

Time : 2 Hours

Max. Marks : 40

Note :-

- I. All questions are compulsory
- II. Use of calculators is not allowed.
- III. The number to the right of the questions indicates full marks.
- IV. In case of MCQs (Q. No. 1(A)) only the first attempt will be evaluated and will be given credit.
- V. For every MCQs the correct alternatives (A), (B), (C) or (D) with subquestion number is to be written as an answer.
For Eg. : (i) (A), (i) (B), (i) (C)
- VI. Scientifically correct, labelled diagrams should be drawn wherever necessary.

1. (A) Write the correct alternative :

- (i) Vestigial organ _____ present in the human body is proof of evolution.
- (A) Human hand
(B) **Appendix**
(C) Ear muscles
(D) Tail-bone

Answer: Option (B) : **Appendix**

Appendix, which is useless or non functional in humans, is a useful and fully functional organ in ruminants.

- (ii) Type of sexual reproduction is _____.
- (A) Fragmentation
(B) Regeneration
(C) **Gamete formation**
(D) Budding

Answer: Option (C) : **Gamete formation**

Sexual reproduction always occurs with the help of two germ cells. Female gamete and male gametes are those two germ cells.

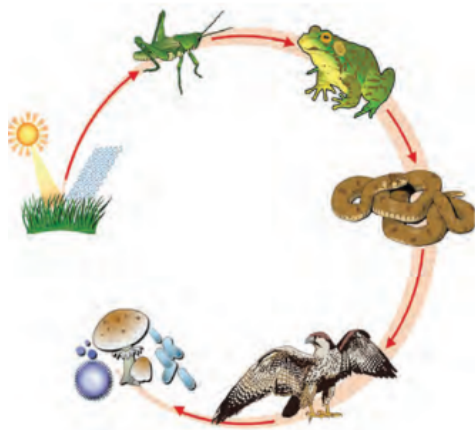
Gametes are formed by the meiosis. In meiosis, chromosome number is reduced to half; hence haploid gametes are formed.

(iii) The apex consumer is _____.

- (A) **Eagle**
- (B) Frog
- (C) Snake
- (D) Grasshopper

Answer: Option (A) : Eagle

The apex consumer is Eagle as it is the top consumer.



(iv) The Hydroelectric capacity of Koyna dam is _____.

- (A) 2400 MW
- (B) **1960 MW**
- (C) 1900 MW
- (D) 1961 MW

Answer: Option (B) : 1960 MW

The Hydroelectric capacity of Koyna dam is 1960 MW

(v) Animal with bilateral symmetry in _____.

- (A) Star fish
- (B) **Human**
- (C) Paramoecium
- (D) Amoeba

Answer: Option (B) : Human

Bilateral symmetry: In this type of body, there is only one such imaginary axis of body through which we can get two equal halves.

(B) Answer the following questions as per the given instructions :

(i) State whether the following statement is true or false :

To take a selfie on the road is an invitation for an accident.

Answer: True

(ii) Write the correct co-relation :

Insulin: diabetes :: Interferon :

Answer: Viral infection

(iii) To which class does bat belong?

Answer: Mammalia

(iv) Match the correct pair:

Column 'A'

(1) Forest Conservation Act

Column 'B'

(a) 1986

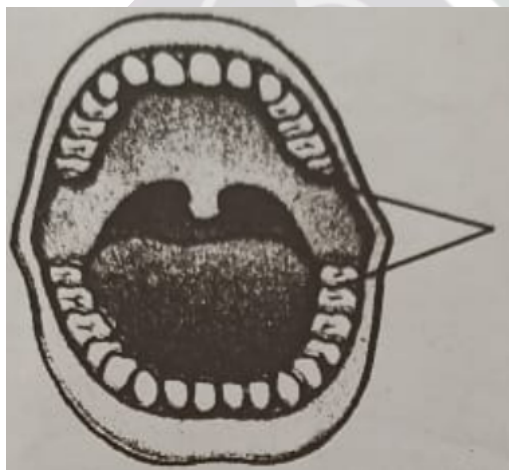
(b) 1980

(c) 1970

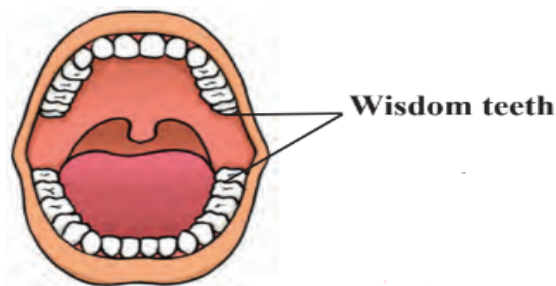
Answer: 1980

(v) Write the name of indicated part in diagram:

Human jaw



Answer: Wisdom Teeth



2. (A) Give scientific reasons (any two):

(i) Sometimes higher plants and animals too perform anaerobic respiration.

Answer : Seeds perform anaerobic respiration if the soil is submerged under water during germination. Similarly, our muscle cells also perform anaerobic respiration while performing the exercise. Due to this, less amount of energy is produced in our body and lactic acid accumulates due to which we feel tired.

(ii) It is absolutely necessary to control the fission reaction in nuclear power plants.

Answer : Uncontrolled fission reactions may lead to the emission of harmful radiations. It can also lead to the meltdown of the nuclear power plant. Thus, it is necessary to control the fission reaction in nuclear power plants.

(iii) Flower is the structural unit of sexual reproduction in plants.

Answer : Flower is the structural unit of sexual reproduction in plants. It consists of four floral whorls as calyx, corolla, androecium and gynoecium; arranged in sequence from outside to inside. Androecium and gynoecium are called 'essential whorls' because they perform the function of reproduction.

(B) Answer the following questions (Any three)

(i) Write a short note on Environmental Conservation.

Answer: Purpose of this act is to control the pollution and punish the persons or institutes harming the environment. Any person or factory is prohibited by this act from releasing the pollutants in atmosphere beyond a permissible limit. The person breaching this rule is entitled for

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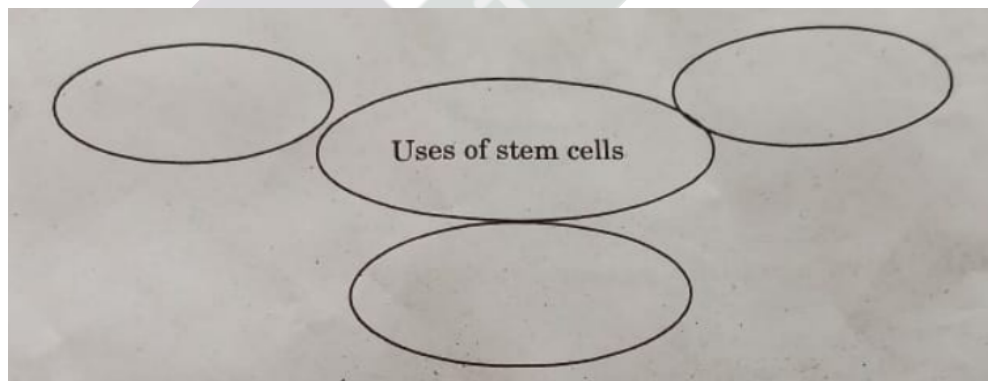
either five year imprisonment or fine up to Rs. 1 lakh. The National Green Tribunal was established in 2010 for effective implementation of environment related laws.

(ii) Distinguish between Chordates and Non-chordates.

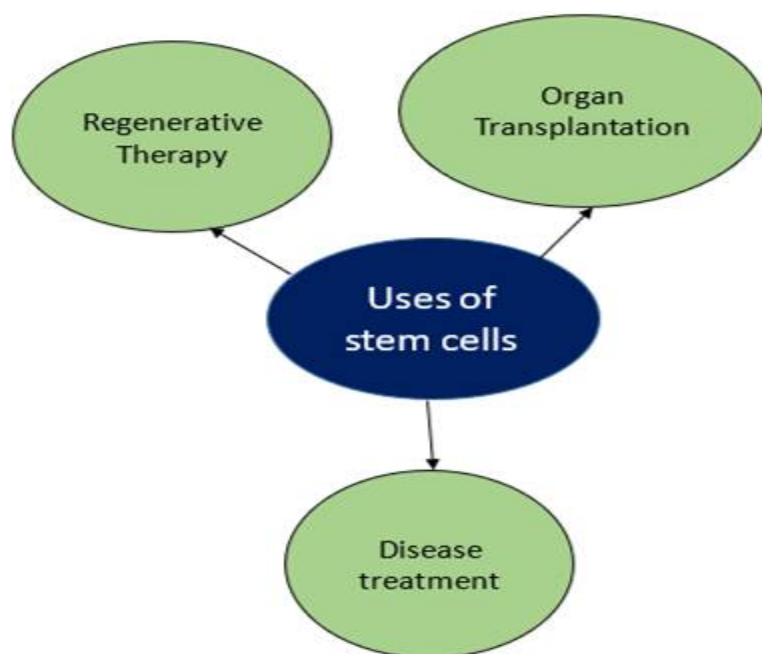
Answer:

Non-Chordates	Chordates
1. Body is not supported by a rod-like notochord.	1. Body is supported by a notochord.
2. Pharyngeal gill-slits are absent.	2. Pharyngeal gill-slits or lungs are present for respiration.
3. Nerve cord; if present, it is on the ventral side. It is solid & paired.	3. Nerve cord is present on the dorsal side of the body. It is hollow.
4. Heart, if present, it is on the dorsal side.	4. Heart is present on the ventral side of the body

(iii) Write the correct answer in blank circles.



Answer:



(iv) Write down any two objectives of disaster management.

Answer : The objectives of disaster management are:

1. Supply of essential commodities.
2. Rehabilitation of disaster victims.
3. Protective measures to reduce the intensity of future disasters.
4. Rescue of victims by the event and disposal of losses suffered.
5. Restoration of human life in the region.

(v) What are the benefits of mixing ethanol with petrol and diesel?

Answer : Whenever ethanol is mixed with petrol and diesel, CO₂ emission from automobiles reduces by 30%. As a result, pollution decreases. Ethanol, when mixed with petrol and diesel, serves as a great cleaning agent for car engines over a long run. It also helps to increase and improve the quantity of fuel.

3. Answer the following questions (any five) :

(i) Darwin's theory of natural selection.

Answer: Darwin says that all the organisms reproduce prolifically. All the organisms compete with each other in a life-threatening manner. In this competition, only those organisms which

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show the modifications are essential for winning the competition. However, besides this, natural selection also plays an important role because nature selects only those organisms which are fit to live and the rest perish. Sustaining and selected organisms can perform reproduction and thereby give rise to the new species with their own specific characters. Darwin's theory of natural selection was widely accepted for a long duration.

However, some objections were raised against the theory. Some of the main objections are-

1. Natural selection is not the only factor responsible for evolution.
2. Darwin did not mention any explanation about useful and useless modifications.
3. There is no explanation about slow changes and abrupt changes.

(ii) Complete the following chart:

Sr. No.	Proteins	Name of the Organs
1.	Melanin, Keratin	_____ Skin _____
2.	_____ Enzymes (trypsinogen, chymotrypsinogen, procarboxypeptidase etc) Hormones (Insulin, Glucagon etc.) _____	Pancreas
3.	Haemoglobin, antibodies	_____ Bone Marrow _____

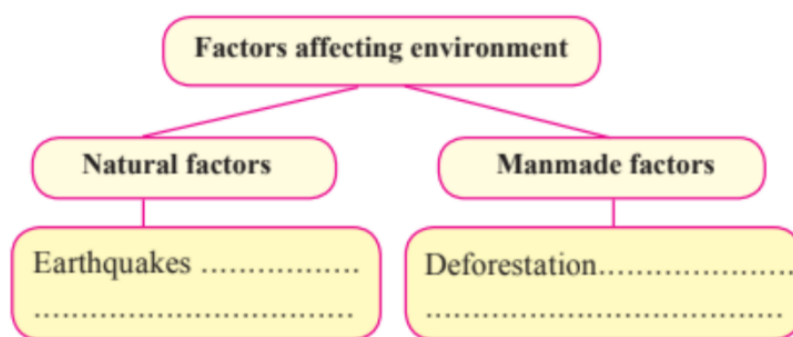
Answer: 1. Skin

2. Enzymes (trypsinogen, chymotrypsinogen, procarboxypeptidase etc) Hormones (Insulin, Glucagon etc.)

3. Bone Marrow

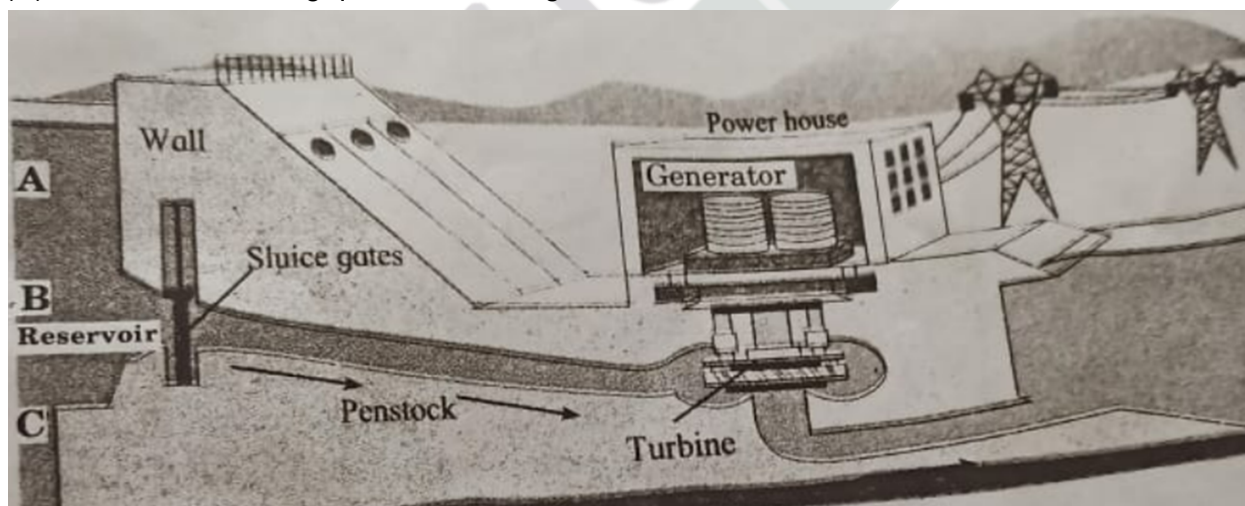
(iii) Write the factors affecting the environment.

Answer: When some natural factors of environment and some artificial polluted factors harm the environment, it creates imbalance between various factors of the environment and ultimately affects the existence of biotic factors.



Environmental pollution is one of those main factors. Generally, contamination of any material is its pollution. Unnecessary and unacceptable change in the surrounding environment due to natural events or human activities is called environmental pollution. i.e. Direct or indirect changes in physical, chemical and biological properties of air, water and soil which will be harmful to human and other living beings is environmental pollution. Various reasons like population explosion, fast industrialization, and indiscriminate use of natural resources, deforestation, and unplanned urbanization are responsible for environmental pollution.

(iv) Answer the following questions from figure:



(a) With reference to point B, potential energy of how much water reservoir in the dam will be converted into kinetic energy?

Answer : When the sluice gate at point B. is opened, potential energy of the stored water level 'A' and 'B' in the dam will be converted into kinetic energy.

(b) What will be the effect on electricity generation, if the channel taking water to the turbine starts at point A ?

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Answer : As height increases , potential energy increases. Thus at point A , potential energy of water will be maximum. If a canal/penstock carrying water from the dam starts at point A, this maximum potential energy will be converted into kinetic energy due to which turbines will rotate with more speed. Thus more electrical energy will be generated.

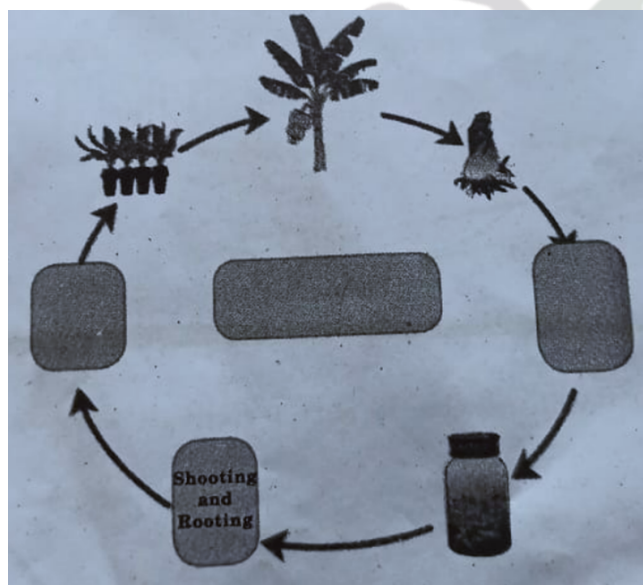
(c) What will be the effect on electricity generation, if the channel taking water to the turbine starts at point C?

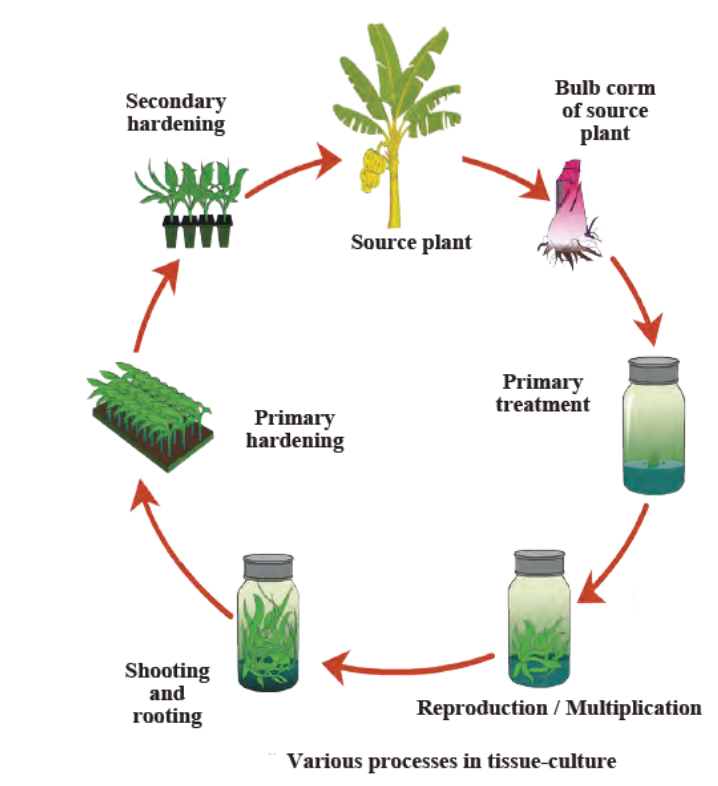
Answer: As height decreases potential energy decreases. Thus at point C, potential energy of water will be minimum. If a canal/penstock carrying water from the dam starts at point C, this minimum potential energy will be converted into kinetic energy due to which turbines will rotate with less speed. Thus less electrical energy will be generated.

(v) Cockroach, Frog, Sparrow, Star fish, from these animals which can regenerate its broken body part?

Answer: Cockroach, Frog, Sparrow, Star fish, from these animals starfish can regenerate its broken body part because In certain situations, star fish can break apart its body parts and regenerate those later on.

(vi) Complete the diagram showing various processes in tissue culture.





(vii) Which fuels are obtained from biomass?

Answer: Fuels that are obtained from biomass are called biofuels and they are an important and renewable source of energy. Biofuels can be in the form of either solid, liquids, or gases.

Solid biofuels- coal, dung, crop residue

Liquid- vegetable oils, alcohol

Gaseous- gobar gas, coal gas

(viii) Complete the following passage by using appropriate words given in brackets:

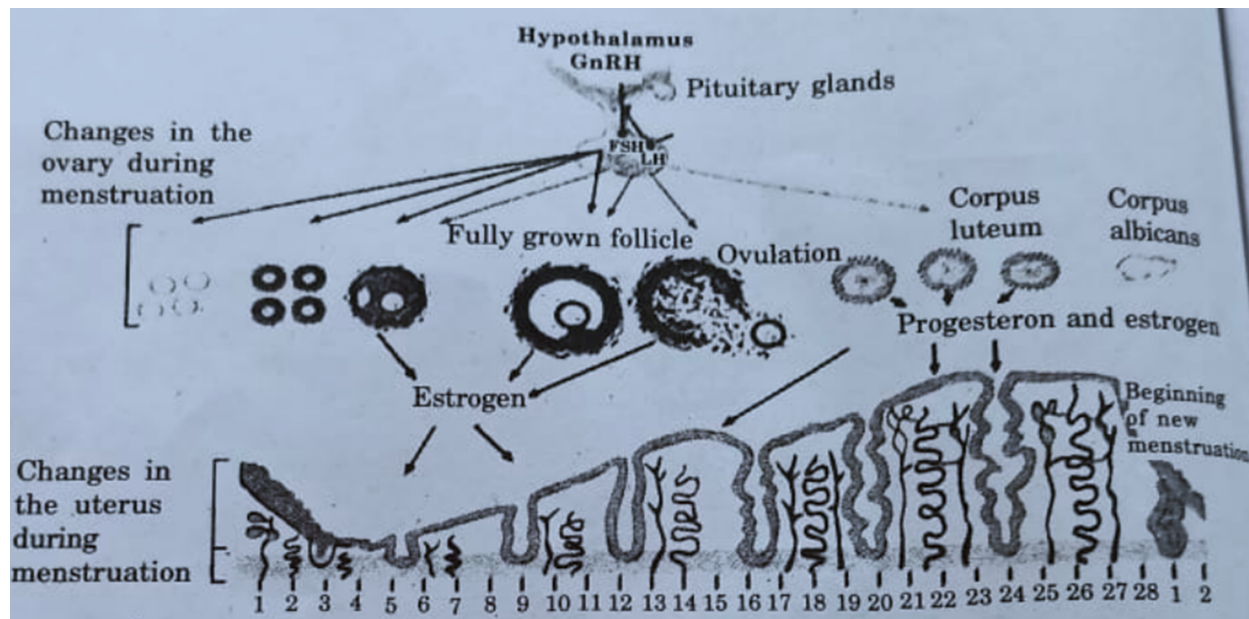
(Delhi, 12, 2005, army, National Disaster, rescue work, State Reserve Police, 2015)

National Disaster Response Force has been established as per the Disaster Management Act, _____ Divisions of this force are working in the army. Overall, _____ divisions are working in the country. Its headquarter is in _____ and it is in action all over the country with the help of _____. In Maharashtra, _____ Response Force is in action through State Reserve Police Force. Personnel of this force have substantial contribution in _____ in disasters like cyclones, cliff-sliding, building collapse, etc.

Answer: National Disaster Response Force has been established as per the Disaster Management Act, **2005**. Divisions of this force are working in the army. Overall, **12** divisions are working in the country. Its headquarter is in **Delhi** and it is in action all over the country with the help of the army. In Maharashtra, **National disaster** Response Force is in action through the State Reserve Police Force. Personnel of this force have substantial contribution in **rescue work** in disasters like cyclones, cliff-sliding, building collapse, etc.

4. Answer any one of the following questions:

(i) Answer the following questions by observing the diagram of menstrual cycle :



(a) What is the period of menstruation ?

Answer : The period of menstruation is from the 1st to 4th day of the menstrual cycle.

(b) On which day does ovulation occur during the menstrual cycle?

Answer : The ovulation occurs during the 14th & 15th day of menstrual cycle.

(c) In the menstrual cycle which reproductive organs undergo changes?

Answer : In the menstrual cycle Ovary & Uterus lining undergo changes.

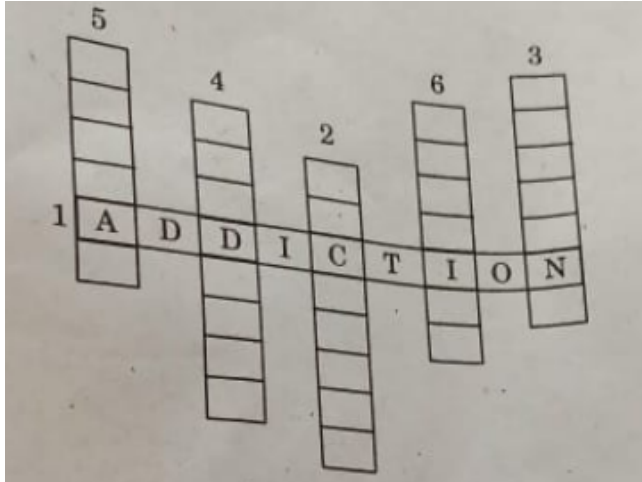
(d) Which period is said to be the period of regeneration of endometrium?

Answer : 5th to 13th day of menstrual cycle is the period of regeneration of endometrium.

(e) Which period is said to be the period of secretions of glands in endometrium ?

Answer : 16th to 28th day are said to be the period of secretions of glands in endometrium

(ii) Solve the following crossword:



- (1) Continuous consumption of alcoholic and tobacco materials.
- (2) This app may cause cyber crimes.
- (3) A remedy to resolve stress.
- (4) Requirement for stress free life.
- (5) Various factors affect _____ health.
- (6) Art of preparing food items.

Answer: (2) Facebook
(3) singing
(4) Goodfood
(5) Social
(6) Cooking