

RET/17/Test B**749****Plant Physiology****10005**

Question Booklet No.

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

Roll No.

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Roll No. (Write the digits in words)

Serial No. of OMR Answer Sheet

Day and Date

(A9) 2017

(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 30 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 fresh 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 changes 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.

[उपर्युक्त निर्देश हिन्दी में अन्तिम आवरण-पृष्ठ पर दिये गये हैं।]

Total No. of Printed Pages : 16

FOR ROUGH WORK

Research Entrance Test – 2017

No. of Questions : 50

Time : 2 Hours

Full Marks : 200

- Note :** (i) This Question Booklet contains **40** Multiple Choice Questions followed by **10** Short Answer Questions.
- (ii) 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.
- (iii) 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.

1. Which lime is referred to as quick lime ?
(1) CaO (2) Ca(OH)₂
(3) CaMg(CO₃)₂ (4) CaCO₃
2. Ooze test is done to detect :
(1) Bacterial disease (2) Fungal disease
(3) Viral disease (4) All of these
3. For test of goodness of fit, which statistical test is applied ?
(1) χ^2 test (2) 'F' test
(3) 'Z' test (4) 't' test
4. Farm management is an :
(1) Intra-farm science (2) Inter-farm science
(3) Inter-regional farm science (4) International farm science
5. The term "Ever Green Revolution" was given by :
(1) R. S. Paroda (2) V. L. Chopra
(3) Norman Borloug (4) M. S. Swaminathan
6. "Operation flood" is related to :
(1) Rice (2) Fish (3) Milk (4) Oilseeds
7. During prophase-I of meiosis crossing over occurs at :
(1) Zygotene (2) Pachytene
(3) Diplotene (4) Diakinesis
8. Larva of butterfly is known as :
(1) Grub (2) Nymph (3) Catterpillar (4) Maggot
9. Marginal product is ratio of :
(1) Input-Output (2) Output-Input
(3) Cost-Income (4) Price-Income
10. Mendel did not work on which of the following ?
(1) Plant height in pea (2) Seed colour in pea
(3) Pod number in pea (4) Pod size in pea
11. When a part of plant organ or tissue is put on a culture media and maintained under optimum growth conditions, the meristematic cells de-differentiate and proliferate to form a mass of cells called :
(1) Callus (2) Embryo
(3) Embryoids (4) Shoot

17. Match the List-I with the List-II and select the correct answer using the codes given below the lists :

List-I (Terms)

- A. P protein
 - B. P-ATPase
 - C. P-protein bodies
 - D. P680
 - E. P700
- (1) A-1, B-3, C-4, D-5, E-2
(3) A-4, B-1, C-2, D-3, E-5

List II (Significance)

- 1. Phioem protein
 - 2. Ion pump
 - 3. Photosystem II
 - 4. Spindle shaped
 - 5. Photosystem I
- (2) A-1, B-2, C-3, D-4, E-5
(4) A-1, B-2, C-4, D-3, E-5

18. Rate of photosynthesis when sink/source ratio is increased :
- (1) Declines (2) Increases
(3) Not affected (4) First declines and then increases
19. The first intergeneric hybrid (pomato) between potato and tomato was demonstrated by :
- (1) Melchers (2) Zelcer (3) Nitsch (4) Muir
20. Which of the following is an important sources of methane emission in the atmosphere ?
- (1) Degraded forests (2) Wetlands
(3) Thermal power generator (4) Wheat fields
21. Leaf area index which intercepts 95% of the incident light radiation on a clear sky day is termed as :
- (1) Optimal leaf area index (2) Critical leaf area index
(3) Ceiling leaf area index (4) Potential leaf area index
22. Which of the following statement is correct for role of ABA in stomatal movement ?
- (1) ABA causes depolarization of guard cells
(2) ABA causes polarization of guard cells
(3) ABA causes efflux of Ca^{++} from guard cells
(4) ABA efflux of water from guard cells to aploplasm through plasmodesmata of guard cells
23. Which of the following plant growth phase is also called as exponential phase ?
- (1) Lag phase (2) Log phase
(3) Constant growth phase (4) Decline phase

24. The conserved core of dehydration responsive element (DRE) in cold regulated gene has a sequence of :
- (1) CCAAC (2) CCGGC
(3) CCAGC (4) CCGAC
25. Which of the following is the immediate precursor of cellulose biosynthesis in plants ?
- (1) ADPG (2) UDPG
(3) GDPG (4) Glucose-1-phosphate
26. Which of the following is the term used for emission of a photon of light as an electron relaxes from the first singlet excited to ground state ?
- (1) Thermal deactivation (2) Phosphorescence
(3) Fluorescence (4) Inductive resonance
27. Which of the following is the range of photosynthetically active radiation for plants ?
- (1) 400-700 nm (2) 240-700 nm (3) 400-660 nm (4) 450-600 nm
28. Which of the following genome(s) encode for large sub-units of RUBISCO ?
- (1) Nuclear genome
(2) Mitochondrial genome
(3) Chloroplast genome
(4) Both Chloroplast as well as mitochondrial genomes are involved
29. The C/N ratio of majority of the crop plants is :
- (1) 5 (2) 10 (3) 20 (4) 35
30. What term is being used for intervening period between the sequential emergence of leaves on the main stem of a plant ?
- (1) Plastochron index (2) Phytochron index
(3) Leaf index (4) Phytochrome index
31. Seed priming with the KNO_3 is termed as :
- (1) Hydro priming (2) Matri priming
(3) Osmo priming (4) Halo priming
32. The sugar which can freely diffuse through the plasmodesmata from the companion cell to sieve tube elements :
- (1) Fructose (2) Sucrose
(3) Lactose (4) Ribulose

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. Describe the process of somatic embryogenesis elaborating various events and factors governing it.
2. Briefly describe any two of the followings :
 - (i) Hormonal control of seed germination
 - (ii) Role of Phytochrome
 - (iii) Haploid production *in vitro*
 - (iv) Modified Atmospheric Packaging
3. Attempt the followings (any two) :
 - (i) Role of Transmembrane Potential in ion uptake
 - (ii) Effects of low temperature stress on membrane permeability
 - (iii) Cybrid
4. Write down the working principle of the following instruments :
 - (a) Spectrophotometer
 - (b) Flame photometer
5. Differentiate between the deficiencies caused by mobile and immobile essential plant nutrients in plants ? Write the deficiency symptoms and physiological roles of Mn and B in plants.
6. Write :
 - (a) One reaction of glycolysis where ATP is generated
 - (b) One reaction of carbon reduction pathway where TPP is involved
 - (c) One reaction of TCA cycle where CoA-SH is involved
 - (d) Reaction of C₄ pathway where ATP is converted into AMP
 - (e) One reaction catalyzed by PEP-carboxy kinase
7. What are different ways by which water-use efficiency (WUE) is defined by agricultural scientists ? Explain effect of different plants and environmental factors in regulating WUE in plants and methods to improve it.
8. Write a note on the structure of chloroplast highlighting about ATP synthesis.
9. Write a note on epigeal and hypogeal germination. What are various tests to test seed viability ?
10. Schematically represent the biosynthesis of ethylene highlighting key roles of ethylene in plants.

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

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Q. No. :

Roll No. :

Q. No. :

FOR ROUGH WORK

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 30 मिनट के अन्दर ही कृपया 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 जागज 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।
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, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक संख्या 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. इस पुस्तिका में 40 बहुविकल्पीय प्रश्नों के साथ 10 लघु उत्तरीय प्रश्न हैं। प्रत्येक बहुविकल्पीय प्रश्न के लिए, आपको उत्तर-पत्र के प्रथम पृष्ठ पर दी गयी गाइडलाइन के अनुसार सही विकल्प के लिए उत्तर-पत्र की संगत पंक्ति में उपयुक्त गोले को पेन द्वारा काला करना है। किन्हीं पाँच लघु उत्तरीय प्रश्नों के उत्तर देने के लिए प्रश्न-पुस्तिका के अन्त में संलग्न पाँच रिक्त पृष्ठों का प्रयोग कीजिए।
9. प्रत्येक प्रश्न के उत्तर के लिये 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 सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे (प्रश्नों पर शून्य अंक दिये जायेंगे।)
11. रफ कार्य के लिये इस पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा अंतिम खाली पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त ओ० एम० आर० उत्तर-पत्र एवं प्रश्न पुस्तिका दोनों परीक्षा भवन में जमा करें।
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।