

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

(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 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 page 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.

FOR ROUGH WORK

Research Entrance Test – 2013

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. One Horse Power (HP) is expressed in term of watt which is
 (1) 720 (2) 786 (3) 746 (4) None of these
2. Number of segments present in insect head is :
 (1) Two (2) Four (3) Six (4) Seven
3. Deficiency symptom of sulphur first appears an :
 (1) Younger leaves (2) Older leaves
 (3) Middle leaves (4) None of these
4. Protein content in lentil is :
 (1) 18% (2) 25% (3) 16% (4) 20%
5. Demonstration showing how to do things is called :
 (1) Method demonstration (2) Result demonstration
 (3) Training (4) Frontline demonstration
6. Dithane M-45 is a :
 (1) Bactericide (2) Insecticide
 (3) Fungicide (4) Nematicide
7. Jamunapari is a breed of :
 (1) Cow (2) Goat
 (3) Buffalo (4) None of the above
8. Select the correct formula of urea :
 (1) $H_2NCO_2NH_2$ (2) $HNCONH$
 (3) H_2NCONH_2 (4) H_4NCONH_4
9. The measure of central tendency is :
 (1) Median (2) Mode
 (3) Mean (4) All of the above
10. On which of the following plant Gregor Mendal perform his classica experiment ?
 (1) Gram (2) Maize (3) Pea (4) Rice

11. The maximum amount of water enter in root through :
- (1) root cap
 - (2) root tip
 - (3) root hair zone
 - (4) root elongation zone
12. Which of the following portion of light spectrum contains the maximum energy per quanta of light ?
- (1) green
 - (2) violet
 - (3) red
 - (4) infrared
13. When electron from first singlet state of chlorophyll comes to ground state and energy is lost in the form of radiation, the phenomenon is termed as :
- (1) incandescence
 - (2) fluorescence
 - (3) phosphorescence
 - (4) luminescence
14. The carbon reduction reactions in plants take place in the :
- (1) grana
 - (2) mitochondria
 - (3) stroma
 - (4) chloroplast membrane
15. The full form of the enzyme RuBISCO is precisely known as :
- (1) Ribulose-di-phosphate carboxylase/oxygenase
 - (2) Ribulose-1, 5-bi-phosphate carboxylase
 - (3) Ribulose-1, 5-bisphosphate carboxylase
 - (4) Ribulose-1, 5-bisphosphate carboxylase/oxygenase
16. NADP glycerinaldehyde-3-phosphate dehydrogenase of Calvin Cycle is regulated by :
- (1) dark
 - (2) light
 - (3) both light and dark
 - (4) phytochrome

17. Malate and aspartate are carboxylation products of the
- (1) C3 Cycle (2) C2 Cycle
(3) C4 Cycle (4) glycolysis
18. In the Citric Acid Cycle, pyruvate is oxidized :
- (1) completely to CO_2
(2) completely to H_2O_2
(3) completely to CO_2 and H_2O
(4) completely to fumaric acid
19. Auxin rapidly increases the extensibility of the :
- (1) mitochondria (2) cell wall
(3) chloroplast (4) nucleus
20. Extreme stem elongation in genetically dwarf plants resemble the tallest varieties of the same species is caused by :
- (1) Exogenous IAA application
(2) Exogenous kinetin application
(3) Exogenous GA_3 application
(4) Exogenous IAA and kinetin application
21. Most abundant natural cytokinin is :
- (1) indole-3-acetic acid (2) zeatin
(3) kinetin (4) benzyladenine
22. Climacteric is caused due to :
- (1) gibberellins (2) auxins
(3) cytokinins (4) ethylene
23. Which of the following is the most sensitive plant process to moisture stress ?
- (1) Photosynthesis (2) Cell enlargement
(3) Respiration (4) Proline accumulation

24. Osmotic adjustment helps plants in which of the following?
- (1) Turgor maintenance (2) Water absorption
(3) Water exclusion (4) Ion accumulation
25. Which of the following plants is most fit for survival under moisture stress?
- (1) C3 plants (2) C4 plants
(3) CAM plants (4) Perennial plants
26. Formation of aerenchyma in plants under waterlogged condition is induced by which of the following?
- (1) Ethylene (2) ABA
(3) Cytokinin (4) Gibberellins
27. The element required for the activity of the enzyme laccase is:
- (1) Mn (2) Zn (3) Cu (4) Cl
28. The element responsible for regulating stomatal movement in maize plant is:
- (1) Na (2) K (3) B (4) Cl
29. Deficiency symptoms of an immobile element appear on:
- (1) upper parts of the plants (2) lower parts of the plants
(3) younger parts of the plants (4) older parts of the plants
30. Which of the following element is involved in the transport of sugar in plants?
- (1) Zn (2) B (3) Fe (4) Cu
31. In MKS system, which of the following is the unit of water potential?
- (1) Atmosphere (2) Bar
(3) Mega Pascal (4) Pound

32. At initial growth stage, the Mo deficiency symptom resembles to deficiency symptoms of the following element :
- (1) N (2) P (3) K (4) Ca
33. Reduction of N_2 up to the level of NH_3 by nitrogenase requires :
- (1) 4 electrons (2) 6 electrons
(3) 8 electrons (4) 10 electrons
34. Starch biosynthesis in plants takes place in :
- (1) cytoplasm (2) mitochondria
(3) chloroplast (4) endoplasmic reticulum
35. Critical photoperiods of plants 'A' and 'B' are 18 hours. Plant 'A' flowers when day length is more than 18 hours, while plant 'B' fails to flower at this photoperiod. Plants 'A' and 'B' may be classified as :
- (1) 'A' and 'B' both long day plants
(2) 'A' short day plant and 'B' long day plant
(3) 'A' and 'B' both are short day plants
(4) 'A' long day plant and 'B' short day plant
36. Which of the morpho-physiological parameters of plants are required to determine net assimilation rate (NAR) ?
- (1) Time duration and total leaf area
(2) Total leaf area and total dry weight
(3) Time duration and total dry weight
(4) Time duration, total leaf area and total dry weight
37. Leaf area index at which rate of dry matter production is the maximum is termed as :
- (1) Ceiling leaf area index (2) Optimum leaf area index
(3) Net leaf area index (4) Extinction point

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

- | | |
|---------------------|---------------------|
| (1) seedless guava | (2) seedless grapes |
| (3) seedless fruits | (4) seedless banana |

39. Kinetin was discovered as a breakdown product of :

- | | |
|---------|-----------------|
| (1) RNA | (2) protein |
| (3) DNA | (4) chlorophyll |

40. Leaf senescence is delayed by :

- | | |
|-------------------|---------------|
| (1) abscisic acid | (2) ethylene |
| (3) paclobutrazol | (4) cytokinen |

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. Define osmosis. How does it differ from imbibition ?
2. Define transpiration. Differentiate between transpiration and guttation.
3. Explain the mechanism of geotropic response in plants.
4. Discuss briefly the mechanism of action of abscisic acid.
5. Define accumulation ratio. What do you understand by symport and antiport of ions ?
6. What is carbon sequestration ? Illustrate the term biodiversity and describe briefly its significance.
7. What are the limitations of NAR estimation ?
8. Write the reactions of C₄ pathway, which occurs in the cytoplasm of the cell.
9. Define substrate level phosphorylation with 3 examples.
10. List greenhouse gases and write in brief the causes of global warming.

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FOR ROUGH WORK

