

**RET/15/Test B****933****Ag. Engg. (Soil & Water  
Conservation Engg.)****5**Question Booklet No. ....**25**.....(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 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.

**Total No. of Printed Pages : 15**

FOR ROUGH WORK

# Research Entrance Test – 2015

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. "Fluid mosaic model" relates to the structure of :  
(1) Cell wall (2) Protoplasm  
(3) Plasma membrane (4) Nucleic acid
2. Spongy tissue of mango is a :  
(1) Bacterial disease (2) Physiological disease  
(3) Viral disease (4) Fungal disease
3. A purpose of initiating a conscious and purposeful action is called :  
(1) Education (2) Motivation (3) Action (4) Coordination
4. Yellow colour of egg is due to :  
(1) Carotene (2) Xanthophyll (3) Anthocyanin (4) Vitamin B
5. During prophase-I of meiosis crossing over occurs at :  
(1) Zygotene (2) Pachytene (3) Diplotene (4) Diakinesis
6. In which crop the use of Blue-Green Algae as a bio-fertilizer will be most useful ?  
(1) Maize (2) Potato (3) Rice (4) Sugarcane
7. Lycopene pigment is present in :  
(1) Beetroot (2) Tomato (3) Radish (4) Chilli
8. Ooze test is done to detect :  
(1) Bacterial disease (2) Fungal disease  
(3) Viral disease (4) All of these
9. Number of chromosome in wheat endosperm is :  
(1) 21 (2) 42 (3) 63 (4) 14
10. Acridine orange is used for inducing :  
(1) DNA denaturation (2) Mutagenesis  
(3) Chiasma formation (4) Bacterial transduction

11. Which one has the greatest potential as an aquifer :
- (1) Glacial outwash (2) Alluvial fan  
(3) Flood plain silt (4) Limestone
12. The storage coefficient is a function of :
- (1) Elasticity of water (2) Elasticity of aquifer skeleton  
(3) Both (1) and (2) (4) Porosity of the aquifer material
13. In an aquifer having an aerial extent of 100 ha the water table drops by 4.5 m which causes a change of 90 ha-m in ground water storage. If the porosity of the aquifer is 30%, its specific retention will be :
- (1) 25% (2) 20% (3) 10% (4) 15%
14. For the construction of flownet in an anisotropic aquifer having  $K_h = 3 K_v$  the transformed section with isotropic medium is obtained by multiplying the horizontal dimension of anisotropic system by :
- (1) 3 (2) 2/3  
(3) 1/3 (4) None of the above
15. If 'v' is the seepage velocity of ground water flow and 'Y' is the kinematic viscosity of the ground water, then the Reynold's number is given by :
- (1)  $Re = (v D_{10})/Y$  (2)  $Re = (v D_{100})/Y$   
(3)  $Re = (v D_{50})/Y$  (4)  $Re = (v D_{60})/Y$
16. Which one is *true* :
- (1) Equation for coefficient of storage was derived by Hantush (1964).  
(2) Flow through the coarse gravelly aquifer is entirely laminar.  
(3) More promising well site are the locations where water table contours are closely spaced.  
(4) In relatively fine grained material permeability is determined by falling head permeameter.
17. Which of the following is an aquifuge :
- (1) Clay lense (2) Granite (3) Shale (4) Slate

18. A steady state ground water flow condition exists when :
- (1) the flow is steady and the water levels have ceased to decline
  - (2) the water level drops with pumping but otherwise remains steady
  - (3) the flow is governed by dupit's equation
  - (4) the laplace equation is satisfied
19. The connate ground water source is a :
- (1) Long term ground water source
  - (2) A limited ground water source
  - (3) An uneconomical source for tapping ground water
  - (4) None of the above
20. In an optimization problem a function is said to be strictly convex, if :
- (1) A straight line connecting any two points on the function lies completely above the function
  - (2) A straight line connecting any two points on the function lies completely below the function
  - (3) The function has a global maximum
  - (4) Both (1) and (3) are true
21. In linear programming the set of basic variables is called as :
- |                        |                        |
|------------------------|------------------------|
| (1) Basis              | (2) Decision variables |
| (3) Entering variables | (4) Slack variables    |
22. A sequential decision problem like reservoir operation problem can be solved by
- |                         |                        |
|-------------------------|------------------------|
| (1) Dynamic programming | (2) linear programming |
| (3) Goal programming    | (4) None of the above  |
23. GTS Bench Mark stands for :
- (1) Great trigonometrical survey bench mark established by survey of India
  - (2) Grand trigonometrical Survey Bench Marks established by Survey of India
  - (3) Great Trigonometrical Survey Bench Mark established by Survey of India and Geological Survey of India
  - (4) Great Trigonometrical Survey Bench Mark established by Survey of India and other Government agencies

24. Rising limb of hydrograph is dependent on :
- (1) Storm and basin characteristics      (2) Storm characteristics  
(3) Basin Characteristics only      (4) Land use characteristics only
25. In standard False Colour Composite (FCC) some water bodies appear in cyan colour which could be because of :
- (1) Large depth only      (2) Shallowness only  
(3) Turbidity only      (4) Presence of Algae
26. Which of the following is an Indian Satellite :
- (1) LANDSAT 5      (2) ENVISAT      (3) EARTH CARE      (4) RISAT-2
27. Gabions are commonly used as :
- (1) Flood control structures      (2) Flow measurement device  
(3) Runoff storage structure      (4) Soil erosion control structure
28. A low drainage density of an area indicates :
- (1) High permeability of the terrain  
(2) Low permeability of the terrain  
(3) Dense network of streams  
(4) Number of first order stream are more
29. The curve number method is used for estimating runoff of :
- (1) Forest Watershed      (2) Agricultural Watersheds  
(3) Urban Catchment      (4) Any watershed
30. The most accurate method of averaging precipitation over an area is :
- (1) Arithmetical mean method      (2) Thiessen mean method  
(3) Isohyetal method      (4) Grid point method
31. A unit hydrograph is the runoff hydrograph of unit :
- (1) Rainfall duration      (2) Rainfall excess  
(3) Watershed area      (4) Rainfall intensity
32. Percolation tanks are used :
- (1) To hold the surface water for recharge  
(2) To increase the water carrying capacity of stream  
(3) For storage of water to be used for irrigation and domestic purpose  
(4) Flood control

33. The topographical details of any area can be derived using the remote sensing data of the following type :
- (1) PAN data
  - (2) Multi-spectral band data
  - (3) Stereoscopic high resolution remote sensing data
  - (4) Multi-spectral multi-date data
34. Among the soluble constituents in irrigation water which one is considered to be most hazardous :
- (1) Magnesium
  - (2) Sodium
  - (3) Calcium
  - (4) None of the above
35. Discharge rate of emitters usually ranges from :
- (1) 2-10 liters/day
  - (2) 2-10 liters/hr
  - (3) 2-10 liters/min
  - (4) 2-10 liters/sec
36. Fraction of water delivered to the field is stored in root zone for crop use is called as :
- (1) Water application efficiency
  - (2) Project efficiency
  - (3) Water use efficiency
  - (4) Water storage efficiency
37. Amongst all possible sections of channel least perimeter is found in :
- (1) semi-circular shape
  - (2) triangular shape
  - (3) trapezoidal shape
  - (4) parabolic shape
38. The roughness coefficient  $n$  in manning's equation for tile drain varies with :
- (1) Type of drain pipe
  - (2) Type of drain pipe and its smoothness
  - (3) type of drain pipe, its smoothness, alignment and corrugations in tubings
  - (4) Roughness of the drain pipe
39. The water front advance is the function of :
- (1) stream size
  - (2) average flow depth
  - (3) infiltration characteristics
  - (4) all the above
40. The two main types of trenchless machines used for laying plastic tubing in tile drains are :
- (1) Vertical plough and MB plough
  - (2) Vertical plough and V-Plough
  - (3) Wheel plough and Vertical Plough
  - (4) Shovel and V-Plough



*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. Briefly describe the performance Characteristics of Centrifugal irrigation pumps.
2. Briefly describe the two properties of the aquifer material related to its storage function.
3. What is systems analysis ? Briefly describe the techniques used in water resources systems analysis.
4. A fully penetrating well is pumped at a constant rate of  $1020 \text{ m}^3/\text{s}$  from a confined aquifer of thickness 30 m and average grain diameter 1 mm. What is the domain around the well for which Darcy's law is applicable.
5. Name the different components of a total hydrograph and explain with the help of neat sketch how are these components found ?
6. What are the most important surface features on which spectral reflectance depends ? Briefly describe the spectral reflectance curves for vegetation, soil and water.
7. Draw a straight drop spillway showing structural components and give the function of these Components.
8. Briefly describe the factors affecting the depth of tile drains.
9. Describe in brief the various components of sprinkler irrigation system.
10. Briefly describe the design parameters for mole drainage.

Roll No. : .....

---

Q. No. :

Roll No. : .....

---

Q. No. :

Roll No. : .....

---

Q. No. :

Roll No. : .....

---

Q. No. :

Roll No. : .....

---

Q. No. :

FOR ROUGH WORK

