BBM

Ludhiana

Half yearly half

Class:- 12th Maximum Marks:- 32

Subject:- Biology TIME ALLOWED:-

General instruction

1 This question paper contains- five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.

2. Section A has 12 MCQ's and 02 Assertion- Reason based question of 1 mark each.

3. Section B has 4 very short answer type questions (VSA) of 2 marks each.

4. Section C has 4 short answer type questions (SA) of 3 marks each.

5. Section D has 2 long answer type questions (LA) of 5 marks each.

6. Section E has 2 source base / case based/passage based

Q.No.	SECTION A (MULTIPLE CHOICE QUESTIONS)	Marks
1	Silencing of a gene could be achieved through the use of: (a) Short interfering RNA (RNAi) (b) Antisense RNA (c) By Both (d) None of the above	1
2	ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA? (a) Adenosine deoxy aminase (b) Adenosine deaminase (c) Aspartate deaminase (d) Arginine deaminase.	1
3	The first clinical gene therapy was done for the treatment of: (a) AIDS (b) Cancer (c) Cystic fibrosis (d) SCID.	1
4	In RNAi, genes are silenced using: (a) ssDNA (b) dsDNA (c) dsRNA (d) ssRNA.	1
5	Golden rice is: (a) A variey of rice grown along the yellow river in China (b) Long stored rice having yellow colour tint	1

(c) A transgenic rice having gene for p-carotene (d) Wild variety of rice with yellow coloured grains.

6 The trigger for activation of toxin of Bacillus thuringiensis is: 1

(a) Acidic pH of stomach (b) High temperature

(c) Alkaline pH of gut (d) Mechanical action in the insect gut.

7 Pathophysiology is the: 1

(a) Study of physiology of pathogen (b) Study of normal physiology of host

(c) Study of altered physiology of host (d) None of the above.

8 A protoxin is: 1

(a) A primitive toxin (b) A denatured toxin

(c) Toxin produced by protozoa (d) Inactive toxin.

9 The site of production of ADA in the body is: 1

(a) Bone marrow (b) Lymphocytes

(c) Blood plasma (d) Monocytes.

10 Choose the correct option regarding Retrovirus. 1

(a) An RNA virus that can synthesise DNA during infection (b) A DNA virus that can synthesise RNA during infection

(c) An ssDNA virus (d) AdsRNA virus.

11 A probe which is a molecule used to locate specific sequences in a mixture of DNA or RNA molecules could be: 1

(a) A single-stranded RNA (b) A single-stranded DNA

(c) Either RNA or DNA (d) Can be ss DNA but not ss RNA.

12 a-1 antitrypsin as: 1

(a) An antacid (b) An enzyme

(c) Used to treat arthritis (d) Used to treat emphysema.

SECTION VERY SHORT QUESTION

13	Which nematode infects the roots of tobacco plant and causes a great reduction in yield?	**2**
14	Give an example to prove that microbes release gases during metabolism?	**2**

SECTION SHOT QUESTION

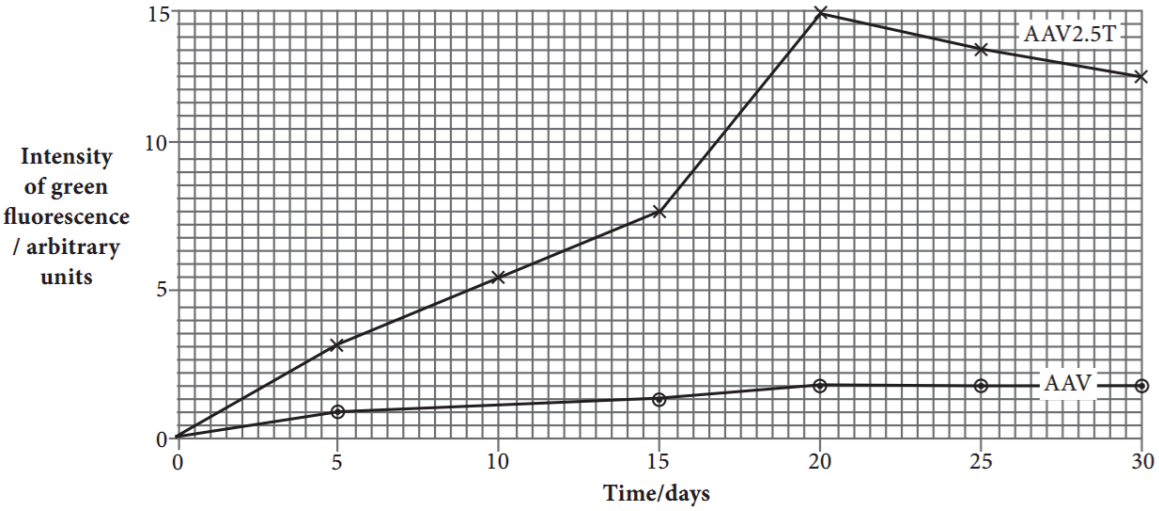
15	What are the advantages of molecular diagnostics over conventional methods?	**3**
16	What are the two methods for correcting ADA deficiency in a child?	**3**

SECTION LONG QUESTION

17	(i) How and at what stage does Plasmodium enter a human body? (ii) With the help of a flow chart only shows the stages of asexual reproduction in the life cycle of the parasite in the infected human. (iii) Why does the victim show symptoms of high fever?	**5**
	OR	
	Suggest the aspects of reproductive health that need to be given special attention in the present scenario.	**5**
18	What is the role of ribosomes during translation? Ribosomes move along mRNA molecules and catalyze the assembly of amino acids into protein chambers.	**5**

SECTION CASE STUDY

19	Read the following and answer any four questions from (i) to (v) given below: One approach of gene therapy to treat cystic fibrosis uses viruses to deliver normal alleles of the CFTR gene into epithelial cells of the airways. A team of researchers in the USA developed a new strain of non-pathogenic adeno-associated virus (AAV), AAV2.ST. Genes for the CFTR protein and the enzyme luciferase were inserted into the DNA of the viruses. Luciferase catalyses the production of a green fluorescent protein when luciferin is added. The normal AAV strain and the AAV2.5T strain were added to cultures of epithelial cells from the airways. After adding luciferin, the number of cells that had taken up the viral genes was estimated using the intensity of the green fluorescence which developed. The result are shown in the given graph.	**0**



I. What could be the probable reason for inserting a gene for luciferase by researchers into the viral DNA?

1. Infected cells are able to produce luciferase.
2. It is easy to identify the infected cells that have taken up viral DNA under fluorescent lamp.
3. THe non-infected cells were easily identified under fluorescent lamp as they will glow.
4. Both (a) and (b).

1. Select the incorrect statement with respect to the graph given.

1. Both AAV and AAV2.ST can infect epithelial cells.
2. Intensity of green fluorescence increases more in AAV 2.5 T as compared to normal AAV.
3. AA V infect cells more readily than AAV 2.5 T.
4. None of these.

1. The name of first transgenic cow is:

1. cDNA does not contain non-coding regions such as intrans.
2. cDNA can be transcribed and translated directly.
3. There is no need of post-trancriptional modification such as splicing, etc.
4. All of these.

1. There is a decrease in intensity of green fluorescence in cells infected with AAV 2.ST during the last 10 day. This is because:

1. Green fluorescent protein was broken down.
2. Luciferin was used up.
3. Infected cells die.
4. All of these.

1. Which of the following best describe gene therapy?

1. Mutating the sequence of a particular gene.
2. Replacing a healthy gene with a defective gene.
3. Replacing a defective gene with a functional gene.

4. Transferring a healthy gene from one species with heathy gene of other species.

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OR

Read the following and answer any four questions from (i) to (v) given below:
A group of teenagers was involved in drug abuse. 'They used syringes and needles to inject drugs. 'They indulged in this habit when they became adults. Administration of drug through needles became a piece of cake for them. Raj was the most active drug abuser amongst them and used to take drugs in high profile parties. In a span of time he started losing weight and suffered persistent diarrhoea. He developed constant low grade fever and used to catch opportunistic infection. When he consulted a doctor, he got himself tested for HIV in his blood and finally diagnosed with AIDS.
Based on the above information, answer the following questions.

1. Select the incorrect statement.

1. AIDS is a disorder of cell mediated immune system of the body.
2. AIDS is caused by Human Immunodeficiency virus.
3. AIDS infections were detected in India for the first time in prostitutes of Chennai, Tamil Nadu in 1986.
4. December 10 is recalled as World AIDS Day.

1. How do you think Raj got AIDS infection?

1. Through transfusion of HIV infected blood
2. Sexual intercourse with an infected partner
3. Sharing towel with infected friend
4. Use of contaminated needles and syringes to inject drugs

1. How AIDS can be diagnosed?

1. ELISA test
2. Ames test
3. Pap's test
4. Widal test

1. How can AIDS be prevented?

1. Blood tests of blood donor before transfusion to check for the presence of AIDS virus.
2. Use of disposable needles and syringes for injecting medicines and vaccination
3. Having protected sex by use of condoms
4. All of these

1. Select the correct statement for AIDS virus.

1. It is rhomboid in shape with a diameter of 10-15 cm.
2. Its genome consists of ds DNA.
3. It consists of reverse transcriptase enzyme.

4. Its envelope consists of lipid bilayer and three protein coats.

Read the following and answer any four questions from (i) to (v) given below:
Oral administration of small doses of hormones is contraceptive method used by the females. They are used in the form of tablets and hence called the pills. The oral pills are two types; mini pills and combined pills.

1. Mini pills contain:

1. Estrogen only.
2. Progestin only.
3. Combination of progesterone-estrogen.
4. Inhibin.

1. How do hormonal pills prevent pregnancy?

1. By phagocytosing the sperms.
2. By inhibiting ovulation.
3. By preventing sperms from entering the vagina.
4. All of these.

1. Pill containing non-steroidal preparation, centchroman is:

1. Mala D.
2. Mala N.
3. I-Pill.
4. Saheli.

20 **0**

1. Which among the following is incorrect for oral contraceptives?

1. Oral pills alter the uterine endometrium and make it unsuitable for implantation.
2. Oral pills have to be taken daily for 7 days starting within first five days of menstrual cycle.
3. Oral pills increase the risk of intravascular clotting.
4. Oral pills contain either progestin alone or combination of progestogen and estrogen.

1. **Assertion:** Mala D, a combined contraceptive pill, have to be taken daily without a break.

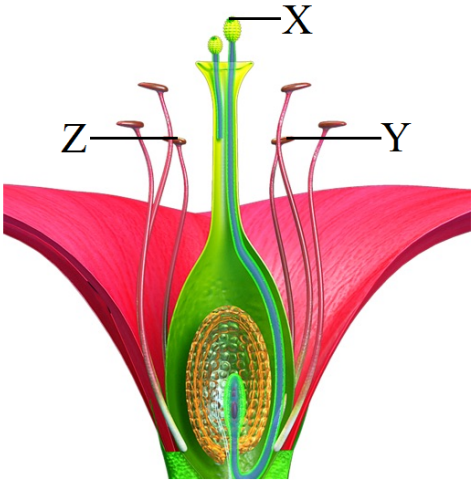
Reason: Mala D contains synthetic progesterone and estrogen.

1. Both assertion and reason are true, and reason is the correct explanation of assertion.
2. Both assertion and reason are true, but reason is not the correct explanation of assertion.
3. Assertion is true, but reason is false.
4. Both assertion and reason are false.

OR

1. Read the following and answer any four questions from (i) to (v) given below:

Cross pollination is the transfer of pollen grains from the anther of a one flower to the stigma of a genetically different flower. It is performed with the help of an external agency which may be abiotic (e.g., wind, water) or biotic (e.g., insects, birds, bats, snails). The diagram shows the carpel of an insect pollinated flower.



1. **What is the most likely reason for non germination of pollen grain Z?**

1. Pollen grains X and Y were brought to the stigma earlier, therefore, their germination inhibited the germination of pollen grain Z.
2. Pollen grain Z was brought to the flower by wind, while pollen grains X and Y were brought to the flower by insect.
3. Pollen grain Z lacks protrusions that allow it to adhere properly onto the stigma surface.
4. Pollen grain Z comes from a flower of an incompatible species.

1:-Which of the following best describes the function of the pollen tube?

- It acts as a conduit to transport male gametes from the anther to the ovule.
- It acts as a conduit to transport male gametes from the stigma to the ovule.
- It contains key nutrients that serve to nourish the newly-formed zygote.
- It digests the tissues of the stigma, style, and ovary.

2:-Pollination of a flower in which the pollen is carried by an insect is called:

1. Anemophily.
2. Ornithophily.
3. Entomophily.
4. Malacophil.

3:-Refer to the given characteristics of some flowers.

1. The stamens hang out of the flower, exposing the anthers to the wind.
2. The pollen grains are tiny and light.

3. The flower has a sweet scent.
4. The flower petals are brightly colored.

4:-Pollenkitt is generally found in:

1. Anemophilous flowers.
2. Entomophilous flowers.
3. Ornithophilous flowers.
4. Malacophilous flowers.
