

पुस्तिका में पृष्ठों की संख्या : 16  
Number of Pages in Booklet : 16  
पुस्तिका में प्रश्नों की संख्या : 100  
No. of Questions in Booklet : 100

**NEAP-25**

इस प्रश्न-पुस्तिका को तब तक न खोलें जब तक  
कहा न जाए। Do not open this Question  
Booklet until you are asked to do so.



**Paper Code : 38**

**Sub : Agriculture Engineering**

प्रश्न-पुस्तिका संख्या व बारकोड /

Question Booklet No. & Barcode

**समय : 02:00 घण्टे + 10 मिनट अतिरिक्त\***

**अधिकतम अंक : 200**

**Time : 02:00 Hours + 10 Minutes Extra\***

**Maximum Marks : 200**

प्रश्न-पुस्तिका के पेपर की सील/पॉलिथीन बैग को खोलने पर प्रश्न-पत्र हल करने से पूर्व परीक्षार्थी यह सुनिश्चित कर लें कि :

- प्रश्न-पुस्तिका संख्या तथा ओ.एम.आर. उत्तर-पत्रक पर अंकित बारकोड संख्या समान हैं।
- प्रश्न-पुस्तिका एवं ओ.एम.आर. उत्तर-पत्रक के सभी पृष्ठ व सभी प्रश्न सही मुद्रित हैं। समस्त प्रश्न, जैसा कि ऊपर वर्णित है, उपलब्ध हैं तथा कोई भी पृष्ठ कम नहीं है/ मुद्रण त्रुटि नहीं है। किसी भी प्रकार की विसंगति या दोषपूर्ण होने पर परीक्षार्थी वीक्षक से दूसरा प्रश्न-पत्र प्राप्त कर लें। यह सुनिश्चित करने की जिम्मेदारी अभ्यर्थी की होगी। परीक्षा प्रारम्भ होने के 5 मिनट पश्चात् ऐसे किसी दावे/आपत्ति पर कोई विचार नहीं किया जायेगा।

On opening the paper seal/polythene bag of the Question Booklet before attempting the question paper, the candidate should ensure that :

- Question Booklet Number and Barcode Number of OMR Answer Sheet are same.
- All pages & Questions of Question Booklet and OMR Answer Sheet are properly printed. All questions as mentioned above are available and no page is missing/misprinted.

If there is any discrepancy/defect, candidate must obtain another Question Booklet from Invigilator. Candidate himself shall be responsible for ensuring this. No claim/objection in this regard will be entertained after five minutes of start of examination.

### परीक्षार्थियों के लिए निर्देश

1. प्रत्येक प्रश्न के लिये एक विकल्प भरना अनिवार्य है।
  2. सभी प्रश्नों के अंक समान हैं।
  3. प्रत्येक प्रश्न का मात्र एक ही उत्तर दीजिए। एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा।
  4. OMR उत्तर-पत्रक इस प्रश्न-पुस्तिका के अन्दर रखा है। जब आपको प्रश्न-पुस्तिका खोलने को कहा जाए, तो उत्तर-पत्रक निकाल कर ध्यान से केवल नीले बॉल पॉइंट पेन से विवरण भरें।
  5. कृपया अपना रोल नम्बर ओ.एम.आर. उत्तर-पत्रक पर सावधानीपूर्वक सही भरें। गलत रोल नम्बर भरने पर परीक्षार्थी स्वयं उत्तरदायी होगा।
  6. ओ.एम.आर. उत्तर-पत्रक में करेशन पेन/व्हाइटनर/सफेदा का उपयोग निषिद्ध है।
  7. प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा। गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है।
  8. प्रत्येक प्रश्न के पाँच विकल्प दिये गये हैं, जिनमें क्रमशः 1, 2, 3, 4, 5 अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले (बबल) को उत्तर-पत्रक पर नीले बॉल पॉइंट पेन से गहरा करना है।
  9. यदि आप प्रश्न का उत्तर नहीं देना चाहते हैं तो उत्तर-पत्रक में पाँचवें (5) विकल्प को गहरा करें। यदि पाँच में से कोई भी गोला गहरा नहीं किया जाता है, तो ऐसे प्रश्न के लिये प्रश्न अंक का 1/3 भाग काटा जायेगा।
  10. \* प्रश्न-पत्र हल करने के उपरान्त अभ्यर्थी अनिवार्य रूप से ओ.एम.आर. उत्तर-पत्रक जाँच लें कि समस्त प्रश्नों के लिये एक विकल्प (गोला) भर दिया गया है। इसके लिये ही निर्धारित समय से 10 मिनट का अतिरिक्त समय दिया गया है।
  11. यदि अभ्यर्थी 10% से अधिक प्रश्नों में पाँच विकल्पों में से कोई भी विकल्प अंकित नहीं करता है तो उसको अयोग्य माना जायेगा।
  12. मोबाइल फोन अथवा अन्य किसी इलेक्ट्रॉनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी।
- चेतावनी :** अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए राजस्थान सार्वजनिक परीक्षा (भर्ती में अनुचित साधनों की रोकथाम अध्यापक) अधिनियम, 2022 तथा अन्य प्रभावी कानून एवं आयोग के नियमों-प्रावधानों के तहत कार्यवाही की जाएगी। साथ ही आयोग ऐसे अभ्यर्थी को भविष्य में होने वाली आयोग की समस्त परीक्षाओं से विवर्जित कर सकता है।

### INSTRUCTIONS FOR CANDIDATES

1. It is mandatory to fill one option for each question.
2. All questions carry equal marks.
3. Only one answer is to be given for each question. If more than one answers are marked, it would be treated as wrong answer.
4. The OMR Answer Sheet is inside this Question Booklet. When you are directed to open the Question Booklet, take out the Answer Sheet and fill in the particulars carefully with Blue Ball Point Pen only.
5. Please correctly fill your Roll Number in OMR Answer Sheet. Candidates will themselves be responsible for filling wrong Roll No.
6. Use of Correction Pen/Whitener in the OMR Answer Sheet is strictly forbidden.
7. 1/3 part of the mark(s) of each question will be deducted for each wrong answer. A wrong answer means an incorrect answer or more than one answers for any question.
8. Each question has five options marked as 1, 2, 3, 4, 5. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
9. If you are not attempting a question then you have to darken the circle '5'. If none of the five circles is darkened, one third (1/3) part of the marks of question shall be deducted.
10. \* After solving question paper, candidate must ascertain that he/she has darkened one of the circles (bubbles) for each of the questions. Extra time of 10 minutes beyond scheduled time, is provided for this.
11. A candidate who has not darkened any of the five circles in more than 10% questions shall be disqualified.
12. Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt with as per rules.

**Warning :** If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would be liable to be prosecuted under Rajasthan Public Examination (Measures for Prevention of Unfair means in Recruitment) Act, 2022 & any other laws applicable and Commission's Rules-Regulations. Commission may also debar him/her permanently from all future examinations.

उत्तर-पत्रक में दो प्रतियाँ हैं - मूल प्रति और कार्बन प्रति। परीक्षा समाप्ति पर परीक्षा कक्ष छोड़ने से पूर्व परीक्षार्थी उत्तर-पत्रक की दोनों प्रतियाँ वीक्षक को सौंपेंगे, परीक्षार्थी स्वयं कार्बन प्रति अलग नहीं करें। वीक्षक उत्तर-पत्रक की मूल प्रति को अपने पास जमा कर, कार्बन प्रति को मूल प्रति से कट लाइन से मोड़ कर सावधानीपूर्वक अलग कर परीक्षार्थी को सौंपेंगे, जिसे परीक्षार्थी अपने साथ ले जायेंगे। परीक्षार्थी को उत्तर-पत्रक की कार्बन प्रति चयन प्रक्रिया पूर्ण होने तक सुरक्षित रखनी होगी एवं आयोग द्वारा माँगे जाने पर प्रस्तुत करनी होगी।



1. The minimum length of shelter belt is about :

- (1) 6 times its height
- (2) 12 times its height
- (3) 18 times its height
- (4) 24 times its height
- (5) Question not attempted

2. The typical sand dunes has gentle slope to windward direction usually ranges between :

- (1) 25 – 33%
- (2) 20 – 25%
- (3) 5 – 11%
- (4) 11 – 15%
- (5) Question not attempted

3. The structure constructed on low lying lands in arid regions where crops are raised by conserving rainwater received from the relatively impervious uplands with steeper slopes are known as :

- (1) Anicut
- (2) Nadi
- (3) Tanka
- (4) Khadin
- (5) Question not attempted

4. Capillary water is held between tensions of about :

- (1) 31 to  $1/3$  atmosphere
- (2) Less than  $1/3$  atmosphere
- (3) More than 10000 atmosphere
- (4) 10000 to 31 atmosphere
- (5) Question not attempted

5. Which of the following statement is not correct ?

- (1) Soil moisture between field capacity and permanent wilting point is referred as readily available moisture.
- (2) Moisture equivalent is amount of water retained by a sample of initially saturated soil material after being subjected to a centrifugal force of ten times that of gravity for half an hour.
- (3) Permanent wilting point is the moisture content at which plants can no longer obtain enough moisture to meet transpiration needs.
- (4) Field capacity of soil is moisture content after drainage of gravitational water.
- (5) Question not attempted

6. The ratio between the irrigated area and the quantity of water used is called :

- (1) Delta
- (2) Duty
- (3) Base period
- (4) Irrigation efficiency
- (5) Question not attempted

7. The "Tensiometers" are installed in the soil to measure :

- (1) Capillary potential
- (2) Gravitational potential
- (3) Osmotic potential
- (4) Pressure potential
- (5) Question not attempted



8. The velocity of water in a stream or river is measured by :

- (1) Water meter
- (2) Current meter
- (3) Venturimeter
- (4) Barometer
- (5) Question not attempted

9. The most efficient cross section for an open channel is

- (1) Rectangular
- (2) Semi-circle
- (3) Trapezoidal
- (4) Parabolic
- (5) Question not attempted

10. Water storage efficiency ( $E_s$ ) is expressed by :

- (1)  $E_s = (W_s / W_n) \times 100$
- (2)  $E_s = (W_s / W_f) \times 100$
- (3)  $E_s = (W_f / W_d) \times 100$
- (4)  $E_s = (W_f / W_n) \times 100$

(5) Question not attempted

Where  $W_s$  = water stored in root zones of plant during irrigation.

$W_n$  = water needed in root zones prior to irrigation.

$W_f$  = water diverted to irrigation fields (plots) at the field supply channel.

$W_d$  = water diverted from the source.

11. In Border method of surface irrigation, the border lengths for sandy loam soils are kept :

- (1) 60-120 metres
- (2) 120-180 metres
- (3) 180-300 metres
- (4) 300-500 metres
- (5) Question not attempted

12. In Sub-irrigation, water reaches the plant roots through :

- (1) Deep percolation
- (2) Lateral spread of water from open ditches
- (3) Capillary action
- (4) Sub-surface flow
- (5) Question not attempted

13. Which method of irrigation is not usually suitable for heavy clay soils with very low infiltration rate ?

- (1) Border irrigation
- (2) Furrow irrigation
- (3) Check Basin irrigation
- (4) Sprinkler irrigation
- (5) Question not attempted

14. The shaft horse power is expressed in terms of ratio of

- (1) Water horse power and pump efficiency.
- (2) Brake horse power and pump efficiency.
- (3) Water horse power and drive efficiency.
- (4) Brake horse power and drive efficiency.
- (5) Question not attempted



15. For optimum performance, the percent submergence of an airlift pump should be more than :

- (1) 30 percent
- (2) 40 percent
- (3) 50 percent
- (4) 60 percent
- (5) Question not attempted

16. A pump lifts 72000 litres of water per hour against a total head of 19 metres. Compute the water Horse Power

- (1) 3
- (2) 4
- (3) 5
- (4) 6
- (5) Question not attempted

17. An imaginary surface representing the hydrostatic pressure in a confined aquifer is called

- (1) Piezometric surface
- (2) Hygroscopic surface
- (3) Unstatic water level
- (4) Static water level
- (5) Question not attempted

18. An Aquifer found between two impermeable layers is called :

- (1) Artesian aquifer
- (2) Non-Artesian aquifer
- (3) Leaky aquifer
- (4) Perched aquifer
- (5) Question not attempted

19. The purpose of well development is :

- (1) To determine the exact geological strata intersected by the well screen.
- (2) To measure the drawdown and pumping rate for pumping test.
- (3) To increase the yield of well by increasing the permeability of the aquifer.
- (4) To sanitize the well casing and screen before use.
- (5) Question not attempted

20. What is primary objective of "On Farm Development Works" ?

- (1) To construct large dams and reservoirs.
- (2) To control floods in command area.
- (3) To develop land below canal outlet including land grading, levelling, construction of field channels & drains.
- (4) To manage the main canals of an irrigation project.
- (5) Question not attempted

21. A drainage canal discharges 1.0 m<sup>3</sup>/sec and drains 864 ha of land area. What is drainage coefficient of this land ?

- (1) 1.0 mm
- (2) 10.0 mm
- (3) 2.4 mm
- (4) 24 mm
- (5) Question not attempted



22. The removal of excess surface & ground water from farm land is called :

- (1) Agricultural drainage
- (2) Infiltration
- (3) Percolation
- (4) Capillary action
- (5) Question not attempted

23. Which of the following is not a layout of Tile drainage system ?

- (1) Random
- (2) Gridiron
- (3) Herringbone
- (4) Mole drain
- (5) Question not attempted

24. In a four-stroke cycle engine the camshaft rotates at \_\_\_\_\_ the crankshaft speed.

- (1) Same
- (2) Double
- (3) Thrice
- (4) Half
- (5) Question not attempted

25. The firing order for a 4-cylinder engine is

- (1) 1 - 2 - 3 - 4
- (2) 1 - 3 - 4 - 2
- (3) 1 - 4 - 2 - 3
- (4) 1 - 4 - 3 - 2
- (5) Question not attempted

26. For the ideal Otto-cycle, it can be assumed that -

- A. The piston has zero friction in the cylinder.
- B. Air is used in the cylinder as the working fluid.
- C. No heat transfer takes place through the engine walls.

Which statement/answer is correct as below :

- (1) Only A is correct.
- (2) Only A & B are correct.
- (3) Only A & C are correct.
- (4) A, B & C are correct.
- (5) Question not attempted

27. The device used to engage and disengage power of the tractor engine from the transmission system is known as

- (1) Gear box
- (2) Chain drive system
- (3) Clutch
- (4) Differential
- (5) Question not attempted

28. The combustion process consists of chemically combining oxygen from the air

- (1) With carbon and hydrogen in the atmosphere.
- (2) With carbon and hydrogen in the fuel.
- (3) With nitrogen and hydrogen in the fuel.
- (4) With oxygen and hydrogen in the fuel.
- (5) Question not attempted



29. Viscosity Index (VI) as per ASTM method of an engine oil is calculated by :

(Where "L" is oil with VI = zero, "H" is oil with VI = 100 and "U" is oil with unknown VI)

(1)  $VI = \frac{L - H}{L - U} \times 100$

(2)  $VI = \frac{L - U}{L - H} \times 100$

(3)  $VI = \frac{H - U}{L - H} \times 100$

(4)  $VI = \frac{L - U}{U - H} \times 100$

(5) Question not attempted

30. The angle between the centre line of the kingpin of the tractor and the vertical line/plane is called as :

(1) Camber angle

(2) Caster angle

(3) Rack angle

(4) Tilt angle

(5) Question not attempted

31. Muffler is provided in a tractor to control \_\_\_\_\_.

(1) Fuel consumption

(2) Vibration

(3) Engine speed

(4) Noise

(5) Question not attempted

32. The mechanical device used to control engine speed is known as

(1) Governor

(2) Carburettor

(3) Spark plug

(4) Camshaft

(5) Question not attempted

33. The ratio between rolling resistance and dynamic weight of a tractor is called as

(1) Tractive efficiency

(2) Co-efficient of rolling resistance

(3) Wheel slip

(4) Rim Pull

(5) Question not attempted

34. Maximum clearance under the landside and horizontal surface in the working position of a MB plough is termed as :

(1) Vertical Suction

(2) Throat clearance

(3) Horizontal suction

(4) Vertical clevis

(5) Question not attempted

35. In a disk plough, increasing the angle of tilt, within the 15° to 25° range may cause :

(1) Increase in the draft and the vertical upward force.

(2) Decrease in the draft and the vertical upward force.

(3) No effect

(4) Decrease in the draft and the horizontal force.

(5) Question not attempted



36. Random dropping of groups of seeds at about equal intervals in rows is called as :

- (1) Hill dropping
- (2) Checkrow planting
- (3) Precision planting
- (4) Seed drilling
- (5) Question not attempted

37. What type of furrow opener in a seed drill used for reduced tillage/zero tillage ?

- (1) Reversible shovel type
- (2) Inverted T- type
- (3) Hoe type
- (4) Disc type
- (5) Question not attempted

38. The uniformity of coverage in a hydraulic boom sprayer depends on :

- A. Nozzle spacing
- B. Nozzle spray angle
- C. Amount of Overlap required

Select the correct answer / statement given below :

- (1) Only A & B are correct.
- (2) Only A & C are correct.
- (3) Only B & C are correct.
- (4) A, B & C are correct.
- (5) Question not attempted

39. A 1.2 m reaper operates at speed of 2 kmph with field efficiency of 80 per cent, what will be its effective field capacity (ha/hr) of operation ?

- (1) 0.15
- (2) 0.19
- (3) 0.23
- (4) 0.27
- (5) Question not attempted

40. Header unit of a self-propelled combine consists of

- (1) Reel, cutter bar, auger conveyor
- (2) Cutter bar, cylinder, straw walker
- (3) Cutter bar, reel, cylinder, blower
- (4) Cylinder, straw walker, sieves, blower
- (5) Question not attempted

41. Broken grain coming out of a thresher may be due to

A. High speed of threshing drum.

B. Less concave clearance.

C. Low speed of threshing cylinder.

Select the correct statement / answer given below :

- (1) Only A is correct.
- (2) Only A and B are correct.
- (3) A, B and C are correct.
- (4) Only B is correct.
- (5) Question not attempted

42. The reduction in the value of a machine caused by obsolescence, wear, weathering, accidental damage, etc. is known as :

- (1) Depreciation
- (2) Damage
- (3) Interest
- (4) Insurance
- (5) Question not attempted



43. The octane number of a gasoline is a measure of its

- (1) Surface tension during combustion in an engine.
- (2) Lubrication during combustion in an engine.
- (3) Tendency to resist detonation during combustion in an engine.
- (4) Viscosity
- (5) Question not attempted

44. Which of the following are the main components of a refrigeration system ?

- (1) Plenum chamber, heater, exhaust fan, thermostat
- (2) Compressor, evaporator, expansion valve, condenser
- (3) Compressor, heater, exhaust fan, plenum chamber
- (4) Evaporator, heater, exhaust fan, thermostat
- (5) Question not attempted

45. Which equipment is most suitable for achieving the separation of mustard seeds from wheat ?

- (1) Disc separator
- (2) Magnetic separator
- (3) Spiral separator
- (4) Roll separator
- (5) Question not attempted

46. The type of evaporator suitable for concentrating heat sensitive foods and widely used in fruit juice industry is –

- (1) Forced circulation evaporator
- (2) Agitated film evaporator
- (3) Falling film evaporator
- (4) Long-tube vertical evaporator
- (5) Question not attempted

47. The process of cooking moistened starchy and/or proteinous food material by a combination of heat, pressure and mechanical shear is known as –

- (1) Pressure cooking
- (2) Thermodynamic cooking
- (3) Extrusion cooking
- (4) Transformation cooking
- (5) Question not attempted

48. Lithium chloride is used as a drying agent in

- (1) Freeze drying
- (2) Osmotic drying
- (3) Vacuum drying
- (4) Desiccant drying
- (5) Question not attempted

49. The breakage of rice during milling may be reduced through \_\_\_\_\_.

- (1) Gelatinization
- (2) Sun drying
- (3) Whitening and polishing
- (4) Mechanical drying
- (5) Question not attempted



50. In a rubber roll paddy sheller, the direction of rotation and speeds of the rollers are \_\_\_\_\_ respectively.

- (1) Same and different
- (2) Opposite and equal
- (3) Opposite and different
- (4) Same and equal
- (5) Question not attempted

51. In dry milling of pulses with edible oil treatment, oil is used at a rate of \_\_\_\_\_ of pulse processed.

- (1) 0.5 to 1.0 kg/tonne
- (2) 1.5 to 2.5 kg/tonne
- (3) 5.0 to 6.0 kg/tonne
- (4) 3.5 to 4.5 kg/tonne
- (5) Question not attempted

52. Methyl Bromide is commonly used for \_\_\_\_\_.

- (1) Fumigation in sealed vertical grain storage
- (2) Preservation of milk products
- (3) Controlling of weeds
- (4) Rodent control in crops
- (5) Question not attempted

53. The speed of movement of moisture from core to the surface of food material during drying is basically –

- (1) Drying front
- (2) Diffusion
- (3) Rate of drying
- (4) Moisture removal
- (5) Question not attempted

54. Which of the following are the methods used for determination of Equilibrium Moisture Content ?

- (1) Oven drying method and Brown Duvel distillation method.
- (2) Infra-red method and dielectric method.
- (3) Electrical resistance method and chemical method.
- (4) Static method and dynamic method.
- (5) Question not attempted

55. What is the unit of thermal conductivity ?

- (1) J/(m °C)
- (2) W/(m °C)
- (3) W/(m<sup>2</sup> °C)
- (4) J/(m<sup>2</sup> °C)
- (5) Question not attempted

56. Name the regions of India in which Morai type rural storage structures are used.

- (1) Southern and northern
- (2) Eastern and western
- (3) Western and northern regions
- (4) Eastern and southern
- (5) Question not attempted

57. Which of the following is an example of direct contact heat exchanger ?

- (1) Shell and tube heat exchanger
- (2) Plate heat exchanger
- (3) Steam infusion heat exchanger
- (4) Spiral heat exchanger
- (5) Question not attempted



58. The ratio of the surface energy created by crushing to the energy absorbed by the solid is referred as \_\_\_\_\_.

- (1) Crushing index
- (2) Crushing efficiency
- (3) Crushing energy
- (4) Crushing strength
- (5) Question not attempted

59. Attrition mill is also known as \_\_\_\_\_.

- (1) Hammer mill
- (2) Ball mill
- (3) Plate mill
- (4) Rietz mill
- (5) Question not attempted

60. In hammer mills, the size of finished product is governed by \_\_\_\_\_.

- (1) size of hammers
- (2) RPM of rotor of the mill
- (3) feed rate of material
- (4) size of screen
- (5) Question not attempted

61. The ratio of humidity (H) to saturation humidity ( $H_s$ ) is defined as \_\_\_\_\_.

- (1) Relative Humidity
- (2) Percentage Humidity
- (3) Humid Heat
- (4) Humid Volume
- (5) Question not attempted

62. In psychrometric processes, heating with humidifying moist air refers to ?

- (1) Increasing both air temperature and moisture content.
- (2) Decreasing both air temperature and moisture content.
- (3) Decreasing air temperature while increasing moisture content.
- (4) Increasing air temperature while decreasing moisture content.
- (5) Question not attempted

63. In LSU type dryers, the layers of \_\_\_\_\_ are installed in the drying chamber.

- (1) Round hole channels
- (2) Rectangular hole channels
- (3) Inverted V-shaped channels
- (4) V-shaped channels
- (5) Question not attempted

64. The garbage and household waste can be buried in :

- (1) Compost pit
- (2) Septic tank
- (3) Drainage tank
- (4) Soakage pit
- (5) Question not attempted

65. What are the important functions that take place within the septic tank ?

- A. Removal of the solids from the sewages.
- B. Decomposition of the solid under anaerobic condition.
- C. Storage of the sludge and scum in the tank.

Select the correct answer / statements given below :

- (1) Only A & B are correct.
- (2) Only B & C are correct.
- (3) Only A & C are correct.
- (4) A, B & C are correct.
- (5) Question not attempted



66. While starting a motor connected with the star-delta starter reduces the line voltage in each phase to :

(1)  $\frac{1}{2}$

(2)  $\frac{1}{3}$

(3)  $\frac{1}{\sqrt{3}}$

(4)  $\frac{1}{\sqrt{5}}$

(5) Question not attempted

67. The size of particles in coarse sand is :

(1) 0.06 to 0.20 mm

(2) 0.25 to 0.5 mm

(3) 0.60 to 2.0 mm

(4) 3.0 to 5.0 mm

(5) Question not attempted

68. What are the methods of estimating cost of building ?

A. Plinth area method

B. Cubic metre method

C. Cost of material and labour

Select the correct answer / statement given below :

(1) Only C is correct.

(2) Only B & C are correct.

(3) Only A & B are correct.

(4) A, B & C are correct.

(5) Question not attempted

69. An air gap of about 2 cm is recommended between the cover and plate of a solar collector primarily to minimize the –

(1) Convective losses

(2) Conductive losses

(3) Radiative losses

(4) Energy balance factor

(5) Question not attempted

70. The ratio of peak power to the product of open-circuit voltage and short-circuit current is defined as –

(1) Conversion efficiency

(2) Fill factor

(3) I-V curve

(4) Peak point curve

(5) Question not attempted

71. Natural circulation solar water heaters involve \_\_\_\_\_.

(1) Mechanical pumping

(2) Thermosyphoning

(3) Pressure pumping

(4) Centrifugal pumping

(5) Question not attempted

72. Maximum electricity production from a wind energy generator directly depends on

A. Hub height.

B. Furling wind speed of the machine.

C. Cut-in-speed of machine.

Select the correct answer/statement given below :

(1) Only B is correct.

(2) Only B and C are correct.

(3) Only A and B are correct.

(4) A, B and C are correct.

(5) Question not attempted



**73.** Solar PV module system have inverter / converter to :

- (1) Convert DC to AC.
- (2) Provide stability to the system.
- (3) Increase efficiency of solar panel.
- (4) Store the energy.
- (5) Question not attempted

**74.** A Solar PV system consists of :

- A. Solar cell array
- B. Load leveller
- C. Storage system



Select the correct answer/statement given below :

- (1) Only A & B are correct.
- (2) Only B & C are correct.
- (3) Only A & C are correct.
- (4) A, B & C are correct.
- (5) Question not attempted

**75.** In a counter flow type of gasifier, the air enters below the combustion zone and the producer gas is drawn off –

- (1) at the top of the gasifier
- (2) at middle left side of the gasifier
- (3) at middle right side of the gasifier
- (4) from bottom of the gasifier
- (5) Question not attempted

**76.** The reaction zone in which combustible gases carbon monoxide, methane and hydrogen is produced in a downdraft gasifier is –

- (1) Reduction zone
- (2) Drying zone
- (3) Oxidation zone
- (4) Pyrolysis zone
- (5) Question not attempted

**77.** In a fixed dome type biogas plant, which of the following regulates gas distribution and outflow of spent slurry ?

- (1) Biogas temperature
- (2) Dome's material of construction
- (3) Biogas pressure in the dome
- (4) Gas pipe material
- (5) Question not attempted

**78.** Methanogenic bacterias in a biogas digester needs following respectively for energy and building cell protein –

- (1) Carbon-dioxide and Hydrogen
- (2) Carbon and Nitrogen
- (3) Sulphur and Calcium
- (4) Oxygen and Carbon
- (5) Question not attempted



**79.** In land levelling design, the centroid of a rectangular field is located at :

- (1) Any corner of the field.
- (2) Bottom of the field.
- (3) Point of Intersection of its diagonals.
- (4) Outside of field.
- (5) Question not attempted

**80.** The process of determining the elevation of a series of points at measured intervals along a selected or predetermined line is known as :

- (1) Differential levelling
- (2) Profile levelling
- (3) Check levelling
- (4) Flying levels
- (5) Question not attempted

**81.** In Land grading task with modern earth moving equipment's :

- (1) Volume of cut and fill must be exactly equal.
- (2) Volume of cut is greater than volume fill.
- (3) Volume of cut is lesser than volume fill.
- (4) Cut-fill ratio must be same for all land grading tasks.
- (5) Question not attempted

**82.** Alidade is the instrument used for

- (1) Chain surveying
- (2) Plane table surveying
- (3) Dumpy level surveying
- (4) Theodolite surveying
- (5) Question not attempted

**83.** The length of engineer's chain is

- (1) 66 feet
- (2) 33 feet
- (3) 100 feet
- (4) 150 feet
- (5) Question not attempted

**84.** Which of the following is not a method of estimating average rainfall of an area over a period ?

- (1) Arithmetical average method
- (2) Thiessen polygon method
- (3) Isohyetal method
- (4) Hyetograph method
- (5) Question not attempted

**85.** The Antecedent Moisture Conditions (AMC) of a watershed are determined on the basis of total antecedent rainfall of

- (1) 1 day
- (2) 2 days
- (3) 5 days
- (4) 10 days
- (5) Question not attempted

**86.** The maximum size of the raindrop is about :

- (1) 6 mm
- (2) 10 mm
- (3) 2 mm
- (4) 0.5 mm
- (5) Question not attempted



87. The equation for Curve Number (CN) is given as :

(Where S = Recharge Capacity, cm)

(1)  $CN = \frac{2540}{25.4 + S}$

(2)  $CN = \frac{25.4 + S}{2540}$

(3)  $CN = \frac{2500}{25.0 + S}$

(4)  $CN = \frac{2540 + S}{25.4}$

(5) Question not attempted

88. The main variables influencing time of concentration of a watershed from the list :

- A. Size of watershed
- B. Shape of watershed
- C. Topography of watershed
- D. Vegetative cover

- (1) Only A
- (2) Only A and B
- (3) Only A, B and C
- (4) A, B, C and D
- (5) Question not attempted

89. Which type of erosion is extremely harmful for the land ?

- (1) Raindrop erosion
- (2) Sheet erosion
- (3) Rill erosion
- (4) Gully erosion
- (5) Question not attempted

90. Which of the following is not a type of water erosion ?

- (1) Surface creep
- (2) Raindrop erosion
- (3) Sheet erosion
- (4) Rill erosion
- (5) Question not attempted

91. As per land capability classification the class IV can be represented by following colour :

- (1) Red colour
- (2) Green colour
- (3) Blue colour
- (4) Yellow colour
- (5) Question not attempted

92. The side slope of contour bunds in medium textured soils is kept at :

- (1) 1:1
- (2) 1.5:1
- (3) 2:1
- (4) 2.5:1
- (5) Question not attempted

93. Small gullies are classified based on dimensions :

- (1) Upto 1.5 m deep, bed width not greater than 9 m.
- (2) Upto 3.0 m deep, bed width not greater than 18 m.
- (3) Upto 3.0 m deep, bed width greater than 18 m, side uniformly sloping between 8 to 15 percent.
- (4) Depth between 3 to 9 m, bed width not less than 18 m, sides uniformly sloping between 8 to 15 percent.
- (5) Question not attempted



94. The peak runoff rate expected to occur once in 5 years from a catchment area of 40 ha having maximum given rainfall intensity of 120 mm/hour which may occur during the time of concentration assuming runoff co-efficient of 0.3 will be (in  $\text{m}^3/\text{sec}$ )

- (1) 1.5
- (2) 2.0
- (3) 2.5
- (4) 4.0
- (5) Question not attempted

95. Pick up the correct statement

- (1) Sloping outwards bench terraces are effective in low rainfall areas.
- (2) Sloping inward bench terraces are effective in low rainfall areas.
- (3) Table top bench terraces are effective in low rainfall area.
- (4) Table top bench terraces are sometimes referred as mangu terrace.
- (5) Question not attempted

96. In stability checks of masonry structures, middle third rule is applied to safeguard against :

- (1) overturning
- (2) sliding
- (3) rupture from tensile stress
- (4) crushing
- (5) Question not attempted

97. Longitudinal sills in drop spillways are provided to

- (1) improve flow distribution in the outlet
- (2) to block the flow and impound water
- (3) strengthen the structure
- (4) protect the structure from siltation
- (5) Question not attempted

98. Soil loss by erosion  $E$  is proportional to the length of slope  $L$ , to the power

- (1) 0.8
- (2) 0.5
- (3) 1.0
- (4) 1.5
- (5) Question not attempted

99. A typical sand dune has highest steeper slope to leeward side of

- (1) 15 percent
- (2) 33 percent
- (3) 50 percent
- (4) 65 percent
- (5) Question not attempted

100. Which of the following describes the process of 'Saltation' in wind erosion ?

- (1) The soil carried by wind is moved in a series of bounces or jumps.
- (2) The slow uniform removal of a thin layer of soil by wind over a large area.
- (3) The rolling and sliding of soil particles along the ground.
- (4) The suspension of very fine soil particles in the air over long distances.
- (5) Question not attempted



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