Sl. No. :

DETE 2012

Register Number

2012
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.
3. Answer **all** questions.
4. **All** questions carry equal marks.
5. 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.
6. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. You must write your Name, Register No., Question Booklet Sl. No. and other particulars with Blue or Black ink Ball point pen on side 2 of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
7. 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.
8. 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.
9. In the Answer Sheet there are **four** brackets [A] [B] [C] and [D] against each question. To answer the questions you are to mark with Ball point pen ONLY ONE bracket 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, [B] is the correct answer, you have to mark as follows :

[A] ■ [C] [D]

10. 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.
11. 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.
12. Do not tick-mark or mark the answers in the Question booklet.
13. The last sheet of the Question Booklet can be used for Rough Work.

SEAL

1. Natural polymer based regenerated fibre
   (A) Polystyrene (B) Polyamide
   (C) Terylene (D) Alginate

2. Introduction of crimp increases _____ in synthetic fibres.
   (A) Strength (B) Cohesion
   (C) Flexibility (D) Porosity

3. Monomers required for the production of PET
   (A) Ethylene Glycol & Terapthatic Acid
   (B) Hexamethylene Diamine & Ethylene Glycol
   (C) Adipic Acid & Dimethyl Terapthalate
   (D) Caprolactum & Adipic Acid

4. Hydroxyl substituted fibre
   (A) PAN (B) PVA
   (C) PTFE (D) PVC

5. Crinkle type textured yarns are produced by
   (A) False twist texturing (B) Draw texturing
   (C) Stuffer-box texturing (D) Knit de-knit

6. Heat of wetting (J/g) from zero regain is maximum for
   (A) Cotton (B) Mercerised Cotton
   (C) Viscose Rayon (D) Wool

7. At a constant shear rate or shear stress, if viscosity of fluid decreases as time increases, the fluid is named as
   (A) Thixotropic (B) Bingham
   (C) Dilatant (D) Rheopectic

8. Dry-jet wet spinning is extensively used for _____ fiber.
   (A) LDPE (B) Aromatic Polyamide
   (C) HDPE (D) Carbon

9. Which one of the following is correctly matched ?

P. Pin Texturing	1. Surging
Q. Draw Texturing	2. Bulked Yarn
R. Friction Texturing	3. POY
S. Air-Jet Texturing	4. More Noise

   (A) P-4, Q-3, R-2, S-1 (B) P-1, Q-2, R-4, S-3
   (C) P-4, Q-3, R-1, S-2 (D) P-2, Q-3, R-4, S-1

10. Assertion-Reason Type :

Consider the following statements :

Assertion (A) : Permanently heat set fibers will exhibit an irreversible thermal shrinkage.

Reason (R) : During heat setting the imperfect crystallites tend to become perfect crystallites.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

11. Main characteristics of rigid textile composites

(i) Low density

(ii) High coefficient of thermal expansion

(iii) High stiffness

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) & (iii) only (D) (i), (ii) and (iii)

12. The construction of a laminate composite can be

(i) Fully isotropic

(ii) Quasi-isotropic

(iii) Anisotropic

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

13. Functions of matrix materials

(i) To bind the fibrous materials together

(ii) To protect the fibres from outside effects

(iii) To contribute to strength

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

14. Matrix used in composite for high-tech application

(A) Polyvinyl Alcohol (B) Polypropylene

(C) Polyester (D) Epoxy

15. Common fibres used for manufacture of prepregs

(i) Graphite (ii) Polyester

(iii) Fibre glass

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

16. Thermo-set matrix material used in composite is

(A) Poly ethylene (B) PEEK

(C) Vinyl ester (D) Poly propylene

17. The driving force that transfer dye from solution to fibre is

(A) solubility (B) chemical potential

(C) enthalpy (D) entropy

18. The fibre with density less than 1 g/cm^3 is

(A) Poly propylene (B) Nylon 6

(C) Nylon 6,6 (D) Nylon 6,10

19. Which one of the following is correctly matched ?

P. Thermo-set resin	1. Closed mould process
Q. Compression moulding	2. Open mould process
R. Filament winding	3. Good control of reinforcement orientation
S. Vacuum bag moulding	4. Expoxy

(A) P-3, Q-1, R-2, S-4 (B) P-2, Q-4, R-3, S-1

(C) P-1, Q-4, R-2, S-3 (D) P-4, Q-1, R-2, S-3

20. Identify the non-woven fabric production techniques based on the typical features observed under stereo microscope.

Feature : The fiber layer is bound with fiber strand.

(A) Bonding with adhesives (B) Bonding with bi-component fibers

(C) Web stitching technique (D) Needling technique

21. Assertion-Reason Type :

Consider the following statement :

Assertion (A) : Finisher draw frame is considered as the important intermediate stage for controlling count variation in yarn.

Reason (R) : Very high draft is given.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

22. The objective of pre comber draw frame is

(A) to get even number of passages in comber preparatory.

(B) for parallelization of fibres during comber preparatory.

(C) to feed fibres with trailing hooks to comber.

(D) for both (A) and (B)

23. If the actual draft in a card is 90, and the mechanical draft is 85, the waste % extracted by the card will be

(A) 5.0% (B) 5.5%

(C) 6.0% (D) 3.0%

24. Which one of the following is correctly matched ?

P. High drafting force	1. Low roller pressure
Q. Periodic variation	2. Short fibers
R. Drafting wave	3. Spin finish
S. Roller slip	4. Eccentric roller

(A) P-2, Q-3, R-4, S-1 (B) P-4, Q-1, R-3, S-2

(C) P-3, Q-4, R-2, S-1 (D) P-1, Q-3, R-2, S-4

25. The main purpose of mixing a large number of bales is to

(A) produce a stronger yarn (B) get consistent yarn quality

(C) reduce waste (D) improve cleaning efficiency

26. Which one of the following is the coarse cleaning machines kept at initial stages of blow room line for processing 5% trash cotton ?

(A) Axioflow cleaner (B) ERM cleaner

(C) Krishner Beater (D) Hopper feeder

27. Determine the cleaning efficiency of blow room line consisting of three machines with individual cleaning efficiency of 30%, 35%, 30%.

(A) $(0.3 \times 0.35 \times 0.3) \times 100$ (B) $[0.7 \times 0.65 \times 0.7] \times 100$

(C) $[1 - (0.7 \times 0.65 \times 0.7)] \times 100$ (D) $[1 - (0.3 \times 0.35 \times 0.3)] \times 100$

28. In carding machine, carding action takes place between _____ and _____.

(A) Licker-in and cylinder (B) Feed roller and Licker-in

(C) Cylinder and Flats (D) Doffer and stripping roller

29. Attenuation refers to

(A) Reduction in linear density (B) Reduction in evenness

(C) Increase in linear density (D) Increase in evenness

30. The total draft given in the comber preparatory is

(A) 4 to 6 (B) 7 to 9

(C) 10 to 12 (D) 13 to 15

31. Match the machine component with their primary functions.

P. Pressure bar	1. Cleaning Card Web
Q. Crushing roller	2. Removing Trash
R. Mote knife	3. Improving Evenness
S. Auto leveller	4. Controlling short fibers

(A) P-4, Q-1, R-2, S-3 (B) P-2, Q-1, R-3, S-4

(C) P-2, Q-1, R-4, S-3 (D) P-3, Q-2, R-3, S-1

32. A comber lap has a linear density of 60 K tex. If 20% noil is extracted, what would be the linear density of web delivered from single head ?

(A) 40 K tex (B) 48 K tex

(C) 50 K tex (D) 54 K tex

33. Twist multiplier is a better indicator of twist characteristics of yarn, than turns per unit length, because

(A) TM is directly proportional to the tangent of twist angle.

(B) TM describes level of twist in yarn irrespective of linear density.

(C) TM is related to both (A) and (B).

(D) TM is not related to both the above characters.

34. The draft between cylinder and doffer in a carding machine is

(A) less than one (B) more than one

(C) 100 (D) 10

35. _____ hooks are preferably fed for combing.

(A) Trailing (B) Leading

(C) Double sided (D) Trailing and leading

36. Match the following :

Set – I	Set – II
a. Bottom apron	i. Cradle
b. Traverse motion	ii. Avoid channeling
c. Anti wedge ring	iii. Nose bar
d. ABC ring	iv. Elliptical traveller
	v. Balloon control

(A) a-ii, b-iii, c-iv, d-v (B) a-i, b-v, c-ii, d-iii

(C) a-iii, b-ii, c-iv, d-v (D) a-v, b-ii, c-iii, d-iv

37. Plying of single yarns results in

(A) reduction in tenacity
(B) reduction in hairiness
(C) reduction in lustre
(D) reduction in regularity

38. Principle of SIRO spinning

(A) Lubricating the fibres at drafting zone
(B) Using false twister just above the lappet eye
(C) Drafting two rovings in a single drafting position at some distance apart and twisting them into a single yarn.
(D) Introducing a filament into the yarn at the front roller.

39. If two ply yarn count is 18 Ne and the contraction due to doubling is 10%, what will be the count of single yarn ?

(A) 18 Ne
(B) 36 Ne
(C) 40 Ne
(D) 33 Ne

40. The overhang of front top roller _____ of the spinning triangle.

(A) widens the width
(B) increases the height
(C) shortens the height
(D) reduces the width

41. Which of the following combination strongly influence the balloon tension ?

(i) Bobbin diameter
(ii) Balloon height
(iii) Spinning triangle
(iv) Traveller speed

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

42. In ring spinning, the traveller rpm is

(A) equal to spindle rpm
(B) higher than spindle rpm
(C) lower than spindle rpm
(D) no relation at all

43. Consider the following statements with reference to compact spinning vis-à-vis ring spinning :

P. The size of the spinning triangle is smaller.
Q. The yarn hairiness is lower.
R. The draft is higher.
S. The imperfections is higher.

The correct set of statement is

(A) P, Q
(B) Q, R
(C) R, S
(D) P, S

44. Which one of the following is correctly matched ?

P. Air-jet spun yarn	1. Highest bending rigidity
Q. Rotor spun yarn	2. Strongest
R. Friction spun yarn (Dref-3)	3. Core-sheath
S. Ring spun yarn	4. Very good evenness

(A) P-3, Q-2, R-4, S-1 (B) P-4, Q-2, R-1, S-3
(C) P-1, Q-4, R-3, S-2 (D) P-2, Q-4, R-1, S-3

45. Sewing thread require final finishing as
(i) a protective coating against abrasion.
(ii) the appearance characteristics desired in final seam.
(iii) the frictional characteristics required for satisfactory sewing.
(iv) protection against heat generated during sewing.
(A) (i), (iii) are only correct. (B) (ii), (iii) are only correct.
(C) (iii), (iv) are only correct. (D) (iv) all statements are correct.

46. Wrapper fibre percentage in rotor yarn depends on
(A) design and speed of opening roller
(B) length of the binding zone
(C) ratio of fibre length to the rotor circumference
(D) both (B) and (C)

47. Which of the following new spinning systems is not working on the principle of "open end spinning" ?
(A) Air vortex spinning (B) Air jet spinning
(C) Friction spinning (D) Rotor spinning

48. During rotor spinning the twist level will be maximum at
(A) Fibre entry to rotor (B) Fibre deposition in the rotor groove
(C) Yarn arm inside the rotor (D) Yarn outside the navel

49. Choose the "True" statements :
(i) The rotor speed can be increased with increase in rotor diameter.
(ii) Rotor spun yarn is relatively evener than its equivalent ring spun yarn.
(iii) Rotor spun yarns are relatively weaker than the corresponding ring spun yarns.
(A) (i) and (ii) only (B) (i) and (iii) only
(C) (ii) and (iii) only (D) (i), (ii) and (iii)

50. Presser bar is used in _____ machine to control floating fibres in the drafting zone.
(A) Ring frame (B) Speed frame
(C) Draw frame (D) Card

51. **Assertion (A) :** Rotor Spun Yarn has three part structure – density packed one in the core, loosely packed fibers twisted around the core and wrapper fibers outside.

Reason (R) : Because fibers have some freedom of movement during twisting, the outer fiber tend to slip more than core fibers.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

52. Consider the following statement with reference to the properties of rotor spun yarn with equivalent ring spun yarn :

P. Breaking strength is lower.

Q. Snarling tendency is lower.

R. Bending rigidity is higher.

S. Uniformity is higher.

(A) P, Q (B) Q, R

(C) P, Q, R, S (D) P, S

53. The yarn manufacturing technologies arranged in ascending order with respect to twisting potential per unit time.

The correct set is

(A) Ring, Friction, Rotor, Jet (B) Rotor, Ring, Jet, Friction

(C) Ring, Rotor, Jet, Friction (D) Rotor, Friction, Ring, Jet

54. In double nozzle air-jet spinning system

(A) Both the nozzles rotates in clockwise direction.

(B) Both the nozzles rotates in anticlockwise direction.

(C) First nozzle rotates in clockwise and second nozzle rotates in anticlockwise.

(D) Both nozzles do not rotate.

55. The packing density of which yarn is lowest ?

(A) Ring yarn (B) Compact yarn

(C) Air-jet yarn (D) Friction spun yarn

56. Warping breakage rate in a super speed warper of a modern mill is of the order of

(A) 10 breaks / million metres warped

(B) 1 break / million metres warped

(C) 1 break / 400 end / 1000 metre

(D) 10 breaks / 400 end / 1000 metre

57. Length of yarn in a bunch on a pirn of automatic loom approximately equals

(A) Reed width
(B) 3-4 times reed width
(C) 6 times reed width
(D) none of the above

58. In beam warping, the warping tension is higher for those ends coming from

(A) Front of the 'V' creel
(B) Middle of the 'V' creel
(C) Back of the 'V' creel
(D) None of the above

59. The clearing efficiency that could be obtained in an electronic clearer

(A) 70 – 100%
(B) 10 – 15%
(C) 30 – 40%
(D) 15 – 30%

60. Role of anti-kinking device in winding

(A) To eliminate static charge accumulation.
(B) To eliminate breakage at cone nose.
(C) To eliminate snarls before yarn clearer.
(D) To eliminate ballooning effect during winding.

61. The primary preparatory process for forming woven and knitting fabrics is

(A) Cone winding
(B) Warping
(C) Quill winding
(D) Cheese winding

62. The velocity of shuttle in conventional loom varies from

(A) 1 – 5 m/s
(B) 10 – 12 m/s
(C) 1 – 5 m/min
(D) 10 – 12 m/min

63. Match the following :

The size ingredients can be divided into four categories.

P.	Adhesives	1.	Water
Q.	Lubricant	2.	Mildew resistance
R.	Additives	3.	Waxes or animal fats
S.	Solvent	4.	Starches

(A) P-1, Q-2, R-3, S-4
(B) P-2, Q-3, R-4, S-1
(C) P-3, Q-4, R-1, S-2
(D) P-4, Q-3, R-2, S-1

64. Standard normal distribution will have mean and variance equal to

(A) 0, 1
(B) 1, 0
(C) 0, 0.5
(D) 0.5, 0.5

65. The yarn passage in a winding machine is as follows :

(A) unwinding zone, clearing zone, tensioning zone, winding zone

(B) unwinding zone, winding zone, clearing zone, tensioning zone

(C) unwinding zone, tensioning zone, winding zone, clearing zone

(D) unwinding zone, tensioning and clearing zone, winding zone

66. Increase in warp tension keeping other variables same will cause

(A) increase in crimp of both warp and weft

(B) increase in warp crimp but decrease in weft crimp

(C) decrease in warp crimp but increase in weft crimp

(D) decrease in crimp of both weft and warp

67. Single left single cylinder jacquard has _____ type of speed.

(A) centre closed

(B) bottom closed

(C) open

(D) all the above

68. Advantages of high sky eccentricity ratio

(i) It facilitates the passage of the shuttle.

(ii) It ensures more rigid loom frame.

(iii) It tends to increase the effectiveness of beat up.

(A) (i) and (ii) only

(B) (ii) and (iii) only

(C) (i) and (iii) only

(D) (i), (ii) and (iii)

69. For a given loom speed, the relative velocity of the healds will _____ if the period of dwell is increased.

(A) decrease

(B) increase

(C) increase initially and then decrease

(D) decrease initially and then increase

70. If the cross sectional area (A) of fibre is in cm^2 and the fibre density (e) in g/cm^3 the linear density (m tex) will be

(A) $A \times e \times 10^8$

(B) $A \times e \times 10^{-8}$

(C) $A \times e \times 10^6$

(D) $A \times e \times 10^{-6}$

71. Which one of the following is not a warp knit structure ?

(A) Marquisette

(B) Shark skin

(C) Tulle

(D) Bourrelet

72. If the linear density of a fibre is 200 m tex and its cross sectional area is 160 μm^2, what will be the linear density of a fibre of the same density but with a cross sectional area of 240 μm^2 ?

(A) 200 m tex
(B) 300 m tex
(C) 100 m tex
(D) 50 m tex

73. Le Coste knit structure is produced by the combination _____ stitches.

(A) Knit and float
(B) Tuck and float
(C) Knit, tuck and float
(D) Knit and tuck

74. Which one of the following fault is defined under short thick fault ?

(A) D_4
(B) G
(C) H
(D) I

75. Which one of the following techniques does not measure crystallanity of fibres ?

(A) Differential scanning calorimeter
(B) Infrared spectroscopy
(C) Density crystallinity
(D) Birefringence

76. To produce knit structure with wider, thicker and slightly less extensible nature _____ loop is preferred.

(A) Single 'U' loop
(B) Float loop
(C) Zig-zag loop
(D) Tuck loop

77. Role of take-up lever in sewing machine

(i) To supply extra thread during loop formation.
(ii) To take-up extra thread after interlocking with bobbin thread.
(iii) To maintain uniform yarn tension.

(A) (i) and (ii) only
(B) (ii) and (iii) only
(C) (i) and (iii) only
(D) (i), (ii) and (iii)

78. _____ attachment to sewing machine is capable of taking uniform gathered or pleated frills.

(A) Hammer foot
(B) Binder
(C) Ruffler
(D) Notcher

79. Spirality occurs in knitted fabric due to

(A) Yarn unevenness
(B) Residual torque in yarn
(C) Hairiness in yarn
(D) Objectionable faults in yarn

80. Lock knit fabric is basically a

(A) Warp knitted fabric
(B) Weft knitted circular fabric
(C) Weft knitted flat fabric
(D) Braided fabric

81. Match the following :

P. Dial	1. Purl
Q. Long and short needles	2. Rib
R. Double headed latch needle	3. Lock knit
S. Bearded needle	4. Interlock

(A) P-2, Q-4, R-1, S-3
(B) P-1, Q-3, R-2, S-4
(C) P-3, Q-2, R-3, S-4
(D) P-2, Q-3, R-1, S-4

82. Spirality is not influenced by the following factors ?

(A) Feeders
(B) Twist
(C) Needles
(D) Cam angle

83. In rib knitting machine the term delay timing denotes

(A) Cylinder needle reaches first at yarn feed point.
(B) Dial needle reaches first at yarn feed point.
(C) Cylinder needle reaches first at stitch point.
(D) Dial needle reaches first at stitch point.

84. Different stitching in warp knitting is effected by the movement of

(A) needle bar
(B) sinker bar
(C) presser bar
(D) guide bar

85. The product of the following gives the areal density of the weft knitted fabric :

(i) Stitch density
(ii) Stitch length
(iii) Course per inch
(iv) Yarn tex
(A) (i), (ii), (iii)
(B) (i), (ii), (iv)
(C) (i), (ii)
(D) (ii), (iii)

86. Souring chemical preferred for calcium hypochlorite bleached material

(A) Sulphurous acid
(B) Sulphuric acid
(C) Hydrochloric acid
(D) Nitric acid

87. Choose "TRUE" statements from the following :

(i) In scouring, proteins are hydrolysed into insoluble products.

(ii) Knitted fabrics are scoured under mild processing conditions.

(iii) Hydrogen peroxide is universal bleaching agent.

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

88. Choose "TRUE" statements from the following :

(i) Vat dyes possess good fastness to washing.

(ii) Sulphur dyes are called as ice dyes.

(iii) When acid dyes are dissolved in water it produces coloured negative ions.

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

89. Choose "TRUE" statements from the following :

(i) Vigoureaux effects can be produced by blending dyed and undyed fibres.

(ii) Fabric intended to be printed in polychromatic dyeing method must be highly absorbent.

(iii) In printing, lower limit of viscosity is determined by process conditions and sharp printing.

(A) (i) and (ii) only (B) (ii) and (iii) only

(C) (i) and (iii) only (D) (i), (ii) and (iii)

90. _____ is a process to eliminate cockling, crow foot pattern and uneven shrinkage in woollen fabrics.

(A) Crabbing (B) Calendering

(C) Surging (D) Schreinering

91. The principal objective of cotton scouring is to

(A) increase whiteness

(B) decrease trash content

(C) increase absorbency

(D) remove deeply embedded proteneous matter

92. Match the following :

P. Crease recovery angle	1. Bleaching
Q. Bending length	2. Wash-n-wear finish
R. Wetting time	3. Scouring
S. Whiteness	4. Stiffening

(A) P-4, Q-3, R-2, S-1 (B) P-3, Q-4, R-1, S-2

(C) P-2, Q-4, R-3, S-1 (D) P-1, Q-4, R-3, S-2

93. The anionic dyes are commonly applied on

(A) Cotton (B) Polypropylene

(C) Polyester (D) Polyethylene

94. **Assertion (A) :** Despite weak dye-fiber interaction, vat dye shows extremely good wash fastness on cotton, because of

Reason (R) : Water insolubility of dye and dye aggregation.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

95. Acid dyes are held by nylon fiber by

(A) Vander Waal's forces (B) Covalent bonds

(C) Electrovalent bonds (D) Co-ordinate bonds

96. If 2.5 coils laid on package of core winding machine per double traverse, the traverse ratio is

(A) 5/2 (B) 7.5/3

(C) 5 (D) 7.5

97. In AFIS Tester, for measuring neps _____ principle is used.

(A) Capacitance (B) Optical / Photoelectric

(C) Interference (D) Inductance

98. Match the following :

Set – I	Set – II
i. Stelometer	a. Surface knots on fabric
ii. Pilling	b. Periodic faults
iii. Spectrogram	c. CRL
iv. Hairiness	d. Optical

(A) i-c, ii-a, iii-b, iv-d (B) i-b, ii-c, iii-a, iv-d

(C) i-d, ii-a, iii-c, iv-b (D) i-a, ii-d, iii-b, iv-c

99. Which one of the following fibres can be produced using melt spinning technology ?

(A) Viscose (B) Lyocell

(C) Cuprammonium rayon (D) Polyacrylonitrile

100. Spontaneous wetting depends on

(A) Capillary sorption (B) Work of adhesion

(C) Interfacial energy (D) Work of cohesion

101. Identify correct relation for index of irregularity (I), where V denotes actual irregularity and V_r denotes calculated limit irregularity.

(A) $IV_r = V$ (B) $IV = V_r$

(C) $IV = V_r \times 100$ (D) $I = (V + V_r) \times 100$

102. The number of faults per kilometre in a yarn follows Poisson distribution with mean n. The standard deviation would be

(A) n (B) $\sqrt{n}$

(C) n^2 (D) 2n

103. Match the following :

P. Lea Tester	1. Uniformity ratio
Q. Classimat faults	2. Periodic variation
R. Fibro graph	3. Objectionable fault
S. Spectrometer	4. Yarn tensile strength

(A) P-4, Q-3, R-1, S-2 (B) P-3, Q-4, R-2, S-1

(C) P-1, Q-4, R-3, S-2 (D) P-2, Q-3, R-4, S-1

104. The CV% of mass irregularity of yarn, generally equal U% multiplied by _____ when the deviation from mean are of random nature.

(A) 1.00 (B) 1.25

(C) 1.40 (D) 1.82

105. The unit of flexural rigidity of a woven fabric is

(A) mN/mm^2 (B) mN/mm

(C) mN mm (D) $mN\ mm^2$

106. The idealised helical yarn structure is assumed to be made up of very large no. of

(A) Fibres (B) Filaments

(C) Fibres and Filaments (D) None of the above

107. Twist multiplier for cotton hosiery yarn

(A) 2.8 – 3.1 (B) 3.2 – 3.6

(C) 4.0 – 4.5 (D) 5.0 – 5.5

108. Contraction factor is given by

(A) $\frac{\text{length of zero twist yarn}}{\text{length of twisted yarn}}$ (B) $\frac{\text{length of twisted yarn}}{\text{length of zero twist yarn}}$

(C) $\left(\frac{\text{length of zero twist yarn}}{\text{length of twisted yarn}}\right)^2$ (D) $\left(\frac{\text{length of twisted yarn}}{\text{length of zero twist yarn}}\right)^2$

109. Contraction factor for a twist angle of 30°

(A) 1.032 (B) 1.078

(C) 1.153 (D) 1.278

110. In ideal migration condition, mean fibre position for a twist angle ranging from 0 – 50° is

(A) 0.5 (B) 0.2

(C) 0.3 (D) 0.7

111. The number of fibre in the cross-section of 20 tex yarn produced from 1.2 diner fiber is

(A) $\frac{20}{1.2}$ (B) $\frac{20}{9 \times 1.2}$

(C) $\frac{20 \times 9}{1.2}$ (D) $\frac{1.2 \times 9}{20}$

112. Match the most appropriate pairs :

P. Tenacity	1. CN mm^2
Q. Bending Rigidity	2. mm
R. Curvature	3. CN/Tex
S. Elongation	4. mm^{-1}

(A) P-3, Q-4, R-1, S-2 (B) P-3, Q-1, R-4, S-2

(C) P-2, Q-3, R-4, S-1 (D) P-2, Q-3, R-1, S-4

113. The number of fibers in the cross-section of a 20 Ne Cotton Yarn would be approximately

(A) 50 (B) 150

(C) 240 (D) 360

114. The coarser fibers preferentially migrate

(A) to the surface of the yarn (B) to the core of the yarn

(C) at random (D) no relation at all

115. The value of retraction for twist angle 10° – 50° lies in the range of

(A) 0 to 0.3 (B) 1 to 1.3

(C) 2 to 2.3 (D) 1 to ∞

116. Fraction of the total area covered by the fabric is given by

(A) $k_1 + k_2 + 28$

(B) $k_1 + k_2 - \frac{k_1 k_2}{28}$

(C) $(k_1 + k_2)^2 - k_1 k_2 \times 28$

(D) $(k_1 + k_2) + \frac{k_1 k_2}{28}$

Where k_1 – warp cover

k_2 – weft cover

117. "Tightness" of a fabric can be determined by

(A) Actual cover factor / Max. cover factor

(B) Max. cover factor / Actual cover factor

(C) (Max. cover factor / Actual cover factor)^2

(D) (Actual cover factor / Max. cover factor)^2

118. Among the following yarn types the specific volume is highest for

(A) spun rayon

(B) cotton

(C) worsted

(D) woollen

119. In woven fabric tensile deformation, initial high modulus of the fabric is due to

(A) frictional resistance to bending of the threads

(B) force needed to unbend the threads

(C) crimp redistribution

(D) (B) and (C)

120. In knitted fabrics, relation between stitch density and stitch length is given by

(A) Stitch density $\propto C l^2$

(B) Stitch density $\propto \frac{c}{l^2}$

(C) Stitch density $\propto \frac{1}{l^2}$

(D) Stitch density $\propto l^2$

121. Which clutch cannot be used for transferring power when the machine elements are running at high speeds ?

(A) Jaw clutch

(B) Flat friction clutch

(C) Conical friction clutch

(D) Centrifugal clutch

122. Internal expanding brake is mainly used in

(A) Lap forming machine

(B) Ring frame

(C) Speed frame

(D) Both (B) & (C)

123. Ball bearings are mainly used in

(A) Blowroom beaters (B) Carding machine

(C) Speed frame (D) All the above

124. Select the correct relationship in the case of bobbin lead mechanism of winding at speed frame.

(A) Winding rate = $\pi \times d_B \times (N_f - N_B)$

(B) Winding rate = $\pi \times d_B \times (N_B - N_f)$

(C) Winding rate = $\pi \times d_B \times (N_B + N_f)$

(D) Winding rate = $\pi \times d_B \left(\frac{N_B}{N_f}\right)$

Where d_B is diameter of bobbin

N_B is bobbin speed

N_f is flyer speed

125. In ½ Twill shedding cam the Lower Dwell Angle is

(A) 80° (B) 160°

(C) 40° (D) 120°

126. The contact angle for the super hydrophobic surface is

(A) 60° (B) 30°

(C) 100° (D) 160°

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

(A) 0.405 (B) 4.050

(C) 4.500 (D) 4500

128. Match the pairs

P. Capillary rise	1. Air permeability
Q. Number of interlacement / unit area	2. Tensile strength
R. Cover factor	3. Drapeability
S. Bending length	4. Wicking

(A) P-2, Q-3, R-4, S-1 (B) P-3, Q-4, R-1, S-2

(C) P-4, Q-2, R-1, S-3 (D) P-2, Q-4, R-3, S-1

129. The fibre with negative birefringence is

(A) polyester (B) acrylic

(C) nylon 6 (D) nylon 6,6

130. Bursting strength is normally carried out for

(A) Woven fabrics (B) Non-woven fabrics

(C) Knitted fabrics (D) Braided fabrics

131. Purpose of full annealing is

(A) To soften the steel (B) To increase hardness

(C) To remove dislocations (D) To enable it to cut other metals

132. Surface hardening is generally given to

(A) Rings (B) Spindle blade

(C) Roller Stand (D) All the above

133. The factor of safety (f_s) in designing any machine component is

(A) $f_s = \frac{\text{Failure stress}}{\text{Allowable stress}}$ (B) $f_s = \frac{\text{Working load}}{\text{Failure load}}$

(C) $f_s = \frac{\text{Allowable stress}}{\text{Failure stress}}$ (D) $f_s = \frac{1 - \text{Failure load}}{\text{Working load}}$

134. Which one of the following does not fall under hardening treatment ?

(A) Nitriding (B) Carburizing

(C) Carbo nitriding (D) Cyrogenics

135. Local hardening can be carried out by

(A) Cyrogenics (B) Flame hardening

(C) Carburising (D) Cyaniding

136. In an _____ system, there is relative motion between two or more of the axes about which the gear wheel rotates.

(A) Worm gear (B) Rack and pinion

(C) Epicyclic gear (D) Belt drive

137. Match the following :

P. Negative Cam	1. Intermittent rotary motion
Q. Cylindrical Cam	2. Periodic motion
R. Positive Cam	3. Transverse motion
S. Ratchet & Pawl Mechanism	4. Controlled upward motion

(A) P-2, Q-3, R-4, S-1 (B) P-3, Q-4, R-1, S-2

(C) P-1, Q-4, R-3, S-2 (D) P-4, Q-3, R-2, S-1

138. _____ is used to transmit rotary motion between non-parallel and non-intersecting shafts.

(A) Worm & worm gear
(B) Spur gear
(C) Helical gear
(D) Herringbone gear

139. In a simple gear train, the direction of rotation of the last wheel will be opposite to that of the first wheel, if the number of intermediate wheel is

(A) 1
(B) 2
(C) 3
(D) 5

140. The shore hardness of back top roller of ring frame for processing 100% cotton is

(A) 23
(B) 36
(C) 80
(D) 93

141. Determine the combined cleaning efficiency of blow room & card, if the cleaning efficiency of blow room is 65% and the card is 95%.

(A) 90.25
(B) 93.25
(C) 98.25
(D) 99.99

142. The type of flutes made on the front, middle and back bottom rollers of ring frame drafting system are respectively

(A) helical, helical, helical
(B) helical, knurled, helical
(C) knurled, helical, knurled
(D) helical, knurled, knurled

143. Maximum flyer speed of speed frame is

(A) 400 rpm
(B) 1400 rpm
(C) 2500 rpm
(D) 3800 rpm

144. Load applied to the front top roller of three roller drafting system of ring frame is

(A) 10 – 12 kg
(B) 12 – 14 kg
(C) 16 – 18 kg
(D) 20 kg

145. Which one of the following is not the function of draw frame ?

(A) blending
(B) hook removal
(C) fibre to fibre separation
(D) fibre parallelisation

146. **Assertion (A) :** The raw material containing high level of particular impurities can be removed at blow room, by combining chemical and mechanical cleaning.

Reason (R) : The chemical will degrade the physical properties of the impurities and later they can be removed mechanically at blow room.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) and (R) are false.

147. Match the following :

P. Ring spinning	1. Metal detector
Q. Compact spinning	2. Polar drafting system
R. Blow room	3. Air suction
S. Draw frame	4. Double apron drafting system

(A) P-4, Q-3, R-1, S-2 (B) P-2, Q-3, R-4, S-1

(C) P-3, Q-4, R-2, S-1 (D) P-1, Q-4, R-3, S-2

148. Fiber properties affect the machine operation as

(i) Longer fibers with close machine setting are likely to get ruptured.

(ii) Immature fibers with close tooth surfaces are likely to produce neps.

(iii) Short fibers with longer roller settings are likely to produce unevenness.

(iv) Fiber fineness affect the processing performance.

(A) (i) is true (B) (i), (ii) are true

(C) (i), (ii), (iii) are true (D) All are true

149. The maximum traveller speed is about

(A) 40 m/s (B) 40 m/min

(C) 40 inches/sec (D) 40 inches/min

150. Which one of the following material is not used for making rings ?

(A) Case harden steel (B) Nitrided steel

(C) Ball bearings steel (D) Cast iron

151. Which of the following is not related to method study ?

(A) Flow process chart (B) Multiple activity chart

(C) String diagram (D) Stop watch method

152. Stages involved in motion study

(A) Process analysis (B) Operation analysis

(C) Activity sampling (D) (A) & (B)

153. To study micro-motion _____ is used.

(A) Wink clock (B) Process chart

(C) Flow diagram (D) Stop watch

154. Find the odd-one out.

(A) Flow diagram (B) String diagram

(C) Simo chart (D) Cycle graph

155. Which one of the following is not a prime cost ?

(A) Material cost (B) Labour cost

(C) Office and administration cost (D) Direct expenses

156. **Assertion (A) :** In spinning, the air currents are used for the removal of trash particles.
Reason (R) : The trash particles are removed by an imbalance of centrifugal and aerodynamic forces of the particle.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

157. Match the following :

P. Air quality	1. Excess number of relay nozzles
Q. Fasciated yarn	2. Dew point below 10 °C
R. Decrease in air velocity	3. Increase in air tube length
S. Weft stop	4. Air-jet twister

(A) P-3, Q-4, R-1, S-2 (B) P-2, Q-4, R-1, S-3

(C) P-2, Q-4, R-3, S-1 (D) P-1, Q-3, R-2, S-4

158. Choose the best :

Air-jet looms has the major advantage of

(A) its ability to weave a wide range of fabric with weft insertion rate of about 2000 m/min.

(B) its low noise level compared to conventional method of weft insertion.

(C) less floor space as it does not require any support for weft insertion.

(D) using spun yarn ranging from gauze to denim fabrics.

159. Capacity of air-jet compressor in air-jet looms is decided by

(i) Consumption of air in each loom.

(ii) Leakage and pressure loss in piping.

(iii) Actual exhaust capacity of the compressor.

(iv) Exact capacity of the air compressor.

(A) (i) is true. (B) (i), (ii) are true.

(C) (i), (ii), (iii) are true. (D) All are true

160. If there exists lot of confusion in the flow of cut pieces of garments in the assembly section, what is the technique to be resorted for correction ?

(A) Snap study
(B) Work measurement
(C) Motion analysis
(D) Flow chart analysis

161. Factors influencing cleaning efficiency air blow room

(A) Trash in mixing
(B) Beater speed
(C) Fan speed
(D) All the above

162. In a carding machine, wire point density is higher for

(A) Cylinder
(B) Doffer
(C) Licker-in
(D) Flats

163. Factors influencing productivity at pirn winding

(A) Spindle stoppages
(B) Efficiency of tenter
(C) Non-availability of empty pirns
(D) All the above

164. Sources of process waste in loom shed

(A) shuttle smash
(B) mending of broken ends
(C) change of pirns
(D) (B) & (C)

165. Bio-scowing is carried out using

(A) amylase
(B) pectinase
(C) catalase
(D) cellulase

166. Work study is a generic term for method study and work measurement.

(i) used in the examination of human work in all its context.
(ii) lead systematically to the investigation of all factors.
(iii) the efficiency and economy of the situation are being reviewed.
(iv) it is used to effect improvement.

(A) (i) is true
(B) (i), (ii) are true
(C) (i), (ii) and (iii) are true
(D) All are true

167. **Assertion (A) :** Work measurement is applied only after method study as work measurement is the subsequent establishment of time standard for the operation determined by method study.

Reason (R) : Method study is concerned with the elimination of unnecessary work content of a job.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(C) (A) is true, but (R) is false.
(D) (A) is false, but (R) is true.

168. In the process chart, match the symbols with events :

P.	Operation	(i)	□
Q.	Storage	(ii)	○
R.	Delay or temporary storage	(iii)	D
S.	Inspection	(iv)	Δ

(A) P-(ii), Q-(i), R-(iii), S-(iv) (B) P-(ii), Q-(iv), R-(i), S-(iii)

(C) P-(ii), Q-(iv), R-(iii), S-(i) (D) P-(ii), Q-(iii), R-(iv), S-(i)

169. Sequencing Type :

The basic procedure for method study

(A) Select, record, develop, examine, install, maintain

(B) Select, record, examine, install, develop, maintain

(C) Select, record, examine, develop, install, maintain

(D) Select, record, examine, develop, maintain, install

170. Productivity is defined as

(A) the ratio of output produced to the input resources utilised in the production.

(B) improving the quality and reducing the wastage.

(C) reducing the cost of production.

(D) reduce the power consumption.

171. Benefits of higher productivity are

(i) more output is produced with same or less input.

(ii) the same output is produced with same input.

(iii) less output is produced from more input.

(iv) increase in output is more than increase in input.

(A) (i) is only true (B) (ii) and (iii) are true

(C) All are true (D) (i) and (iv) are true

172. **Assertion (A) :** Besides, satisfactory quality of preparation, the process control programme in winding should also ensure a satisfactory level of productivity.

Reason (R) : Some of the important factors that govern productivity in winding are end breakage rate, the length of the yarn in cop, the winding speed etc.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

173. 'Cross bar' fabric defect is occurred due to

(A) missing of warp
(B) cut ends
(C) wrong ends
(D) blend variation of fibres in the yarn

174. Maintenance checks are carried out while the machine is in operation in _____ type of maintenance.

(A) Corrective
(B) Predictive
(C) Retentive
(D) Remedial

175. **Assertion (A) :** "Machinery Audit" is generally carried out in textile mills to examine the mechanical condition of the various process machinery.

Reason (R) : For enhancing the machine productivity and product.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true, and (R) is not the correct explanation of (A).
(C) (A) is true, but (R) is false.
(D) (A) is false, but (R) is true.

176. The closest setting in carding machine is in between

(A) licker-in and cylinder
(B) cylinder and flat
(C) cylinder and doffer
(D) feed plate and licker-in

177. Which of the following are warp protector mechanisms ?

(A) Fast reed
(B) Drop wire warp stop
(C) Side sweep weft feeler mechanism
(D) Both (A) and (B)

178. Overhead travelling cleaners in ring frame has the following faculty :

(A) Blowing only
(B) Suction only
(C) Blowing and Suction
(D) Wiping only

179. The lubricating oil or grease is not used at

(A) Spur gears of drafting arrangement
(B) Jockey pulley
(C) Spindles
(D) Rings

180. Pick out the odd one :

(A) Machine card
(B) Maintenance checklist
(C) Renovation
(D) End breakage report

181. Within lap cv% of blow room lap should be within _____.
(A) 1% (B) 2%
(C) 3% (D) 4%

182. Limiting oxygen index value is higher for
(A) Polyester (B) Polyethylene
(C) Cotton (D) Wool

183. Biopolishing is carried out using _____ enzyme.
(A) amylase (B) cellulase
(C) catalase (D) lipase

184. Which one of the following is not starch based size formulation ?
(A) Sago (B) Maize
(C) Potato (D) CMC

185. Spectrogram is drawn between
(A) Wavelength in X axis and amplitude in Y axis
(B) Amplitude in X axis and wavelength in Y axis
(C) Frequency in X axis and wavelength in Y axis
(D) Diameter in X axis and wavelength in Y axis

186. Which one of the following is not related to roller cots ?
(A) Berkolisation (B) Buffing
(C) Trucing (D) Acid treatment

187. Berkolising is a treatment associated with
(A) Ring (B) Traveller
(C) Flyer (D) Cots

188. For the production of 100% cotton yarn, the hardness of front roller cot is
(A) more than that of back roller. (B) less than that of back roller.
(C) equal to that of back roller. (D) Irrelevant.

189. In Ring Frame middle bottom roller that carries apron has
(A) Straight flutes (B) Helical flutes
(C) Knurled flutes (D) Plain surface

190. The parabolic speed pattern in ring frame could be obtained with the use of
(A) Dual drive motor (B) Step pulley drive
(C) Frequency controlled drive motor (D) Energy saving motor

191. Which one of the following is used to test the quality of grease ?

(A) acid number
(B) volatility
(C) dropping point
(D) viscosity index

192. The RH% required at Ring Frame Section is

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

193. The solar protection factor is higher for

(A) Cotton fibre
(B) Jute fibre
(C) Hemp fibre
(D) Wool fibre

194. The fibre that will float in water

(A) Polypropylene
(B) Nylon 6
(C) Nylon 6,6
(D) PET

195. The light intensity in lumens/ft^2 for weaving department ranges from

(A) 10 to 20
(B) 30 to 40
(C) 60 to 80
(D) 80 to 100

196. R.H. % suitable for warping

(A) 45%
(B) 60%
(C) 70%
(D) 85%

197. In _____ layout similar machines or similar operations are kept at one location.

(A) process layout
(B) product layout
(C) line layout
(D) none of the above

198. Ergonomics refers to

(A) Scientific study of design of experiments
(B) Study of plant layout
(C) Study of plant location
(D) Scientific study of relationship between man and his working environment

199. Factors affecting selection of material handling equipments

(A) Nature of handling devices
(B) Effective use of labour
(C) Manufacturing cycle
(D) All the above

200. Desirable lighting level in a weaving shed for grey cloth weaving

(A) 40 lumens/ft^2
(B) 55 lumens/ft^2
(C) 80 lumens/ft^2
(D) 100 lumens/ft^2