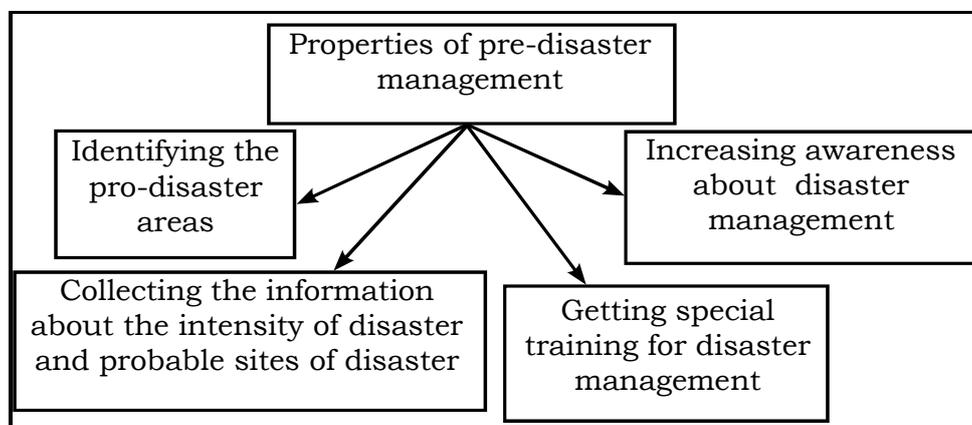
Preliminary Model Answer Paper

Max. Marks : 40

A.1.	(A) Solve the following questions :	
(1)	Male : 44 + XY :: Female : XX .	1
(2)	(i) Implantation of embryo occurs in uterus . (ii) Process of coagulation of milk proteins occurs due to lactic acid.	1 1
(3)	Cholera : Others are air borne diseases whereas cholera is a water borne disease.	1
(4)	Interferon : Viral infection : Erythropoietin: Anemia.	1
A.1.	(B) Choose the correct alternative and rewrite the sentences :	
(1)	(c) Ethanol	1
(2)	(c) Starfish	1
(3)	(b) Metaphase	1
(4)	(d) Deer	1
(5)	(d) 200 MeV	1
A.2.	Solve the following questions :	
(1)	Evolution :	2
(i)	Evolution is a gradual change occurring in living organisms over a long duration.	
(ii)	This is a very slow-going process through which development of organisms is achieved.	
(iii)	All the stages in changes occurred in various components ranging from stars and planets in space to the biosphere present on the earth should be included in the study of evolution.	
(iv)	Formation of new species due to changes in specific characters of several generations of living organisms as a response to natural selection is called as evolution.	
(v)	Different theories about origin and evolution of life have been proposed till today of which theory of gradual development of living organisms is accepted.	
(vi)	According to this theory, first living material (Protoplasm) has been formed in the ocean. In due course of time, unicellular organism was formed.	

- (vii) Gradual changes took place in unicellular organisms from which larger and more complex organisms were formed. Duration of all these changes is about 300 crore years.
- (viii) Changes and development in living organisms has been all round and multi-dimensional and this led to evolution of different types of organisms.
Hence, this overall process is called as evolution which is organizational.
- (ix) Progressive development of plants and animals from the ancestors having different structural and functional organization is called evolution.

(2)



2

(3)

- (i) Microbial enzymes are active at low temperature, pH and pressure, due to which energy is saved and erosion - proof instruments are also not necessary.
- (ii) Enzymes carry out specific processes, hence unnecessary by-products are not formed due which expenses on purification are minimised.
- (iii) Elimination and decomposition of waste materials is avoided and enzymes can be reused. Such enzymes are eco-friendly.
- (iv) Therefore microbial enzymes are used instead of chemical catalysts in chemical industry.

2

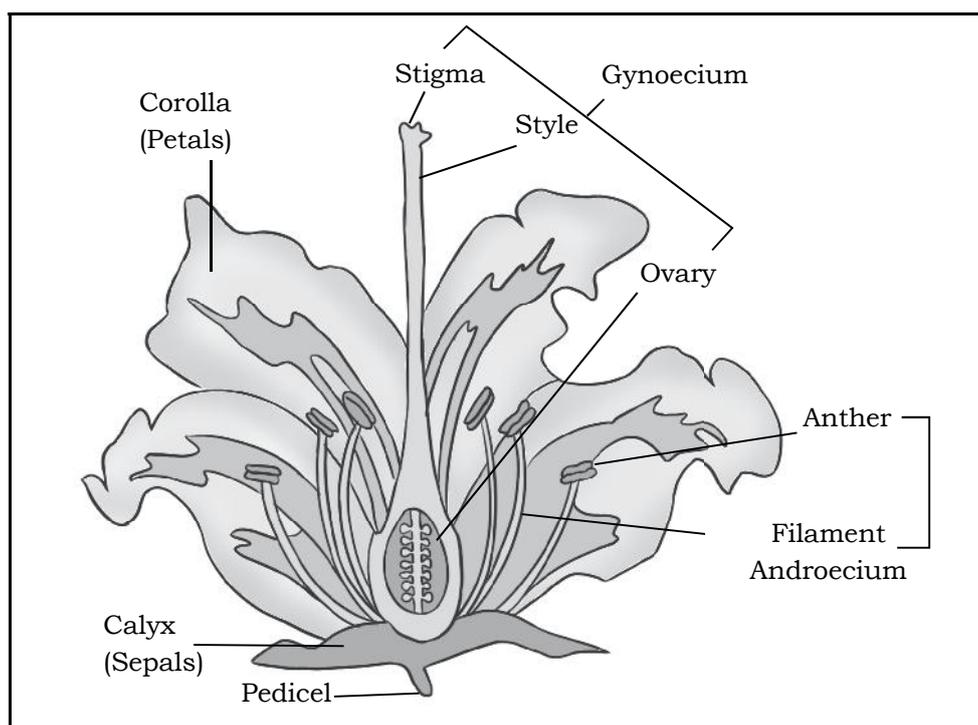
(4) Complete the chart :

2

Sr. No.	Source	Microbe	Use
1.	Sugar molasses	Brevibacterium, Corynebacterium	Production of monosodium glutamate
2.	Sugar molasses and salt	Aspergillus niger	Drinks, toffees, chocolate production
3.	Glucose and corn steep liquor	Aspergillus niger	Production of minerals used as supplement for calcium and iron
4.	Molasses and corn steep liquor	Lactobacillus delbrueckii	Production of vitamins, Source of nitrogen

(5)

2

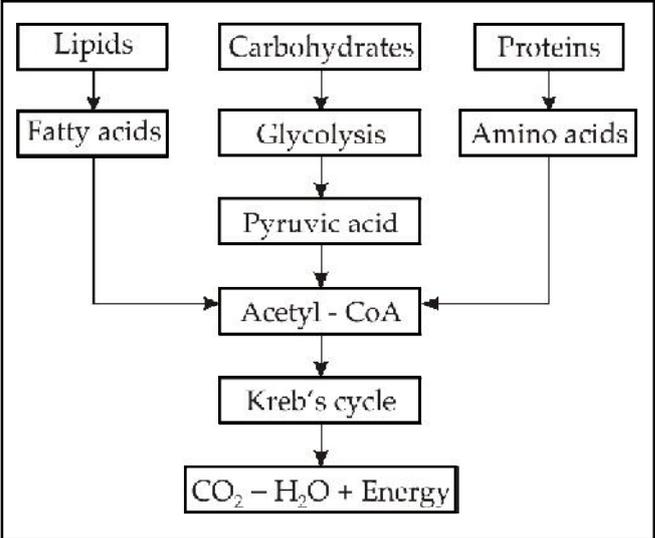


(6) Edible vaccines :

2

- (i) Work on production of edible vaccines is in progress and presently, potatoes are being produced with the help of biotechnology.
- (ii) These potatoes are called as transgenic potatoes.
- (iii) These potatoes will act against bacteria like *Vibrio cholerae*, *Escherichia coli*.

	(iv) Consumption of these raw potatoes generates immunity against cholera and the diseases due to E-coli.	
(7)	DNA has three types of chemical components: (1) phosphate (2) a sugar called deoxyribose (3) four nitrogenous bases-adenine, guanine, cytosine and thymine.	2
A.3.	Solve the following questions :	
(1)	Following problems are faced by common man due to incidence of cyber crime: (i) Consumers are deceived by showing superior items on websites but actually selling items of either inferior quality or impaired ones. (ii) Bank transactions are done using PIN without the knowledge of consumers causing financial loss. (iii) Confidential information about government institutes and companies is obtained from the internet with the help of computer programs or other ideas and misused. This is called as hacking of information. (iv) Crimes like opening a fake account on Facebook and displaying false information and thereby teasing the girls or exploiting them financially. (v) Piracy of written literature, software, photos, videos, music etc. (vi) Electronic media is also misused by sending derogatory messages, spreading vulgar pictures and inflammatory statements. (vii) Our personal information and phone numbers are spread through email, Facebook and whatsapp and reaches unwanted persons. This leads to malpractices like incoming of unnecessary messages. Some of such messages either impair or shut down mobiles and computers.	3
(2)	Usefulness of biotechnology: (i) Biotechnology has worked for human welfare. (ii) There is considerable progress in the field of agriculture, pharmacy, plant as well as animal life. (iii) Scientist have modified plants, animals, human beings using various techniques of biotechnology. (iv) Biotechnology has modified shape, size, taste, seed/seedless fruits and vegetables. (v) Reliable, rapid and consistent enzymes have been created which play a major role in food processing. (vi) A number of dairy products are made available to us. (vii) A number of human and animal diseases have found cure and prevention.	3

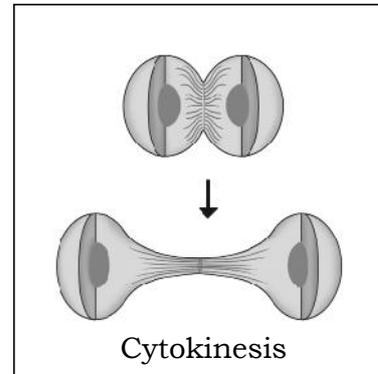
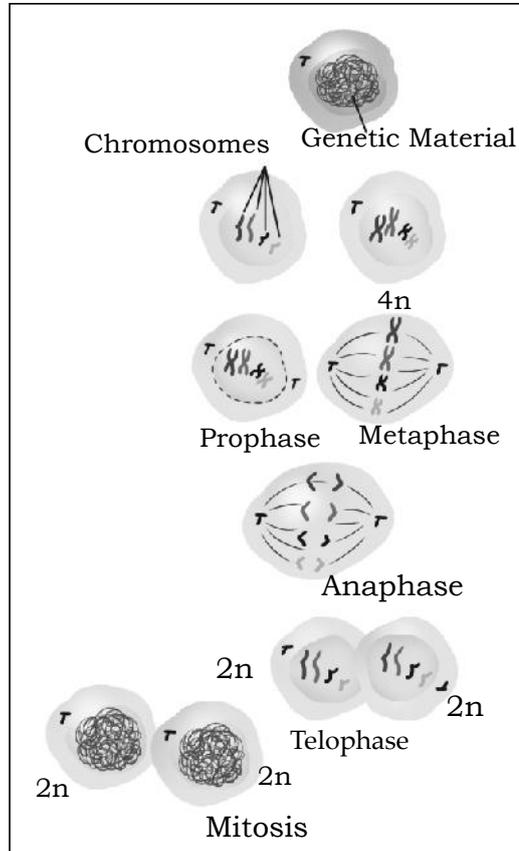
	<p>(viii) Biotechnology has modified plants to have their own pest resistant traits.</p> <p>(ix) Diagnostic kits are available for various diseases.</p> <p>Harmful effects of Biotechnology are as follows.</p> <p>(i) High cost of genetic engineering apparatus.</p> <p>(ii) Crosses between different species gives rise to hazardous organisms.</p> <p>(iii) During experimentation when more Transgenic potatoes are grown, it can be life threatening</p> <p>(iv) Thus biotechnology should be balanced.</p>	
(3)	<p>(i) Length of epididymis is about 6 meters.</p> <p>(ii) Length of a sperm is about 60 micrometers.</p> <p>(iii) Sperm contains fructose to give energy to sperm.</p>	3
(4)	<p>(a) This sign is used for indicating that 'this object can be reused and recycled'. We can collect and give it to rag pickers.</p> <p>(b) This sign is used to indicate 'Save Water'. We must close the taps which are left open, not to waste water.</p> <p>(c) This sign indicates 'Solar Panel'. We can save energy by using solar energy.</p>	3
(5)	 <pre> graph TD Lipids --> Fatty_acids Carbohydrates --> Glycolysis Proteins --> Amino_acids Fatty_acids --> Acetyl_CoA Glycolysis --> Pyruvic_acid Pyruvic_acid --> Acetyl_CoA Amino_acids --> Acetyl_CoA Acetyl_CoA --> Krebs_cycle Krebs_cycle --> CO2_H2O_Energy </pre>	3
(6)	<p>(i) Remnants and impressions of organisms which get buried remain preserved underground. These are called as fossils. Study of fossils is an important aspect of study of evolution.</p> <p>(ii) Carbon consumption of animals and plants stops after death and</p>	3

	<p>since then, only the decaying process of C-14 occurs continuously.</p> <p>(iii) In case of dead bodies of plants and animals, instead of remaining constant, the ratio between C-14 and C-12 changes continuously as C-12 is non-radioactive.</p> <p>(iv) The time passed since the death of a plant or animal can be calculated by measuring the radioactivity of C-14 and the ratio of C-14 to C-12 present in their body.</p> <p>(v) This is carbon dating method. It is used in determining the age of human fossils and manuscripts.</p> <p>(vi) Once the age of fossil has been determined, it becomes easy to deduce information about other erstwhile organisms. It seems that vertebrates have been slowly originated from invertebrates.</p> <p>(7) (i) Conventional and Non-conventional sources of energy</p> <table border="1"> <thead> <tr> <th>Conventional energy sources</th> <th>Non-conventional energy sources</th> </tr> </thead> <tbody> <tr> <td>(1) Conventional energy sources are exhaustible.</td> <td>(1) Non-conventional sources of energy are inexhaustible</td> </tr> <tr> <td>(2) Conventional sources of energy cause pollution.</td> <td>(2) Non - conventional sources of energy are pollution free.</td> </tr> <tr> <td>(3) Conventional sources are used extensively by us.</td> <td>(3) Non-conventional sources of energy are not used as extensively as conventional.</td> </tr> <tr> <td>(4) These sources require thousands of years to form.</td> <td>(4) They are abundantly available in nature.</td> </tr> <tr> <td>(5) Examples: Coal, Crude oil, Natural gas are the conventional sources</td> <td>(5) Examples: Solar energy, wind energy, Bio-gas etc.</td> </tr> </tbody> </table> <p>(ii) Wind energy is a non-conventional source of energy as it is abundantly available in nature and pollution free.</p>	Conventional energy sources	Non-conventional energy sources	(1) Conventional energy sources are exhaustible.	(1) Non-conventional sources of energy are inexhaustible	(2) Conventional sources of energy cause pollution.	(2) Non - conventional sources of energy are pollution free.	(3) Conventional sources are used extensively by us.	(3) Non-conventional sources of energy are not used as extensively as conventional.	(4) These sources require thousands of years to form.	(4) They are abundantly available in nature.	(5) Examples: Coal, Crude oil, Natural gas are the conventional sources	(5) Examples: Solar energy, wind energy, Bio-gas etc.	<p style="text-align: center;">2</p> <p style="text-align: center;">1</p>
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A.4. Solve the following questions :

(1)

5



- (i) Somatic cells and stem cells divide by mitosis.
- (ii) Mitosis is completed through two main steps,
 - (a) Karyokinesis (nuclear division)
 - (b) Cytokinesis (cytoplasmic division)
- (iii) Karyokinesis is completed through 4 steps.
 - (a) Prophase : (1) Condensation of basically thin thread - like chromosomes starts.
 - (2) Due to this, they become short and thick and they start to appear along with the pairs of sister chromatids.
 - (3) Centrioles duplicate and each centriole moves to opposite poles of the cell.
 - (4) Nuclear membrane and nucleolus start to disappear.
 - (b) Metaphase :
 - (1) Nuclear membrane completely disappears. Chromosomes complete their condensation and become clearly visible.
 - (2) All chromosomes are arranged parallel to equatorial plane (central plane) of the cell.

	<p>(3) Special type of flexible protein fibres (spindle fibres) are formed between centrioles and centromere of each chromosome.</p> <p>(c) Anaphase : (1) Centromeres split and thereby sister chromatids of each chromosome separate and they are pulled apart in opposite directions with the help of spindle fibres.</p> <p>(2) Separated sister chromatids are called daughter chromosomes.</p> <p>(3) In this way, each set of chromosomes reach at two opposite poles of the cell.</p> <p>(d) Telophase :</p> <p>(1) The chromosomes which have reached at opposite poles of the cell now start to decondense due to which they again become thread like thin and invisible.</p> <p>(2) Nuclear membrane is formed around each set of chromosomes reached at poles.</p> <p>(3) Thus two daughter nuclei are formed in a cell.</p> <p>(4) Nucleolus also appears in each daughter nucleus. Spindle fibres completely disappear.</p> <p>(iv) In this way, karyokinesis completes and cytokinesis begin.</p> <p>(v) Cytokinesis : The cytoplasm divides by cytokinesis and two new cells are formed which are called as daughter cells. In this process, a notch is formed at the equatorial plane of the cell which deepens gradually and thereby two new cells are formed.</p> <p>(vi) However, in case of plant cells, instead of the notch, a cell plate is formed exactly along the midline of the cell and thus cytokinesis is completed.</p> <p>(2) (i) Photosynthesis (ii) Biomass is organic matter used to produce fuel. (iii) Enzymes. (iv) Ethanol. (v) Solid fuel, Liquid fuel, Gaseous fuel.</p> <p style="text-align: center;">} , , , }</p>	5
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