Sl. No. : 50001553

TXE08

Register Number

2014

TEXTILE ENGINEERING
(Degree Standard)

Time Allowed : 3 Hours] **[Maximum Marks : 300**

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

IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains **200** questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there 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.
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. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen 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, your Answer Sheet will not be evaluated.
6. 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.
7. In the Answer Sheet there are **four** circles Ⓐ, Ⓑ, Ⓒ and Ⓓ against each question. To answer the questions you are to mark with 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 :

Ⓐ ● Ⓒ Ⓓ

8. 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 examination. 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.
9. The sheet before the last page of the Question Booklet can be used for Rough Work.
10. 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.
11. Do not tick-mark or mark the answers in the Question booklet.

SEAL

1. The chemical which is used in the xanthation process of viscose fibre manufacturing is

(A) sodium hydroxide
(B) sodium chloride
(C) an ionic surfactant
(D) carbon di sulfide

2. When the natural cellulose is converted to viscose, the molecular weight is reduced to less than ———— of the natural value.

(A) one-fourth
(B) one-sixth
(C) one-tenth
(D) half

3. Which one of the following is a glassy amorphous polymer?

(A) Polyester
(B) Polypropylene
(C) Polyethylene
(D) Polymethyl metha acrylate

4. The molecular wt. of hydrogen bonded polyamides which is/are used in apparel is

(A) 18,000 g mol^{-1}
(B) 24,000 g mol^{-1}
(C) 50,000 g mol^{-1}
(D) 75,000 g mol^{-1}

5. The thermal transitions of fibres can be mapped with the help of

(A) Thermometer
(B) Stelometer
(C) Hot air oven
(D) Dilatometer

6. At the melting point of fibres, an equilibrium exists between

(A) the liquid and semi solid phases
(B) the liquid and crystal phases
(C) the semi solid and crystal phases
(D) the liquid and vapour phases

7. Among the following manmade fibre production system, which one has fast production rate?

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

8. Which one of the following comes under the category of non-destructive testing of composites?

(A) Inter laminar shear strength test (B) Tensile test

(C) Thermography test (D) Flexural test

9. Identify the incorrect statement regarding pultrusion process :

(A) It is a continuous molding process

(B) It can achieve only low fiber content in composite

(C) Fibre wet-out is one of the critical parameter controlling mechanical performance of pultruded products

(D) It can also be used for thermoplastic polymers

10. The correct relation for fibre volume fraction in composites is ————————

where W_f = fibre weight fraction, W_m = matrix weight fraction

e_f = Fiber density e_m = matrix density

(A) $V_f = \dfrac{\dfrac{W_f}{e_f}}{\left(\dfrac{W_f}{e_f}\right)+\left(\dfrac{W_m}{e_m}\right)}$ (B) $V_f = \dfrac{\dfrac{e_f}{W_f}}{\left(\dfrac{e_f}{W_f}\right)+\left(\dfrac{e_m}{W_m}\right)}$

(C) $V_f = \dfrac{W_f}{W_f + W_m}$ (D) $V_f = \dfrac{e_f}{e_f + e_m}$

11. While processing cotton in blow room the neps/unit weight of cotton ————————. Such change has to be maintained ———————— for optimum performance of blow room.

(A) decreases, above 60% (B) decreases, above 80%

(C) increases, below 70% (D) increases, below 150%

12. In the autoleveller draw frame, if the hank (Ne) of feed slivers increase, the autolevelling is carried out as follows :

(A) The main zone draft is increased and break draft is maintained same

(B) The main zone draft is reduced and break draft is maintained same

(C) Both break draft and main zone draft are reduced

(D) Both break draft and main zone draft are increased

13. The overall cleaning efficiency of blow room line having three machines with individual cleaning efficiency of M each is

(A) $3M \times 100$ (B) $M^3 \times 100$

(C) $[1-(1-M)^3] \times 100$ (D) $(1-M)^3 \times 100$

14. Detachment setting in the comber, normally lies in the range of

(A) 5-15 mm (B) 15-25 mm (C) 25-35 mm (D) 35-45 mm

15. The extension with time under an applied load is defined as

(A) Breaking extension (B) Creep

(C) Work of rupture (D) Elastic recovery

16. Neps present in the cotton

(A) Decreases during blow room and carding operation

(B) Increases during blow room and carding operation

(C) Decreases during blow room and increases during carding operation

(D) Increases during blow room and decreases during carding operation

17. In the blow room line, which one of the following machine is intensive in opening/cleaning?

(A) Mono cylinder (B) Axiflow cleaner

(C) ERM cleaner (D) Unifloc

18. Grinding of metallic wire of card causes

(A) increase in land area at the teeth point and expose of harder metal layer

(B) increase in land area at the teeth point and expose of softer metal layer

(C) decrease in land area at the teeth point and expose of harder metal layer

(D) decrease in land area at the teeth point and expose of softer metal layer

19. The centrifugal force (N) acting on a mass of M (kg) present at the tip of beater of radius R (m) rotating at n rpm is ————————. Assume the radius of the mass is r (m).

(A) $M.R.\left(\frac{2\pi n}{60}\right)^2$ (B) $M.r.\left(\frac{2\pi n}{60}\right)^2$

(C) $M.r.\left(\frac{2\pi R n}{60}\right)^2$ (D) $M.R.\left(\frac{2\pi r n}{60}\right)^2$

20. When the angle of fibre inclination with respect to yarn axis increases, the component of fibre strength in the direction of the yarn axis

(A) initially increases then decreases (B) initially decreases then increases

(C) increases (D) decreases

21. Under normal circumstances, the majority of floating fibres can take on the speed

(A) of the front pair of rollers

(B) of the back pair of rollers

(C) between the front and back pair of rollers

(D) higher than the speed of the front pair of rollers

22. The type of traveller which is best suitable for antiwedge ring is
(A) 'c' type traveller
(B) elliptical traveller
(C) flat traveller
(D) 'n' traveller

23. In ring spinning, the excessive spinde speed leads to
(A) reduction of end breakage rate
(B) reduction of twist variation
(C) increase of yarn hairiness
(D) reduction of yarn hairiness

24. Which one of the following increases the amount of fly waste in ring spinning section?
(A) Finer roving
(B) Higher spindle speed
(C) Higher roving twist
(D) Higher relative humidity

25. A high degree of migration of fibres from core to outer layers in the yarn
(A) increases hairiness
(B) increases neps level
(C) increases yarn strength
(D) decreases elongation

26. Which one of the following is not a type of ring used in ring frame?
(i) Low crown
(ii) Antiwedge
(iii) Elliptical
(iv) SU
(A) (i)
(B) (ii)
(C) (iii)
(D) (iv)

27. The production rate of ring spinning is
(A) higher than rotor spinning
(B) higher than friction spinning
(C) higher than air jet spinning
(D) lower than rotor spinning

28. In friction spinning, the fineness of yarn is determined by
(A) the mass of fibre feed per unit time alone
(B) the withdrawal speed of yarn alone
(C) the ratio of (A) and (B)
(D) ratio between yarn revolution and withdrawal speed

29. In which of the following yarn formation system, two opening assemblies are available?
(A) Rotor spinning
(B) Dref – I
(C) Dref – II
(D) Dref – III

30. Which of the following property is better for ring yarn compared to rotor yarn?

(A) Breaking strength
(B) CV% of the strength
(C) Imperfections
(D) Resistance to abrasion

31. The strength of yarns produced by different spinning in decreasing order is

(A) Ring yarn, Rotor yarn, Friction spun yarn
(B) Friction spun yarn, Rotor yarn, Ring yarn
(C) Friction spun yarn, Ring yarn, Rotor yarn
(D) Rotor yarn, Friction spun yarn, Ring yarn

32. Back doubling of fibres is higher in ———————— spinning system.

(A) ring
(B) rotor
(C) friction
(D) compact

33. Which one of the following yarn has higher specific volume?

(A) Conventional ring spun yarn
(B) Condensed ring spun yarn
(C) Rotor yarn
(D) Friction spun yarn

34. Select the correct statement with regard to twist inserting drum of DREF 2 spinning system.

(A) Both the drums are perforated and rotate in the same direction
(B) Both the drums are perforated and rotate in opposite direction
(C) One of the drum is perforated and other is without perforation; they rotate in same direction
(D) One of the drum is perforated and other is without perforation; they rotate in opposite direction

35. Pick the odd one out in the following process operations.

(A) Leasing
(B) Knotting
(C) Drawing
(D) Twisting

36. Find the odd one in the following sizing material.

(A) Sago
(B) Maize
(C) PVA
(D) Corn starch

37. On a shuttleless loom weaving a cloth having a reed width of 225 cm and 265 picks inserted per minute. Find out the rate of weft insertion in metres per minute if the over-all running efficiency of the loom is 90%.

(A) 493 m/min (B) 537 m/min (C) 586 m/min (D) 608 m/min

38. The clearer efficiency of the mechanical yarn clearer is

(A) 35% (B) 55% (C) 75% (D) 95%

39. In precision winding machine

(i) The package makes a fixed number of revolutions.

(ii) The velocity of the traverse guide is constant.

(iii) The surface velocity of the package increases as winding proceeds.

(iv) The angle of wind increases as winding continues.

(A) (i), (iii) and (iv) are correct (B) (iv) only correct

(C) (i), (ii), (iv) are correct (D) (i), (ii), (iii) are correct

40. The full diameter of a pirn wound from cotton yarn is 32 mm, and the bare-pirn diameter at the nose of the chase is 14 mm. Find out the chase angle when the traverse is 34 mm.

(A) $\sin^{-1}(0.2646)$ (B) $\tan^{-1}(0.2646)$ (C) $\sin^{-1}(0.5292)$ (D) $\tan^{-1}(0.5292)$

41. In case of profile reed used in shuttleless weaving, the distance between the fell of the cloth and temple

(A) should not be set very close

(B) should not be set very wide

(C) need not be specially adjusted

(D) setting should be adjusted as per warp count α ends per inch

42. In tappet shedding for a twill weave repeating on 4 ends and 4 picks the loom requires

(A) 4 tappets (B) 8 tappets (C) 2 tappets (D) 6 tappets

43. The fibre with negative birefrigence value is

(A) Polyester (B) Polyethylene

(C) Nylon 6 (D) Acrylic

44. Which of the following weave is constructed by extending the plain weave both vertically and horizontally, so that in both direction there are two or more threads working together in the same order?

(A) Basket weave (B) Twill weave

(C) Herring bone weave (D) Sateen weave

45. The production/hour of a shuttless loom (sulzer) is 15 yards. Calculate the length of warp that would be required 1 hour, if the waste and take-up warp in weaving is 8%

(A) 15.6 yards (B) 16.2 yards (C) 16.8 yards (D) 17.0 yards

46. If a pirn of 25 ton yarn contains 20 grams of weft, find the length of weft per pirn

(A) 700 meter (B) 750 meter (C) 800 meter (D) 850 meter

47. Warp rib, weft rib and the basket weave are the derivatives of

(A) Plain weave (B) Twill weave
(C) Sateen weave (D) Jacquard

48. The term 'stitch density' in double Jersey knitted fabric is defined on

(A) Number of course per unit area (B) Number of wales per unit area
(C) Total number of loops per inch (D) Total number of loops per unit area

49. Which of the following yarn property could improve the yarn knittability?

(A) High work of rupture with low flexural value
(B) Low work of rupture with high flexural value
(C) High work of rupture with high flexural value
(D) Low work of rupture with low flexural value

50. Which of the following needle is used in finer gauge knitting machine?

(A) Friction latch needle (B) Friction less latch needle
(C) Spring bearded needle (D) Compound needle

51. The fabric spreader used in the circular knitting machine can

(A) increase the production (B) remove the crease marks
(C) fold the fabric properly (D) drives the fabric continuously

52. The machine gauge of circular knitting machine can be defined as

(A) Number of needles per one inch (B) Number of needles per two inches
(C) Number of needles per four inches (D) Number of needles per ten inches

53. The air permeability of knitted fabric can be increased by introducing

(A) tuck stitches (B) miss stitches
(C) knit stitches (D) tuck and knit stitches

54. What will be the loop length of plain knitted fabric made by 16 Ne having tightness factor 10?

(A) 0.2 cm (B) 0.4 cm (C) 0.6 cm (D) 0.8 cm

55. Disperse dyes are mostly used for colouring ———— fabrics.

(A) cotton (B) wool (C) polyester (D) silk

56. Identify which of below structures is not a chromophone

(A) $>C=O$ (B) $>C=S$ (C) $>C=C<$ (D) $-\overset{\overset{O}{\|}}{C}-OH$

57. The bleaching agent that does not form adsorbable organohalogens is

(A) Hydrogen peroxide (B) Sodium hypochlorite

(C) Calcium hypochlorite (D) Sodium chlorite

58. Which one of the following amino acids does not contain sulphur groups in it?

(A) Cysteine (B) Cystine (C) Methionine (D) Alanine

59. The reaction of vinyl sulphore reactive dye with cotton comes under category of

(A) Nucleophilic addition (B) Nucleophilic substitution

(C) Nucleophobic addition (D) Nucleophobic substitution

60. Slack mercerization of cotton fabrics leads to

(A) less dye consumption compared to non-mercerized fibre

(B) poor brillnary of colour

(C) lower reactivity of cellulose

(D) increased orientation of cellulose macromolecules

61. The relative wet fastness of dye classes in decreasing order of fastness may be suggested as follows

(A) vat > azoic > reactive > direct – dyes
(B) direct > reactive > azoic > vat – dyes
(C) direct > vat > reactive > azoic – dyes
(D) vat > azoic > direct > reactive dyes

62. The reducing agent used in vat dyeing is

(A) Sodium dithionite
(B) Hydrogen peroxide
(C) Peracetic acid
(D) Ozone

63. ———— type of acid dyes are applied from neutral solutions.

(A) Levelling
(B) Milling
(C) Levelling – Milling
(D) Super Milling

64. Identify the incorrect statement about direct dyes

(A) Direct dyes are anionic dyes
(B) Direct often exist as aggregates of ions or molecules
(C) Without after treatment, direct dyes show good discharge ability
(D) Pthalocyanine direct dyes are not water soluble

65. The stabilizer used in hydrogen peroxide bleaching is

(A) Sodium silicate
(B) Pottassium hydroxide
(C) Lithium hydroxide
(D) Sodium hydroxide

66. Which one of the following statement is incorrect about sodium chlorite bleaching?

(A) Bleaching is carried out in acidic conditions
(B) ClO_2 is generated at acidic conditions on usage of chlorite
(C) Chlorite bleaching has very good effect on oil stains
(D) The AOX generated by chlorite is 1/10 of that generated by hypochlorite

67. An oxy cellulose with a great number of aldehyde groups is characterized by

(A) High copper number and low sorption of basic dyes
(B) Low copper number and high sorption of basic dyes
(C) Low copper number and low sorption of basic dyes
(D) Low copper number and very high sorption of basic dyes

68. Which one of the following is a correct statement regarding hydrogen peroxide?

(A) Hydrogen peroxide is a weak acid
(B) Hydrogen peroxide is thermodynamically stable
(C) Heavy metals will not accelerate the disintegration of hydrogen peroxide
(D) Hydrogen peroxide is not a bleaching agent

69. The term "control chart" used in testing refers to

(A) a method of controlling a manufacturing process to ensure uniformity of product
(B) a statistical tool to examine whether the quality in a production line is being maintained
(C) a statistical tool to minimise the cost of running the production line
(D) an optimisation tool that controls process parameters to produce the best possible product

70. The students "t"-test is a test of

(A) the standard deviation of 2 sets of values

(B) the mean of 2 sets of values

(C) the frequency distribution of 2 sets of values

(D) the quartile deviation of 2 sets of values

71. In testing to determine a property of a textile material, the preferred method of selecting samples for testing is one that picks

(A) A set with a bimodal distribution

(B) A set with a negative skew distribution

(C) A set with a random distribution

(D) A set with a positive skew distribution

72. A solid surface on which a drop of water forms a sphere shows

(A) A high contact angle

(B) A low contact angle

(C) An intermediate angle

(D) Nothing as relationship exist between type of drop and contact angle

73. The kawa bata evaluation system measure the following combination of fabric testing

(A) Tensile, bending, shear, compression, surface roughness, friction

(B) Tensile, shear, bending, abrasion, surface roughness, friction

(C) Bending, compression, tensile, hygral expansion, abrasion, shear

(D) Tensile, bending, shear, dimensional stability, abrasion, extension

74. If A is the area of the cell wall of a cotton fiber and A' is the area of the circle with same perimeter P, then the degree of cell wall thickening (θ) is given by

(A) A/P (B) P/A (C) $4\pi A/P$ (D) $4\pi A/P^2$

75. For a given fiber the flame resistance rating of a fabric has been found to

(A) increase linearly with increase in weight

(B) decreases exponentially with increase in weight

(C) decrease linearly with increase in weight

(D) increase exponentially with increase in weight

76. If the cloth is of 150 grams per square meter and its bending length in the warp direction is 3cm, then its corresponding flexural rigidity in g.cm would be

(A) 4.050 (B) 0.405 (C) 4.500 (D) 4500.0

77. The component of power cost of 20 Ne and 40 Ne yarns with respect to sales turn over is
(A) 8.5% and 10.0% (B) 10.5% and 12.5%
(C) 12.3% and 14.5% (D) 15.6% and 17.3%

78. The power requirement by a chute feed blow room and cards to process fibers for producing 100 Kgs of 40 Ne cotton yarn is about
(A) 22 KW. Hours (B) 28 KW. Hours (C) 33 KW. Hours (D) 37 KW. Hours

79. The fraction of power cost component of 80 Ne and 100 Ne cotton yarn as % of sales turnover are
(A) 0.25 and 0.3 (B) 0.17 and 0.18 (C) 0.14 and 0.15 (D) 0.14 and 0.12

80. The energy consumption (Kwh for 8 machine running hours) by different machines are given in decreasing order (higher to lower).

Select the correct order

(i) Chute feed blow room line and card (with AWES)
(ii) Automatic cone winder (60 drums/winder)
(iii) Speed frame (120 spindles per frame)
(iv) Ring frame (1008 spindles per frame with OHTC)

(A) (iv), (i), (ii), (iii) (B) (iv), (ii), (i), (iii)
(C) (iv), (i), (iii), (ii) (D) (iv), (ii), (iii), (i)

81. If the optimum speed for a loom of 100 cm reed width is 200 picks per minute, the optimum speed for a similar loom with reed width of 144 cm would be

(A) $200 \times \frac{100}{144}$ picks per minute (B) $200 \times \sqrt{\frac{100}{144}}$ picks per minute

(C) $200 \times \frac{144}{100}$ picks per minute (D) $200 \times \sqrt{\frac{144}{100}}$ picks per minute

82. The three primary motions of a shuttle loom are the
(A) Let off, take up and shedding (B) Let off, beat up and picking
(C) Shedding, picking and beat up (D) Take up, beat up and let off

83. For a drum driven winder, package the wind angle
(A) increases as package diameter increases
(B) decreases as package diameter increases
(C) is constant throughout the package growth
(D) first increases and then decreases as the package radius increases

84. The problem with "simple helical gears" is
(A) they, tend to push the meshing gears side ways out of mesh
(B) they are noisy
(C) they cannot mesh with centre lines that are non parallel
(D) they work only on low speed shafts

85. Which one of the following is not the assumption made in the idealized helical geometry of yarn?

(A) The yarn is circular in cross section

(B) A filament at the centre will follow straight line of the yarn axis; but going out from the centre, the helix angle gradually decreases as twist per unit length in all the layers remains constant

(C) Number of filaments of fibres crossing the unit area is constant

(D) Yarn is made up of a large number of filaments

86. Select the correct expression for the linear density of yarn

(A) $C = \frac{\pi R^2}{V_y} \times 10^5$ denier

(B) $C = \frac{\pi R^2}{V_y} \times 10^5$ Ne

(C) $C = \frac{\pi R^2}{V_y} \times 10^5$ tex

(D) $C = \frac{\pi R^2}{V_y} \times 10^5$ dtex

Where

C = Yarn count in tex

πR^2 = Volume of unit length of idealised yarn

V_y = Specific volume of the yarn in cm^3/g

87. The packing fraction of staple fibre yarns, generally lies in the range of

(A) 0 to 0.2 (B) 0.3 to 0.5 (C) 0.6 to 0.9 (D) 1.0 to 1.3

88. During catastrophic rupture of filament yarn, the ratio of yarn to filament tenacity

(A) Remains same for any twist level

(B) Increases with increase in twist

(C) Decreases with increase in twist

(D) Increases with decrease in twist

89. In the cross section of yarn, 'x' number of fibre 1 and 'y' number of fibre 2 are found. The denier of fibre 1 is 1.2 and fibre 2 is 1.3. The mass blend ratio of fibre 1 : fibre 2 is

(A) $\frac{1.2x}{1.2(x+y)}, \frac{1.3y}{1.3(x+y)}$

(B) $\frac{1.2x+1.3y}{1.2x}, \frac{1.2x+1.3y}{1.3y}$

(C) $\frac{1.2x}{1.2x+1.3y}, \frac{1.3y}{1.2x+1.3y}$

(D) $\frac{x}{1.2x+1.3y}, \frac{y}{1.2x+1.3y}$

90. The industrial disease caused by air pollution (dust) to the textile industry workers is

(A) Filaria (B) Sinus (C) Thrombosis (D) Byssinosis

91. The pneumatic loading on the front, middle and back top rollers of a ring frame should be

(A) 16 – 18 Kgs, 10- 12 Kgs and 12 – 14 Kgs respectively

(B) 10 – 12 Kgs, 8 - 10 Kgs and 10 – 12 Kgs respectively

(C) 12 – 15 Kgs, 10- 12 Kgs and 10 – 12 Kgs respectively

(D) 8 – 10 Kgs, 6 - 8 Kgs and 12 – 14 Kgs respectively

92. The top roller pressure on the front, middle and back roller of draw frame are

(A) 10Kgs, 20 Kgs and 30 Kgs

(B) 15 Kgs, 25 Kgs and 30 Kgs

(C) 20 Kgs, 30 Kgs and 40 Kgs

(D) 30 Kgs, 40 Kgs and 50 Kgs

93. The pneumatic suction pressure required at the fan end, middle and gear end of a long ring frame processing cotton yarn are

(A) 10, 6 and 4 cm of water

(B) 2, 7 and 15 cm of water

(C) 15, 10 and 6 cm of water

(D) 3, 5 and 12 cm of water

94. Normally a loom's "picking motion" is checked for wear and necessary maintenance is done

(A) When the shuttle is changed

(B) When a new beam is mounted

(C) Once a month

(D) When the cloth beam is removed

95. Loom cleaning with compressed air and cleaning waste should be carried out

(A) Twice a shift

(B) Once a shift

(C) Once in 3 shifts (daily)

(D) Once in a week

96. In load, elongation behaviour of woven fabric, the initial modulus of the fabric

(A) Increases with the increase in crimp

(B) Increases with the decrease in cover

(C) Decreases with the increase in crimp

(D) Decreases with the decrease in cover

97. The relationship between the warp and weft crimp in the stretched fabric is

(A) $\frac{l_1\sqrt{c_1'}}{(1+c_1')}+\frac{l_2\sqrt{c_2'}}{(1+c_2')}=\frac{4D}{3}$

(B) $\frac{l_1\sqrt{c_1'}}{(1+c_1')}+\frac{l_2\sqrt{c_2'}}{(1+c_2')}=\frac{3}{4}D$

(C) $\frac{l_1\sqrt{c_1'}}{l_2\sqrt{c_2'}}+\frac{(1+c_1')}{(1+c_2')}=\frac{3}{4}D$

(D) $\frac{l_1\sqrt{c_1'}}{l_2\sqrt{c_2'}}+\frac{(1+c_1')}{(1+c_2')}=\frac{4}{3}D$

98. The unit for viscosity of a polymeric solution is

(A) N/m^2

(B) N/mm^2

(C) Pa.sec

(D) Pa/sec

99. _____ is the process of progressive entanglement of wool fibers in a fabric.

(A) Milling

(B) Carbonizing

(C) Scouring

(D) Degumming

100. Congo red is a

(A) direct dye

(B) reactive dye

(C) disperse dye

(D) sulphur dye

101. The efficient arrangement of pattern pieces on a paper is called

(A) Pattern making

(B) Marker making

(C) Plotting

(D) Pattern grading

102. In draw texturing, the dynamic filament to filament friction should be

(A) low
(B) high
(C) higher than friction texturing
(D) higher than false twist texturing

103. In polypropylene polymerisation process, the catalyst is destroyed by

(A) an alkali treatment
(B) washing with water
(C) an alcohol treatment
(D) an acid treatment

104. The length to diameter ratio of a thin polyethylene polymer chain is

(A) 1000
(B) 2000
(C) 4000
(D) 8000

105. The minimum molecular weight required for producing commercial polyamide and polyester is

(A) 5,000 g mol^{-1}
(B) 10,000 g mol^{-1}
(C) 1,00,000 – 2,00,000 g mol^{-1}
(D) 2,00,000 – 4,00,000 g mol^{-1}

106. The tenacity of triacetate fibre is ———— gf tex^{-1}.

(A) 25 to 54
(B) 19 to 46
(C) 12
(D) 39

107. The length of staple fibres produced by nature are generally from ———— to ————

(A) 1 mm, 5 mm
(B) 5 mm, 10 mm
(C) 10 mm, 500 mm
(D) 500 mm, 750 mm

108. The true extension ratio in solution spinning is always ———— than would appear from the filament diameter.

(A) smaller than
(B) higher than
(C) equal to
(D) greater than dry spinning and equal to

109. In a polymer solution, the tendency to entangle the chain molecules increases with
(A) decreasing stiffness of the macro molecules
(B) increasing stiffness of the macro molecules
(C) decreasing stiffness of the micro molecules
(D) increasing stiffness of the micro molecules

110. The ultrasonic C-scan testing of composites gives information on ———— in the composites.
(A) defect boundaries
(B) gelation
(C) shrinkage
(D) thermal transitions

111. Inter Laminar Shear Strength (ILSS) is majorly influenced by
(A) fibre type
(B) reinforcement form
(C) fibre-matrix interfacial strength
(D) number of layers of reinforcement

112. Among the following thermoplastic matrix, the glass transition temperature (T_g) is lower for
(A) Polyether-ether ketone
(B) Polyphenylene sulphide
(C) Polyetherimide
(D) Polyamide-imide

113. The starting material for vinyl ester resin matrix are
(A) epoxy resin and unsaturated carboxylic acid
(B) epoxy resin and mono-ethylene glycol
(C) epoxy resin and di-ethylene glycol
(D) epoxy resin and tri-ethylene glycol

114. Among the following resin-matrix combination, thermal conductivity is highest for ———— combination.
(A) S-glass-epoxy
(B) Kerlar 49-epoxy
(C) Carbon-epoxy
(D) Boron-epoxy

115. In-plane shear mode of crack propagation occurs in ———— type of composite delamination.
(A) Mode-I
(B) Mode-II
(C) Mode-III
(D) Mode-IV

116. The fracture toughness of an epoxy resin can be increased by
(A) reducing cross-link density
(B) increasing cross-link density
(C) decreasing the resin chain flexibility between cross links
(D) removal of moisture in the resin

117. Select the wrong statement with regard to counter feed in comber.

(A) Noil% increases with decrease in feed distance/nip

(B) Noil% increases with increase in detachment setting

(C) Counter feed is used for extracting noil% of 12-25%

(D) The cylinder comb acts on the fibres more often than concurrent feed

118. Which one of the following autolevelling principle is commonly used in the card?

(A) Sensing and correcting at delivery side of oard

(B) Sensing at the feed and correcting at delivery side of card

(C) Sensing at the delivery and correcting at feed side of card

(D) Sensing at delivery and correcting at middle of card

119. If the base width is x mm and pitch is y mm for the wire, the points/inch^2 and points/cm^2 of wire clothing is

(A) $\frac{xy}{100}, \frac{xy}{645}$

(B) $\frac{100}{xy}, \frac{645}{xy}$

(C) $\frac{645}{xy}, \frac{100}{xy}$

(D) $\frac{xy}{645}, \frac{xy}{100}$

120. The direction of rotation of which of the following machine elements of carding machine are same. Assume the feed plate is below the feed roller.

(A) Feed roller, licker in and cylinder

(B) Feed roller, licker in and doffer

(C) Feed roller, cylinder and doffer

(D) Licker in, cylinder and doffer

121. 20 slivers of 5 Ktex each are fed to the sliver lap former. The draft applied in the sliver lap former is 1.25. The draft given at the ribbon lap former is 6. The linear density of ribbon lap will be ————————. Assume 6 sliver laps are fed to the ribbon lap former.

(A) 13.3 Ktex

(B) 16.67 Ktex

(C) 80 Ktex

(D) 417.2 Ktex

122. In a draw frame, 5 cotton slivers of 5 Ktex each and 3 polyester slivers of 6 Ktex each are fed. The total draft given at the draw frame is 8. The proportion of polyester and cotton fibres in the output sliver is approximately

(A) $\frac{18}{43} \times \frac{5}{8}, \frac{25}{43} \times \frac{3}{8}$

(B) $\frac{18}{43}, \frac{25}{43}$

(C) $\frac{25}{43}, \frac{18}{43}$

(D) $\frac{25}{43} \times \frac{5}{8}, \frac{18}{43} \times \frac{3}{8}$

123. The compactness of ring spun yarn is

(A) lower than rotor spun yarn
(B) higher than friction spun yarn
(C) lower than friction spun yarn
(D) higher than condensed spun yarn

124. In ring spinning, the spinning tension is approximately proportional to

(A) $\sqrt{\text{yarn twist}}$
(B) $(\text{spindle speed})^2$
(C) traveller lag
(D) $(\text{spindle speed})^{-1}$

125. The lower limits of the no. of fibres in the cross section of carded cotton ring yarn is

(A) 75 fibres
(B) 33 fibres
(C) 100 fibres
(D) 50 fibres

126. In ring spinning, what is the angle of inclination of yarn running between thread guide and delivery roller with respect to spindle axis?

(A) 5° to 10°
(B) 15° to 30°
(C) 45° to 60°
(D) 60° to 75°

127. The traveller has a difference in speed of ———— to ———— compared with the speed of spindle in ring frame.

(A) 0.77%, 1.41%
(B) 2%, 4%
(C) 3.81%, 4.24%
(D) 33%, 67%

128. The minimum ratio between the diameter of empty ring cop and the diameter of ring should be approximately ———— to ensure that the yarn tension oscillations do not become too great.

(A) 1 : 2
(B) 1 : 3.5
(C) 1 : 5
(D) 1 : 10

129. In ring frame drafting system, the front top roller is set slightly forward, which results

(A) reduction of no. of floating fibres
(B) shorten the spinning triangle
(C) increase of end breaks
(D) increase of twist per unit length

130. The level of shore hardness of rubber cots used in back top roller of ring frame drafting system is

(A) 50° – 60°
(B) 60° – 70°
(C) 80° – 85°
(D) above 100°

131. The strength of friction spun yarn is

(A) lower than rotor spun yarn
(B) higher than ring spun yarn
(C) higher than rotor spun yarn
(D) higher than compact spun yarn

132. In which one of the following yarn manufacturing system, the delivery speed is independent of yarn fineness?

(A) Ring spinning
(B) Rotor spinning
(C) Air vortex spinning
(D) Dref – II

133. The count range of yarn produced by air jet spinning system is

(A) 0.5 to 6 Ne
(B) 15 to 60 Ne
(C) 10 to 200 Ne
(D) 10 to 35 Ne

134. In a friction spinning process, the number of yarn turns generated by one revolution of a drum is

(A) 1
(B) 10
(C) 50
(D) 100 and above

135. In which one of the following systems recycled fibres can be used?

(A) Siro spinning
(B) Dref – II spinning
(C) Ring spinning
(D) Air jet spinning

136. The snarling tendency is lower for

(A) Ring spun yarn
(B) Rotor spun yarn
(C) Dref – I yarn
(D) Dref – II yarn

137. When finer fibres are used, the ends down rate of rotor spinning process is

(A) lesser than ring spinning process
(B) higher than ring spinning process
(C) equal to ring spinning process
(D) higher than coarser fibres used

138. Which one of the following formula is wrong?

(A) Total number of ends in cloth = No. of ends / inch in cloth × cloth width + Extra ends for selvedges

(B) Total number of ends in cloth = No. of ends / inch in reed × width of warp in reed + Extra ends for selvedges

(C) Count (Ne) of warp yarn = $\frac{\text{Total length of warp yarn in hanks}}{\text{Wt. of warp in lbs}}$

(D) Weight of warp in lbs = $\frac{840 \times \text{Count (Ne)}}{\text{Total no. of ends} \times \text{Tape length of warp in yds.}}$

139. Find the number of ends per inch in a reed of $3/72^{S}$ Bradford.

(A) 36 ends (B) 72 ends (C) 40 ends (D) 120 ends

140. What will be the number of ends per inch in a reed of $3/80^{S}$ Stockport?.

(A) 40 ends (B) 80 ends (C) 120 ends (D) 240 ends

141. A warp containing 2800 ends is required to be sized to 25% add on. The length of the sized warp on the beam is required to be 1080 yds. If the counts of the yarn is 40 Ne find out the count of sized warp

(A) 52 Ne (B) 42 Ne (C) 32 Ne (D) 22 Ne

142. It is required to prepare a warp of 12,000 yards long from 1000 lbs of 30 Ne yarn. Calculate the number of ends in the warp sheet allowing 5% for waste and material left on the bobbins.

(A) 1925 ends (B) 1995 ends (C) 2225 ends (D) 2275 ends

143. The oven dry weight of a sample of cotton yarn is found to be 200 grains. Calculate the conditioned weight of the cotton yarn. Assume moisture content of the cotton yarn is 8.5%.

(A) 210 grains (B) 209 grains (C) 207 grains (D) 217 grains

144. Calculate the count of the corkscrew yarn produced by twisting together one thread of 2/40 Ne and the other of 10 Ne cotton yarn. By actual measurement it was found that 20 inches of 10 Ne thread and 10 inches of 2/40 Ne are contained in 10 inches of the corkscrew yarn

(A) 20 Ne (B) 8 Ne (C) 4 Ne (D) 2 Ne

145. One yarn of 40 Ne and another yarn of 20 tex are plied to make a doubled yarn. The resultant count of yarn (Ne) is

(A) 10 Ne (B) 17 Ne (C) 34 Ne (D) 60 Ne

146. Which one of the following parameter do not affect winding angle of the yarn in cone winding m/c?

(A) Rotational speed of yarn package (B) Diameter of yarn package

(C) Traverse speed of yarn (D) Helical angle of fibre in the yarn

147. Shaded twills comes under the classification of

(A) Fancy twills (B) Transposed twills

(C) Diamond twills (D) Reversing twills

148. Twills which runs at various angles constructed by moving the points of intersection two or more threads in one direction, one thread in the other direction are called as

(A) Elongated twills (B) Broken twills

(C) Transposed twills (D) Fancy twills

149. The weave that contain little or no twilled or other prominent effects and which give a cloth the appearance of being covered by minute spots or seeds is called a

(A) Crepe weave (B) Sateen weave

(C) Hopsack weave (D) Diamond weave

150. In colour theories that explain the effects obtained by mixing dyes and mixing lights respectively are known as the

(A) pigment theory and the light theory

(B) light theory and the pigment theory

(C) primary theory and the secondary theory

(D) complementary theory and the tertiary theory

151. A filament yarn made at speeds of ———— is called a Highly Oriented Yarn (HOY).

(A) upto 1800 mpm (B) less than 600 mpm

(C) 4000 – 6000 mpm (D) 2800 – 4000 mpm

152. The terry towel fabric is

(A) warp pile structure with two series of warp and one series of weft yarn

(B) weft pile structure with two series of warp and one series of warp

(C) warp pile structure with two series of weft and one series of warp yarn

(D) weft pile structure with two series of weft and one series of warp yarn

153. A heavy silk fabric ornamented with raised figures formed by extra threads or by embroidery are known as

(A) Bedford cords (B) Brocade fabrics

(C) Beaverteen fabrics (D) Blazer fabrics

154. Find the size of the change wheel required for a 5 wheel take-up motion, if the cloth to be woven should be 70 picks per inch. The dividend is 2030.

(A) 29 (B) 30 (C) 32 (D) 33

155. Which of the following statement is true?
(A) tuck stitches are thinner than knit stitches
(B) tuck stitches are wider than knit stitches
(C) tuck stitches are more extensible than knit stitches
(D) tuck stitches are less open than knit stitches

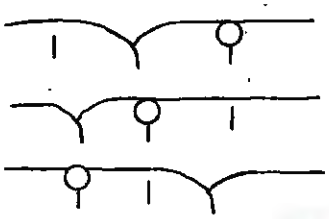
156. In weft knitting, platted structures are developed by
(A) introducing two different coloured yarn in one feeder
(B) introducing two different coloured yarn in seperate feeders
(C) introducing plied yarn in one feeder
(D) introducing metal plated yarn in one feeder

157. Double hooked needle is used in ———— knitting machine.
(A) Rib (B) Interlock (C) Flat (D) Purl

158. Identify the correct statement
(A) Interlock structures can be produced in the rib knitting machine
(B) Rib structure can be produced in the interlock knitting machine
(C) Plain structure can be produced in interlock machine
(D) Purl structure can be produced in the plain knit machine

159. Multi cam tracks are used in single jersey knitting machine to
(A) Increase the production (B) Improve the fabric quality
(C) Produce designs (D) Reduce the yarn tension during knitting

160. Find the number of feeder and cam track for the following structure



(A) 2 Feeder and 3 cam track (B) 3 Feeder and 3 cam track
(C) 3 Feeder and 2 cam track (D) 2 Feeder and 2 cam track

161. In circular weft knitting machine, large designs can be produced by using ———— needle control mechanism.
(A) split cam (B) multi cam (C) pattern drum (D) swing cam

162. The value of cam angle in the linear cams of circular knitting machine is
(A) 35° (B) 45° (C) 65° (D) 75°

163. A compound that absorbs light at a shorter wavelength and remit it at a longer wavelength is called as

(A) Fluorescent brightening agent
(B) Reducing brightening agent
(C) Oxidising brightening agent
(D) Chelating brightening agent

164. If the cotton fabrics after treatment with acids are not neutralized properly, ———— type of cellulose is likely to be developed during storage

(A) Hydrocellulose
(B) Oxy cellulose
(C) Cellulose I
(D) Cellulose II

165. The ionic form of indigo that has limited solubility but relatively high affinity for cotton is

(A) Non-ionic form
(B) Reduced non-ionic form
(C) Mono–ionic form
(D) Di-ionic form

166. Fibroin present in silk fibre is not soluble in

(A) Petroleum ether
(B) Cuprammonium solution
(C) Dichloro acetic acid
(D) Phosphoric acid

167. Which one of the following is not a primary colour?

(A) Red
(B) Violet
(C) Blue
(D) Yellow

168. Among the given dye classes, the class of water soluble dyes are the

(A) Vat dyes
(B) Sulphur dyes
(C) Disperse dyes
(D) Reactive dyes

169. The major dye consumption to dye knitted cotton goods is from the class of

(A) reactive dyes
(B) azoic dyes
(C) sulphur dyes
(D) acid dyes

170. In statistics the term "A Random sample" refers to
(A) Samples selected at equal time intervals from flow of material in the production line
(B) Samples collected from all sides of an assembly of the product
(C) A sample so selected that every member of the population has an equal chance of being selected
(D) A sample so selected that all units varying in a particular property are equally represented in the sample

171. An assessment of the difference between the dispersions of 2 sets of numbers can be made by
(A) Computing the 't' statistic for the 2 sets of numbers
(B) Computing the 'correlation' between the 2 sets of numbers
(C) Computing the "F" statistic between the 2 sets of numbers
(D) Computing the "regression" coefficient of the first set on the second

172. The expression "correlation between an independent and dependent variable" refers to
(A) the extent to which changes in the dependent variable change the value of the independent variable
(B) the extent to which changes in the independent variable change the value of the dependent variable
(C) the slope of the line formed by plotting the two sets of variables as pairs on XY graph
(D) the points on the X and Y axis where the line formed by plotting the 2 sets as pairs on XY graph cut the axises

173. The arithmetic mean and the standard deviation of the five numbers 12, 10, 14, 13 and 11 are
(A) 11 and 1.41 (B) 12 and 2.32 (C) 12 and 1.41 (D) 11 and 3.01

174. The mean and the standard deviation of the five numbers 7, 8, 9, 10 and 12
(A) 8.5 and 2.7 (B) 9.2 and 1.72 (C) 9.2 and 2.3 (D) 9.5 and 1.72

175. The "normal" or "Gaussian" distribution refers to a set of numbers that are
(A) Symmetrically distributed about the mean, which is also the median and the mode
(B) So distributed that there are more values lesser than the mean
(C) So distributed that there are more values greater than the mean
(D) So distributed that there are two modes one lesser and one greater than the mean

176. In statistical methodology the term "standard deviation" means
(A) The difference between the highest and lowest of a set of numbers
(B) The difference between the values of the first and third quartiles of a set of numbers
(C) The square root of the sum of squares of deviation from the mean divided first by the number of values in the set of numbers
(D) Sum of the deviations from the mean divided by the number of values in the set of numbers

177. The steps involved in the work measurement are

(A) Select, Record, Compile, Examine, Measure, Define

(B) Select, Measure, Examine, Record, Compile, Define

(C) Select, Record, Examine, Measure, Compile, Define

(D) Select, Examine, Measure, Record, Compile, Define

178. The noise level preferred to avoid occupational deafness is

(A) Less than 8 db (A)

(B) Less than 80 db (A)

(C) Less than 160 db (A)

(D) Less than 240 db (A)

179. The allowance time which is intended to "provide the worker with an opportunity to recover from the physiological and psychological effects of carrying out specified work under specified condition and to allow attention to personal needs" is

(A) Fixed allowance

(B) Policy allowance

(C) Contingency allowance

(D) Relaxation allowance

180. (i) Systematic recording and critical examination of ways of doing things in order to make improvement

(ii) Application of techniques designed to establish the time for a qualified worker to carryout a task at a defined rate of working

The above two definitions are respectively means

(A) Time study and method study

(B) Work measurement and method study

(C) Method study and work measurement

(D) Time study and motion study

181. The ratio of power for Indirect use in what percentage of the total power spent in processing 40 Ne yarn in a spinning mill?

(A) 26% (B) 34% (C) 42% (D) 50%

182. "Rack and pinion drive" means the drive system having

(A) A helical gear and a worm wheel
(B) A worm and a worm wheel
(C) A bar with teeth and a spur gear
(D) A screw shaft and a lose nut

183. The pattern on a winding drum designed to produce a cone with increasing taper angle with cone build is known as a

(A) fixed pitch groove
(B) a half accelerated groove
(C) a fully accelerated groove
(D) a retarded groove

184. When two spur gears mesh the distance between the centers of the two gears is

(A) The difference between the diameter of their pitch circles
(B) The sum of the addendum of the 2 gears
(C) The sum of the dedendum of the 2 gears
(D) The sum of the radii of the pitch circles of the two gears

185. A "Cam" is a mechanism that

(A) converts linear motion to rotary motion
(B) converts constant rotation to intermittent rotation
(C) converts rotary motion into linear motion
(D) converts intermittent rotation into constant rotation

186. Select the correct equations for the continuous filament yarn e_f and e_y are fibre strain and yarn strain respectively and E_f and E_y are fiber modulus and yarn modulus respectively and α the twist angle

(A) $e_f = e_y.\cos^2\alpha;\ E_f = E_y.\cos^2\alpha$
(B) $e_f = e_y.\cos^2\alpha;\ E_y = E_f.\cos^2\alpha$
(C) $e_y = e_f.\cos^2\alpha;\ E_y = E_f.\cos^2\alpha$
(D) $e_y = e_f.\cos^2\alpha;\ E_f = E_y.\cos^2\alpha$

187. In the case of catastrophic rupture, the ratio of yarn breaking extension to filament breaking extension of a multi filament yarn

(A) is constant independent of twist
(B) decreases with increases in twist
(C) increases with increase in twist
(D) initially increases and then remains constant

188. Amplitude of migration of fibres in the yarn can be best expressed by

(A) Mean fibre position
(B) Mean migration intensity
(C) Equivalent migration intensity
(D) Root mean square deviation

189. Langelier Index indicates

(A) Corrosivity of water
(B) Hardness of water
(C) pH of water
(D) Cleanliness of water

190. The illumination, levels required at preparatory, spinning and post spinning sections of spinning mill are

(A) 30, 50, 80 lux respectively
(B) 50, 60, 90 lux respectively
(C) 70, 100, 150 lux respectively
(D) 110, 140, 180 lux respectively

191. Select the wrong statement

(A) The shore hardness of front and back top rollers of ring frame drafting system is 60 to 70° and 80-85° respectively
(B) Lower shore hardness of cots cause greater area of contact, enclose the fibre strand more completely
(C) Softer cots tend to form fewer laps
(D) Softer cots wears out faster

192. Chrome vanadium steel (used for bearings) typically has what percentages of carbon chromium and vanadium?

(A) 1%, 1% and 1%
(B) 0.26%, 0.92%, and 0.76%
(C) 0.50%, 0.5% and 2.00%
(D) 2.30%, 0.88% and 2.52%

193. According to Industrial norms, the number of cards, first passage draw frame deliveries and second passage draw frame deliveries required to support 36,000 ring frame spindles producing 40 Ne carded cotton yarn is about

(A) 8, 12 and 12
(B) 6, 8 and 8
(C) 12, 6 and 6
(D) 2, 3 and 3

194. Select the group showing ancillary operatives in a spinning mill as per SITRA

(A) Fitter, Jobber, Cleaner, Mixing attendant
(B) Jobber, cleaner, Bobbin carrier, Mixing attendant
(C) Fitter, Jobber, Cleaner, Bobbin carrier
(D) Blow room tenter, Ring frame tenter, Ring frame doffer, Jobber

195. Atleast how many times should an automatic winding machine be cleaned in a shift of 8 hours?

(A) Once (B) Twice

(C) Thrice (D) Four Times

196. _____ crystal form is exhibited in drawn polypropylene fiber.

(A) α (B) β

(C) γ (D) smectic

197. The pattern on a winding drum designed to maintain a "Uniformly increasing diameter" is known as

(A) a fixed pitch groove (B) a fully accelerated groove

(C) a fully retarted groove (D) a half accelerated groove

198. Which of the following relation is valid for a jammed fabric structure? Assume the cross section of the thread is circular

(A) $\sqrt{1+\left(\frac{P_1}{D}\right)^2}-\sqrt{1+\left(\frac{P_1}{D}\right)^2}=1$ (B) $\sqrt{1-\left(\frac{P_1}{D}\right)^2}+\sqrt{1-\left(\frac{P_2}{D}\right)^2}=1$

(C) $\sqrt{1+\left(\frac{D}{P_1}\right)^2}-\sqrt{1+\left(\frac{D}{P_2}\right)^2}=1$ (D) $\sqrt{1-\left(\frac{D}{P_1}\right)^2}+\sqrt{1-\left(\frac{D}{P_2}\right)^2}=1$

199. What will be the fractional cover of the woven fabric having thread diameter 'd' and gap between adjacent threads 's'?

(A) $\frac{d}{s}$ (B) $d \times s$ (C) $\frac{d}{d+s}$ (D) $\frac{s}{d+s}$

200. The understanding of buckling behaviour of woven fabric would be more useful for

(A) Dyeing (B) Garment making

(C) Printing (D) Finishing