

Last 12 Years AIPMT/NEET Questions with Explanations (2005-16)

NEET

Chapter-wise MCQ & Last Minute Notes



Biology



Chemistry

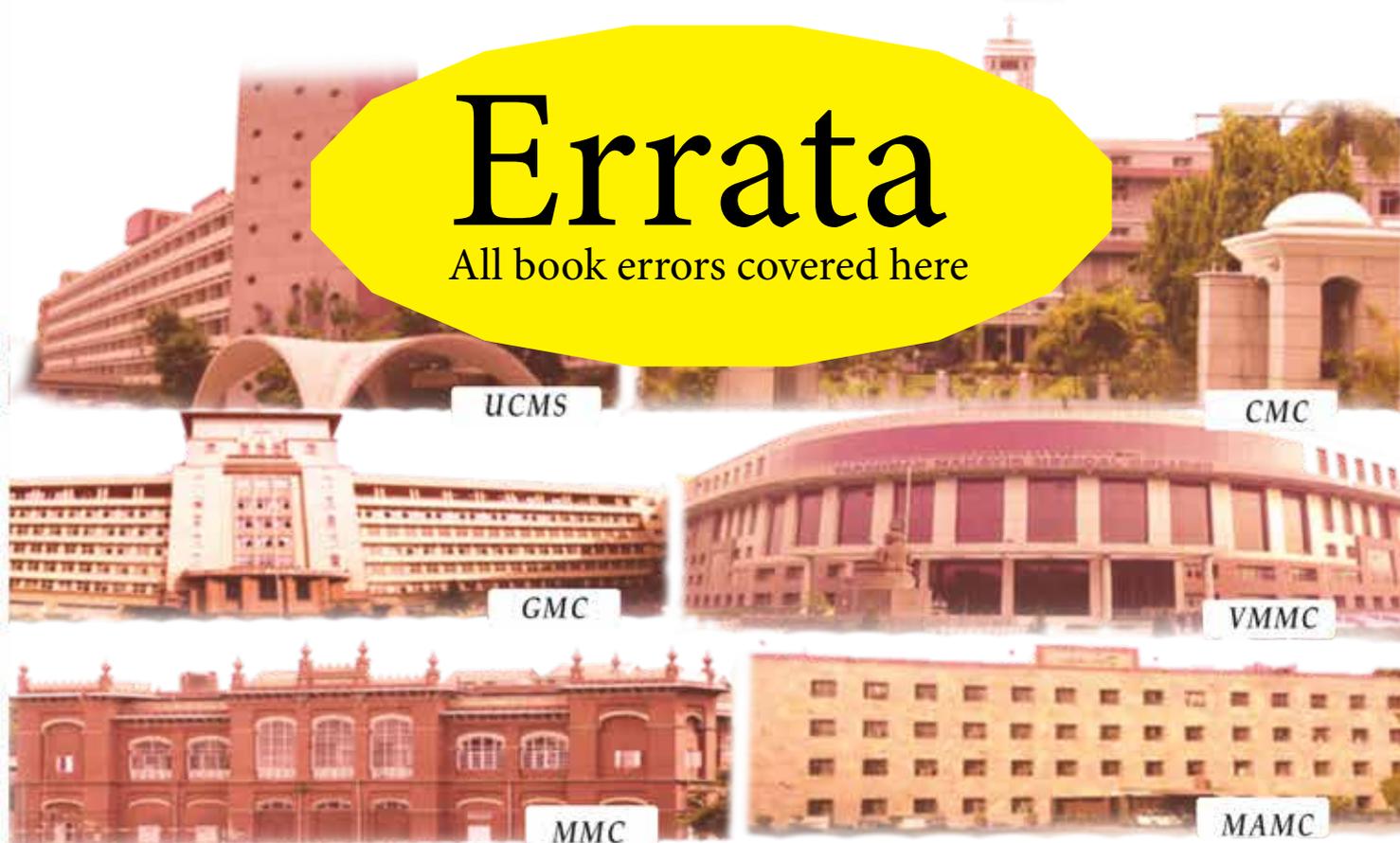


Physics

Outside NCERT HOT Points Memory Chart Organic Reactions Imp. Graphs & Flowcharts

Errata

All book errors covered here



*Page-wise NCERT References
5 Practice Paper for NEET-2017 Exam*

*Special Emphasis on Outside NCERT Topics
Prelims AIPMT Questions Added*

Aim4AIIMS



Chemistry

Page No. 367

Q9. Match items of Column I with the items of Column II and assign the correct code: (2016 - I)

Column I		Column II	
(a)	Cyanide process	(i)	Ultrapure Ge
(b)	Froth floatation process	(ii)	Dressing of ZnS
(c)	Electrolytic reduction	(iii)	Extraction of Au
(d)	Zone refining	(iv)	Extraction of Al
		(v)	Purification of Ni

Code

- | | | | |
|----------|-------|-------|------|
| (a) | (b) | (c) | (d) |
| a. (iii) | (iv) | (v) | (i) |
| b. (iv) | (ii) | (iii) | (i) |
| c. (ii) | (iii) | (i) | (v) |
| d. (i) | (ii) | (iii) | (iv) |

Correct Ans.

(a) NCERT (XII-I) Ch - 6 Pg. 150

Cyanide is a leaching process for Au[Au(CN)₂]⁻ formation. Froth floatation is refining of ZnS (sulphide ore concentration). Electrolytic reduction is extraction of Al from bauxite. Zone refining is purification of Si & Ge.

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Q2. Which has highest pH: (2005)

- | | |
|-------------------------|------------------------------------|
| a. CH ₃ COOK | b. Na ₂ CO ₃ |
| c. NH ₄ Cl | d. NaNO ₃ |

Correct Ans.

(b) NCERT (XI) Ch - 7

As Na₂CO₃ dissolves in water to give Na⁺ & CO₃²⁻. It is a salt of strong base & weak acid. So contribute to highest pH.

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Q9. Which of the following pairs constitutes a buffer? (2006)

- | | |
|---|------------------|
| a. HNO ₂ and NaNO ₂ | b. NaOH and NaCl |
| c. HNO ₃ and NH ₄ NO ₃ | d. HCl and KCl |

Correct Ans.

(a) NCERT (XI) Ch - 7 Pg. 217-218

Buffer solutions are made by mixing of a weak acid/ base with in strong conjugate base/ acid. These solutions resists the change in pH.

HNO₂ is a weak acid & NaNO₂ is its strong conjugate base. So this mixture constitutes a buffer.

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Q11. Calculate the pOH of a solution at 25°C that contains 1 × 10⁻¹⁰ M of hydronium ions, i.e., H₃O⁺: (2007)

- | | |
|----------|-----------|
| a. 4.000 | b. 9.0000 |
| c. 1.000 | d. 7.000 |

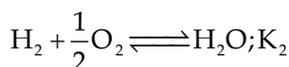
Correct Ans.

(a) NCERT (XI) Ch - 7 Pg. 215

Given [H₃O⁺] = 1 × 10⁻¹⁰ M
 at 25°C [H₃O⁺] [OH⁻] = 10⁻¹⁴
 \therefore [OH⁻] = $\frac{10^{-14}}{10^{-10}} = 10^{-4}$
 Now, [OH⁻] = 10⁻⁴
 pOH = 4

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Q12. The following equilibrium constants are given:



The equilibrium constant for the oxidation of NH₃ by oxygen to give NO is? (2007)

- | | |
|----------------------------|----------------------------|
| a. $\frac{K_2 K_3^2}{K_1}$ | b. $\frac{K_2^2 K_3}{K_1}$ |
| c. $\frac{K_1 K_2}{K_3}$ | d. $\frac{K_2 K_3^3}{K_1}$ |

Correct Ans.

(d) NCERT (XI) Ch - 7 Pg. 216-217

Given,
 $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3; K_1 \dots (i)$
 $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO}; K_2 \dots (ii)$
 $\text{H}_2 + \frac{1}{2}\text{O}_2 \rightleftharpoons \text{H}_2\text{O}; K_3 \dots (iii)$

$$K_c = \frac{[\text{NO}]^2 [\text{H}_2\text{O}]^3}{[\text{NH}_3]^2 [\text{O}_2]^{5/2}}$$

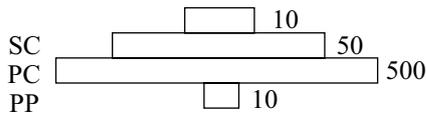
$$K_1 = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}, K_2 = \frac{[\text{NO}]^2}{[\text{N}_2][\text{O}_2]}$$

$$\& K_3 = \frac{[\text{H}_2\text{O}]}{[\text{H}_2][\text{O}_2]^{1/2}}$$

$$\text{Or } K_3 = \frac{[\text{H}_2\text{O}]^3}{[\text{H}_2]^3 [\text{O}_2]^{3/2}}$$

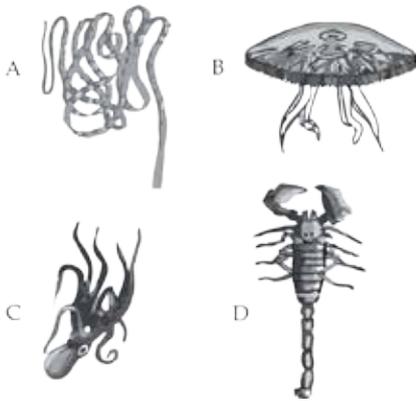
Now,

Q21. Given below is an imaginary pyramid of numbers. What could be one of the possibilities about certain organisms at some of the different levels? (2012 Pre)



- Level PC is "rats" and level SC is "cats"
- Level PC is "insects" and level SC is "small insectivorous birds"
- Level PP is "phytoplankton's" in sea and "Whale" on top level TC
- Level one PP is "Pipal trees" and the level SC is "sheep"

Q33. The figure shows four animals (a), (b), (c) and (d). Select the correct answer with respect to common characteristics of two of these animals. (2011 Mains)



- (a) and (d) have cnidoblasts for self-defense
- (c) and (d) have a true coelom
- (a) and (d) respire mainly through body wall
- (b) and (c) show radial symmetry

Q1. Given below are four methods (A-D) and their modes of action (i - iv) in achieving contraception. Select the correct combination about contraceptives (2008)

	I		II
A	Pill	(i)	Prevents sperm reaching cervix
B	Condom	(ii)	Prevents implantation
C	Vasectomy	(iii)	Prevents ovulation
D	Copper - T	(iv)	Semen contains no sperm

- A - iii, B - iv, C - i, D - ii
- A - ii, B - iii, C - i, D - iv
- A - iii, B - i, C - iv, D - ii
- A - iv, B - i, C - ii, D - iii

Father of Indian Green Revolution: **Dr. Swaminathan.**

Bt Cotton: Some strains of *Bacillus thuringiensis* produce proteins that kill certain insects such as lepidopterans (tobacco budworm, armyworm), coleopterans (beetles) and dipterans (flies, mosquitoes). *B. thuringiensis* forms protein crystals during a particular phase of their growth.

The proteins encoded by the genes *cryIAC* and *cryIIAB* control the cotton bollworms that of *cryIAb* controls corn borer.

Pest Resistant: A nematode *Meloidegyny incognitia* infects the roots of tobacco plants and causes a great reduction in yield.

RNAi takes place in all eukaryotic organisms as a method of cellular defense. This method involves silencing of a specific mRNA due to a complementary dsRNA molecule that binds to and prevents translation of the mRNA (silencing).

Using *Agrobacterium* vectors, nematode-specific genes were introduced into the host plant

The introduction of DNA was such that it produced both sense and anti-sense RNA in the host cells. These two RNA's being complementary to each other formed a double stranded (dsRNA) that initiated RNAi silenced the specific mRNA of the nematode. The consequence was that the parasite could not survive in a transgenic host expressing specific interfering RNA.

Insulin: Insulin consists of two short polypeptide chains: chain A and chain B, that are linked together by disulphide bridges.

In 1983, Eli Lilly an American company prepared two DNA sequences corresponding to A and B, chains of human insulin and introduced them in plasmids of *E. coli* to produce insulin chains.

Chains A and B were produced separately, extracted and combined by creating disulfide bonds to form human insulin.

The first clinical gene therapy was given in 1990 to a 4-year old girl with adenosine deaminase (ADA) deficiency.

Recombinant DNA technology, Polymerase Chain Reaction (PCR) and Enzyme Linked Immuno-sorbent Assay (ELISA) are some of the techniques that serve the purpose of early diagnosis

ELISA is based on the principle of antigen-antibody interaction.

Transgenic animals that produce useful biological products can be created by the introduction of the portion of DNA (or

genes) which codes for a particular product such as human protein (alpha-1-antitrypsin) used to treat emphysema.

In 1997, the first transgenic cow, Rosie, produced human protein-enriched milk (2.4 grams per liter). The milk contained the human alpha-lactalbumin and was nutritionally a more balanced product for human babies than natural cow-milk.

GEAC (Genetic Engineering Approval Committee), which will make decisions regarding the validity of GM research and the safety of introducing GM-organisms for public services.

Biopiracy is the term used to refer to the use of bio-resources by multinational companies and other organizations without proper authorization from the countries and people concerned without compensatory payment.

Previous Year's Questions

- Q1. Golden rice will help in (2006)**
- Producing petrol-like fuel
 - Pest resistance
 - Herbicide tolerance
 - Alleviation of vitamin a deficiency
- Q2. Which is used in production of insulin by genetic engineering (2008)**
- | | |
|-------------------------|-------------------------|
| a. <i>Rhizobium</i> | b. <i>Saccharomyces</i> |
| c. <i>Mycobacterium</i> | d. <i>Escherichia</i> |
- Q3. Genetically engineered microorganism used successfully in bioremediation of oil spills is (2007)**
- | | |
|-----------------------|-----------------------|
| a. <i>Trichoderma</i> | b. <i>Xanthomonas</i> |
| c. <i>Bacillus</i> | d. <i>Pseudomonas</i> |
- Q4. Main objective of production of herbicide resistant GM crops is to (2008)**
- Encourage ecofriendly herbicides
 - Reduce herbicide accumulation in food articles for health safety
 - Eliminate weeds from fields without the use of manual labour
 - Eliminate weeds from field without the use of herbicides

- Q5. The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as** (2009)
- Source of industrial enzyme
 - Insecticide
 - Indicator of water pollution
 - Agent for production of dairy products
- Q6. What is true of Bt toxin?** (2009)
- The concerned bacillus has antitoxins
 - The inactive protoxin gets converted into active form in the insect gut
 - Bt protein exists as active toxin in the bacillus
 - The activated toxin enters the ovaries of the pest to sterilize it and thus prevents its multiplication
- Q7. The genetic defect adenosine deaminase (ADA) deficiency may be cured permanently by** (2009)
- Introducing bone marrow cells producing (ADA) into cells at early embryonic stages
 - Administering adenosine deaminase activators
 - Periodic infusion of genetically engineered lymphocytes having functional ADA cDNA
 - Enzyme replacement therapy
- Q8. GM brinjal has been developed in India for** (2010 Pre)
- Enhancing shelf life
 - Enhancing mineral content
 - Drought resistance
 - Insect resistance
- Q9. Some of the characteristics of Bt cotton are** (2010 Pre)
- Medium yield, long fibre and resistance to beetle pests
 - High yield and production of toxic protein crystals which kill dipteran pests
 - High yield and resistance to bollworms
 - Long fibre and resistance to aphids
- Q10. Genetic engineering has been successfully used for producing** (2010 Pre)
- Transgenic models for studying new treatments for certain cardiac disease
 - Transgenic cow, Rosie, which produces high fat milk for making ghee
 - Animals like bulls for farm work as they have super power
 - Transgenic mice for testing safety of polio vaccine before use in humans
- Q11. The process of RNA interference has been used in the development of plants resistant to** (2011 Pre)
- Insects
 - Nematodes
 - Fungi
 - Viruses
- Q12. Read the following four statements (A-D) about certain mistakes in two of them**
- (A) The first transgenic buffalo Rosie produced milk which was human alpha-lactalbumin enriched
- (B) Restriction enzymes are used in isolation of DNA from other macro-molecules
- (C) Downstream processing is one of the steps of R-DNA technology
- (D) Disarmed pathogen vectors are also used in transfer of R-DNA into the host
- Which are the two statements having mistakes?** (2011 Mains)
- Statements (A) and (C)
 - Statements (A) and (B)
 - Statements (B) and (C)
 - Statements (C) and (D)
- Q13. *Bacillus thuringiensis* forms protein crystals which contain insecticidal protein. This protein:** (2011 Mains)
- Is activated by acid pH of the foregut of the insect pest
 - Does not kill the carrier bacterium which is itself resistant to this toxin
 - Binds with epithelial cells of midgut of the insect pest ultimately killing it
 - Is coded by several genes including the gene cry
- Q14. Which one of the following is an example of carrying out biological control of pests/diseases using microbes?** (2012 Pre)
- Lady bird beetle against aphids in mustard
 - Trichoderma* sp. against certain plant pathogens
 - Nucleopolyhedrovirus* against white rust in Brassica
 - Bt-cotton to increase cotton yield
- Q15. Which one is a true statement regarding DNA polymerase used in PCR?** (2012 Pre)
- It remains active at high temperature
 - It is used to ligate introduced DNA in recipient cells
 - It serves as a selectable marker
 - It is isolated from a virus
- Q16. In genetic engineering, the antibiotics are used:** (2012 Mains)
- As selectable markers

- b. To select healthy vectors
- c. As sequences from where replication starts
- d. To keep the cultures free of infection

Q17. The first clinical gene therapy was given for treating? (2012 Mains)

- a. Diabetes mellitus
- b. Chicken pox
- c. Rheumatoid arthritis
- d. Adenosine deaminase deficiency

Q18. Which of the following Bt crops is being grown in India by the farmers? (2013)

- a. Soybean
- b. Maize
- c. Cotton
- d. Brinjal

Q19. Which vector can clone only a small fragment of DNA? (2014)

- a. Cosmid
- b. Bacterial artificial chromosome
- c. Yeast artificial chromosome
- d. Plasmid

Q20. In vitro clonal propagation in plants is characterized by (2014)

- a. Microscopy
- b. PCR and RAPD
- c. Northern blotting
- d. Electrophoresis and HPLC

Q21. Which of the following is responsible for peat formation? (2014)

- a. *Sphagnum*
- b. *Marchantia*
- c. *Riccia*
- d. *Funaria*

Q22. The cutting of DNA at specific locations became possible with the discovery of: (2015 Re)

- a. Probes
- b. Selectable markers
- c. Ligases
- d. Restriction enzymes

Q23. The DNA molecule to which the gene of interest is integrated for cloning is called: (2015 Re)

- a. Vector
- b. Template
- c. Carrier
- d. Transformer

Q24. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of : (2015 Re)

- a. Vitamin C
- b. Omega 3
- c. Vitamin A
- d. Vitamin B

Q25. The introduction of t-DNA into plants involves: (2015 Re)

- a. Altering the pH of the soil, then heat shocking the plants

- b. Exposing the plants to cold for a brief period
- c. Allowing the plant roots to stand in water
- d. Infection of the plant by *Agrobacterium tumifaciens*

Q26. In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to (2015)

- a. Action of gut micro-organism
- b. Presence of conversion factors in insect gut
- c. Alkaline pH of the insect gut
- d. Acidic pH of the insect gut

Q27. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services? (2015)

- a. Genetic Engineering Approval Committee
- b. Research Committee on Genetic Manipulation
- c. Bio-safety committee
- d. Indian Council of Agricultural Research

Q28. The two polypeptides of human insulin are linked together by (2016 - I)

- a. Hydrogen bonds
- b. Phosphodiester bond
- c. Covalent bond
- d. Disulphide bridges

Q29. Which part of the tobacco plant is infected by *Meloidogyne incognita*? (2016 - I)

- a. Flower
- b. Leaf
- c. Stem
- d. Root

Q30. Which kind of therapy was given in 1990 to a four year old girl with adenosine deaminase (ADA) deficiency? (2016 - II)

- a. Immunotherapy
- b. Radiation therapy
- c. Gene therapy
- d. Chemotherapy

Solutions

1. (d) NCERT (XII) Ch - 12

Golden rice is the result of Biotechnology with the help of which we are able to enhance the nutritional value of food E.g. Vitamin 'A' enriched rice.

2. (d) NCERT (XII) Ch - 12 Pg. 211

Insulin consists of two polypeptide chains A and B. Two DNA sequences corresponding to "A and B" is introduced in the plasmids of *E. coli* to produce insulin with the help of rDNA technology.

3. (d) NCERT (XII) Ch - 12

Pseudomonas putida is genetically modified organisms used successfully in bioremediation of

oil spill.

- 4. (c) NCERT (XII) Ch - 12 Pg. 208**
Productions of herbicide resistant GM crops are aim towards to reduce reliance on chemical pesticides.
- 5. (b) NCERT (XII) Ch - 12 Pg. 208**
Bacillus thuringiensis is insecticide. It is effective against lepidopterans, coleopterans and dipterans.
- 6. (b) NCERT (XII) Ch - 12 Pg. 208**
Bt toxin is inactive toxin secreted by Bacteria *bacillus thuringiensis*. It requires alkaline medium to get active which is possible in insect gut.
- 7. (a) NCERT (XII) Ch - 12 Pg. 211**
ADA cannot have permanent cure because lympho-transfused are not immortal. But if bone marrow cells producing ADA introduced at an early embryonic stage. It will be permanent cure.
- 8. (d) NCERT (XII) Ch - 12 Pg. 208**
Bt. brinjal has been developed in India is resistant to insect.
- 9. (b) NCERT (XII) Ch - 12 Pg. 209**
High yield and production of toxin by cryI Ac and cryII Ab to control (cotton bollworm)
- 10. (c) NCERT (XII) Ch - 12 Pg. 212**
95% of transgenic animals one mice.
- 11. (b) NCERT (XII) Ch - 12 Pg. 209**
A nematode *Meloidogyne incognitia* infects the roots of tobacco plants and causes a great reduction in yield. A novel strategy was adopted to prevent this infestation which was based on the process of RNA interference (RNAi). RNAi takes place in all eukaryotic organisms as a method of cellular defense.
- 12. (b) NCERT (XII) Ch - 12 Pg. 213**
Statement A: In 1997, the first transgenic cow, Rosie, produced human protein-enriched milk (2.4 grams per litre). The milk contained the human alpha-lactalbumin and was nutritionally a more balanced product for human babies than natural cow-milk.

Restriction Enzymes bind to the DNA and cut each of the two strands of the double helix at specific points in their sugar -phosphate backbones.
- 13. (c) NCERT (XII) Ch - 12 Pg. 208**
The activated toxin binds to the surface of midgut epithelial cells and creates pores that cause cell swelling and lysis and eventually cause death of the insect.
- 14. (b) NCERT (XII) Ch - 12 Pg. 187**
A biological control being developed for use in the treatment of plant disease is the fungus *Trichoderma*. *Trichoderma* species are free-living fungi that are very common in the root ecosystems.
- 15. (a) NCERT (XII) Ch - 12**
Repeated amplification is achieved by the use of a thermostable DNA polymerase (isolated from a bacterium, *Thermus aquaticus*), which remain active during the high temperature induced denaturation of double stranded DNA.
- 16. (a) NCERT (XII) Ch - 12 Pg. 199.**
- 17. (a) NCERT (XII) Ch - 12 Pg. 211**
First clinical gene therapy was given in 1990 to 4 year old gene with (ADA) deficiency: caused by deletion of gene.
- 18. (c) NCERT (XII) Ch - 12 Pg. 208**
Bt - cotton grown in India.
- 19. (d) NCERT (XII) Ch - 12**
Some plasmids have 1 or 2 copies per cell.
- 20. (b) NCERT (XII) Ch - 12**
PCR and RAPD. In this segments of DNA that are amplified are random. It creates short primers (8-12 nucleotides)
- 21. (a) NCERT (XII) Ch - 12**
Sphagnum, a moss, provide peat that one been used as fuel.
- 22. (j) NCERT (XII) Ch - 12**
In 1963, two enzymes responsible for restricting the Bacteriophage growth in bacteria a was discovered. Second enzyme cut DNA molecule at a particular point by recognizing a specific sequence DNA.
- 23. (a) NCERT (XII) Ch - 12**
The vectors are DNA molecules that can carry a foreign DNA (gene of interest) and replicate inside the host cells vectors may be plasmids, a bacteriophage, cosmids, phagmids, YAC, BAC, trans posons and virus etc.
- 24. (c) NCERT (XII) Ch - 12**
Genetic modification enhanced nutritional value of food.
Eg. Vitamin 'A' enriched rice
- 25. (d) NCERT (XII) Ch - 12**
Agrobacterium tumifaciens, a pathogen of several dicots plants is able to deliver a piece of DNA into the plant cells.
- 26. (c) NCERT (XII) Ch - 12**
The Bt toxin protein exists as inactive protoxins but once ingested by insect, it is converted into an active form of toxin due to alkaline pH of the gut which solubilise the crystal. The activated toxin

binds to the surface of midgut epithelial cells and creates pores, causes insect death.

27. (a) NCERT (XII) Ch - 12

The Indian government has set up organizations such as GEAC (Genetic Engineering approval Committee), which will make decisions regarding the validity of GM research and safety of introducing (GMO) for public services.

28. (d) NCERT XII Ch.12 Pg. 211

The two polypeptides of human insulin are linked together by Disulphide bridges

29. (d) NCERT (XII) Ch - 12 Pg. 209

A nematode *Meloidegryne incognitia* infects the roots of tobacco plants and causes a great reduction in yield.

30. (c) NCERT (XII) Ch - 12 Pg. 211

Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo.

The first clinical gene therapy was given in 1990 to a 4-year old girl with adenosine deaminase (ADA) deficiency. This enzyme is crucial for the immune system to function.