

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 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

SEAL

Research Entrance Test – 2018

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 of the following is referred as Buffalo grass ?
(1) Para grass (2) Napier grass (3) Setaria grass (4) Guinea grass
2. Who is known as "Father of White Revolution in India" ?
(1) Dr. M. S. Swaminathan (2) Dr. J. J. Chinoy
(3) Dr. R. S. Paroda (4) Dr. Verghese Kurien
3. A character which is expressed in hybrid is called :
(1) Epistatic (2) Co-dominant (3) Dominant (4) Recessive
4. First antibiotic isolated was :
(1) Neomycin (2) Streptomycin (3) Terramycin (4) Penicillin
5. Mycorrhiza is the :
(1) Parasitic association between fungus and roots of seed plants
(2) Symbiotic association between fungus and roots of seed plants
(3) Saprophytic association between fungus and roots of seed plants
(4) Symbiotic association between bacteria and the roots of seed plants
6. Growing of complete plant from a cell is known as :
(1) Totipotency (2) Axenic culture
(3) Clone formation (4) Micro propagation
7. Clay soil particle size is :
(1) Less than 0.002 mm (2) Between 0.002-0.02 mm
(3) Between 0.02-0.2 mm (4) More than 2 mm
8. Which bacteria is useful for "Dairy Industry" ?
(1) *Clostridium acetobutyricum* (2) *Bacillus megatherium*
(3) *Acetobacteria aceti* (4) *Bacterium acidi lactic*
9. The silkworm Bombyx mori is fed on :
(1) Rose leaves (2) Mulberry leaves
(3) Hibiscus leaves (4) Gladiolus leaves
10. Sansad Adarsh Gram Yojana (SAANJHI) was launched on :
(1) November, 2005 (2) January, 2010
(3) October, 2014 (4) March, 2017

11. Which of the following mineral element is most abundant in crop plants?
(1) C (2) H (3) O (4) N
12. Who among the following Indian scientists for the first time experimentally demonstrated that atmospheric stress is the major constraint to limit wheat yield in north India?
(1) R. D. Asana (2) J. J. Chinoy
(3) S. K. Sinha (4) R. H. Dastur
13. In north India when atmospheric temperature increases above 27°C during grain filling in wheat, which of the following process of the plant mainly limits grain growth?
(1) Photosynthetic rate
(2) Translocation of photosynthates from leaves to grains
(3) Synthesis of starch in grains
(4) Respiration rate of the grains
14. Which of the following is considered to be the one of the most important characteristics for a plant to be used for phytoremediation ?
(1) Slow growing (2) Fast growing
(3) More root to shoot ratio (4) Much tolerant to stress
15. Toxicity of which of the following essential nutrient may take place in crop plants under waterlogged condition ?
(1) N (2) P (3) S (4) Mn
16. Which of the following plants absorb iron by 'Strategy I' mechanism ?
(1) All monocots
(2) All dicots
(3) Only graminaceous monocots
(4) Dicots and non-graminaceous monocots
17. Growth of which of the following crop may be enhanced under aluminium supply ?
(1) Tea (2) Turnip (3) Wheat (4) Pea

18. Seeds of which of the following plant is classified as a recalcitrant seed ?
- (1) Hevea (2) Populus
(3) Pinus (4) Eucalyptus
19. A cell is put in solution. If at equilibrium the concentration of a particular ion inside the cell is C_1 and outside the cell (in the bathing medium) is C_2 , then the accumulation ratio would be :
- (1) C_1/C_2 (2) C_2/C_1
(3) $(C_1 + C_2)/C_2$ (4) $C_2/(C_1 + C_2)$
20. Which of the following mineral elements are the constituents of chlorophyll-a molecule ?
- (1) C, H, O, N and Mg (2) C, O, N and Mg
(3) C, H, N and Mg (4) N and Mg
21. Cristae is a part present in :
- (1) Inner membrane of mitochondria (2) Outer membrane of mitochondria
(3) Inner membrane of chloroplast (4) Inner membrane of ribosome
22. Chloroplast dimorphism can be seen in the leaves of :
- (1) Rice (2) Wheat
(3) Maize (4) Sunflower
23. Maximum density of water is presented at the following temperature :
- (1) 100°C (2) 25°C (3) 0°C (4) 4°C
24. Mitochondria and Plastids are multiplied through :
- (1) Binary fission (2) Mitosis (3) Budding (4) Multiple fission
25. Positive root pressure in a plant can be represented by :
- (1) Transpiration (2) Evapotranspiration
(3) Guttation (4) Imbibition
26. Scotoactive type of stomata is present in :
- (1) C_3 Plants (2) CAM Plants
(3) C_4 Plants (4) In both (b) and (c)
27. Transpiration pull and cohesive -tension theory of translocation of water was introduced by :
- (1) Dixon and Jolly (2) Blackman
(3) Hill (4) Bendall

28. The outer solution having equal concentration as that of the cell sap is called :
- (1) Neutral solution (2) Isotonic solution
 (3) Hypotonic solution (4) Hypertonic solution
29. Symplastic movement of water takes place through :
- (1) Cell wall (2) Plasmodesmata
 (3) Casparian strips (4) Endodermis
30. When we add one teaspoonful of sugar in a glass of water, then the water potential of solution will be :
- (1) Zero (2) No change will occur
 (3) Less than zero (4) More than zero
31. Match the following :

(Process/Features)	(Importance)
A. Nitrate reductase	1. Nitrite to ammonium ion
B. Nitrogen fixation	2. Natural and Industrial processes
C. Nitrogenase complex	3. Two component protein
D. Nod factors	4. Lipochitin oligosaccharide signal molecules

The correct matching codes will be:

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

32. Match the following :

(Features)	(C ₃ plants)
A. Photorespiration	1. Present
B. CO ₂ compensation	2. 20-100
C. Photosynthesis optimum temperature	3. 20-25°C
D. Quantum yield	4. Decline

The correct matching codes will be:

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

33. Lipids, proteins, nucleic acids and carbohydrates are called :
- (1) Primary metabolites
 - (2) Secondary metabolites
 - (3) Both
 - (4) Tertiary metabolites
34. Both photochemical quenching and non-photochemical quenching capacity can be estimated *in vivo* using :
- (1) Pulse -amplitude -modulated chlorophyll fluorescence (PAM)
 - (2) Kautsky effects
 - (3) Both 1 & 2
 - (4) Tyndall effects
35. During phosphorylation, the proton electro-chemical gradient across the thylakoid membrane is from :
- (1) Stroma to Lumen of Thylakoids
 - (2) Lumen of Thylakoids to Stroma
 - (3) Lumen of one Thylakoid to Lumen of another Thylakoid
 - (4) Stroma only
36. NADP⁺-Me Type C4-pathway is found in :
- (1) Sugarcane and maize
 - (2) Panicum maximum
 - (3) Atriplex and Amaranthus
 - (4) Arabidopsis
37. C₃ cycle represents which of the following reactions ?
- (1) Substrate level phosphorylation
 - (2) Salt respiration
 - (3) Oxidative carboxylation
 - (4) Reductive carboxylation
38. How many molecules of NADPH and ATP respectively are required for the reduction of 6CO₂ molecules to generate one molecule of hexose sugar in photosynthesis of C₃ plants ?
- (1) 12 NADP+12ATP
 - (2) 18 NADP+ 12 ATP
 - (3) 18 NADP+ 18 ATP
 - (4) 12 NADP+ 18 ATP
39. RuBP carboxylase was crystallized in 1971 from :
- (1) Maize leaves
 - (2) Wheat roots
 - (3) Chlorella
 - (4) Dahlia leaves
40. Which of the following is an example of electroneutral pumps ?
- (1) H⁺/K⁺-ATPase
 - (2) H⁺-ATPase
 - (3) Ca²⁺-ATPase
 - (4) H⁺-PPase