DO NOT OPEN THE SEAL UNTIL INSTRUCTED TO DO SO

Question Booklet No.

QUESTION BOOKLET

TEXTILE TECHNOLOGY

Booklet Series

A

Roll No. | | | | | |

(Enter your Roll number in the above space)

Time Allowed : 2 Hours **Maximum Marks : 100**

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4. You have to mark all your responses **ONLY** on the separate OMR Answer Sheet provided. See Instructions at the backside of the OMR Answer Sheet.
5. **All** questions carry equal marks.
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8. Sheets for rough work are appended in the Question Booklet at the end.
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   THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE AS UNDER.

   (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **0.25 mark** assigned to that question will be deducted as penalty.

   (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to that question.

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1. A good fibre forming polymer should ***not*** have

[A] linear polymeric chain

[B] branched polymeric chain

[C] high DP

[D] high inter-molecular interaction

2. The DP of viscose fibre is approximately

[A] 25000

[B] 2500

[C] 250

[D] 25

3. For production of dry-spun acrylic fibre, the suitable solvent for dope preparation is

[A] acetone

[B] N,N-Dimethyl formamide

[C] formic acid

[D] aqueous sodium thiocyanate (55 wt %)

4. In melt spinning line, the melting of solid polymer and its homo-genization takes place in

[A] manifold

[B] extruder

[C] metering pump

[D] quench duct

5. Which of the following stereo structures of polypropylene is/are used for commercial fibre manufacture?

[A] Atactic

[B] Syndiotactic

[C] Isotactic and Syndiotactic

[D] Isotactic

6. In which of the following polymerization methods, the rate of reaction is very high and leads to uncontrolled polymerization?

[A] Solution polymerization

[B] Suspension polymerization

[C] Bulk polymerization

[D] Emulsion polymerization

7. What happens during crystallization of polyester?

[A] Heat is evolved

[B] Heat is absorbed

[C] No exchange of heat takes place

[D] Small molecule such as water is eliminated

8. Which of the following is/are bast fibre(s)?

P. Cotton

Q. Flax

R. Silk

S. Jute

[A] P only

[B] Q and R only

[C] Q and S only

[D] S only

9. Drawing of synthetic filament ***does not*** lead to an increase in

[A] crystallinity

[B] tenacity

[C] tensile modulus

[D] elongation at break

10. The correct combination of techniques to determine the crystallinity in fibres is

[A] TGA and DSC

[B] Birefringence and DSC

[C] X-ray diffraction and density measurement

[D] Birefringence and X-ray diffraction

11. Viscose rayon is soluble in

[A] acetone

[B] chloroform

[C] formic acid 85% (v/v)

[D] sulphuric acid 59% (v/v)

12. In melt spinning of poly (ethylene terephthalate), pre-drying of polymer chips is essential to avoid

[A] hydrolytic degradation

[B] oxidative degradation

[C] microbial degradation

[D] photo-induced degradation

13. In a cotton card, the wire point density on

[A] cylinder is lesser than that on flat

[B] doffer is greater than that on cylinder

[C] cylinder is greater than that on flat

[D] flat is greater than that on doffer

14. Fibre parallelization in drawn sliver improves with

[A] increase in draft

[B] increase in doubling

[C] decrease in roller setting

[D] increase in roller pressure

15. In a cotton comber, noil extraction increases

[A] with a decrease in detachment setting

[B] with an increase in pre-combing draft

[C] if majority of hooks are presented in leading direction

[D] with an increase in short fibres

16. The bottom roller surface used for driving aprons in ring frame drafting system is

[A] knurled

[B] axially fluted

[C] spirally fluted

[D] smooth

17. Which of the following is the correct sequence of events that happen in a roller drafting zone?

[A] Fibre elongation — fibre decrimping — fibre sliding

[B] Fibre sliding — fibre elongation — fibre decrimping

[C] Fibre decrimping — fibre sliding — fibre elongation

[D] Fibre decrimping — fibre elongation — fibre sliding

18. In which region of ring spinning, Coriolis force acts?

[A] Lappet to ring cop

[B] Delivery pair of drafting rollers to lappet

[C] Back pair of drafting rollers to delivery pair of drafting rollers

[D] Feed bobbin to back pair of drafting rollers

19. In cotton combing process, the counter-feed system gives

[A] low removal of noil and low elimination of impurities

[B] low removal of noil and high elimination of impurities

[C] high removal of noil and low elimination of impurities

[D] high removal of noil and high elimination of impurities

20. The tenacity of

P. carded sliver

Q. first drawn sliver

R. second drawn sliver

S. combed sliver

Choose the ***correct*** order.

[A] P > Q > R > S

[B] S > R > Q > P

[C] R > S > P > Q

[D] Q > R > S > P

21. An eccentric top roller in a drafting system leads to

[A] change in draft with oscillation of nip line

[B] change in draft without oscillation of nip line

[C] neither change in draft nor oscillation of nip line

[D] oscillation of nip line only

22. The increase in traveller weight leads to an increase in

[A] yarn twist

[B] traveller lag

[C] balloon diameter

[D] yarn tension

23. An opening roller in blowroom with 100 cm length, 38 cm diameter and 2 teeth per cm^2 is rotating at an angular velocity of 400 r.p.m. to deliver fibre tufts at a production rate of 500 kg/h. The intensity of opening (fibre mass in mg per tooth) of the opening roller approximately is

[A] 0·44

[B] 0·87

[C] 1·74

[D] 2·74

24. Six carded slivers of 4 ktex are drawn to produce a sliver of 5 tex. The draft required (rounded off to 1 decimal place) is

[A] 4·2

[B] 4·4

[C] 4·6

[D] 4·8

25. Two roving, each with mass CV of 10%, are fed to a ring spinning machine that adds a mass CV of 20%. The mass CV (in %) of the yarn is

[A] 17·6

[B] 21·2

[C] 30

[D] 35

26. The spinning system in which one revolution of twisting element imparts several turns to the fibre strand is

[A] ring

[B] rotor

[C] friction

[D] wrap

27. Double acting dobby is driven from

[A] bottom shaft

[B] crankshaft

[C] tappet shaft

[D] rocking shaft

28. In air-jet loom,

[A] all the relay nozzles start jetting at the same time

[B] each relay nozzle has separate jetting time

[C] relay nozzles of a group start jetting at the same time

[D] main and relay nozzles have same jetting time

29. Patterning is most likely to occur in

[A] precision winding

[B] random winding

[C] step-precision winding

[D] pirn winding

30. In cotton yarn sizing, the starch primarily acts as

[A] binding agent

[B] lubricating agent

[C] antistatic agent

[D] antimicrobial agent

31. Which of the following shedding mechanisms provides control of individual warp thread during weaving?

[A] Crank

[B] Tappet

[C] Dobby

[D] Jacquard

32. The time required (in minutes) to wind 10 kg of 40 tex yarn when the winding machine works at 1000 m/min with an efficiency of 90% is

[A] 50

[B] 77·74

[C] 90

[D] 277·78

33. In terms of weft insertion rate, which of the following is ***correct***?

[A] Air-jet > Water jet > Multiphase > Projectile

[B] Multiphase > Air-jet > Water jet > Projectile

[C] Projectile > Water jet > Air-jet > Multiphase

[D] Water jet > Projectile > Multiphase > Air-jet

34. A tuck stitch in knitting makes the fabric

[A] narrower

[B] thinner

[C] more rigid in course direction

[D] wider and porous

35. In the context of thermal bonding of non-woven web, the statement which is ***not*** true is

[A] a thermoplastic component has to be present in the web

[B] heat is applied until the thermoplastic component melts

[C] the polymer flows by surface tension and capillary action to fibre cross-over points

[D] chemical reaction takes place

36. The movements of guide bars in warp knitting are

[A] swinging and shaking

[B] shaking and shogging

[C] shogging and twisting

[D] swinging and shogging

37. In air-jet weaving, choose the correct combination of parameters, on which drag force on weft yarn depends.

P. Weave pattern

Q. Density of air

R. Weft yarn diameter

S. Picks per cm

[A] P and Q

[B] Q and R

[C] R and S

[D] P and S

38. At front centre (0°) and at back centre (180°) of shuttle loom, the sley velocities are

[A] the same but accelerations are different

[B] different but accelerations are the same

[C] the same and also accelerations are the same

[D] different and also accelerations are different

39. In a drum-driven winder, the grooved drum having a width of 20 cm is rotating at 1000 r.p.m. If the drum makes 5 revolutions per double traverse, the traverse speed (in m/min) is

[A] 70

[B] 75

[C] 80

[D] 85

40. Sodium chlorite bleaching of cotton is carried out in the temperature range of

[A] 95–110 °C

[B] 80–85 °C

[C] 50–60 °C

[D] 30–40 °C

41. K/S ratio is related to reflectance (R) as

[A] $K/S = (1 - R^2)/2R$

[B] $K/S = (1 + R^2)/2R$

[C] $K/S = (1 - R)/2R$

[D] $K/S = (1 - R)^2/2R$

42. In the context of effluent discharge, BOD means

[A] bio-oxidative degradation

[B] bio-oxygen distress

[C] biological oxygen demand

[D] bacteria observed on disc

43. Dyed wool fabric standards are used for the evaluation of

[A] wash fastness

[B] perspiration fastness

[C] sublimation fastness

[D] light fastness

44. Sodium persulphate is used in

[A] bleaching

[B] scouring

[C] mercerization

[D] desizing

45. A dye with dischargeability rating of 1 (one) will ***not*** be suitable for

[A] resist printing

[B] direct printing

[C] discharge printing

[D] melt transfer printing

46. White specks observed in dyed cotton fabric are attributed to

[A] poor wash fastness to dyes

[B] non-uniform agitation of bath

[C] low temperature of dyeing

[D] presence of immature cotton fibre

47. Number of moles, required in 200 cm^3 to make 0·5 mol L^{-1} sodium hydroxide solution, is

[A] 0·011–0·02

[B] 0·03–0·06

[C] 0·09–0·11

[D] None of the above

48. Bleached cotton fabric was sent to a laboratory for determination of Cooper Number, which is an estimate of the presence of

[A] hydroxyl groups

[B] carboxyl groups

[C] reducing groups

[D] oxidizing group

49. A typical curve between equilibrium dye uptake and dyeing temperature goes through a maximum. After the maximum, the dye uptake decreases because

[A] kinetic energy increases rapidly

[B] pressure in the dye bath increases

[C] saturation value is reached

[D] dyeing is an exothermic process

50. A wool fabric is to be dyed with an acid dye to a shade of 4% on the weight of the fabric (owf). The material to liquor ratio is 1 : 40 and the exhaustion is 100%. The concentration (gpl) of the dye in initial dye bath is

[A] 0·8

[B] 1·0

[C] 1·2

[D] 1·4

51. Bio-polishing of cotton fabrics is done using

[A] cellulose

[B] amylase

[C] proteinase

[D] esterase

52. A padding mangle is processing a fabric at 1320 m/h. The bottom bowl of the mangle is rotating at 25 r.p.m. Assuming zero slippage at the nip, the diameter (in cm) of this bowl is

[A] 24

[B] 26

[C] 28

[D] 30

53. A 25 tex cotton yarn has a twist factor of 30. The yarn twist, in turns per cm, is

[A] 4

[B] 5

[C] 6

[D] 7

54. With an increase in gauge length, the tenacity of a spun yarn would

[A] increase

[B] decrease

[C] remain the same

[D] first increase and then decrease

55. The property that Kawabata Evaluation System (KES) ***does not*** measure is

[A] shear rigidity

[B] bending rigidity

[C] compressional resilience

[D] tensile strength

56. On absorption of moisture, the thermal insulation of cotton fabric will

[A] decrease

[B] increase

[C] remain the same

[D] first increase and then decrease

57. In a three-sigma control chart, the probability that a point falls outside the control limits, when a process is under control, is

[A] 0·02

[B] 0·0027

[C] 0·01

[D] 0·05

58. Theoretical limit for mass irregularity (CV_{lim}) of cotton yarn ***does not*** depend on

[A] mean fibre length

[B] mean fibre fineness

[C] mean yarn count

[D] coefficient of variation of fibre fineness

59. On a mass-based evenness tester, thin place in a yarn at –40 % setting is counted if mass per unit length is

[A] 40 % of the mean mass per unit length

[B] 60 % of the mean mass per unit length

[C] 40 % of the mean mass per unit length or less

[D] 60 % of the mean mass per unit length or less

60. Bursting strength of a woven fabric with the same warp and weft yarns is the highest when the ratio of ends/cm and picks/cm is

[A] 1·1

[B] 1·0

[C] 0·9

[D] 0·8

61. The 2·5 % span length and uniformity ratio of a particular variety of cotton fibre are 30 mm and 45 % respectively. The 50 % span length (in mm) of the fibre is

[A] 12·5

[B] 13·5

[C] 14·5

[D] 15·5

62. If the moisture content of fibre is 10 %, its moisture regain (in %) is

[A] 11·11

[B] 12·12

[C] 13·13

[D] 9·09

63. Under the load of 500 cN, the extension of yarn of 300 mm length is 10%. If the elastic recovery is 90%, then the length (in mm) of the yarn after removal of load is

[A] 303

[B] 306

[C] 309

[D] 310

64. Dry jet wet spinning is used to manufacture

[A] HPPE

[B] polyester

[C] Kevlar

[D] carbon

65. With increase in spinning speed,

[A] the voids in fiber increases

[B] orientation in fiber increases

[C] crystallinity in fiber increases

[D] Both [B] and [C]

66. Acrylic is generally polymerized through

[A] bulk polymerization

[B] solution polymerization

[C] gas phase polymerization

[D] condensation polymerization

67. At room temperature, methylene chloride will dissolve

[A] polyester

[B] viscose rayon

[C] acrylic

[D] triacetate

68. Maximum draft takes place in the carding machine at

[A] cylinder vs doffer zone

[B] licker-in vs cylinder zone

[C] feed roller vs licker-in zone

[D] doffer vs calendar roller zone

69. Traveller number in ISO standards indicates

[A] 1000 travellers in-lbs

[B] 1000 travellers in-gms

[C] 10000 travellers in-lbs

[D] 10000 travellers in-gms

70. Opening roller speed in the rotor spinning machine is

[A] 1000 to 3000 r.p.m.

[B] 6000 to 10000 r.p.m.

[C] 16000 to 20000 r.p.m.

[D] 35000 to 160000 r.p.m.

71. The differential gearing box in the roving frame is used to vary the

[A] twist of roving

[B] speed of spindle

[C] speed of bobbin

[D] speed of flyer

72. The term 'seed yarn' is associated with the

[A] ring spinning

[B] cotton spinning

[C] rotor spinning

[D] worsted spinning

73. TPI of ring spinning is ***not*** affected by

[A] speed of spindle

[B] speed of drafting rollers

[C] motor speed

[D] twist change pinion

74. The self-twist spinning produces

[A] S twist in the yarn

[B] Z twist in the yarn

[C] S and Z twists in the yarn

[D] twistless yarn

75. In roller drafting systems, the diameters of top rollers are

[A] 25 to 40 mm

[B] 10 to 25 mm

[C] 40 to 50 mm

[D] more than 50 mm

76. The building motion in the roving frame is ***not*** associated with

[A] shifting of cone drum belt to reduce the bobbin speed

[B] reversing of bobbin rail

[C] shifting of cone drum belt to reduce the flyer speed

[D] shortening the lift of the bobbin rail

77. 20000 r.p.m. refers to the maximum practical speed of

[A] rotor in rotor spinning

[B] spindle in ring spinning

[C] air in air-jet spinning

[D] drum in friction spinning

78. Nep count in a cotton fibre sample is measured by

[A] AFIS

[B] HVI

[C] Uster tester

[D] Stelometer

79. A yarn with n fibres in its cross-section will have limiting CV (in %) as

[A] $\sqrt{n}$

[B] $100\sqrt{n}$

[C] $100/n$

[D] $100/\sqrt{n}$

80. The area under stress-strain curve of a fibre represents its

[A] toughness

[B] ductility

[C] tenacity

[D] elongation

81. If A is the area of cell wall of cotton fibre and p is its parameter, the degree of cell wall thickness is given by

[A] A/p

[B] p/A

[C] $4\pi A/p$

[D] $4\pi A/p^2$

82. Fabric can be made to the widest possible width by

[A] air-jet loom

[B] water jet loom

[C] projectile loom

[D] shuttle loom

83. The shore hardness of the top squeezing roller in the sizing machine is around

[A] 28°

[B] 32°

[C] 45°

[D] 65°

84. A 3·5 crossing drum means, there are

[A] 3·5 turns in a double traverse

[B] 7 turns in a double traverse

[C] 7 turns in a single traverse

[D] 3·5 turns in a single traverse

85. Wilt-on and Brussels are the examples of

[A] carpet fabric

[B] narrow fabric

[C] tubular fabric

[D] 3-D fabric

86. The filling yarn density at selvage is doubled in case of

[A] leno selvage

[B] tucked-in selvage

[C] fused selvage

[D] fringe selvage

87. A shuttle loom is running at 240 picks per minute. The angular velocity of the bottom shaft in radian per second is $n\pi$. The value of n is

[A] 4

[B] 6

[C] 8

[D] 2

88. A very even fabric of 50 g/m^2, produced at the rate of 1000 m^2/h, can be produced by

[A] weaving process

[B] knitting process

[C] needle punching process

[D] spun bonding process

89. The power required for picking in a shuttle loom depends on

[A] weave of the fabric

[B] number of heald shafts

[C] reed width

[D] number of picking cams

90. Pigment printing is suitable for

[A] cotton

[B] wool

[C] polyester

[D] All of the above

91. In which printing method, printing paste is transferred via engraving?

[A] Block

[B] Screen

[C] Roller

[D] Rotary

92. Sodium chlorite bleaching of polyester is carried out at which pH value?

[A] 4

[B] 7

[C] 8

[D] 9

93. The reduction clearing of polyester is carried out in industry by

[A] sodium hydrosulphide and sodium hydroxide

[B] sodium hydrosulphide and sulphuric acid

[C] sodium chloride and sodium hydroxide

[D] soap and sodium hydroxide

94. Which of the following ***does not*** fall under the anti-creasing finishing agent?

[A] Dimethylol urea

[B] Butanetetracarboxylic acid

[C] Citric acid

[D] Phosphoric acid

95. Singeing of polyester is carried out

[A] before desizing

[B] after desizing

[C] after bleaching

[D] after dyeing

96. The barium activity number of effectively mercerized cotton fabric should lie in the range of

[A] 120–130

[B] 115–120

[C] 130–140

[D] 150–160

97. Attachment of direct dye with cotton occurs through

[A] ionic bonding

[B] covalent bonding

[C] co-ordination attachment

[D] H-bonding and van der Waals attachment

98. Reactive dyes possessing general chemical formula $D—SO_2—CH=CH_2$ are known as

[A] monochlorotriazine dyes

[B] dichlorotriazine dyes

[C] bifunctional reactive dyes

[D] vinylsulphone dyes

99. Binders are invariably used in

[A] discharge printing

[B] transfer printing

[C] pigment printing

[D] resist printing

100. In kier boiling of cotton, concentration of NaOH at the start should be

[A] 2 g/l

[B] 5 g/l

[C] 10 g/l

[D] 20 g/l

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