Question Booklet Code :   Register Number

2019
TEXTILE TECHNOLOGY
(DEGREE Std.)

Time Allowed : 3 Hours]   [Maximum Marks : 300

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. The applicant will be supplied with Question Booklet 15 minutes before commencement of the examination.

2. This Question Booklet contains **200** questions. Prior to attempting to answer, the candidates are requested to check whether all the questions are there in series and ensure there are no blank pages in the question booklet. **In case any defect in the Question Paper is noticed, it shall be reported to the Invigilator within first 10 minutes and get it replaced with a complete Question Booklet. If any defect is noticed in the Question Booklet after the commencement of examination, it will not be replaced.**

3. Answer **all** questions. **All** questions carry equal marks.

4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.

5. An answer sheet will be supplied to you, separately by the Room Invigilator to mark the answers.

6. You will also encode your Question Booklet Code <u>with Blue or Black ink Ball point pen</u> in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, action will be taken as per Commission's notification.

7. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.

8. In the Answer Sheet there are **four** circles Ⓐ, Ⓑ, Ⓒ and Ⓓ against each question. To answer the questions you are to mark with Blue or Black ink Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. *e.g.* If for any item, Ⓑ is the correct answer, you have to mark as follows :

Ⓐ ● Ⓒ Ⓓ

9. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the time of examination. <u>After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.</u>

10. **Do not make any marking in the question booklet except in the sheet before the last page of the question booklet, which can be used for rough work. This should be strictly adhered.**

11. In all matters and in cases of doubt, the English version is final.

12. Applicants have to write and shade the total number of answer fields left blank on the boxes provided at side 2 of OMR Answer Sheet. An extra time of 5 minutes will be given to specify the number of answer fields left blank.

13. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.

△   **CETET/19**

1. The tensile properties of synthetic fibers depend on

   (A) Melting point of the polymer

   (B) Molecular weight of the polymer

   (C) Extrusion pressure

   (D) Static changes

2. The work of rupture is equal to

   (A) Gain of potential energy

   (B) Loss of potential energy

   (C) Gain of kinetic energy

   (D) Loss of kinetic energy

3. The Instron Tensile Tester is working under ——————— principle

   (A) Constant rate of Loading

   (B) Constant rate of Traverse

   (C) Constant rate of Tension

   (D) Constant rate of Elongation

4. The Work of rupture of fiber will be

   (A) Directly proportional to its mass per unit length

   (B) Inversely proportional to its mass per unit length

   (C) Directly proportional to its length per mass

   (D) Inversely proportional to its length per mass

5. Elastic recovery is highest for ——————— among the following fibres

   (A) Cotton

   (B) Nylon

   (C) Casein

   (D) Silk

6. The initial modulus value is lowest for ——————— fibres.

   (A) Acetate

   (B) Nylon

   (C) Glass

   (D) Silk

7. The breakdown potential of air at atmospheric pressure is ——————— with respect to leakage of static charge through the air

(A) 30 V/cm
(B) 30 kV/cm
(C) 30 mV/cm
(D) 10 kV/cm

8. The dielectric property is high for which one of the following material?

(A) Cellophane film
(B) Nylon film
(C) Wool
(D) Nylon fibre

9. Which one of the following statement is correct with respect to wet spinning technique?

(A) Microporous and fibrillar structure can be obtained by this technique
(B) Normally used to produce finer denier fibres
(C) Polymer concentration for spinning is 30–40%
(D) Fibres are produced at higher speeds

10. In dry spinning ——————— is generally used as the solvent.

(A) Dimethyl formamide
(B) Dimethyl acetamide
(C) Dimethyl sulphoxide
(D) Nitric acid

11. Choose the correct polymer – solvent combination for dry spinning process.

	Polymer		Solvent
(a)	Cellulose acetate	1.	Water
(b)	Cellulose triacetate	2.	Dimethyl formamide
(c)	Poly urethane	3.	Methylchloride
(d)	Polyvinyl alcohol	4.	Acetone

	(a)	(b)	(c)	(d)
(A)	3	1	4	2
(B)	3	4	2	1
(C)	2	3	4	1
(D)	4	3	2	1

12. Which one of the following is not correct with respect to heat setting of synthetic fibres?

(A) Increases crystallinity

(B) Increases crystallite size

(C) Increases perfection in the unit cell

(D) Increases residual internal strains ✓

13. Match the correct combinations with respect to the air textured yarn property and application.

	Property		Applications
(a)	Low friction character	1.	Belts and Straps
(b)	Spun yarn	2.	Tarpaulin
(c)	High friction	3.	Sports and leisure wear
(d)	Dimensional stability	4.	Sewing threads

	(a)	(b)	(c)	(d)
(A)	2	4	1	3
(B)	4	3	2	1
(C) ✓	4	3	1	2
(D)	3	4	2	1

14. _____ is a stereo-regular polymer, arranged in a regular alternating fashion above and below of the polymer backbone.

(A) Atactic Polymer

(B) Isotactic Polymer

(C) Syndyotactic Polymer ✓

(D) Both (B) and (C)

15. For many synthetic polyamides and polyesters, fiber formation becomes possible at a molecular weight of

(A) 2000 g/mol

(B) 3000 g/mol

(C) 4000 g/mol

(D) 5000 g/mol ✓

16. Polymer having linear polymer chain and no or very few short side chains are called as

(A) HDPE ✓

(B) HMHDPE

(C) LDPE

(D) LLDPE

17. Match the length to breadth ratio of the following fibres :

     (a) Cotton   1. 3000
     (b) Ramie   2. 33×10^6
     (c) Silk   3. 1209
     (d) Flax   4. 1400

          (a)   (b)   (c)   (d)
     (A)   1   3   2   4
     (B)   4   1   3   2
     (C)   3   2   1   4
     ✓(D) 4   1   2   3

18. In SI units, tenacity of fibre is expressed in mN/tex, which is equal to gf/den X

     (A) 9.8   (B) 19.6
     ✓(C) 88.3   (D) 111.1

19. Pick the odd fibre from the list, based on heterochain and carbo chain arrangement.

     (A) Polyester   (B) Polyamide
     ✓(C) Polyacrylonitrile   (D) Polyurethane

20. Match the following :

     (a) Vegetable origin·   1. Dynel
     (b) Animal origin   2. Polynosic
     (c) Regenerated cellulose fibres 3. Vicuna
     (d) Synthetic Fibre   4. Abaca

          (a)   (b)   (c)   (d)
     (A)   2   4   1   3
     ✓(B) 4   3   2   1
     (C)   4   3   1   2
     (D)   3   1   4   2

21. Acrylic fibre is made from atleast 85% by weight of ———————— monomer
    (A) Acrylic acid
    (B) Acrylonitrile ✓
    (C) Acrylamide
    (D) Methyl methacrylate

22. The chemical that is used to convert soda cellulose to sodium cellulose xanthate in the manufacture of viscose rayon is
    (A) sodium xanthate
    (B) carbon disulphide ✓
    (C) sodium disulphide
    (D) sodium hydroxide

23. The pair of fibres most prone to accumulation of static change is
    (A) cotton and polyester
    (B) silk and polyester
    (C) polyester and polypropylene ✓
    (D) silk and polypropylene

24. ———————— is the major part of the wool fibre and is made up of long, slightly flattened, cigar shaped cells with a nucleus near the centre.
    (A) medulla
    (B) cuticle
    (C) cortex ✓
    (D) keratin

25. The approximate number of cellobiose units in cotton is
    (A) 175
    (B) 250
    (C) 300
    (D) 5000 ✓

26. Which of the following reagent would be suitable to separate wool from a mixture of wool and silk fibres?
    (A) 5% NaOH solution
    (B) dilute H_2SO_4 (2% solution)
    (C) Conc. HCl ✓
    (D) Acetone

27. In a burning test, the following fibre does not burn, but melts at a temperature above 1500°C
    (A) Arnel
    (B) Fibre glass ✓
    (C) Polyester
    (D) Viscose Rayon

△

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28. The twist multiplier for the combed cotton ring yarn used for weaving normally lies in the range of

(A) 1.7 to 2.4

(B) 2.4 to 3.1

(C) 3.1 to 3.9

(D) 4.0 to 4.3

29. The contraction factor of yarn (Cy) and surface angle of twist (α) of fibre with respect to axis of yarn can be related as

(A) $Cy = \frac{1}{2}(1 + \cos\alpha)$

(B) $Cy = \frac{1}{2}(1 + \tan\alpha)$

(C) $Cy = \frac{1}{2}(1 + \csc\alpha)$

(D) $Cy = \frac{1}{2}(1 + \sec\alpha)$

30. The relationship between yarn extension (e_y) and filament extension (e_f), when the idealised helical structured filament yarn is subjected to tensile loading, is ——————————. It is assumed that there is no change in yarn diameter during extension. In the equational α is the first angle of filament with respect to axis of yarn

(A) $e_y = e_f \cdot \cos^2\alpha$

(B) $e_f = e_y\left(1 + \frac{\sec\alpha}{2}\right)$

(C) $e_f = e_y \cdot \cos^2\alpha$

(D) $e_y = e_f\left(1 + \frac{\sec\alpha}{2}\right)$

31. Select the correct relationship between speeds in the case of leading bobbin method of winding in moving frame; in the equation

L – delivery rate (m/min)

n_b – rotational speed of bobbin (rpm)

n_s – rotational speed of flyer (rpm)

d – diameter of bobbin (m)

(A) $L = \dfrac{n_b}{\text{Twist per unit length of moving}}$

(B) $n_s = \dfrac{L}{\pi \cdot d} + n_b$

(C) $n_b = \dfrac{L}{\pi \cdot d} + n_s$

(D) $L = n_b - n_s$

32. For cotton roving drafting at ring frame, the critical drafting region lies between
————— and ————— draft.

(A) 1.1 to 1.2
(B) 1.2 to 1.3
(C) 1.3 to 1.7 ✓
(D) 1.7 to 2.0

33. For producing blended yarn in the spinning mill, sliver blending gives good blending evenness along ————— of product and flock blending gives good blending evenness in ————— direction.

(A) length, transverse ✓
(B) transverse, length
(C) length, length
(D) transverse, transverse

34. The limiting irregularity of fibre assemblies expressed as $CV_{lim}\%$ and $U_{lim}\%$ can be calculated using the equations ————— and ————— respectively. In the equation n is the number of fibres in the cross section of strand. Assume the cross sectional size of fibres are same.

(A) $\dfrac{100}{n}, \dfrac{80}{n}$
(B) $\dfrac{80}{n}, \dfrac{100}{n}$

(C) $\dfrac{80}{\sqrt{n}}, \dfrac{100}{\sqrt{n}}$
(D) $\dfrac{100}{\sqrt{n}}, \dfrac{80}{\sqrt{n}}$ ✓

35. The total draft given at the card is D_T, actual draft is D_a $\left(Tex_{lap}/Tex_{sliver}\right)$ and waste removed at the card is W.

Select the correct relationship

(A) $W = 100\left(\dfrac{D_a}{D_T} - 1\right)$
(B) $W = 100\left(\dfrac{D_T}{D_a} - 1\right)$

(C) $W = 100\left(1 - \dfrac{D_a}{D_T}\right)$
(D) $W = 100\left(1 - \dfrac{D_T}{D_a}\right)$ ✓

36. Which one of the following task is not normally carried out in blow room?

(A) opening to flocks
(B) opening to fibres ✓
(C) opening out of flocks
(D) breaking apart of flocks

37. The closest setting in the high production carding machine is kept between ————— and ————— and it is —————

(A) cylinder and flat, 0.1 mm
(B) cylinder and flat, 0.25 mm
(C) cylinder and doffer, 0.1 mm ✓
(D) cylinder and doffer, 0.25 mm

38. Choose the correct statement for selecting the left hand dobby among the following
    (i)   Starting handle is on the right hand side of the loom
    (ii) Pattern cylinder rotates in the clockwise direction
    (iii) Pattern cylinder rotates in the anti–clock wise direction
    (iv) Straight feder operating the top row of hooks
    (A)   (i),(ii)
    (B)   (ii),(iii)
    (C)   (iii),(iv)
    (D)   (i),(iv)

39. A standard card for a ————————— needle machine measures about 6 cm in width and 40 cm in length.
    (A)   400   (B)   600
    (C)   800   (D)   1200

40. A loom runs at 300 picks/min and produces fabric at 6 inches/min. Find out pick spacing in inches.
    (A)   0.001   (B)   0.002
    (C)   0.02   (D)   0.2

41. Which of the following particular is not necessary while designing negative tappet?
    (A)   Weave structure   (B)   Number of picks to a repeat
    (C)   Dwell period of the heald frame   (D)   Diameter of the treadle bowl

42. What is the speed ratio between tappet shaft and crank shaft while producing 4/4 twill weave?
    (A)   1 : 2   (B)   1 : 4
    (C)   1 : 6   (D)   1 : 8

43. Find out the false statement with respect to jacquard shedding.
    (A)   Griffe moves vertically to operate the hooks.
    (B)   In double lift jacquard, for each insertion of a pick, a new card is presented to the needle board.
    (C)   The hooks raised or lowered to form the warp shed.
    (D)   The number needles must be equal to number of hooks in all types of jacquard loom.

44. Which one of the following **auxiliary motion** is used to keep the width of cloth fell same as that of warp in the need?

    (A) Warp Protector
    (B) Warp stop
    (C) Weft stop
    (D) Temple motion

45. Which one of the following statement is incorrect to achieve a pirn changing mechanism efficiency?

    (A) the shuttle is in the correct position
    (B) weft tension is maintained as zero
    (C) the ejected bobbin is guided into a storage can
    (D) the weft yarn from the new pirn is guided into the shuttle eye

46. Centre weft fork motion is a ——————.

    (A) warp stop motion
    (B) warp protector motion
    (C) weft stop motion
    (D) automatic warp beam changing motion.

47. According to KESF system which of the following is correct?

    (A) FB1 – Bending
    (B) FB2 – Surface friction and variation
    (C) FB3 – Compression
    (D) FB4 – Tensile and shearing

48. Dimensional stability test can be carried out with the help of

    (A) FAST 1
    (B) FAST 2
    (C) FAST 3
    (D) FAST 4

49. According to 'Uster' yarn standards, a fault length of approximately the fibre staple length, having a cross section of 50% increase over the average value is

    (A) Neps
    (B) Thick Places
    (C) Thin Places
    (D) Slubs

50. The minimum number of twist needed for plied and cabled yarn is
   (A) 10
   ✓(B) 20
   (C) 30
   (D) 50

51. A high initial Young's Modulus indicates
   (A) Great extensibility ✓(B) In extensibility
   (C) High work factors (D) Low work factor

52. CV% of doubted strands can be calculated by
   ✓(A) $\dfrac{\text{CV\% of individuals}}{\sqrt{n}}$
   (B) CV% of individuals × $\sqrt{n}$
   (C) $\dfrac{\text{CV\% of individuals}}{n}$
   (D) CV% of individuals × n

53. The fabric strip methods, the length of test specimen should be ——————— inch between the jaws.
   (A) 2 (B) 4
   ✓(C) 8 (D) 12

54. The range of short term periodic variation according to fiber length is
   ✓(A) 1 to 10 times the fiber length (B) 10 to 100 times the fiber length
   (C) 100 to 1000 times the fiber length (D) 1000 to 10000 times the fiber length

55. According to comb sorter diagram, which of the following expression is used to measure dispersion percentage?
   (A) Upper-quartile length/Effective length
   (B) Lower quartile length/ Effective length
   ✓(C) Inter-quartile length/ Effective length
   (D) Modal Length/ Effective length

56. Which of the following parameter is not proportional to work of rupture of a yarn?
   (A) Cross-sectional area (B) Linear density
   (C) Initial length before extension ✓(D) Extended length

57. Why is Sodium trichloroacetate an essential ingrediant of the printing paste in printing of polyester/cotton fabric with disperse/reactive dyes?

(A) to catalyse the reaction between reactive dye and cotton during steaming.

(B) to protect the cotton fabric during steaming at high temperature.

(C) to protect the polyester fabric during steaming at high temperature.

(D) to catalyse the reaction between disperse dye and Polyester during steaming.

58. Advantages of high temperature steaming of Polyester fabric printed with disperse dye are

(A) continuous process and bright prints.

(B) gives full colour yield and bright prints.

(C) continuous process and full colour yield.

(D) continuous process and gives full colour yield and bright prints.

59. Which one of the following agents is used as discharging agent in printing of polyester with disperse dye?

(A) Sodium Chloride

(B) Acetic acid

(C) Stannous Chloride

(D) Citric acid

60. In development of white design on colour background using resist style printing with reactive dye, the printing paste should contain.

(A) alkali

(B) acid

(C) salt

(D) hygroscopic agent

61. The reason for the formation of scumming defect during roller printing is due to

(A) insufficient scrapping of the printing paste from the unengraved portion of the roller

(B) deposition of loose fibres on the surface of printing roller

(C) improper engraving of the design on the printing roller

(D) insufficient preparatory processes given to the fabric

62. The main quality parameter of the thickener film developed on the fabric after printing is

(A) should be brittle

(B) should be flake off

(C) should not be brittle

(D) should not be flexible

63. ——————— is not a natural polymer based thickener.

(A) Carboxymethyl Cellulose

(B) Methyl and ethyl Cellulose

(C) Sodium alginate

(D) Polyvinyl alcohol

64. In enzyme desizing the action of both $\alpha-$ and $\beta-$amylases are the

(A) rupture of C1 – C6 linkages of starch

(B) rupture of C5 – C6 linkages of starch

(C) rupture of C1 – C4 linkages of starch

(D) rupture of C1 – C2 linkages of starch

65. The specky dyeing problem occured in dyeing of polyester fabric is due to

(A) Acid treatment of fabric before dyeing

(B) Bleaching of fabric before dyeing

(C) Singeing of fabric before dyeing

(D) Alkali treatment of fabric before dyeing

66. Scouring and Milling can be processed with minimum quantity of alkali at temperatures not exceeding

(A) 50°C

(B) 55°C

(C) 60°C

(D) 65°C

67. ——————— seam uses only one piece of strip of fabric and turned on both edges

(A) class 5

(B) class 6

(C) class 7

(D) class 8

68. ——————— is a passing a loop of thread through another loop formed by a different thread

(A) Intra looping

(B) Inter looping

(C) Inter lacing

(D) Double looping

69. The purpose of laying underlay paper ply in the cutting process is

(A) to ensure easy transfer of the spread along the table

(B) to avoid fusing of fabric plys

(C) to move hand operated cutting machine easily

(D) to avoid fabric extension at the bottom of lay

70. ———————— are the devices which converts the rotary machine drive into a suitable reciprocating action for the needles.

(A) Yarn feeder

(B) Cylinder

(C) Jack

(D) Cam ✓

71. ———————— is the ratio of the area covered by the yarn in one loop to the area occupied by that loop.

(A) Stitch

(B) Stitch length

(C) Stitch density

(D) Tightness factor ✓

72. Which of the following property of textile fibre is important for texturising of yarn?

(A) Hydrophilicity

(B) Hydrophobicity

(C) Thermo plasticity ✓

(D) Thermal conductivity

73. In automotives, in general ———————— carpeting is used in the passenger cabin floor.

(A) Tufted cut pile ✓

(B) Rib based

(C) Cord based

(D) Terry pile

74. Main natural fibers used in ropes are

(i) Cotton

(ii) Sisal

(iii) Manila

(A) (i) and (ii) only

(B) (ii) and (iii) only ✓

(C) (i) and (iii) only

(D) (i) only

75. ———————— belting is used for fire resistance

(A) PVA

(B) PVC ✓

(C) Nylon

(D) Polyester

76. Fiber reinforced composites that reduces overall weight and cost of fabrication find itself in the applications namely boat hulls and car bodies.

(A) Carbon – reinforced composites

(B) Ceramic – reinforced composites

(C) Glass – reinforced composites ✓

(D) Plastic – reinforced composites

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[Turn over

77. In hot gas filters, ———————— fibres are mostly preferred.

    (A) Mineral ✓

    (B) Bast

    (C) Regenerated

    (D) Seed

78. Through–air bonding method of thermal bonded nonwovens based on ———————— bi component filaments webs find itself in the applications of air and water filtration media.

    (A) Co-PET/PET

    (B) PE/PET

    (C) PET/PA6

    (D) PP/PE ✓

79. In these type of nonwoven fabric finishing, Fluorocarbons are claimed to produce a low surface tension applied in an aqueous dispersion medium

    (A) Biocidal finishes

    (B) Flameproof finishes

    (C) Softener finishes

    (D) Waterproof finishes ✓

80. In hydro entanglement, use of fibres with ———————— results in better hydroentanglement effect under identical conditions.

    (A) lower fineness

    (B) Lower stiffness

    (C) higher stiffness

    (D) higher fineness ✓

81. In needling, use of longer fibre results in ———————— of needled felt.

    (A) lower strength

    (B) lower felt density

    (C) lower air permeability ✓

    (D) higher air permeability

82. In needling, stitch density (Ed) is calculated by

    $[n_h$ – number of lifts, min^{-1}

    N_D – number of needles by 'm' working width, m^{-1}

    V_V – web outlet speed, $m.min^{-1}]$

    (A) $Ed = \dfrac{N_D \cdot V_V}{nh \cdot 10^4}\ cm^{-2}$

    (B) $Ed = \dfrac{nh^2 \cdot V_V}{N_D^2 \cdot 10^4}\ cm^{-2}$

    (C) $Ed = \dfrac{n_h \cdot V_V}{N_D \cdot 10^4}\ cm^{-2}$

    (D) $Ed = \dfrac{n_h \cdot N_D}{V_V \cdot 10^4}\ cm^{-2}$ ✓

83. Production rate of web laying machine (p) is calculated by

[AB_{eff} – effective web width, m

m_F – web mass g/m^2

V_F – card web fed rate, m/min]

(A) $p = \dfrac{AB_{eff} \cdot V_F \cdot 60}{m_F \cdot 1000}$ kg/h

(B) $p = \dfrac{m_F \cdot V_F \cdot 60}{AB_{eff} \cdot 1000}$ kg/h

(C) $p = \dfrac{AB_{eff} \cdot m_F \cdot 60}{V_F \cdot 1000}$ kg/h

(D) ✓ $p = \dfrac{AB_{eff} \cdot m_F \cdot V_F \cdot 60}{1000}$ kg/h

84. The concentration of fibre per 1000 ml of water that are normally required as per level of dilution in conventional flat wire machines for wet-laid web formation.

(A) ✓ 0.5 grams

(B) 0.3 grams

(C) 0.05 grams

(D) 0.03 grams

85. Which one of the following chemical can be recovered from effluent for reusage?

(A) Starch

(B) ✓ Poly Vinyl Alcohol

(C) Sodium Carbonate

(D) Hydrogen peroxide

86. Choose the correct statements from the following for energy conservation

1. The waste water and exhaust air/gas can be used for heating the clean and cold input water

2. Renewable energy could be utilized to minimize the thermal energy consumption

3. Good quality of soft water reduces the usage more quantity of water

4. Low calorific fuel increases the energy conservation

(A) 1, 2

(B) 2, 3

(C) ✓ 1, 2, 3

(D) 3, 4

87. In marketing management, the psychological theories was propounded by

(A) B. H. George

(B) ✓ Philip Kotler

(C) Sigmund Fraud

(D) Thorstein Vebler

88. The heat treatments are true with one or combinations of the following statements in Nylon 6.

(I) Heat Exposure upto 120°C improves the dye uptake

(II) Heat Exposure above 190°C, there is a decrease in dye uptake

(III) The crystalline regions are becoming larger and more perfect.

(IV) Non-Crystalline regions become more oriented and less mobile

(A) (I), (II)

(B) (II), (III), (IV)

(C) ✓ (I), (II), (III)

(D) (IV)

89. If a fibre of thermoplastic nature is cooled down through the transition in a deformed state, then it will become rigid-set in the new form. It is called

(A) Annealing

(B) ✓ Heat setting

(C) Melting

(D) Glass-Transition

90. The strategy of ——————— is that everyday must be an improvement day, in the social context, in our personal lives, or at work.

(A) 5S

(B) Total Productive Maintenance

(C) Total Quality Management

(D) ✓ Kaizen

91. The continual improvement tool under Total Quality Management that has Seiri, Seiton, Seiso, Seiketsu and Shitsuka are the terms originated from ——————.

   (A) China

   (B) Italy

   ✓(C) Japan

   (D) USA

92. The system type that integrates ERP, SCM and CRM in major e-business applications is ——————.

   (A) Functional Business system

   (B) Transaction Processing system

   (C) Accounting and Finance system

   ✓(D) Cross-functional Enterprise system.

93. Economic order quantity is computed so that ——————.

   ✓(A) The ordering and carrying costs are least

   (B) The ordering and stock out costs are least

   (C) The ordering and back ordering costs are least

   (D) The cost of materials are least

94. An example of fixed cost is ——————.

   (A) Direct material cost

   (B) Direct labour cost

   ✓(C) Taxes

   (D) Lubricants

△

95. The Specific Torsional Rigidity $(mN\ mm^2/tex^2)$ is the lowest for

    (A) Wool   (B) Polyester

    (C) Secondary acetate   (D) Cotton

96. The Poison ratio (σ_{LT}) for Nylon fibre is about

    (A) 0.19   (B) 0.29

    (C) 0.39   (D) 0.49

97. The Torisional Rigidity of fiber does not depend on

    (A) Period of the oscillation

    (B) Moment of inertia of the bar

    (C) Flexibility of fiber

    (D) Length of fiber

98. The flexibility of a fiber NOT depends on

    (A) Tensile modulus

    (B) Density

    (C) Thickness

    (D) Fineness

99. Increase in relative humidity, the creep behaviour of acetate rayon is

    (A) Increased

    (B) Decreased

    (C) Increased and then decreased

    (D) Remain same

100. The elastic recovery is ratio between

    (A) Elastic extension/Total extension

    (B) Total extension/Elastic extension

    (C) Elastic extension/Work extension

    (D) Work extension/Elastic extension

101. The work factor is highest for ―――――――― fibre.

(A) Ramie

(B) Cotton

(C) Jute

(D) Wool

102. The increasing order of flexural rigidity of fibres among the below fibres is ――――――――

1. Silk
2. Polyester
3. Casein
4. Cotton

(A) 3-2-4-1

(B) 3-4-2-1

(C) 2-3-1-4

(D) 2-3-4-1

103. Which one of the below given factors are not directly influence the creep of textile fibres?

(A) Relative Humidity of atmosphere

(B) Stress on fibre

(C) Temperature of fibre

(D) Melting point of polymer

104. The Dichroic constant for Ramie fibre is

(A) 3

(B) 6

(C) 9

(D) 12

105. The ratio of refractive index is

(A) Sin of angle of incidence to sin of angle of refraction

(B) Sin of angle of refraction to sin of angle of incidence

(C) Cos of angle of incidence to cos of angle of refraction

(D) Cos of angle of refraction to cos of angle of incidence

106. The shrinkage (%) of thermoplastic fibre increases because of one of the following reason

(A) Reducing dry heat (°C)

(B) Reducing tension of fibre (N)

(C) Presence of high per cent of oriented non-crystalline material in fibre

(D) Melting of low percentage of small crystallites

107. In ─────────── spinning, the spinning solution is extended through the spinneret which is suspended at a short distance above the coagulation bath.

  (A) Melt spinning

  (B) Wet spinning

  ✓(C) Dry-Jet-Wet spinning

  (D) Dry spinning

108. In melt spinning process, melt homogeneity and uniform temperature profile is maintained with the help of

  (A) Spinneret

  (B) Spin pack

  ✓(C) Static mixer

  (D) Extruder

109. Typical Fibre–forming acrylic polymers have M_n in the range of

  ✓(A) 45,000 – 60,000

  (B) 60,000 – 75,000

  (C) 75,000 – 90,000

  (D) 90,000 – 1, 40,000

110. Which one of the following is incorrect for making spinneret?

  (A) Nickel

  ✓(B) Molded plastic

  (C) Stainless steel

  (D) Tantalum

111. Drawing of low molecular weight polymers leads to

  ✓(A) High chain slippage

  (B) High orientation

  (C) High neck stability

  (D) High strain hardening

112. ——————— is defined as the energy of vapourization divided by its molar volume.

(A) Coherent energy density
(B) Cohesive energy difference
(C) Coherent energy difference
(D) Cohesive energy density ✓

113. The ratio of evaporation to diffusion rate for scrated cross section is

(A) =1
(B) >1 ✓
(C) <1
(D) >>1

114. ——————— is the simplest, most economical and technologically the most elegant method of producing filaments.

(A) Dry Spinning
(B) Wet Spinning
(C) Melt Spinning ✓
(D) Dry-jet-wet Spinning

115. ——————— spinning technique, a wide variety of fiber cross sectional shapes can be produced.

(A) Melt
(B) Wet ✓
(C) Dry
(D) Dry-jet-wet

116. The wet spinning technique is used to produce ——————— fibre.

(A) Polyester
(B) Viscose ✓
(C) Cellulose acetate
(D) Nylon

117. The speed of false twist spindle in false twist texturisation method ranges between

(A) 1000 – 10,000 rpm
(B) 10,000 – 50,000 rpm
(C) 50,000 – 1,00,000 rpm ✓
(D) 1,00,000 – 1,50,000 rpm

118. A filament of 200 meter has a diameter of 16 μm. What will be the linear density of a filament of similar type but with a diameter of 20 μm?

(A) 128
(B) 160
(C) 250
(D) 312 ✓

119. Match the following :

(a)	Vegetable Hair fibre	1.	Caroa
(b)	Bast fibre	2.	Angora
(c)	Leaf fibre	3.	Nettle
(d)	Fruit fibre	4.	Kapok
(e)	Fur fibre	5.	Coir

	(a)	(b)	(c)	(d)	(e)
(A)	5	4	1	3	2
(B)	2	5	4	1	3
(C) ✔	4	3	1	5	2
(D)	3	1	5	2	4

120. The fineness of wool fibre is generally expressed in

(A) micrograms/inch   (B) ✔ microns

(C) denier   (D) tex

121. Which of the following species doesn't belong to wild silk?

(A) ✔ Bombyx Mori   (B) Tussar

(C) Muga   (D) Eri

122. The cellulose content in the cotton is about ———————— %.

(A) 80%   (B) 84%

(C) 88%   (D) ✔ 94%

123. In which of the following fibre, the degree of orientation at molecular level can be controlled?

(A) ✔ Polyester   (B) Ramie

(C) Sisal   (D) Kneaf

124. Which of the following fibre is suitable for use as filters for chemicals?

(A) Abaca   (B) Nettle

(C) Eri Silk   (D) ✔ Asbestos

125. Cellobiose is NOT the basic unit for which of the following fibre?

(A) ✔ silk   (B) viscose rayon

(C) cotton   (D) cuprammonium rayon

126. In the longitudinal cross-section of cotton, if 'L' represents width of lumen and 'W' represents wall width, then according to ISI, the following is true for a matured fibre

(A) $1 \leq \dfrac{L}{W} < 2$

(B) $1.5 \leq \dfrac{L}{W} < 2.5$

(C) $\dfrac{L}{W} < 1$

(D) $\dfrac{L}{W} \geq 2$

127. The presence of medulla in wool is to
   (A) produce good results in dyeing
   (B) promote the growth of fibre
   (C) increase the protective property of fibre
   (D) enhance spinning property

128. Which one of the following spinning process is based on rubbing technique
   (A) DREF 3 spinning
   (B) Air-Vortex spinning
   (C) Probtex Integrated Composite Spinning
   (D) Self twist spinning

129. The twist level at the separation point of rotor is about ——————, —————— than those at the navel of the rotor spinning machine
   (A) 10-20%; higher
   (B) 10-20%; less
   (C) 20-40%; higher
   (D) 20-40%; less

130. The flange number of ring used in ringframe is related to
   (A) Surface inclination of ring with respect to horizontal plane
   (B) Diameter of ring
   (C) Height of ring
   (D) Width of upper part of ring over which traveller moves

131. Twenty slivers of 0.12 Ne each are fed to the sliver lap former. Total draft of 1.5 is applied in the machine. The linear density (ktex) of sliver lap is

(A) $\dfrac{0.12}{20 \times 1.5}$

(B) $\dfrac{0.591 \times 20}{0.12 \times 1.5}$

(C) $\dfrac{0.591}{20 \times 0.12 \times 1.5}$

(D) $\dfrac{0.12 \times 20}{0.591 \times 1.5}$

△

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[Turn over

132. Select the correct answer with respect to ringframe. ϕ is the diameter

a – ϕ_{ring}

b – $\phi_{balloon\ control\ ring}$

c – $\phi_{thread\ guide}$

(A) $b > c > a$

(B) $b > a > c$

(C) $a > c > b$

(D) $c > b > a$

133. The traveller speed at ringframe for the following data is

The spindle speed : 18000 rpm

Delivery rate : 19.8 m/min

Diameter of ring cop at which winding taking place : 42 mm

(A) 17850 rpm   (B) 17985 rpm

(C) 18000 rpm   (D) 18150 rpm

134. The ring bobbin (tube) to ring diameters ratio should lie between ———————
and ——————— to ensure lesser yarn tension difference due to winding.

(A) $1 : 4, 1 : 4.4$ (B) $1 : 2, 1 : 2.2$

(C) $4 : 1, 4.4 : 1$ (D) $2 : 1, 2.2 : 1$

135. Advantage of long bottom apron compared to short bottom apron at the roller drafting arrangement of ring frame is that

(A) It can be brought closer to the front roller

(B) It is cheaper

(C) The elements beneath the drafting arrangement such as deflecting rolls, guides can be omitted

(D) The chance of choking with fibre fly is less

136. The draft to be given at the carding machine is ———————, if the linear density of feed is 400 g/m and delivery is 5 ktex. Assume the waste extracted at the card is 5%.

(A) 7.6   (B) 76

(C) 80   (D) 84

137. The cleaning efficiency of blow room is 60% and that of card is 90%. The combined cleaning efficiency of blow room and card is

(A) 4%   (B) 30%

✓(C) 96%   (D) 150%

138. In water jet loom, a lead angle of ——————— is prefered for 30 to 100 denier flat yarn.

(A) 5°   (B) 10°

✓(C) 15°   (D) 20°

139. In air jet loom, the weft velocity ——————— as the yarn flight distance is increased and drops gradually after passing half way through the shed.

✓(A) Increases   (B) Decreases

(C) Constant   (D) Stick and slip

140. The gripper projectile is subjected to a maximum acceleration force of ——————— N/m^2.

✓(A) 6800   (B) 7200

(C) 7600   (D) 8000

141. In seven wheel take–up mechanism, the drive arrangement for ratchet wheel pulling pawl is as follows from ——————— to ——————— and then to ———————.

(A) Motor, bottom shaft, sley sword

(B) Motor, bottom shaft, picking stick

(C) Motor, crank shaft, heald frame

✓(D) Motor, crank shaft, sley sword

142. Positive tappet sheddings are prefered for weaving

(A) at low speed

(B) low dense warp beam

(C) at low speed and high dense warp beam

✓(D) at high speed and high dense warp beam.

△   27   CETET/19

[Turn over

143. In random winding, the traverse ratio decreases as the package diameter increases, this leads to a ——————— problem.

(A) Patterning ✓

(B) Stitches

(C) Soft nose

(D) Snarls

144. A cylindrical package in winding machine rotates at 3000 rev/min, and the yarn completes 500 double traverse/min. Find out the 'wind' of the machine?

(A) 6

(B) 3 ✓

(C) $\dfrac{1}{6}$

(D) $\dfrac{1}{3}$

145. The values of the stretch given on 100 m warp threads during sizing in the three zones are 3, 5 and 2% respectively. Find out the final length of the warp threads.

(A) 90 m

(B) 110 m

(C) 110.313 m ✓

(D) 111.313 m

146. A full beam produced on a direct warping system is having 1.4 m width and contains 500 end of 30 fex yarn. If the volume of yarn on the beam is 519541 cm³ and beam density is 0.4 g/cm³, then calculate the mass of yarn on beam in kgs.

(A) 207.82 ✓

(B) 375

(C) 1298.85

(D) 1385.44

147. The function of leather buffer present in the shuttle box is

(A) to strike the shuttle so that the weft thread will be passed across the warp threads

(B) to pass the shuttle parallel

(C) to prevent the picker from beating up against the metal part of the spindle stud ✓

(D) to protect the leather strap present on the picking stick

148. In air-ject weaving, air pressure should be about ——————— bar at the exhaust point of compressor and minimum of about ——————— bar at just the inlet position of loom.

(A) 3, 1

(B) 5, 2

(C) 7, 5 ✓

(D) 5, 7

149. If periodic variation is 5 times of its fibre length, then it is
   (A) Short term variation
   (B) Medium term variation
   (C) Long term variation
   (D) Zero term variation

150. In abrasion testing, which property is not used to asses the amount of damage of the fabric
   (A) Loss in weight of the fabric
   (B) Loss in Elongation of the fabric
   (C) Loss in Strength of the fabric
   (D) Change the air permiability of the fabric

151. What will be the drape co-efficient, if the area of the specimen is 200 cm² and the area of the supporting disk is 100 cm², actual projected area of the specimen is 150 cm² ?
   (A) 0.1
   (B) 0.25
   (C) 0.50
   (D) 1.0

152. Which of the following statements are correct?
   1. Viscose have a higher abrasion resistance than poly propylene.
   2. Filament yarns are more abrasion resistance than stable yarns made from stable fibre
   3. Low twist yarn have good abrasion resistance
   4. The crimp of the yarns in the fabric does not affect abrasion property
   (A) 1, 2
   (B) 2 only
   (C) 3, 4
   (D) 3 only

153. The twist factor of a yarn is directly proportional to
   (A) 1 / sin θ
   (B) cos θ
   (C) tan θ
   (D) cot θ

154. The multiplying factor to convert cotton count to worsted count is
   (A) 590.5
   (B) 0.1111
   (C) 0.6667
   (D) 1.500

155. According to Peirce and Lord, the relationship between maturity ratio (M) and the degree of thickening of cotton cell wall is

(A) $\theta = \dfrac{0 \cdot 577}{M}$

(B) $\theta = 0.577\,M$ ✓

(C) $\theta = \dfrac{0 \cdot 577}{\sqrt{M}}$

(D) $\theta = 0.577\,\sqrt{M}$

156. In which of the following technique the samples are taken from all parts of the bulk to achieve a representative of test sample?

(A) Zoning technique ✓

(B) Spot technique

(C) True biased technique

(D) Random spot technique

157. The limiting oxygen index value for wool fibre is

(A) 18

(B) 24 ✓

(C) 16

(D) 32

158. Which one of the following compounds is used as stabilizers in foam preparation for textile finishing

(A) Hydroxy ethyl cellulose ✓

(B) Sodium lauryl sulphate

(C) Nonyl phenol-ethylene oxide

(D) Sodium myristate

159. Calculate the % expression of the fabric during chemical finishing using padding technique. The GSM of the fabric before and after padding (without drying) is 150 and 300.

(A) 150%

(B) 75%

(C) 100% ✓

(D) 125%

160. Silk-like brilliance to cotton fabrics can be obtained using.

(A) Swizzing Calendering

(B) Schreiner Calendering ✓

(C) Friction Calendering

(D) Chasing Calendering

161. The modifications taking place during treatment of cotton fabric with nonionic softners are

(A) Hard, Smooth but yellowing

(B) Soft, Smooth but yellowing

(C) Soft, Smooth and non yellowing ✓

(D) Hard, Smooth and non yellowing

162. ——————— type of dyeing machine, the material is stationery but the liquor is moveable.

   (A)   Jigger dyeing   (B)   Package dyeing

   (C)   Soft flow dyeing   (D)   Winch dyeing

163. The critical temperature range which requires control to obtain levelling property in dyeing of polyester with disperse dyes using HTHP method is

   (A) $80 - 180°C$ (B) $90 - 120°C$

   (C) $130 - 160°C$ (D) $60 - 90°C$

164. Why ice temperature is to be maintained during diazotisation reaction?

   (A)   to modify the structure of diazotised salt

   (B)   to suppress the diazotization reaction

   (C)   to prevent the decomposition of diazotised salt

   (D)   to enhance the decomposition of diazotised salt

165. The role of alkali in fixation of reactive dye molecules with cellulose is

   (A)   to minimise the formation of hydrolysation

   (B)   to neutralise the liberated acid

   (C)   to enhance the hydrolysis reaction

   (D)   to improve the solubility of dye

166. Which one of the following class of reactive dyes is reacting with cellulose fibres by means of additive method?

   (A)   Monochlorotriazine dye   (B)   Dichlorotriazine dye

   (C)   Hot brand dyes   (D)   Vinyl sulphone dye

167. The optimum concentration of sodium hydroxide solution preferred for mercerization of cotton fabric is

   (A) $18° - 22°$ Tw   (B) $72° - 76°$ Tw

   (C) $52° - 54°$ Tw   (D) $8° - 10°$ Tw

168. Which one of the pH range is preferred for bleaching of cotton with sodium hypochlorite solution?

   (A) $10 - 11$ (B) $6 - 8$

   (C) $3 - 4$ (D) $12 - 13$

169. Flat patter making is not based on the following pattern making principle?

    (A) Balancing ✓   (B) Dart manipulation

    (C) Added fullness   (D) Contouring

170. In warp knitting, ———————— is a shog, across one needle hook and forms the head of a needle loop.

    (A) Closed lap   (B) Open lap

    (C) Over lap ✓   (D) Under lap

171. ———————— is the only structure having wales containing both face and back loops.

    (A) Plain   (B) Rib

    (C) Interlock   (D) Purl ✓

172. The 2 × 2 rib version of half-cardigan is termed as

    (A) Royal rib   (B) Polka rib

    (C) Fisherman's rib ✓   (D) Sweater stitch

173. ———————— loops reduce fabric length and length-wise elasticity.

    (A) Knit   (B) Tuck ✓

    (C) Float   (D) Cable

174. ———————— stitch fabrics are narrower than equivalent all – knit fabrics.

    (A) miss ✓   (B) tuck

    (C) cable   (D) closed

175. In ————————, guide bar laps progressively in the same direction for a minimum of two consecutive courses

    (A) pillar stitches   (B) tricot lapping

    (C) atlas lapping ✓   (D) miss lapping

176. ———————— is the most widely used needle in weft knitting and is sometimes termed as ———————— needle.

    (A) Latch needle and automatic ✓   (B) Latch needle and High speed

    (C) Compound needle and automatic   (D) Compound needle and highspeed

177. Oxidised acrylic fibres which has a LOI OF 0.55 is one type of high combustion resistant organic fibres choose the correct answer from the below.

   (A) Acetate
   (B) Modacrylic
   (C) PEK
   (D) PAN–OX ✓

178. In tyre-cord applications, the yarn materials used to built into internal structure of tyres for adverse conditions is ——————.

   (A) Nylon 6 and polyester
   (B) Nylon 6,6 and polyester
   (C) Low tenacity viscose and polyester
   (D) High tenacity viscose and polyester ✓

179. Usually ——————— fabric is used for rotary filters and filter presses where abrasion is critical

   (A) rayon woven
   (B) needle punched nylon
   (C) poly propylene woven ✓
   (D) needle punched polyester

180. Most widely used weave designs in liquid filtration

   (i) plain
   (ii) twill
   (iii) satin
   (A) (i) and (ii) only
   (B) (ii) and (iii) only
   (C) (i) and (iii) only ✓
   (D) (ii) only

181. ——————— fibres are suitable for hot gas filtration around 1000°C

   (A) Polyester
   (B) Acrylic
   (C) Nylon
   (D) Ceramic ✓

182. ——————— is the most widely used fibre in gas filtration

   (A) viscose
   (B) ceramic
   (C) carbon
   (D) polyester ✓

183. Mostly ——————— fabrics are used in liquid filtration

   (A) Spun bonded
   (B) Spun laid
   (C) Stitch bonded
   (D) Needle punched ✓

184. Structure element in felt looping is —————

    (A)   Loose fibers   (B)   Plugs

    ✓(C)   Loops   (D)   Balls

185. The type of non woven fabric finishing that comprises of coloration, printing and scouring processes is

    (A)   Chemical finish   (B)   Mechanical finish

    (C)   Surface finish   ✓(D)   Wet finish

186. In calendar bonding system, the heat conductivity of polyamide is ————— W/m-K for uniform nonwoven web formation.

    (A)   0.48   (B)   0.36

    ✓(C)   0.22   (D)   0.04

187. Characteristics of web formation stage of manufacture of spun laid nonwovens is

    (A)   mechanical and thermal   (B)   physico-chemical and aerodynamic

    ✓(C)   aerodynamic and electrostatic   (D)   hydrodynamic and thermal

188. In spun bonding, through put per nozzle (m) is determined by

$[d_A$ – nozzle diameter, mm

V_A – emerging velocity, m/min

ρ_p – polymer density, g/cm³]

    (A) $m = \dfrac{d_A^2 \cdot \pi \cdot V_A^2 \cdot \rho_p}{4}$

    (B) $m = \dfrac{d_A \cdot \pi \cdot V_A^2 \cdot \rho_p}{4}$

    (C) $m = \dfrac{d_A \cdot \pi \cdot V_A \cdot \rho_p^2}{4}$

    ✓(D) $m = \dfrac{d_A^2 \cdot \pi \cdot V_A \cdot \rho_p}{4}$

189. Find the correct statements with respect to Sexual Harassment of women at workplace Act 2013.

    (I)   Every employer should constitute a Internal Complaints Committee at workplace.

    (II) The presiding officer who shall be a woman of senior level at workplace amongst the employees.

    (III) Two or more members' from the employees.

    (IV) Two members from a NGO or Associations committed to the cause of women.

    (A)   (I), (II)

    (B)   (I), (II), (III) ✓

    (C)   (III), (IV)

    (D)   (II), (III), (IV)

190. The employees' provident funds and miscellaneous provisions Act was enacted in the year

    (A)   1961

    (B)   1954

    (C)   1956

    (D)   1952 ✓

191. The type of marketing strategy used in marketing segmentation that has the strategy of "one product, one marketing mix and one segment".

    (A)   Concentrated marketing ✓

    (B)   Differentiated marketing

    (C)   Undifferentiated marketing

    (D)   Particularised marketing

192. According to Philip Kotler and William H. Hamby, the organisation task is to determine the needs and wants of target markets with a philosophy "Beware the 'Market' Thinkers" remarkably given by ————————— concept of marketing management.

    (A)   Selling

    (B)   Societal Marketing ✓

    (C)   Selling and Marketing

    (D)   Production

193. If the total of production cost is Rs. 40,000/- and 20% of sale price is the profit to be added to cost, what is the profit?

(A) Rs. 6,000

(B) Rs. 8,000

✓(C) Rs. 10,000

(D) Rs. 12,000

194. Which of the following is a best example of a variable cost?

(A) Interest on Capital

(B) Depreciation on Machinery

✓(C) Cost of Materials

(D) Rent and taxes

195. The statement of an organisation which presents the financial position at the end of fiscal period is ——————.

✓(A) Balance sheet statement

(B) Cash flow statement

(C) Income statement

(D) Retained earnings statement

196. Calculate Basic time for an operator working on an operation using single needle lock stich machine with observed single cycle time of 0.85 and Rating factor of 0.70.

(A) 1.550

(B) 1.214

✓(C) 0.595

(D) 0.150

197. "There will be no progress if you keep on doing things exactly the same way all the time". One of the following concepts based on the above cited belief.

   (A) ✓ Kaizen

   (B) 5S

   (C) TQM (Total Quality Management)

   (D) Six Sigma

198. One of the following is incorrect on the principles of Total Quality Management.

   (A) Delight The Customer

   (B) Continuous Improvement

   (C) People Based Management

   (D) ✓ Management by theory and forecasting

199. Through Kaizen, high performance levels at —————— investments will be possible either in the workplace or at home.

   (A) High

   (B) ✓ Low

   (C) Meagre

   (D) Nil

200. The term 'Seiri' coined in the 5 S system is a Japanese word that describes the action to be followed in an organisation.

   (A) Shine

   (B) ✓ Sort

   (C) Standardize

   (D) Sustain

$\triangle$