Discipline   : Post Harvest Technology (*Post Harvest Engineering and Technology*)

Discipline Code : 19, *Sub code : 02*   Roll No.

Please Note:

(i) This question paper contains 12 pages. **Please check whether all the pages are printed in this set.** Report discrepancy, if any, **immediately** to the invigilator.

(ii) *There shall be NEGATIVE marking for WRONG answers in the Multiple Choice type questions (No. 1 to 130) which carry one mark each. For every wrong answer 0.25 mark will be deducted.*

PART – I (General Agriculture)

Multiple choice questions (No. 1 to 30). Choose the correct answer (*a, b, c or d*) and enter your choice in the circle (by shading with a pencil) on the OMR - answer sheet as per the instructions given on the answer sheet.

1. Which of the following crops have been approved for commercial cultivation in India?
a) Bt cotton and Bt brinjal
b) Bt cotton and Golden Rice
c) Bt maize and Bt cotton
d) Bt cotton only

2. This year (2010-11) the expected food grain production in India is
a) 212 million tonnes
b) 220 million tonnes
c) 235 million tonnes
d) 250 million tonnes

3. The genome of which of the following crops is still not completely sequenced?
a) Rice
b) Soybean
c) Sorghum
d) Wheat

4. According to the Approach Paper to the 12th Five Year Plan, the basic objective of the 12th Plan is
a) Inclusive growth
b) Sustainable growth
c) Faster, more inclusive and sustainable growth
d) Inclusive and sustainable growth

5. To address the problems of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood system approaches, the Government of India has set up the
a) National Rainfed Area Authority
b) National Watershed Development Project for Rainfed Areas
c) National Mission on Rainfed Areas
d) Command Area Development and Water Management Authority

6. Which of the following sub-schemes are not covered under the Rashtriya Krishi Vikas Yojana?
a) Extending the Green Revolution to eastern India
b) Development of 60,000 pulses and oilseeds villages in identified watersheds
c) National Mission on Saffron
d) National Mission on Bamboo

7. The minimum support price for the common variety of paddy announced by the Government of India for the year 2010-11 was
a) ₹ 1030
b) ₹ 1000
c) ₹ 980
d) ₹ 950

8. According to the Human Development Report 2010 of the United Nations, India's rank in terms of the human development index is
a) 119
b) 134
c) 169
d) 182

9. Which of the following does not apply to SRI method of paddy cultivation?
a) Reduced water application
b) Reduced plant density
c) Increased application of chemical fertilizers
d) Reduced age of seedlings

10. Which organic acid, often used as a preservative, occurs naturally in cranberries, prunes, cinnamon and cloves?
a) Citric acid
b) Benzoic acid
c) Tartaric acid
d) Lactic acid

11. Cotton belongs to the family
a) Cruciferae
b) Anacardiaceae
c) Malvaceae
d) Solanaceae

12. Photoperiodism is
a) Bending of shoot towards source of light
b) Effect of light/dark durations on physiological processes
c) Movement of chloroplast in cell in response to light
d) Effect of light on chlorophyll synthesis

13. Ergot disease is caused by which pathogen on which host?
a) *Claviceps purpurea* on rye
b) *Puccinia recondita* on wheat
c) *Drechlera sorokiniana* on wheat
d) *Albugo candida* on mustard

14. Rocks are the chief sources of parent materials over which soils are developed. Granite, an important rock, is classified as
a) Igneous rock
b) Metamorphic rock
c) Sedimentary rock
d) Hybrid rock

15. Which one of the following is a *Kharif* crop?
a) Pearl millet
b) Lentil
c) Mustard
d) Wheat

16. The coefficient of variation (C.V.) is calculated by the formula
a) (Mean/S.D.) × 100
b) (S.D./Mean) × 100
c) S.D./Mean
d) Mean/S.D.

17. Which of the following is commonly referred to as muriate of potash?
a) Potassium nitrate
b) Potassium chloride
c) Potassium sulphate
d) Potassium silicate

18. Inbred lines that have same genetic constitution but differ only at one locus are called
a) Multi lines
b) Monohybrid
c) Isogenic lines
d) Pure lines

19. For applying 100 kg of nitrogen, how much urea would one use?
a) 45 kg
b) 111 kg
c) 222 kg
d) 333 kg

20. The devastating impact of plant disease on human suffering and survival was first realized by epidemic of
a) Brown spot of rice in Bengal
b) Late blight of potato in USA
c) Late blight of potato in Europe
d) Rust of wheat in India

21. The species of rice (*Oryza*) other than O. *sativa* that is cultivated is
a) O. *rufipugon*
b) O. *longisteminata*
c) O. *glaberrima*
d) O. *nivara*

22. The enzyme responsible for the fixation of CO_2 in mesophyll cells of C-4 plants is
a) Malic enzyme
b) Phosphoenol pyruvate carboxylase
c) Phosphoenol pyruvate carboxykinase
d) RuBP carboxylase

23. Which one of the following is a 'Vertisol'?
a) Black cotton soil
b) Red sandy loam soil
c) Sandy loam sodic soil
d) Submontane (Tarai) soil

24. What is the most visible physical characteristic of cells in metaphase?
a) Elongated chromosomes
b) Nucleus visible but chromosomes not
c) Fragile double stranded loose chromosomes
d) Condensed paired chromosomes on the cell plate

25. All weather phenomena like rain, fog and mist occur in
a) Troposphere
b) Mesosphere
c) Ionosphere
d) Ozonosphere

26. Which of the following elements is common to all proteins and nucleic acids?
a) Sulphur
b) Magnesium
c) Nitrogen
d) Phosphorous

27. Silt has intermediate characteristics between
a) Sand and loam
b) Clay and loam
c) Loam and gravel
d) Sand and clay

28. Certified seed is produced from
a) Nucleus seed
b) Breeder seed
c) Foundation seed
d) Truthful seed

29. Seedless banana is an
a) Autotriploid
b) Autotetraploid
c) Allotriploid
d) Allotetraploid

30. Which one of the following is used to test the goodness-of-fit of a distribution?
a) Normal test
b) t-test
c) Chi-square test
d) F-test

PART – II (Subject Paper)

Multiple choice questions (No. 31 to 130). Choose the correct answer (*a, b, c* or *d*) and enter your choice in the circle (by shading with a pencil) on the OMR - answer sheet as per the instructions given on the answer sheet.

31. In a cylindrical silo of 5 m diameter, calculate the hoop tension at the bottom of the silo if the lateral pressure at bottom is 100 kg/m^2
a) 25 kgm/m
b) 50 kgm/m
c) 250 kgm/m
d) 500 kgm/m

32. In a deep vertical silo of 4 m diameter, calculate maximum lateral pressure generated if the paddy grain having bulk density 600 kg/m^3 is stored in it. Coefficient of friction between grain and wall may be taken as 0.30.
a) 1000 kg/m^2
b) 2000 kg/m^2
c) 3500 kg/m^2
d) 4000 kg/m^2

33. Rubber roller husker is suited for dehusking
a) Barley
b) Millet
c) Paddy
d) Legumes

34. The diameter in mm of rubber rolls used for dehusking of paddy varies between
a) 100-150
b) 150-250
c) 250-300
d) 300-350

35. Which of the following affect rate of formation of FFA during storage of bran
a) Storage temperatures
b) Moisture content of bran
c) Storage relative humidity
d) All of the above

36. Commodity not recommended for blanching before dehydration
a) Peas
b) Cauliflower
c) Onion
d) Carrot

37. The term not related to food texture is
a) Adhesiveness
b) Hardness
c) Gumminess
d) None of the above

38. Energy required in pumping fluid foods depends upon
a) Thermal losses
b) Frictional losses
c) Environmental conditions
d) None of the above

39. The dimensionless number not related to forced air connection is
a) Nusselt number
b) Grashoff number
c) Prandtl number
d) Reynold's number

40. Which of the following structures are used for poultry housing?
a) Wire floored poultry house
b) Deep litter poultry house
c) Cage house
d) All of the above

41. For estimation of food freezing times, the equation used is
a) Plank's
b) Fourier
c) Newton's law of cooling
d) Stefan Boltzman

42. Area required per cow in loose housing barn is
a) More than stanchion barn
b) Less than stanchion barn
c) Equal to stanchion barn
d) None

43. The refrigerant not used for cryogenic freezing is
a) Liquid N_2
b) Liquid CO_2
c) NH_3
d) Freon12

44. The peeling methods used for fruit/vegetables include
a) Knife peeling
b) Abrasion peeling
c) Caustic peeling
d) All of the above

45. Fluids which exhibit a linear increase in the shear stress with the rate of shear are called
a) Pseudoplastic fluid
b) Dilatant fluid
c) Newtonian fluid
d) Bingham fluid

46. Which one of the following is a type of can?
a) A10
b) B10
c) C10
d) D10

47. Which one of the following is not a commodity sorter/grader?
a) Weight sorter
b) Image processor
c) Bar coder
d) Colour sorter

48. A mixture of solid-liquid food can be separated by
a) Filtration
b) Screening
c) Expression
d) All of the above

49. The shape of normal distribution curve is
a) Rectangular
b) Hyperbolic
c) Bell shaped
d) Parabolic

50. A chromatograph is used for
a) Measuring rainfall
b) Measuring temperature of a gas
c) Analysing the composition of a gas
d) Measuring the pressure of a gas

51. The temperature to which the vapour gas mixture must be cooled to saturate, is known as
a) Wet bulb temperature
b) Wet bulb depression
c) Dew point
d) None of the above

52. Time independent non-Newtonian fluids are called
a) Thixotropic
b) Rheopectic
c) Shear thinning
d) None of the above

53. The temperature dependency of the viscosity of a fluid is related by a mathematical relation known as
a) Fourier equation
b) Power law
c) Arrhenius equation
d) Plank's equation

54. The method not used for determination of thermal processing time of foods is
a) Graphical method by Bigelow
b) Simpson's method of Integration
c) Kelvin-Plank's method
d) Formula method by ball

55. Psychrometric chart has applications in designing equipment for
a) Food freezing
b) Conveyors
c) Canning
d) Drying of foods

56. Which law gives most precise estimation of energy required during grinding of grains?
a) Rittinger's law
b) Kick's law
c) Bond's law
d) All of the above

57. In a storage bin, flow factor is a function of
a) Hopper
b) Material stored
c) Both hopper and material stored
d) Bin wall

58. Most heat resistant spores are produced by the species
a) *Ciostridium*
b) *Streptococcus*
c) *Aspergillus*
d) *Saccharomyces*

59. Which one of the following gases is more effective for ripening of fruits?
a) Propylene
b) Acetylene
c) Ethylene
d) None of the above

60. Irradiation dose of 6-10 krad can be used for
a) Sterilization of spices
b) Sprout inhibition of potato and onion
c) Delaying ripening of mango and banana
d) Disinfestation of grains

61. Storage of fruit below their optimum temperature causes
a) Freezing injury
b) Chilling injury
c) Bruising
d) None of the above

62. Dry and wet bulb thermometer are used to measure the
a) Temperature
b) Relative humidity
c) Firmness
d) None of the above

63. The process which kills majority but not all microorganisms is known as
a) Canning
b) Sterilization
c) Pasteurization
d) Freezing

64. Exclusion of air from containers of products increases keeping quality because
a) It prevents browning
b) It prevents oxidative rancidity
c) It prevents hydrolytic rancidity
d) It maintains the nutritive value

65. Spray drying is used for preparation of powder from
a) Poultry
b) Meat
c) Egg
d) Gelatin

66. The preservative which can control both enzymatic and non-enzymatic browning in fruit is
a) Sulphur dioxide
b) Benzoic acid
c) Sorbic acid
d) Ascorbic acid

67. The most commonly used salt as source of sulphur dioxide (as preservative) in food is
a) Sodium sulphite
b) Sodium metabisulphite
c) Potassium sulphite
d) Potassium metabisulphate

68. The process of dehydration in which moisture is removed by sublimation is known as
a) Foam mat drying
b) Spray drying
c) Freeze drying,
d) Pneumatic drying

69. Freezer burn is a storage defect in food products which is caused in
a) Refrigeration
b) Dehydration
c) Frozen storage
d) Concentration

70. Which of the following model can be used to explain rheological behaviour of biological material?
a) Kelvin
b) Planck
c) Fick's
d) None

71. The analogy between heat, mass and momentum transfer is given by
a) Chilton-Colburn
b) Fick's
c) Newton
d) None of the above

72. Maximum lateral and vertical pressures in a silo exists at
a) Top of silo
b) Bottom of silo
c) Center of silo
d) Varies from silo to silo

73. Mixing of two solid constituents could be considered as complete when standard deviation of relevant property is
a) Maximum
b) Moderate
c) Minimum
d) None of the above

74. Critical moisture content in soaking of paddy during parboiling process is
a) 20-25%
b) 30-35%
c) 40-45%
d) 50-55%

75. Higher wet bulb depression will result in
a) Longer drying time
b) No effect on drying time
c) Reduced drying time
d) None of the above

76. The important function of ventilation system in grain storage is
a) To eliminate / reduce insect infestation
b) To reduce moisture content of stored grain
c) To replace intergranular atmosphere
d) To remove odour

77. Screw conveyors are used for
a) Low and medium capacities for short runs
b) High capacities for short runs
c) High capacities for long runs
d) Low capacities for long runs

78. The clearance between screw flight edges and trough wall of a screw conveyor
a) Decreases with the length of screw
b) Increases with diameter of screw
c) Increases with length of screw
d) Remains same throughout the length of screw

79. The Gelatinization temperature of paddy starch is
a) 50-55°C
b) 65-70°C
c) 80-85°C
d) 90-95°C

80. Mechanical oil expellers leave 'residual oil' in the oil cake which is approximately
a) 0.5 to 1.0 percent
b) 6 to 12 percent
c) 15 to 20 percent
d) In excess of 20 percent

81. The cyclone separator is used for
a) Removal of heavy particles from air
b) Removal of light particles from air
c) Separation of cream from milk
d) Cleaning of grain

82. Optical pyrometers are used to measure
a) Low temperature
b) High temperature
c) Light intensity
d) Focal length

83. Stokes' law is used to find out
a) Terminal velocity
b) Drag coefficient
c) Surface tension
d) Specific gravity

84. A dimensionless ratio of convective heat transfer to conduction heat transfer within a solid is known as
a) Nusselt number
b) Biot number
c) Lewis number
d) Prandtl number

85. The specific gravity separator grades seeds of
a) Same size and same specific gravity
b) Different size and different specific gravity
c) Different size and same specific gravity
d) Same size but different specific gravity

86. Mycotoxins are toxic substances produced by
a) Rats
b) Bacteria
c) Fungi
d) Insects

87. The quantity of oil required for oil treatment of pulses before milling is
a) 100 g/quintal
b) 300-500 g/quintal
c) 1000-1500 g/quintal
d) 1500-2000 g/quintal

88. Which of the following is not a scalar quantity?
a) Speed
b) Pressure
c) Temperature
d) Momentum

89. Average food grain loss per year in India is estimated to be approximately
a) 5%
b) 10%
c) 20%
d) 30%

90. Extrusion cooking of food is a
a) High temperature short time process
b) High temperature long time process
c) Low temperature short time process
d) Low temperature long time process

91. If electrical current is flowing in a circuit of two dissimilar metals then heat is absorbed at one junction and liberated at the other junction. This phenomenon is known as
a) Seeback effect
b) Thompson effect
c) Peltier effect
d) Refrigeration effect

92. The emissive power of a body depends on
a) Temperature of the body
b) Physical nature
c) Nature of the body
d) All of the above

93. The property of a material to form into a thin sheet by beating is called
a) Ductility
b) Malleability
c) Softness
d) None of the above

94. Rheology is the science of
a) Deformation of metal
b) Stress and strain behaviour of metals
c) Deformation and flow in visco-elastic material
d) Flow of viscous materials only

95. Rice bran stabilization, a thermal treatment is done for
a) Extracting oil from bran
b) Reducing the FFA by arresting lipase enzyme activity
c) Increasing oil recovery from bran
d) Improving colour of bran

96. A commonly used instrument for measuring relative humidity of air is called
a) Calorimeter
b) Rheometer
c) Sling psychrometer
d) Barometer

97. A scalper is used to remove/separate
a) Fine impurities from the grain mass
b) Brokens from the grain mass
c) Dust from the grain mass
d) Bigger impurities from the grain mass for rough cleaning

98. Which of the following is a food safety standard?
a) ISO 9001
b) ISO 22000
c) ISO 14000
d) All of the above

99. The relationship between thermal diffusivity ($\propto$), thermal conductivity (K), density (ρ) and specific heat (C_p) of a material is given by
a) $\propto_v = \dfrac{K}{\rho C_p}$

b) $\propto = \dfrac{\rho}{K C_p}$

c) $\propto = \dfrac{K C_p}{\rho}$

d) $\propto = \dfrac{K \rho}{C_p}$

100. A hot wire anemometer is used to measure
a) Temperature of solids
b) Temperature of fluids
c) Flow of fluids
d) Heat flow in fluids

101. An LVDT is primarily used to measure
a) Strain
b) Stress
c) Voltage
d) Displacement

102. 500 kg of paddy grains at 22% moisture (wb) is dried to 10% moisture (wb). The amount of water removed (approx.) is
a) 50 kg
b) 67 kg
c) 75 kg
d) 81 kg

103. For seed drying, the safe drying air temperature range is
a) $35^\circ C$
b) $40\text{-}45^\circ C$
c) $55\text{-}60^\circ C$
d) $60\text{-}75^\circ C$

104. In a multiple effect evaporator
a) Fresh steam is supplied from a source for each 'effect'
b) No steam is used for the subsequent 'effects'
c) Steam produced in the first effect is used for the next 'effect'
d) Heat is supplied through electrical heaters

105. Rotameter is a
a) Drag flow meter
b) Variable area flow meter
c) Variable head flow meter
d) Rotating propeller type flow meter

106. The first law of thermodynamics is a special case of
a) Newton's law
b) Charles' law
c) Law of conservation of energy
d) Law of heat exchange

107. A faster method employed for separating solid particle from a mixture is
a) Centrifugal separation
b) Gravity separation
c) Filtration
d) Size separation

108. Photovoltaic solar cells are made of
a) Gun metal
b) Silicon
c) Carbon
d) Zinc

109. If a_1, a_2, ...a_n be 'n' observations and then the quantity $(a_1 \times a_2 \times a_3.......a_n)^{1/n}$ is called
a) Arithmetic mean
b) Geometric mean
c) Harmonic mean
d) Log mean

110. The Stefan-Boltzman law is applicable to heat transfer by
a) Radiation
b) Conduction
c) Convection
d) Conduction and convection combined

111. Dry ice is known as
a) Solidified water kept in moisture free environment
b) Solidified freon-12
c) Solidified nitrogen
d) Solidified carbon dioxide

112. Fluids which become more fluid (viscosity decreases), with time as they are stirred are known as
a) Pseudoplastic
b) Dilatant
c) Thixotropic
d) Rheopectic

113. Which one of the following will have least value of thermal conductivity?
a) Iron
b) Copper
c) Water
d) Air

114. Fumigation can be done in a sealed grain storage structure using
a) Methyl bromide/ethyle ditromide (EDB) and phosphine
b) DDT and BHC powder
c) Chloroform, sulphur
d) Aluminium phosphate and zinc phosphate

115. 'Hukills analysis' is related with
a) Moisture measurement
b) Shelling of grains
c) Drying of grains
d) Storage of grains

116. The purpose of pitting is in the pulse milling is
a) Splitting of pulses
b) Pearling of pulses
c) Polishing
d) To aid the process of oil penetration for loosening of husk

117. The distance from the leading edge where the flow becomes turbulent is known as
a) Sub-critical length
b) Super-critical length
c) Marginal length
d) Critical length

118. A refrigeration system can be used for
a) Heating
b) Cooling
c) Heating and cooling
d) Neither heating nor cooling

119. According to WHO, irradiation dose for fruit and vegetable treatment should not exceed
a) 4 KGy
b) 5 KGy
c) 8 KGy
d) 10 KGy

120. Major product of dry milling of corn is
a) Starch
b) Gluten
c) Fibre
d) Grits

121. Hot water treatment to fruits and vegetables is mainly used for controlling
a) Insect
b) Fungi
c) Bacteria
d) Viruses

122. Products sterilized by 'UHT' method involve temperature and time combination of
a) +135°C for 3-5 sec.
b) +135°C for 13-15 sec.
c) +150°C for 3-5 sec.
d) +150°C for 13-15 sec.

123. The most appropriate enzyme preparation used commercially to increase juice yields in fruit processing is
a) Amylases
b) Lipases
c) Proteases
d) Pectinases

124. 'Biosave' and 'Aspire' have been recently developed for controlling post harvest diseases. These are
a) Growth regulators
b) Bioinsecticides
c) Synthetic plant products
d) Microbial formulations

125. 'Quality assurance' in relation to food manufacture ensures
a) The food produced is nutritious
b) Quality raw material is used
c) Food meets specifcation and standards
d) The food is produced at affordable cost

126. In 1963, FAO and WHO established a Commission for setting of food standards which is known as
a) FPO
b) PFA
c) Codex Alimentarius
d) BIS

127. The term lacquering is related to
a) Wine industry
b) Tin-cans
c) Syruping
d) Fermentation

128. Surface active agents are also known as
a) Buffers
b) Colouring agents
c) Emulsifiers
d) Hormones

129. Browning of apple juice during processing is due to
a) Lipoxygenase
b) Catalase
c) Polyphenol oxidase
d) Peroxidase

130. Respiratory quotient of fruits is defined as the ratio of
a) CO_2 produced to O_2 consumed
b) CO_2 consumed to O_2 produced
c) O_2 consumed to H_2O produced
d) None of the above

Matching type questions (No. 131 to 140); all questions carry equal marks. Choose the correct answer (a, b, c, d or e) for each sub-question (i, ii, iii, iv and v) and enter your choice in the circle (by shading with a pencil) on the OMR - answer sheet as per the instructions given on the answer sheet.

131.

Major deteriorating changes in foods	Water activity
i) Auto-oxidation	a) >0.8
ii) Non-enzymatic browning	b) 0.3-0.65
iii) Mold growth	c) >0.9
iv) Yeast growth	d) <0.3
v) Bacterial growth	e) >0.65

132.

i) Hammer mill	a) Shear
ii) Burr mill	b) Impact and friction
iii) Vertical toothed disk mill	c) Impact and crushing
iv) Attrition mill	d) Compression
v) Flattening mill	e) Compression and shear

133.

i) Transport process	a) Grain storage
ii) Screw conveyor	b) Momentum transfer
iii) Diffusion molecules	c) Augur flight
iv) Planck's equation	d) Freezing
v) Jansen's equation	e) Concentration gradient

134.

i) Water in oil emulsion	a) Spray drying
ii) Liquid droplet	b) Fluidized bed dryer
iii) Fine granular products	c) Parboiling of paddy
iv) Equalization of flat particles	d) Butter
v) Hydro-thermal treatment	e) Homogenizer

135.

i) Reynold number	a) $V/\sqrt{gL}$
ii) Nusselt number	b) eV^2L/σ
iii) Froude number	c) DVe/μ
iv) Weber number	d) $Cp\mu/K$
v) Prandtl number	e) hD/K

136.

i) Pressure	a) W/m^oK
ii) Thermal conductivity	b) m/s^2
iii) Specific heat	c) Pascal
iv) Acceleration	d) kJ/kg^oK
v) Mass transfer coefficient	e) m/s

137.

i) Colour sorter	a) Surface texture
ii) Cyclone separator	b) Affinity to liquids
iii) Indented cylinder separator	c) Centrifugal force
iv) Magnetic separator	d) Grain size
v) Dodder mill	e) Colour of grain

138.

i) Thermocouple	a) Stress/strain
ii) Strain gauge	b) Velocity of fluids
iii) Piezoelectric	c) Composition of gases
iv) Chromatograph	d) Temperature
v) Pitot tube	e) Pressure

139.

i) Anthocyanin	a) Citrus
ii) Pickle	b) Cabbage
iii) Sauerkraut	c) Black carrot
iv) Astringency	d) Bamboo shoot
v) Limonin	e) Date palm

140.

i) ANOVA	a) Citrus
ii) Granulation	b) Quarantine
iii) Stem end rot	c) Milk
iv) Vapour heat treatment	d) Test of significance
v) Ultra high temperature processing	e) Mango

Short questions (No. 141 to 146); each question carries FIVE marks. Write answers, including computation / mathematical calculations if any, in the space provided for each question on the question paper itself.

141. Explain the process of solvent extraction of soybean oil.

142. Draw shear stress-shear strain relationship to explain various non-Newtonian and Newtonian behaviour of fluid foods. Use general power law relation to explain the various types.

143. What is precooling? Why It is necessary for horticulture crops? Explain various methods of precooling.

144. Draw a block diagram and explain the automatic feedback type control system.

145. What is filtration? Briefly discuss the principle of cake filtration.

146. Derive Jansen's equation for calculation of lateral pressure in a silo.

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