

QUESTIONS & SOLUTIONS OF AIPMT 2012 (MAINS)

Date : 13-05-2012

Duration : 3 Hours

Max. Marks : 480

IMPORTANT INSTRUCTIONS

1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on **Side-1** and **Side-2** carefully with **blue/black** ball point pen only.
2. The test is of **3 hours** duration and Test Booklet contains 120 questions. Each question carries 4 marks. For each correct response, the candidate will get **4 marks**. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **480**.
3. Use **Blue/Black Ball Point Pen** only for writing particulars on this page/marking responses.
4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
5. **On completion of the test, the candidate must handover the Answer Sheet to the invigilator in the Room/Hall. The candidates are allowed to take away this Test Booklet with them.**
6. The CODE for this Booklet is A. Make sure that the CODE printed on **Side-2** of the Answer Sheet is the same as that on this Booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklets and the Answer Sheets.
7. The Candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your roll no. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.

Name of the Candidate (in Capitals): _____

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Candidate's Signature: _____ Invigilator's Signature: _____

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PART - C (BIOLOGY)

61. How many organisms in the list given below are autotrophs ?
Lactobacillus, *Nostoc*, *Chara*, *Nitrosomonas*, *Nitrobacter*, *Streptomyces*, *Sacharomyces*,
Trypanosoma, *Porphyra*, *Wolfia*
(1) Four (2) Five (3) Six (4) Three
- Sol.** *Nostoc*, *chara*, *porphyra* and *wolfia* are Photoautotrophs while *nitrosomonas* and *nitrobacter* are chemoautotrophs.
- Ans.** (3)
62. Read the following five statements (A - E) and answer as asked next to them.
(A) In *Equisetum* the female gametophyte is retained on the parent sporophyte.
(B) In *Ginkgo* male gametophyte is not independent.
(C) The sporophyte in *Riccia* is more developed than that in *Polytrichum*.
(D) Sexual reproduction in *Volvox* is isogamous.
(E) The spores of slime molds lack cell walls.
How many of the above statements are correct ?
(1) Two (2) Three (3) Four (4) One
- Sol.** **Equisetum** - Pteridophytes - Free living gametophyte - Prothallus
Riccia - It is liverwort in which simplest sporophyte consists of capsule only while *polytrichum* is moss in which sporophyte consists of of foot seta & capsule.
Volvox - oogamy is present
Slime moulds - Spores bear cell wall.
- Ans.** (4)
63. Which one of the following pairs is wrongly matched ?
(1) Ginkgo - Archegonia
(2) Salvinia - Prothallus
(3) Viroids - RNA
(4) Mustard - Synergids
- Ans.** (2)
64. In the five-kingdom classification, *Chlamydomonas* and *Chlorella* have been included in :
(1) Protista (2) Algae (3) Plantae (4) Monera
- Sol.** *Chlamydomonas* & *chlorella* have been mentioned in algae in kingdom protista
- Ans.** (1)
65. For its activity, carboxypeptidase requires :
(1) Zinc (2) Iron (3) Niacin (4) Copper
- Sol.** Zinc is a cofactor for carboxypeptidases
- Ans.** (1)
66. Which one of the following structures is an organelle within an organelle ?
(1) Ribosome (2) Peroxisome (3) ER (4) Mesosome
- Sol.** Ribosome is present in some cell organelles like mitochondria
- Ans.** (1)
67. Which one of the following is a wrong statement regarding mutations ?
(1) Deletion and insertion of base pairs cause frame-shift mutations
(2) Cancer cells commonly show chromosomal aberrations
(3) UV and Gamma rays are mutagens
(4) Change in a single base pair of DNA does not cause mutation]
- Sol.** Change in single base pair of DNA is also a type of mutations called point mutations
- Ans.** (4)
68. A test cross is carried out to :
(1) determine the genotype of a plant at F₂.
(2) predict whether two traits are linked.
(3) assess the number of alleles of a gene.
(4) determine whether two species or varieties will breed successfully.
- Sol.** Testcross - It takes place between F₁ - Generation and recessive parent & it is useful to check the homozy-

- gous or heterozygous condition.
- Ans. (1)**
- 69.** Read the following four statements (A-D):
 (A) In transcription, adenosine pairs with uracil.
 (B) Regulation of *lac* operon by repressor is referred to as positive regulation.
 (C) The human genome has approximately 50,000 genes.
 (D) Haemophilia is a sex-linked recessive disease.
 How many of the above statements are right ?
 (1) Two (2) Three (3) Four (4) One
- Sol.** Regulation of *lac* operon by repressor is referred as negative regulation.
 Human genome has approximately 30000 genes.
- Ans. (1)**
- 70.** Which one of the following organisms is correctly matched with its three characteristics ?
 (1) Pea : C₃ pathway, Endospermic seed, Vexillary aestivation
 (2) Tomato : Twisted aestivation, Axile placentation, Berry
 (3) Onion : Bulb, Imbricate aestivation, Axile placentation
 (4) Maize : C₃ pathway, Closed vascular bundles, Scutellum
- Sol.** Onion - Bulb - Underground stem -Imbricate aestivation -Axile placentation - Member of Liliaceae.
- Ans. (3)**
- 71.** How many plants in the list given below have marginal placentation ?
 Mustard, Gram, Tulip, Asparagus, Arhar, Sun hemp, Chilli, Colchicine, Onion, Moong, Pea, Tobacco, Lupin
 (1) Four (2) Five (3) Six (4) Three
- Sol.** Gram, Arhar, Sunhemp, Moong, Pea & Lupin belongs to Fabaceae family that bears marginal placentation.
- Ans. (3)**
- 72.** Read the following four statements (A-D):
 (A) Both, photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane.
 (B) In dicot stems, a new cambium originates from cells of pericycle at the time of secondary growth.
 (C) Stamens in flowers of *Gloriosa* and *Petunia* are polyandrous.
 (D) Symbiotic nitrogen-fixers occur in free-living state also in soil.
 How many of the above statements are right ?
 (1) Two (2) Three (3) Four (4) One
- Ans. (1)**
- 73.** Through their effect on plant growth regulators, what do the temperature and light control in the plants ?
 (1) Apical dominance (2) Flowering (3) Closure of stomata (4) Fruit elongation
- Sol.** Flowering is induced by light temperature
- Ans. (2)**
- 74.** Which one of the following generally acts as an antagonist to gibberellins ?
 (1) Zeatin (2) Ethylene (3) ABA (4) IAA
- Sol.** Gibberellins & ABA are antagonistic with each other.
- Ans. (3)**
- 75.** As compared to a dicot root, a monocot root has :
 (1) More abundant secondary xylem (2) Many xylem bundles
 (3) Inconspicuous annual rings (4) Relatively thicker periderm
- Sol.** Monocot root - Xylem is polyarch (more than 6)
- Ans. (2)**
- 76.** For its action, nitrogenase requires :
 (1) High input of energy (2) Light
 (3) Mn²⁺ (4) Super oxygen radicals
- Sol.** Nitrogenase require high input of energy & anaerobic condition.
- Ans. (1)**
- 77.** Vernalisation stimulates flowering in :

Ans. (1) Zamikand (2) Turmeric (3) Carrot (4) Ginger
(3)

78. What is the function of germ pore ?

- (1) Emergence of radicle (2) Absorption of water for seed germination
(3) Initiation of pollen tube (4) Release of male gametes

Ans. **(3)**

79. Which one of the following statements is wrong ?

- (1) When pollen is shed at two-celled stage, double fertilization does not take place.
(2) Vegetative cell is larger than generative cell.
(3) Pollen grains in some plants remain viable for months.
(4) Intine is made up of cellulose and - pectin.

Sol. In more than 60% angiospermic plants. Pollen grains release in 2-celled stage.

Ans. **(1)**

80. Plants with ovaries having only one or a few ovules, are generally pollinated by :

- (1) Bees (2) Butterflies (3) Birds (4) Wind

Sol. Wind pollinated flowers have generally single ovule in each ovary.

Ans. **(4)**

81. Sacred groves are specially useful in :

- (1) generating environmental awareness
(2) preventing soil erosion
(3) year-round flow of water in rivers
(4) conserving rare and threatened species

Sol. Sacred groves are important to conserve rare and threatened species

Ans. **(4)**

82. The rate of formation of new organic matter by rabbit in a grassland, is called :

- (1) Net productivity (2) Secondary productivity
(3) Net primary productivity (4) Gross primary productivity

Sol. The productivity at consumer level is called secondary productivity & Rabbit is consumer.

Ans. **(2)**

83. *Cuscuta* is an example of :

- (1) Ectoparasitism (2) Brood parasitism (3) Predation (4) Endoparasitism

Sol. *Cuscuta* is found on outer side of the host and are total stem parasite.

Ans. **(1)**

84. The second stage of hydrosere is occupied by plants like :

- (1) *Azolla* (2) *Typha* (3) *Salix* (4) *Vallisneria*

Sol. Second stage of Hydrosere is submerged stage that is represented by *Vallisneria*.

Ans. **(4)**

85. Green revolution in India occurred during :

- (1) 1960's (2) 1970's (3) 1980's (4) 1950's

Sol. Green revolution in india occurred in 1960's

Ans. **(1)**

86. In gobar gas, the maximum amount is that of :

- (1) Butane (2) Methane (3) Propane (4) Carbon dioxide

Sol. In gobar gas the maximum amount of methane is produced by methanogenic bacteria.

Ans. **(2)**

87. Read the following four statements (A-D):

- (A) Colostrum is recommended for the new born because it is rich in antigens.
- (B) Chikengunya is caused by a Gram negative bacterium.
- (C) Tissue culture has proved useful in obtaining virus-free plants.
- (D) Beer is manufactured by distillation of fermented grape juice.

How many of the above statements are wrong ?

- (1) Two (2) Three (3) Four (4) One **Sol.** Colostrum is recommended for the

new born because it is rich in antibodies.

- (B) Chikengunya is caused by a virus.

Ans. (1)

88. Tobacco plants resistant to a nematode have been developed by the introduction of DNA that produced (in the host cells).

- (1) both sense and anti-sense RNA
- (2) a particular hormone
- (3) an antifeedant
- (4) a toxic protein

Sol. RNA interference technique, sense & Antisense RNA fused to form DS RNA that silent the expression of m-RNA of nematode.

Ans. (1)

89. Biolistics (gene-gun) is suitable for :

- (1) Disarming pathogen vectors
- (2) Transformation of plant cells
- (3) Constructing recombinant DNA by joining with vectors
- (4) DNA finger printing

Sol. Biolistic - it is direct gene transferd method for constructing recombinant DNA.

Ans. (3)

90. In genetic engineering, the antibiotics are used :

- (1) as selectable markers
- (2) to select healthy vectors
- (3) as sequences from where replication starts
- (4) to keep the cultures free of infection

Ans. (1)

91. Which one of the following pairs of animals are similar to each other pertaining to the feature stated against them ?

- (1) *Pteropus* and *Ornithorhyncus* - Viviparity
- (2) Garden lizard and Crocodile - Three chambered heart
- (3) *Ascaris* and *Ancylostoma* - Metameric segmentation
- (4) Sea horse and Flying fish - Cold blooded (poikilothermal)

Sol. Sea horse and flying fish are coold blooded animals.

Ans. (4)

92. Which one of the following categories of animals, is correctly described with no single exception in it ?

- (1) All reptiles possess scales, have a three chambered heart and are cold blooded (poikilothermal)
- (2) All bony fishes have four pairs of gills and an operculum on each side.
- (3) All sponges are marine and have collared cells.
- (4) All mammals are viviparous and possess diaphragm for breathing

Sol. All sponges are marine and have collared cells without any exception.

Ans. (3)

93. Which one of the following organisms is scientifically correctly named, correctly printed. according to the International Rules of Nomenclature and correctly described ?

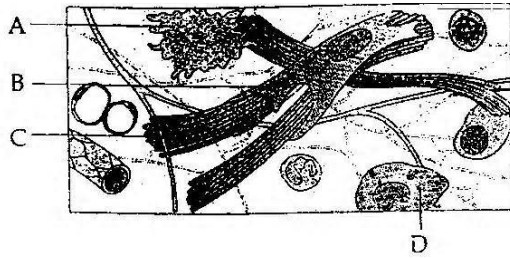
- (1) *Musca domestica* - The common house lizard, a reptile
- (2) *Plasmodium falciparum* - A protozoan pathogen causing the most serious type of malaria
- (3) *Felis tigris* - The Indian tiger, well protected in Gir forests.
- (4) *E.coli* - Full name *Entamoeba coli*, a commonly occurring bacterium in human intestine

Sol. *Plasmodium falciparum* - A protozoan pathogen causes the most serious type of malaria that is falciparum malaria.

Ans. (3)

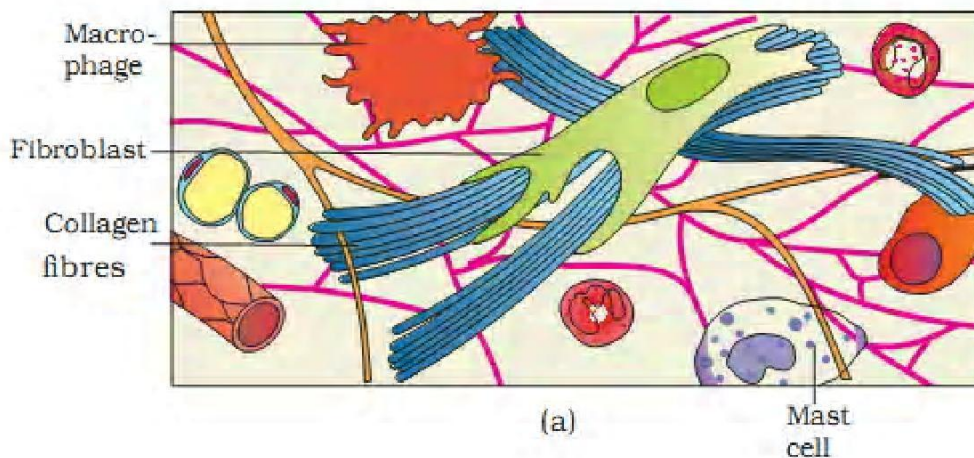
94. Which one of the following cellular parts is correctly described ?

B, C and D, and select the right option about them.



	Pa rt-A	Pa rt-B	Pa rt-C	Pa rt - D
(1)	Macro-phage	Fibroblast	Collagen fibres	Mast cells
(2)	Mast cell	Macro-phage	Fibroblast	Collagen, fibres
(3)	Macro-phage	Collagen fibres	Fibroblast	Mast cell
(4)	Mast cell	Collagen fibres	Fibroblast	II Macro-phage

Sol. Correct labelling as follows :



Ans. (1)

101. Which one of the following options gives the correct categorisation of six animals according to the type of nitrogenous wastes (A, B, C), they give out ?

	A - AMMONOTELIC	B - UREOTELIC	C - URICOTELIC
(1)	Pigeon, Humans	Aquatic Amphibia, Lizards	Cockroach, Frog
(2)	Frog, Lizards	Aquatic Amphibia, Humans	Cockroach, Pigeon
(3)	Aquatic Amphibia	Frog, Humans	Pigeon, Lizards, Cockroach
(4)	Aquatic Amphibia	Cockroach, Humans	Frog, Pigeon, Lizards

Sol. Those animals who excrete Ammonia are called as Ammonotelic. Eg. Aquatic Amphibia
 Those animals who excrete Urea are called as Ureotelic. Eg. Frog, Humans
 Those animals who excrete Uric Acid are called as Uricotelic. Eg. Pigeon, Lizards, Cockroach

Ans. (3)

102. Where do certain symbiotic microorganisms normally occur in human body ?

- (1) Caecum (2) Oral lining and tongue surface
 (3) Vermiform appendix and rectum (4) Duodenum

Sol. Caecum is small blind sac which host some symbiotic micro-organism.

Ans. (1)

103. Which one of the following pairs of, chemical substances, is correctly categorised ?

- (1) Calcitonin and thymosin - Thyroid hormones
 (2) Pepsin and prolactin - Two digestive enzymes secreted in stomach
 (3) Troponin and myosin - Complex proteins in striated muscles
 (4) Secretin and rhodopsin - Polypeptide hormones

Sol. Troponin is a protein which is found on Actin filament and myosin protein is found in myosin filament. Both Actin and Myosin are complex proteins in striated muscles.

Ans. (3)

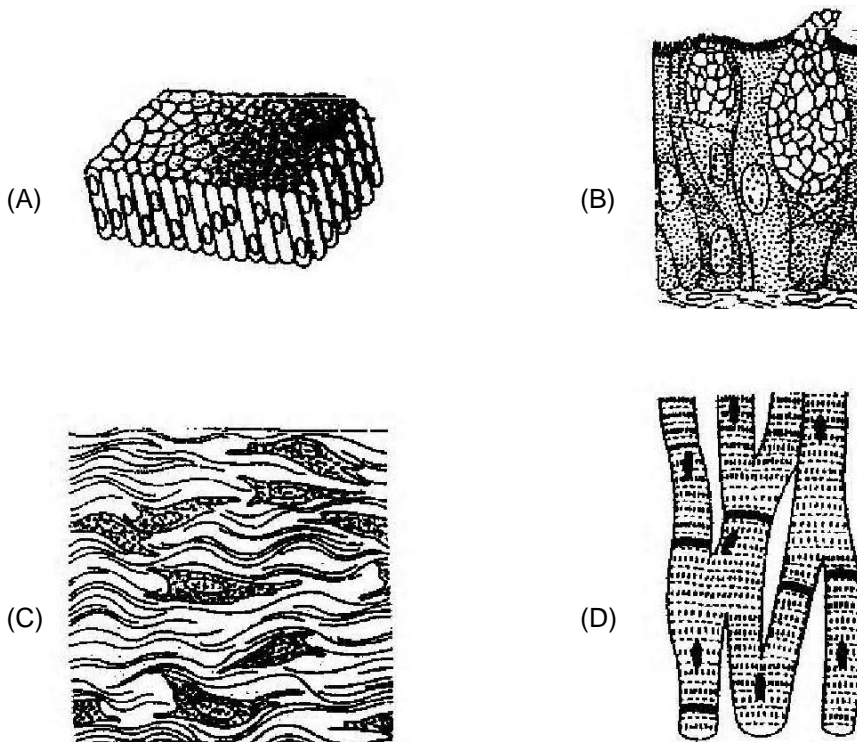
104. The supportive skeletal structures in the human external ears and in the nose tip are examples of :

- (1) ligament (2) areolar tissue (3) bone (4) cartilage

Sol. Cartilage is a type of connective tissue which is present in human external ears and in the nose tip.

Ans. (4)

105. The four sketches (A, B, C and D) given below, represent four different types of animal tissues. Which one of these is correctly identified in the options given, along with its correct location and function ?



		Tissue	Location	Function
(1)	(B)	Glandular epithelium	Intestine	Secretion
(2)	(C)	Collagen fibres	Cartilage	Attach skeletal muscles to bones
(3)	(D)	Smooth muscle tissue	Heart	Heart contraction
(4)	(A)	Columnar epithelium	Nephron	Secretion and absorption

Sol. The diagramme is given in Biology NCERT book class XII (page-102). Intestinal epithelium is glandular in

nature and secretory in function.

Ans. (1)

106. A fall in glomerular filtration rate (GFR) activates :

- (1) juxta glomerular cells to release renin (2) adrenal cortex to release aldosterone
(3) adrenal medulla to release adrenaline (4) posterior pituitary to release vasopressin

Sol. A fall in glomerular blood flow/glomerular blood pressure/GFR can activate the JG cells to release renin which converts Angiotensinogen in blood to Angiotensin I and further angiotensin II. Angiotensin II being powerful vasoconstrictor increases the Glomerular Blood pressure and thereby GFR.

Ans. (1)

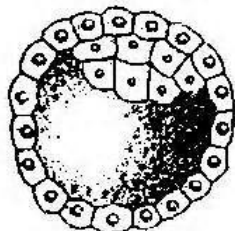
107. Which one of the following characteristics is common both in humans and adult frogs ?

- (1) Four - chambered heart (2) Internal fertilisation
(3) Nucleated RBCs (4) Ureotelic mode of excretion

Sol. Adult frog and human exhibit ureotelism because their excretory waste product is urea.

Ans. (4)

108. Identify the human developmental stage shown below as well as the related right place of its occurrence in a normal pregnant woman, and select the right option for the two together.



Options :

	De ve lopm e nta l sta ge	Site of occurre nce
(1)	Late morula	Middle Part of Fallopian tube
(2)	Blastula	End part of Fallopian tube
(3)	Blastocyst	Uterine wall
(4)	8 – celled morula	Starting point of Fallopian tube

Sol. The diagramme is from Biology NCERT XII (Page - 52). Blastocyst embeds itself in endometrium of uterus and this is called Implantation.

Ans. (3)

109. Which one of the following human organs is often called the “graveyard” of RBCs ?

- (1) Gall bladder (2) Kidney (3) Spleen (4) Liver

Sol. Spleen is called graveyard of RBC because it removes dead RBC from the blood.

Ans. (3)

110. The secretory phase in the human menstrual cycle is also called :

- (1) luteal phase and lasts for about 6 days (2) follicular phase lasting for about 6 days
(3) luteal phase and lasts for about 13 days (4) follicular phase and lasts for about 13 days

Sol. The first phase of human menstrual cycle is called Proliferative phase (Follicular phase), why Second phase of human menstrual cycle is called as secretory phase or luteal phase and it lasts for about 13 days.

Ans. (3)

111. Select the correct statement about biodiversity :

- (1) The desert areas of Rajasthan and Gujarat have a very high level of desert animal species as well as numerous rare animals.
(2) Large scale planting of Bt cotton has no adverse effect on biodiversity.
(3) Western Ghats have a very high degree of species richness and endemism.
(4) Conservation of biodiversity is just a fad pursued by the developed countries.

Sol. Western ghat is biodiversity rich zone along with endemism.

Ans. (3)

112. The domestic sewage in large cities :
- (1) has a high BOD as it contains both aerobic and anaerobic bacteria
 - (2) is processed by aerobic and then anaerobic bacteria in the secondary treatment in Sewage Treatment Plants (STPs)
 - (3) When treated in STPs does not really require the aeration step as the sewage contains adequate oxygen.
 - (4) has very high amounts of suspended solids and dissolved salts

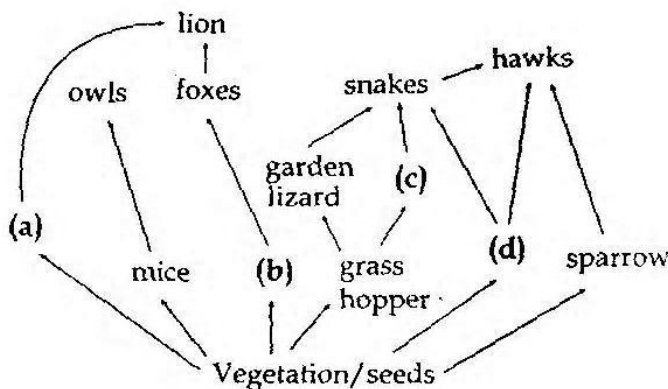
Ans. (2)

113. Which one of the following sets of items in the options 1 - 4 are correctly categorised with one exception in it ?

	ITEMS	CATEGORY	EXCEPTION
(1)	UAA, UAG, UGA	Stop codons	UAG
(2)	Kangaroo, Koala, Wombat	Australian marsupials	Wombat
(3)	Plasmodium, Cuscuta, Trypanosoma	Protozoan parasites	Cuscuta
(4)	Typhoid, Pneumonia, Diphtheria	Bacterial diseases	Diphtheria

Ans. (3)

114. Identify the likely organisms (a), (b), (c) and (d) in the food web shown below :



Options

	(a)	(b)	(c)	(d)
(1)	deer	rabbit	frog	rat
(2)	dog	squirrel	bat	deer
(3)	rat	dog	tortoise	crow
(4)	squirrel	cat	rat	pigeon

Ans. (1)

115. Consider the following four statements (a-d) and select the option which includes all the correct ones only.
- (a) Single cell Spirulina can produce large quantities of food rich in protein, minerals, vitamins etc.
 - (b) Body weight-wise the microorganism *Methylophilus methylotrophus* may be able to produce several times more proteins than the cows per day
 - (c) Common button mushrooms are a very rich source of vitamin C
 - (d) A rice variety has been developed which is very rich in calcium.

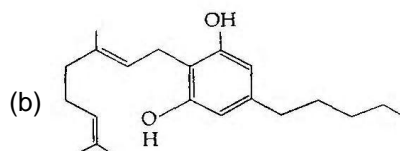
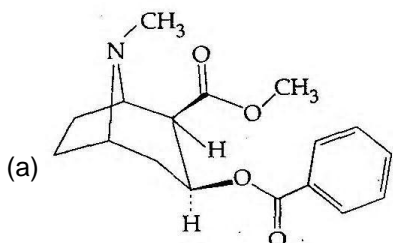
Options :

- (1) Statements (c), (d)
- (2) Statements (a), (c) and (d)
- (3) Statements (b), (c) and (d)
- (4) Statements (a), (b)

Sol. Spirulina is SCP rich in protein, vitamins & minerals & rice variety rich in iron content.
250 gram biomass of *Methylophilus methylotrophus* produce 25 ton protein/day while cow of 250 Kg. produces only 200 gm. protein/day.

Ans. (4)

116. Identify the molecules (a) and (b) shown below and select the right option giving their source and use.



Options:

	Mole cule	Source	Use
(1)	(a) Cocaine	Erythroxyllum coca	Accelerates the transport of dopamine
(2)	(b) Heroin	Cannabis Sativa	Depressant and slows down body functions
(3)	(b) Cannabinoid	Atropa belladona	Produces hallucinations
(4)	(a) Morphine	Papaver somniferum	Sedative and pain killer

Sol. The diagramme is given on biology NCERT XII (page - 158-159). Option (a) represents morphine which is obtained from *Papaver somniferum*. Morphine is used as Sedative and pain killer.

Ans. (4)

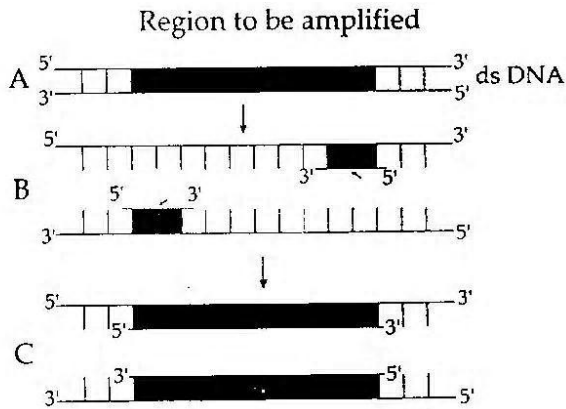
117. Which one of the following statements is correct with respect to immunity ?

- (1) Preformed antibodies need to be injected to treat the bite by a viper snake
- (2) The antibodies against small pox pathogen are produced by T - lymphocytes
- (3) Antibodies are protein molecules, each of which has four light chains
- (4) Rejection of a kidney graft is the function of B-lymphocytes

Sol. Preformed antibodies need to be injected to treat the bite by a viper snake. It is also a type of Immunisation which is called as passive immunisation.

Ans. (1)

118. The figure below shows three steps (A,B,C) of Polymerase Chain Reaction (PCR). Select the option giving correct identification together with what it represents ?



Options :

- (1) B - Denaturation at a temperature of about 98°C separating the two DNA strands.
- (2) A - Denaturation at a temperature of about 50°C
- (3) C - Extension in the presence of heat stable DNA polymerase
- (4) A - Annealing with two sets of primers

Sol. Expansion proceeds at 72°C in the presence of Taq DNA polymerase in PCR

Ans. (3)

119. The first clinical gene therapy was given for treating :

- (1) Diabetes mellitus
- (2) Chicken pox
- (3) Rheumatoid arthritis
- (4) Adenosine deaminase deficiency

Ans. (4)

120. Which one of the following represents a palindromic sequence in DNA ?

- (1) 5'- GAATTC - 3'
3'- CTTAAG - 5'
- (2) 5'- CCAATG - 3'
3'- GAATCC - 5'
- (3) 5'- CATTAG - 3'
3'- GATAAC - 5'
- (4) 5'- GATACC - 3'
3'- CCTAAG - 5'

Sol. 5' - GAATTC - 3'

3' - CTTAAG - 5'

It is a palindromic sequence of DNA cut by restriction enzyme ECORI.

Ans. (1)

