Set No. : 1

RET/14/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 She

1. Within 10 minutes of the issue of the Question Booklet, Please ensure that you have got the cor booklet and it contains all the pages in correct sequence and no page/question is missing. In case of fa 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 Queston 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 shbort 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 : 16

ROUGH WORK
रफ़ कार्य

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. Which one of the following is **not** a kharif crop :

(1) Paddy (2) Maize
(3) Mustard (4) Arhar

02. Select the crop, which is used for green manuring :

(1) Daincha (sunhemp) (2) Sugarcane
(3) Tobacco (4) Onion

03. Panama wilt disease is found in :

(1) Papaya (2) Mango
(3) Peach (4) Banana

04. Osmotic expansion of a cell kept in water is chiefly regulated by :

(1) Ribosomes (2) Mitochondria
(3) Plastids (4) Vacuoles

05. Community Development Programme was started in :

(1) 1952 (2) 1965
(3) 1957 (4) 1960

06. Food grains have :

(1) Inelastic demand (2) Elastic demand
(3) Perfectly elastic demand (4) Perfectly inelastic demand

07. The disease "ricket" in animal is caused due to deficiency of :

(1) Vitamin A (2) Vitamin B
(3) Vitamin C (4) Vitamin D

08. For comparing the variability of the two series, which one of the following measures is used :

(1) Standard Deviation (2) Mean Deviation
(3) Range (4) Coefficient of Variation

09. Which one of the following is an anticoagulant :

(1) Heparin (2) Interleukin

(3) Plasmin (4) Lymphokine

10. The fertility of soil is reduced by :

(1) Alternate cropping (2) Intensive cropping

(3) Nitrogen fixing bacteria (4) None of the above

11. Glycerol, DMSO and methanol are which type of cryoprotectants ?

(1) Permeating (2) Non permeating

(3) Both (4) Damaging

12. Through suspension culture, Ojima and Ohira selected two cell lines of which of the following vegetable crops tolerant to Al and Mn by subculturing cells in excessive amounts of $AICI_3$, and $MnCl_3$ for several months :

(1) Carrot (2) Cabbage

(3) Cauliflower (4) Ladyfinger

13. Zeatin is considered as more active than any other cytokinins probably because of presence of which of the following highly reactive groups in its side chain ?

(1) Allylic-OH group (2) Carboxylic group

(3) Methyl group (4) Alkyl group

14. Ice nucleation means :

(1) Formation of ice under influence of nucleus

(2) Formation of ice in chloroplasts

(3) Formation of ice crystals around large polysaccharides and proteins in cell walls

(4) Formation of ice in tonoplast

15. Sink strength is equal to :

(1) Sink size + sink activity (2) Sink size x sink activity

(3) Sink size – sink activity (4) Sink size + sink activity

16. DCMU is an inhibitor of :

(1) PSII (2) PSI

(3) LHC (4) Both 1 and 2

17. If both plant and animal cells are placed in equally hypotonic solutions then which of the followings will burst easily ?

(1) Animal cells (2) Plant cells

(3) Both will burst easily (4) None will burst

18. What is the concentration of non reducing sugar in phloem sap ?

(1) 5 - 10 % (2) 10 - 25 %

(3) 30 - 45 % (4) 100%

19. Substrate level phosphorylation occurs in :

(1) Photosynthesis (2) Respiration

(3) Nitrogen metabolism (4) Photorespiration

20. A protein molecule consisting of a large single polypeptide chain is composed of several independently folding units knows as domains have a molecular mass of about :

(1) 10^2 daltons (2) 10^3 daltons

(3) 10^4 daltons (4) 10^5 daltons

21. In Calvin cycle :

(1) Fructose 1, 6 bisphosphate undergoes dephosphorylation

(2) ATP is formed during dephosphorylation of fructose

(3) 1,3 di PGA undergoes phosphorylation

(4) Malic acid undergoes phosphorylation

22. Seed which contain growth inhibitors including ABA that can suppress germination of the embryo are relatively more in ?

(1) Cotyledons (2) Embryo

(3) Seed coat and pericarp (4) Embryo and pericarp

23. The meristematic zone lies :

(1) Just above the root cap

(2) Just under the root cap

(3) Just at root stem transition

(4) Just above root stem transition

24. The total leaf area and total dry matter content are required for growth analysis in terms of :

(1) Absolute growth rate (2) Relative growth rate

(3) Net assimilation rate (4) Specific leaf rate

25. A major use of gibberellins is to increase the stalk length of :

(1) Seedless Guava (2) Seedless Grapes

(3) Seedless Fruits (4) Seedless Orange

26. Which one of the following is not a light regulated enzyme that operates in the calvin cycle ?
(1) Rubisco
(2) Aspartate aminotransferase
(3) NADP: glyceraladehyde-3-phosphate dehydrogenase
(4) Ribulose-5-phosphate kinase

27. Crop models are a powerful tool for testing our understanding of :
(1) Crop genetics
(2) Crop varieties
(3) Crop behaviour and productivity
(4) Crop tolerance to stressess

28. The major function of leaf area index is :
(1) Root shoot ratio
(2) Light interception
(3) Water retention
(4) Total biomass

29. If tolerance increases as a result of exposure to prior stress, the plant is said to be :
(1) Adapted
(2) Resistant
(3) Tolerant
(4) Acclimated

30. Identify which one is a signaling molecule under abiotic stress ?
(1) Proline
(2) Glycine betaine
(3) Potassium ion
(4) Reactive oxygen species

31. Some chloroplasts are found in :
(1) Phloem
(2) Cortex
(3) Xylem
(4) Guard cell

32. Opening and closing of stomata are regulated by :
(1) Cytokinin
(2) ABA
(3) Mn^{++}
(4) Cu^{++}

33. Translocatory sugar in plants in mainly :
(1) Starch
(2) Mannose
(3) Glucose
(4) Sucrose

34. Matric Potential is related with :
(1) Exoosmosis
(2) Endoosmosis
(3) Plasmolysis
(4) Imbibition

35. Photorespiration occurs in :
(1) Chloroplast and mitochondria
(2) Chloroplast and cytoplasm
(3) Chloroplast, cytoplasm and peroxisome
(4) Chloroplast, mitochondria and peroxisome

36. Nitrogenase enzyme contains :
(1) Mo-Fe
(2) Mo and K
(3) Mo
(4) Fe

37. Acetyl CoA is a precursor of :
(1) Fatty acid synthesis
(2) Protein synthesis
(3) Amino acid synthesis
(4) Strach synthesis

38. Cytokinin regulates :
(1) Floral initiation
(2) Chlorophyll retention
(3) Seed germination
(4) Apical dominance

39. Glycolysis generates following number of ATP :
(1) Eight
(2) Six
(3) Two
(4) Thirty

40. The following is a light sensitive enzyme :
(1) Nitrogenase
(2) Amylase
(3) Protease
(4) Rubisco

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.

01. Explain osmosis and components of water potential.

02. Describe physiological roles and symptoms of deficiencies of iron and boron. What are the criteria of essentiality of mineral elements ?

03. What is the most accepted theory of translocation of water. Explain.

04. **(i)** Give any three differences between C_3 and C_4 plants

(ii) Which part of photorespiration occurs in mitochondria ? Explain briefly.

05. Highlight how tissue culture techniques help in improving crop productivity. What are the advantage of cryopreservation ?

06. (i) Discuss briefly the role of phytochrome in photomorphogenesis.

(ii) Summarize Electron Transport System (ETS) during plant respiration.

07. What is bioassay ? Discuss bioassays for auxins and cytokinins.

08. Name any five compatible osmolytes. Discuss osmoregulation in view of abiotic stress tolerance.

09. Define allometry. Explain growth analysis based on any three parameters known to you.

10. Write brief notes on :

(i) Physiological changes during seed germination

(ii) Seed priming methods

Question No. प्रश्न संख्या	Page for Short Answer लघु उत्तरीय के लिए पृष्ठ

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Question No. प्रश्न संख्या	Page for Short Answer लघु उत्तरीय के लिए पृष्ठ

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।