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[29/44/A-14]

[ ] SARDAR PATEL UNIVERSITY
M.Sc. (II & III Semester- CBCS) Examination
Subject: Biochemistry/ Microbiology
PS02EBIC02/PS03EMIC01; Plant Biotechnology
Tuesday, April 18, 2017
Time: 10.00 a.m. to 1.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks
Answer all the questions in the given answer book

Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)

i) The phenomena of callus formation and further formation of organized structures are called:
a) Differentiation and redifferentiation
b) Redifferentiation and dedifferentiation
c) Dedifferentiation and redifferentiation
d) Dedifferentiation and differentiation

ii) Crown galls are often seen on:
(a) Dicot plants
(b) Monocot plants
(c) Gymnosperms
(d) Both (a) & (b)

iii) Among different culture systems used to generate in vitro plants _____culture system show the maximum frequency of somaclonal variation:
(a) Cell suspension cultures
(b) Protoplast cultures
(c) Anther cultures
(d) Meristem cultures

iv) Which type of cultures are used for production of homozygous plants in *in vitro.*
(a) Ovule cultures
(b) Anther cultures
(c) Both (a) & (b)
(d) Meristem cultures

v) The growth hormone responsible for apical dominance
(a) Ethylene
(b) cytokinin
(c) Gibberellin
(d) auxin

vi) The GFP reporter system is advantageous over other systems since
(a) it is a standalone system
(b) it is non toxic
(c) expressed in prokaryotic and eukaryotic cells
(d) all of these

vii) Induced resistance in plants against pathogens is a
(a) Energy requiring mechanism
(b) gene mediated response
(c) both (a) and (b)
(d) none of these

viii) Which of the following population is not suitable for mapping?
a) BC1
b) RILs
c) Doubled haploids
d) F1

Q2. Answer <u>any SEVEN</u> of the following in brief: (7x2=14)

a) Why sucrose requirement differ for globular stage and cotyledonary stage zygotic embryos?
(b) Show the theoretical products of protoplast fusion. Which of them are most commonly observed?
(c) Differentiate between organogenesis and embryogenesis.
(d) Give a brief note about Biotransformation.
(e) Explain in brief about Binary vectors.
(f) Why cultured anthers will permit pollen to develop into pollen embryos whereas cultured isolated pollen grains may not form embryos? Give reasons.
(g) What are the salient features of Systemic acquired resistance (SAR) ?
(h) Note on: Patenting.
(i) Role of Vir genes in Agrobacterium based transformation in plants.

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Q3. (a) Outline the methods for protoplast isolation and fusion. (6)

(b) Explain different stages of in vitro clonal propagation, its advantages and disadvantages. (6)

OR

(b) Describe in detail various pathways of in vitro morphogenesis. (6)

Q4 (a) Enlist the strategies used for production of disease free plants. Discuss any one in detail. (6)

(b) Explain the technique for the production of synthetic seeds. What are the merits and demerits of synthetic seeds?

OR (6)

(b) Define the term somaclonal variation. Write a note on somaclonal variation. (6)

Q5 (a) Provide a detailed description of Ti-plasmid mediated gene transfer in plants. (6)

(b) Describe various types of bioreactors used for in vitro production of secondary metabolites.

OR (6)

(b) Describe the direct DNA delivery systems for genetic transformation in plants. (6)

Q6 (a) Explain the role of Hyper sensitive response in plant defence mechanisms. (6)

(b) What are molecular markers? Explain principle, merits and demerits of RFLP and RAPD.

OR (6)

(b) Write a descriptive note on IPR.

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SARDAR PATEL UNIVERSITY

M. Sc. (III Semester) Biochemistry (under CBCS) Examination

Wednesday, 19th April 2017

Time: 10.00 a.m. to 1.00 p.m.

Paper: PS03CBIC03 (Human Physiology)

Total Marks: 70

N.B.: (i) Answers of all the questions (including multiple choice questions) should be written in the provided answer book only.

(ii) Figures in the right indicate marks.

Q1. Choose the most appropriate answer for the following multiple choice questions: (8)

(i) The type of white blood cell that often arrives at the site of infection first, is

(a) basophil (b) eosinophil (c) neutrophil (d) monocyte

(ii) Which of the following cells can do phagocytosis?

(a) Neutrophils only (c) Only Macrophages

(b) Both Neutrophils & Macrophages (d) none

(iii) Which muscular valve prevents gastric juices from flowing back out of the stomach and into the esophagus

(a) Cecum (b) Uvula (c) cardiac sphincter (d) pyloric sphincter

(iv) The maintenance of posture and body position is the function of

(a) endocrine system (b) muscular system (c) homeostasis (d) nervous & endocrine

(v) Which of the following statements concerning the rate of action potential propagation is true?

(a) It is faster in large-diameter axons than in small-diameter ones.
(b) It is faster for a strong stimulus than for a weak one.
(c) It is faster in myelinated nerve fibres than in non-myelinated ones.
(d) Both a and c are true

(vi) The only organ which is exocrine as well as endocrine in nature, located behind the great curvature of the stomach is

(a) Gall bladder (b) Duodenum (c) Pancreas (d) Oesophagus

(vii) An excitatory neurotransmitter _____ the postsynaptic membrane.

(a) Depolarizes (c) Repolarizes

(b) Hyperpolarizes (d) does not affect the polarity of

(viii) _____ muscle is the only voluntary muscle in the body.

(a) skeletal (b) cardiac (c) smooth (d) visceral

Q2. Answer <u>any SEVEN</u> of the following questions briefly: **(7 X 2 = 14 Marks)**

1. What is Homeostasis? Which systems play role in maintaining homeostasis in human body?
2. Which is the functional unit for excretion of metabolic wastes and other toxic products from the body?
3. Name the location, major secretion and functions of Absorptive cells and Goblet cells.
4. How does digested food reach to blood stream?
5. Differentiate between transcellular and paracellular reabsorption routes in nephron. Give examples.
6. Why peristaltic contractions in the small intestine are weaker compared with those in esophagus and stomach?
7. What is grey matter and white matter?
8. What prevents food from entering the wind pipe?
9. Narrate the functions of estrogens.

Q3. **(a)** What is erythropoiesis? Which factors speed up or slow down erythropoiesis? (6)

(b) Explain the extrinsic and intrinsic pathways of blood clotting. (6)

<u>OR</u>

(b) What is anemia? List and describe briefly various types of anemia. (6)

Q.4 (a) What are the functions of rugae, mucous surface cells, mucous neck cells, chief cells, parietal cells and G cells in the stomach? (6)

(b) Describe the functions of liver in digestive system. (6)

<u>OR</u>

(b) How much saliva is secreted each day and how is secretion of saliva regulated? (6)

Q.5 (a) Explain the structure and functions of nephrons. (6)

(b) Describe the reabsorption and secretion in the proximal convolute tubule. (6)

<u>OR</u>

(b) Write a note on different types of muscles. (6)

Q.6 (a) Describe the organization of the nervous system. (6)

(b) Explain the role of anterior pituitary and ovarian hormones during normal female reproductive cycle. (6)

<u>OR</u>

(b) Narrate the functions of all neuroglial cells. (6)

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SARDAR PATEL UNIVERSITY

M. Sc. Biochemistry (III Semester) Examination

Monday, 17th April, 2017

2.00 to 5.00 p.m.

Paper PS03EBIC01: Plant Biochemistry

Max. Marks: 70 (Seventy only)

N.B.: (i) Answers of all the questions (including multiple choice questions) should be written in the provided answer book only.

(ii) Figures in the right indicate marks.

Q1. Select the appropriate answer for the following multiple choice questions: (8)

(i) Diffusion of water through semipermeable membrane from dilute solution to concentrated solution is

(A) Imbibition (B)Osmosis
(C) Plasmolysis (D) Necrosis

(ii) Cell becomes turgid because of

(A) Plasmolysis (B)Exosmosis
(C) Endosmosis (D) Diffusion

(iii) The pathway in which water moves through cell wall without crossing any membrane

(A) Apoplast pathway (B) Symplast pathway
(C) Vaculoar pathway (D) Transmembrane pathway

(iv) The hormone responsible for phototropic responses in the growing tips of plants is:

(A) auxin (B) cytokinin
(C) gibberellins (D) abscisic acid

(v) Precursor of indole acetic acid is

(A) Glycine (B) Methionine
(C) Isopentynyl pyrophosphate (D) Tryptophan

(vi) Which of the following is necessary for biological nitrogen fixation

(A) Copper (B) Zinc
(C) Manganese (D) Molybdenum

(vii) The biochemical pathway in which phosphenol pyruvic acid convertyed to tyrosine is commonly known as

(A) Hatch and slack pathway (B) Glycolate pathway
(C) EMP pathway (D) Shikimic acid pathway

(viii) Cell wall posses

(A) Cellulose (B) Hemicellulose
(C) Protein (D) all the above

(Contd.....2)

Q2. Answer <u>any SEVEN</u> of the following questions briefly: **(14)**

(i) "From the physiological perspective, plants are viewed primarily as biochemical machines". Explain.

(ii) "Of all the resources that plants need to grow and function, water is the most abundant and at the same time the most limiting for agricultural productivity". Explain.

(iii) Concerning their permeability how are membranes classified?

(iv) Distinguish between C3 and C4 plants.

(v) Define: Systemic acquired resistance

(vi) What is meant by hypersensitive reaction?

(vii) Define: Allelopathy

(viii) Differentiate between Positive photoblastic and Negative photobalstic seeds

(ix) What are alkaloids?

Q3. (a) Giving a brief account of factors influencing the rate of diffusion, briefly discuss the significance of diffusion in plants. **(6)**

(b) Discuss the cohesion theory for uptake of water in plants. **(6)**

<u>OR</u>

(b) Write briefly on the mechanism of opening and closing of stomata, especially with reference to the involvement of ion transport. Also briefly comment upon whether transpiration serves any useful function in the plants? . **(6)**

Q4. (a) Give an account of the mechanism of CO2 fixation, explain major steps and the end products in photosynthesis. **(6)**

(b) What do you understand by fermentation in plants? Aerobic organisms are generally much larger than anaerobic organisms. Can you suggest how this may be related to respiration. **(6)**

<u>OR</u>

(b) Explain the role of light in the regulation of plant development and briefly discuss the function of phytochrome? **(6)**

Q5. (a) Discuss the physiology of flowering with special reference to photoperiodism **(6)**

(b) Briefly discuss the biochemistry of fruit ripening and its control. **(6)**

<u>OR</u>

(b) Briefly discuss the abscission and senescence processes and their significance in plants **(6)**

Q6. (a) Write a note on cynogenic glycosides **(6)**

(b) Write a note on nitrogenase. **(6)**

<u>OR</u>

(c) Explain the biosynthesis of ethylene **(6)**

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