Set No. : 1

RET/16/TEST-B

Question Booklet No.

749 | Plant Physiology

(To be filled up by the candidate by blue/black ball point pen)

Roll No. | | | | | | | | | | |

Roll No. (Write the digits in words) .....

Serial No. of OMR Answer Sheet .....

Day and Date .....

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES

(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)

1. Within 10 minutes of the issue of the Question Booklet, Please ensure that you have got the correct booklet and it contains all the pages in correct sequence and no page/question is missing. In case of faulty Question Booklet, Bring it to the notice of the Superintendent/Invigilators immediately to obtain a fesh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall ***except the Admit Card without its envelope.***
3. ***A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided.***
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. ***On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.***
6. *No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.*
7. *Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.*
8. *This Booklet contains 40 multiple choice questions followed by 10 short answer questions. For each MCQ, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet. For answering any five short Answer Questions use five Blank pages attached at the end of this Question Booklet.*
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. ***Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).***
11. For rough work, use the inner back pages of the title cover and the blank page at the end of this Booklet.
12. ***Deposit both OMR Answer Sheet and Question Booklet at the end of the Test.***
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the *University* may determine and impose on him/her.

Total No. of Printed Pages : 20

10 · A2 ·

ROUGH WORK
रफ़ कार्य

Research Entrance Test-2016

No. of Questions : 50

Time : 2 Hours ***Full Marks : 200***

Note: (1) This Question Booklet contains **40** Multiple Choice Questions followed by **10** Short Answer Questions.

(2) Attempt as many MCQs as you can. Each MCQ carries **3 (Three)** marks. **1 (One)** mark will be deducted for each incorrect answer. **Zero** mark will be awarded for each unattempted question. If more than one alternative answers of MCQs seem to be approximate to the correct answer, choose the closest one.

(3) Answer only **5** Short Answer Questions. Each question carries **16 (Sixteen)** marks and should be answered in **150-200** words. Blank **5 (Five)** pages attached with this booklet shall only be used for the purpose. Answer each question on separate page, after writing Question No.

01. Where is the International Rice Research Institute located ?

(1) Manila (2) Chicago

(3) Cairo (4) Cuttack

02. Trypsin is basically what ?

(1) Fatty acid (2) Sugar

(3) Oligo-nucleotide (4) Protein

03. GMO stands for what ?

(1) Genetically Modified Organisms

(2) Genetically Multipied Organisms

(3) Green Modified Organisms

(4) Green Modified Orange

04. Which international treaty was documented in 1987 and implemented in 1989, to avoid deleterious effects of ultra- violet radiation owing to ozone layer depletion ?

(1) Cartagene protocal

(2) Montreal protocol

(3) Geneva protocol

(4) Antartica Environmental protocol

05. The tissue bearing dead cells is ?

(1) Collenchyma (2) Parenchyma

(3) Xylem (4) Phellogen

06. Sub-cellular components are separated by means of ?

(1) Chromatography

(2) Autoradiography

(3) Electrophoresis

(4) Differential and density gradient centrifugation

07. Which these is a vertebrate animal ?

(1) Prawn (2) Snake

(3) Mosquito (4) Octopus

08. Which of these is not a C_4 plant ?

(1) Maize (2) Rice

(3) Sorghum (4) Sugarcane

09. Cell theory was first formulated by ?

(1) Schleiden and Schwann (2) Rudolf Vrichow

(3) A.V. Leeuwenhock (4) Ruth Sagar

10. Apple is a ?

(1) True fruit (2) False fruit

(3) Vegetable (4) Parthenocarpic fruit

11. ATP is produced in which of the following step of ETS ?

(1) Cytb-Cytc (2) Cyta-Cytc

(3) Cytc-Cytc1 (4) FAD-UQ

12. From which of the following plant parts phytochrome was initially isolated from etiolated turnip seedlings ?

(1) Leaves (2) Cotyledons

(3) Shoots (4) Roots

13. Legume seeds are generally rich in :

(1) Albuminus (2) Globulins

(3) Glutelins (4) Prolamins

14. Sink strength may be defined as :

(1) Sink size × Sink activity (2) Sink size + Sink activity

(3) Sink size – Sink activity (4) Sink size ÷ Sink activity

15. Match the list I with the list II and select the correct answer using the codes given below the lists :

List I (Terms)	List II (Meaning)
(A) Artificial seed	1. Somatic embryo
(B) Ascent of sap	2. Does not require union of gametes
(C) Asexual reproduction	3. Raise against gravity
(D) Asphyxiant	4. Gas for killing pests through respiratory difficulties
(E) Assimilation	5. Conversion of substances taken in form the outside into living tissue of plants or animals

(1) A: 1, B: 3, C: 4, D: 5, E: 2

(2) A: 1, B: 2, C: 3, D: 4, E: 5

(3) A: 1, B: 3, C: 2, D: 4, E: 5

(4) A: 4, B: 2, C: 3, D: 5, E: 1

16. When a cell ruptures by keeping it in a solution, the solution, in respect to the cell sap is referred as ?

(1) Hypotonic (2) Pure water

(3) Hypertonic (4) Isotonic

17. Which of the following elements acts as second messenger in metabolic regulations ?

(1) Calcium (2) Potassium

(3) Iron (4) Zinc

18. Under low atmospheric pressure the rate of transpiration :

(1) Decreases slowly (2) Increases

(3) Remains unchanged (4) Decreases rapidly

19. The idea that O_2 comes form water and not from CO_2 was first given by :

(1) Van Niel (2) Arnon

(3) Ruben and Kamen (4) Lamarck

20. $H_2O+A \xrightarrow{\downarrow Light} \frac{1}{2} O_2+H_2A$

Where A= electron acceptor

This reaction is known as :

(1) Arnon reaction (2) Hill reaction

(3) Calvin reaction (4) Mayer reaction

21. Which of the following elements has role in auxin biosynthesis ?

(1) Copper (2) Zinc

(3) Boron (4) Molybdenum

22. How many ATP molecules are required for the fixation of one molecule of $C0_2$ in C_4 plants ?

(1) 2 (2) 3 (3) 4 (4) 5

23. What type of canopy architecture would be if leaf angle of more than 90% of leaves in more than 80^0 ?

(1) Erectophyle (2) Plainophyle

(3) Spherical (4) Plageophyle

24. Water-use efficiency of which of the following is supposed to be the maximum ?

(1) C_3 plants (2) C_4 plants

(3) CAM plants (4) Trees

25. Which of the following essential element is the constituent of nitrogenase ?

(1) Ca (2) Mo (3) B (4) Mg

26. In SPAC which of the following is true for an actively transpiring plant?

(1) Leaf water potential is the minimum

(2) Root water potential is the minimum

(3) Soil water potential is the minimum

(4) Water potential of the atmosphere is the minimum

27. Which of the following phytohormone is responsible for Tanada effect ?

(1) Auxin (2) Gibberellin

(3) Cytokinin (4) ABA

28. If *ab* and *ad* are the abaxial and adaxial leaf resistances, respectively then the total leaf conductance may be expressed by which of the following equation ?

(1) $ab+ad$ (2) $1/ab+1/ad$

(3) $(ab+ad)/(ab\times ad)$ (4) $(ab\times ad)/(ab+ad)$

29. The approximate molecular weight of a heavy sub-unit of RuBISCO is :

(1) 56 KD (2) 76 KD (3) 106 KD (4) 156 KD

30. If leaf area index of a crop are L_1 and L_2 at time t_1 and t_2, respectively, the LAD between t_1 and t_2 can be expressed as :

(1) $(L_1+L_2)\times(t_2-t_1)/2$ (2) $(L_1-L_2)\times(t_2-t_1)/2$

(3) $(L_1+L_2)/(t_2-t_1)$ (4) $(L_1+L_2)/2$

31. Dry matter accumulated per unit area of a crop can be calculated as :

(1) LAI×NAR (2) NAR×CGR

(3) LAD×NAR (4) LAD×CGR

32. What is the site of operation of HMP-pathway in cells ?

(1) Mitochondria (2) Chloroplast

(3) Cytosol (4) Microsomes

33. The pressure exerted on cell wall during the influx/entrance of water in plant cell is termed as :

(1) Turgor pressure (2) Root Pressure

(3) Osmotic pressure (4) Hydrostatic Pressure

34. Maximum root pressure occurs in the following condition :

(1) Transpiration and absorption both are slow

(2) Transpiration is very high and absorption is high

(3) Transpiration is very low and absorption is high

(4) Transpiration is high and absorption is low

35. During germination of a seed the following occurs first :

(1) Active uptake of water (2) Exosmosis

(3) Endosmosis (4) Imbibition

36. Which of the following is essential for nitrogen fixation by leguminous plants ?

(1) Phycocyanin (2) Anthocyanin

(3) Leghaemoglobin (4) Chlorophyll

37. Little leaf disease is due to the deficiency of :

(1) Nitrogen (2) Zinc

(3) Molybdenum (4) Manganese

38. End product of glycolysis is a :

(1) Two carbon compound (2) Three carbon compound

(3) Four carbon compound (4) Five carbon compound

39. Agranal chloroplasts occur in the following plants :

(1) C3 plants (2) Hydrophytes

(3) C4 plants (4) Halophytes

40. Most accepted hypothesis of ATP generation was given by :

(1) Munch (2) Dixon and Jolly

(3) Gardener (4) Mitchell

Short Answer Questions

Note: Attempt any **five** questions. Write answer in **150-200** words. Each question carries **16** marks. Answer each question on separate page, after writing Question Number.

1. Write in detail various physiological and biochemical changes taking place during plant senescence.

2. Discuss various stages involved in micropropagation. What are its advantages and limitations ?

3. What is seed viability ? Describe methods of estimating seed viability.

4. Describe mode of actions of auxin and its cross talk with other plant growth regulators controlling physiological processes.

5. (a) How one can take the dry weight of any leaf sample ? Write the procedure.

(b) Define molar and molal solution with example.

6. Define germination and write on hypogeal and epigeal germination with suitable diagram.

7. Draw schematically the photorespiratory cycle with suitable illustrations of enzymes and cell organelles taking part in this process.

8. Explain interrelationship between RGR, NAR and LAR.

9. Explain mechanism of starch synthesis in plants.

10. What do you mean by green house gases ? What are the major causes of increase in the concentrations of these gases in atmosphere ? How climate change is going to affect crop productivity ?

Question No.	Page for Short Answer

Question No.	Page for Short Answer

Question No.	Page for Short Answer

Question No.	Page for Short Answer

Question No. Page for Short Answer

अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 10 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में *लिफाफा रहित प्रवेश-पत्र के अतिरिक्त,* लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. *उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।*
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. *उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।*
6. *ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।*
7. *उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।*
8. *प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।*
9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. *ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।*
11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल *ओ एम आर उत्तर-पत्र* परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।