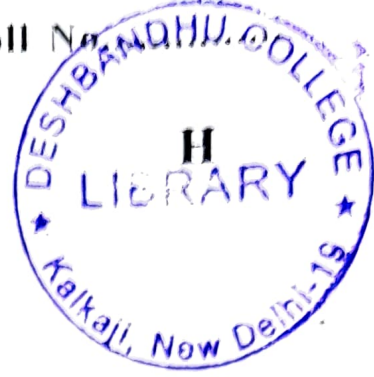


04/6/24

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Your Roll No.



Sr. No. of Question Paper : 3019

Unique Paper Code : 32497907

Name of the Paper : Plant Biochemistry

Name of the Course : **B.Sc. (H) Biochemistry**

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **8** questions.
3. Attempt any **5** questions.
4. **All** questions carry equal marks.
5. Question no. **1** is compulsory.

P.T.O.

1. (a) Define the following terms (**any six**) :

- (i) Terpenoids
- (ii) Nod factors
- (iii) Bacteroides
- (iv) Enhancement effect
- (v) Callus
- (vi) High irradiance response
- (vii) Phytoalexins
- (viii) GOGAT

(b) Differentiate between the following :

- (i) Somatic embryogenesis and organogenesis
- (ii) Determinate and indeterminate root nodules
- (iii) C₄ plants and CAM plants (9,6)

2. (a) Explain the mechanism of plant respiration adopted by plants growing under water-logged conditions.
- (b) Plant glycolysis is flexible and is regulated from bottom to up in plants. Explain the statement.
- (c) Plant and fungal mitochondria have branched electron transport. Explain this with help of a diagram. (6,5,4)
3. (a) What is the significance of nitrogen fixation? Mention the different ways by which nitrogen fixation occurs in the environment? Give an example of each of the following :
- (i) an aerobic free living nitrogen-fixing bacteria
 - (ii) an anaerobic free living nitrogen-fixing bacteria

(iii) a symbiotic nitrogen-fixing bacteria

(iv) a symbiont with woody plants

(b) Explain the role of secondary metabolites in the defence mechanism of plants.

(c) Discuss the various physical and biochemical mechanisms that help the plants to create anaerobic environment for carrying out nitrogen fixation. (5,5,5)

4. (a) Diagrammatically show the Z-scheme of photosynthesis.

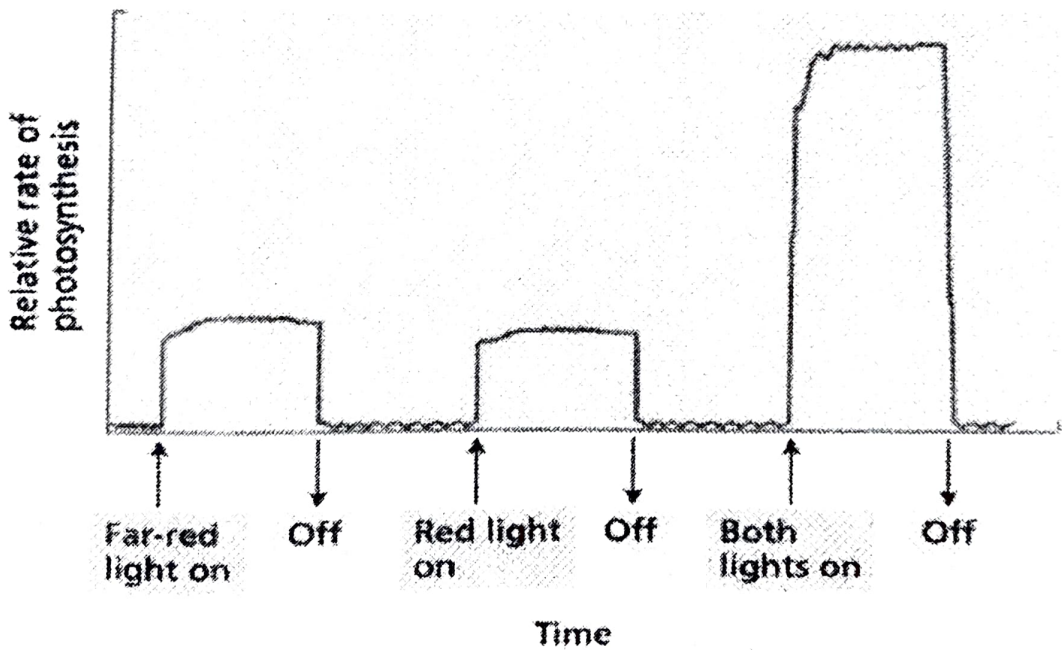
(b) Write the reaction catalyzed by Ribulose biphosphate carboxylase. Mention its importance in photosynthesis.

(c) Give the structure and composition of cell wall.

(5,5,5)

5. (a) Explain the biochemical mechanism that modulate photomorphogenesis, photoperiodism and phototropism.

(b) Identify and describe the process shown in the picture below. How would you relate light intensity and duration to the metabolic regulation of photomorphogenesis?



(c) With help of an ultrastructure of chloroplast label within the diagram where are the following located or occur in it :

(i) Photosystem I

(ii) Dark reaction

(iii) Cytochrome b_6f

(iv) ATP synthase (6,5,4)

6. (a) Describe the various mechanisms by which plants can cope up with the following stress :

(i) High salinity

(ii) Drought

(iii) Biotic stress

(b) Explain the structure, mechanism and regulation of Nitrogenase enzyme.

(c) Nitrogenase enzyme functions in an anaerobic environment but the process of nitrogen fixation is more efficient in aerobes. Comment. (6,6,3)

7. (a) Classify alkaloids and discuss their important role in plants?

(b) List the different types of plant growth regulators. Describe in detail the functions of two plant growth regulators that are most important in plant tissue culture.

(c) Describe the process of plant tissue culture describing the different stages. (5,5,5)

8. Write short note on :

(i) Protoplast culturing

(ii) Xanthophyll Cycle

(iii) Q cycle

(iv) Process of nodule formation

(5,5,5)

[This question paper contains 4 printed pages.]

Your Roll No.....



Sr. No. of Question Paper : 3128

Unique Paper Code : 32497904

Name of the Paper : Molecular Basis of Infectious Diseases

Name of the Course : B.Sc. (Hons.) Biochemistry

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **8** questions.
3. Attempt any **5** questions.
4. **All** questions carry equal marks. Question no. **1** is compulsory.

1. (a) Define the following :

- (i) Nosocomial infections
- (ii) Zoonosis
- (iii) Viremia
- (iv) Reservoir
- (v) Vector

(b) Explain in brief :

- (i) Antibody enhancement effect

P.T.O.

- (ii) Toxoid
 - (iii) Pathogenicity islands
 - (iv) Molecular diagnostics
 - (v) Opportunistic infections (5,10)
2. (a) Differentiate between : (15)
- (i) Antigenic shift and antigenic drift
 - (ii) African Sleeping sickness and American sleeping sickness
 - (iii) Gram positive and Gram negative bacteria
 - (iv) Salk and Sabin vaccine
 - (v) Emerging and Re-emerging diseases
3. Give the causative agent, characteristic symptoms and diagnostic indicators of the following : (15)
- (a) Rabies
 - (b) Anthrax
 - (c) Giardiasis
 - (d) Ringworm
 - (e) Tetanus
4. (a) Write short notes on :
- (i) Candidiasis
 - (ii) Pertussis

- (iii) Hepatitis C viral infection
- (b) Give the treatment regime of new cases of TB. Give the molecular mechanism behind MDR development. (9,6)
5. (a) Justify the following :
- (i) Periodic fever in malaria is not always a definite diagnostic indicator.
 - (ii) Polymorphic form of fungi helps in its pathogenesis.
 - (iii) Acyclovir is ineffective against latent Herpes infection.
 - (iv) A new flu-shot is introduced every year.
 - (v) Hepatitis D is an incomplete virus.
 - (vi) Mantoux test is not a reliable diagnostic test for TB.
- (b) Draw a diagram of Varicella Zoster virus. (12,3)
- 6 (a) Answer the following :
- (i) Discuss the anti-retroviral therapy used against HIV infections. Explain why rapid resistance to antivirals is observed in case of HIV treatment?

- (ii) Why are fungal infections difficult to treat as compared to bacterial infections?
- (iii) Pneumonia can have varied causative agents. Justify.
- (iv) What is the basis of viral classification?

(6,3,3,3)

7. (a) Explain in brief the mechanism of action of the following drugs :

- (i) Isoniazid
- (ii) Penicillin
- (iii) Chloroquine
- (iv) Tamiflu
- (v) Amphotericin B

(b) Discuss in brief a serological diagnostic method for Tuberculosis.

(c) Vaccination is the best strategy to control a disease spread. Justify this statement with appropriate examples.

(10,2,3)

8. Draw the following :

(a) Life cycle of *Plasmodium vivax*

(b) Mechanism of action of any 2 exotoxins

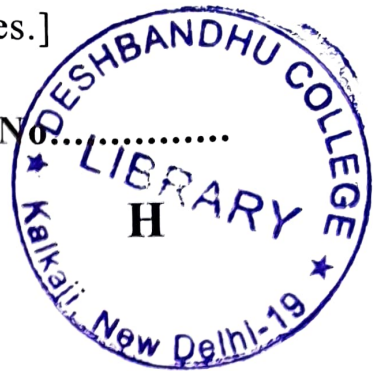
(c) Structure of HIV

(7,5,3)

(200)

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Your Roll No.....



Sr. No. of Question Paper : 3129

Unique Paper Code : 32497907

Name of the Paper : Plant Biochemistry

Name of the Course : B.Sc. (H) Biochemistry

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. There are **8** questions.
3. Attempt any **5** questions. **All** questions carry equal marks. Question no. **1** is compulsory.

1. (a) Define any **six** of the following terms :

- (i) Coumarins
- (ii) Red drop effect
- (iii) Saponins

P.T.O.

(iv) Denitrification

(v) Nodulins

(vi) Etioplast

(vii) Tonoplast

(viii) Infection thread

(b) Differentiate between the following :

(i) Photosystem I and Photosystem II.

(ii) NADP-Malic enzyme and NAD-malic enzyme pathway.

(iii) Form 1 and Form 2 of Rubisco. (9,6)

2. (a) What are the advantages and disadvantages of C₃, C₄ and CAM photosynthetic pathway?

(b) Under what conditions these alternative pathways become active in the plants. Explain the mechanism of plant respiration adopted by plants growing under water-logged conditions.

(c) Elaborate on the distinctive features of glycolysis in higher plants. (6,4,5)

3. (a) Diagrammatically show the Z-scheme of photosynthesis.
- (b) Write the reaction catalyzed by Ribulose biphosphate carboxylase. Mention its importance in photosynthesis.
- (c) Give the structure and composition of cell wall. (5,5,5)
4. (a) Give a brief account of the biological role of the following plant hormones.
- (i) Auxin
 - (ii) Gibberellin
 - (iii) Ethylene
- (b) What do you understand by somaclonal variations and what is its major disadvantage? (9,6)
5. (a) Give the steps involved in formation of symbiotic relationship between *Rhizobium* and legume plant.
- (b) Detail out the structure and mechanism of Nitrogenase enzyme.
- (c) Write a short note on cereal seed storage proteins. (5,5,5)

6. (a) Give the structure of phytochrome. How do they mediate photomorphogenesis?
- (b) Show how phototropins promote stomata opening in blue light.
- (c) Differentiate between the stress responses exhibited by plants during drought and flooding.
(5,5,5)
7. (a) What are the different steps involved in Plant tissue culture?
- (b) What are the biological roles of alkaloids? Give names of three alkaloids having pharmacological role.
- (c) What are Phytoalexins? Give their biological role.
(5,5,5)
8. Write short notes on the following :
- (a) Somatic embryogenesis
- (b) Cell Suspension
- (c) Protoplast culture
(5,5,5)

[This question paper contains 4 printed pages]

Your Roll No.



Sr. No. of Question Paper : 3212

Unique Paper Code : 32237910

Name of the Paper : Reproductive Biology

Name of the Course : B.Sc Hons., LOCF (VI), DSE

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer any **FIVE** questions in all. Question No. 1 is compulsory.
3. Draw well labelled diagrams wherever necessary.

1. (A) Define the following terms (**Any four**) :

(2×4=8)

- (a) Colostrum
- (b) Follicular atresia
- (c) Vitrification
- (d) Prepubertal hiatus
- (e) Infertility

P.T.O.

(B) Differentiate between the following (**Any four**):
(2×4=8)

- (a) Fibroids and endometrial polyps
- (b) Spermiogenesis and spermiation
- (c) Cumulus oophorus and zona pellucida
- (d) Primary follicle and Tertiary follicle
- (e) Spermatogenic cycle and spermatogenic wave

(C) Fill in the blanks (**Any four**): (4)

- (a) GnRH acts on _____ in the anterior pituitary to stimulate secretion of gonadotropins.
- (b) Mild irregular uterine contractions experienced by women, especially in the last few weeks of gestation are known as _____.
- (c) _____ is used as an emergency pill.
- (d) The glycoprotein hormone secreted by the placenta is _____.
- (e) Milk ejection response is mainly due to action of _____.

(D) Name the source of secretion and one function of the following (**Any three**): (3)

- (a) DHT
- (b) Inhibin
- (c) Estrone
- (d) Oxytocin

(E) Expand the following terms (**Any four**): (4)

- (a) ICSI
- (b) PGD
- (c) ICM
- (d) GAP
- (e) HRE

2. (a) What is contraception? Discuss various barrier methods of contraception. (5)

(b) What is implantation? Discuss in detail the process of implantation and support your answer with a suitable diagram. (7)

3. What is spermatogenesis? Discuss the process in detail, supported by a suitable diagram. Explain the significance of Sertoli cells and blood-testis-barrier in the process. (12)

4. (a) Discuss the process of maturation of sperm in epididymis. (4)
- (b) What is the hypothalamic-hypophyseal-gonadal axis? How does it regulate the reproductive functions in humans? (8)
5. (a) Discuss the process of lactation and its hormonal regulation. (6)
- (b) What are steroid hormones? Elaborate on the mechanism of their action. (6)
6. (a) Discuss in brief the maternal, fetal and placental circulation during pregnancy. (6)
- (b) What is the menstrual cycle? Explain different phases of the menstrual cycle. (6)
7. Write short notes on (**Any three**): (4×3=12)
- (a) IUCD
- (b) Ferguson reflex
- (c) Crypto orchidism
- (d) Estrous Cycle