

Booklet Series

ARegister
Number**2008****TEXTILE ENGINEERING****Time Allowed : 3 Hours]****[Maximum Marks : 300****Read the following instructions carefully before you begin to answer the questions.****IMPORTANT INSTRUCTIONS**

- 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.
- This Question Booklet contains **200** questions.
- Answer **all** questions.
- All** questions carry equal marks.
- The Test Booklet is printed in *four* series e.g. A B C or D (See Top left side of this page): The candidate has to indicate in the space provided in the Answer Sheet the series of the booklet. For example, if the candidate gets A series booklet, he/she has to indicate in the side 2 of the Answer Sheet with Blue or Black Ink Ball point pen as follows :

<input type="checkbox"/> A	<input checked="" type="checkbox"/>	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D
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- 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.
- An Answer Sheet will be supplied to you separately by the invigilator to mark the answers. You must write your Name, Register No. and other particulars on side 1 of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
- You will also encode your Register Number, Subject Code 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.
- 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.
- 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 :

<input type="checkbox"/> A	<input checked="" type="checkbox"/>	<input type="checkbox"/> C	<input type="checkbox"/> D
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- 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.
- Do not tick-mark or mark the answers in the Question Booklet.

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1. The speed at which POY (PET) is produced is
 - A) 100 m / min
 - B) 6000 m / min
 - C) 3000 m / min
 - D) 4500 m / min.
2. Polystyrene cannot be made into fibre because
 - A) it is amorphous
 - B) it is linear
 - C) it is semi-crystalline
 - D) it is crystalline.
3. Glass transition temperature (T_g) is reaction.
 - A) endothermic
 - B) exothermic
 - C) partially exothermic
 - D) partially endothermic.
4. The crystallinity % of polypropylene fibre is
 - A) 6%
 - B) 75%
 - C) 25%
 - D) 50%.
5. The fibre with negative birefringence is
 - A) PET
 - B) nylon-6
 - C) nylon-66
 - D) acrylic.
6. The precursor for carbon fibre is
 - A) nylon-6
 - B) PET
 - C) acrylic
 - D) nylon-66.
7. The melt flow index of high molecular weight PP is
 - A) 3
 - B) 25
 - C) 30
 - D) 35.
8. is used as preferred catalyst for polymerisation of caprolactum.
 - A) Acid
 - B) Base
 - C) Water
 - D) Salt solution.

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9. The glass transition temperature of polypropylene is
- | | |
|------------|-------------|
| A) - 10° C | B) - 100° C |
| C) - 50° C | D) 10° C. |
10. The fibre that can be cold drawn is
- | | |
|------------|------------|
| A) nylon | B) PET |
| C) acrylic | D) Aramid. |
11. The relationship between molecular weight (MW) and DP (degree of polymerisation) in nylon-6 polymerisation is
- | | |
|------------------|-------------------|
| A) MW = 10 × DP | B) MW = 113 × DP |
| C) MW = 200 × DP | D) MW = 250 × DP. |
12. PET dissolves in
- | | |
|-------------------|-----------------|
| A) acetic acid | B) acrylic acid |
| C) o-chlorophenol | D) acetone. |
13. The length of screw in extruder is higher for
- | | |
|------------|-------------|
| A) nylon-6 | B) nylon-66 |
| C) PET | D) PP. |
14. The density of fibre is highest.
- | | |
|------------------|-----------------|
| A) polypropylene | B) polyethylene |
| C) nylon | D) cotton. |
15. Which one of the following is a fault produced in friction texturing ?
- | | |
|----------------|-------------------|
| A) Die swell | B) Draw resonance |
| C) Tight spots | D) Melt drips. |
16. The melting point of high performance polyethylene is
- | | |
|-----------|-----------|
| A) 150° C | B) 200° C |
| C) 10° C | D) 70° C. |
17. The fibre that is used for ballistic protection is
- | | |
|----------------------------------|----------------|
| A) carbon fibre | B) glass fibre |
| C) high performance polyethylene | D) PET fibre. |

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26. The definition of textile composite is
- A) a filament spun from two components
 - B) a material polymerised from two types of monomers
 - C) a matrix of resin reinforced by textile fibres, yarns or fabrics
 - D) a fabric woven from two different materials.
27. The yield % of carbon fibre is higher when fibre is used as precursor.
- A) acrylic
 - B) cotton
 - C) pitch
 - D) nylon.
28. Epoxy resins come under the category of
- A) thermoplastic
 - B) thermoset
 - C) oil soluble
 - D) protein substances.
29. The resin that is used for high temperature application is
- A) unsaturated PET resin
 - B) saturated PET resin
 - C) epoxy resin
 - D) thermoplastic resin.
30. The thermal stability of acrylic fibres is
- A) due to cyclisation of nitrile groups
 - B) due to its T_g
 - C) due to its T_c
 - D) due to the presence of comonomer.
31. The high strength of glass fibres is attributed to
- A) minimum flaws per unit length
 - B) high SiO_2 content
 - C) high MgO content
 - D) high Ca_2O content.
32. The specific strength of which fibre is highest ?
- A) PET
 - B) Nylon
 - C) Polypropylene
 - D) Glass.

33. Which one of the following techniques is used to calculate crystallinity and orientation of crystals in fibre ?
- A) Density
B) DSC
C) X-ray diffraction
D) Sonic modulus.
34. PET can be easily texturised because of
- A) high specific heat and high thermal conductivity
B) low specific heat and high thermal conductivity
C) low specific heat and low thermal conductivity
D) high specific heat and low thermal conductivity.
35. Which one of the following fibres can be steam set ?
- A) PET
B) Acrylic
C) Polypropylene
D) Polyethylene.
36. The delivery rate of modern high production card is upto about
- A) 10 m / min
B) 50 m / min
C) 250 m / min
D) 600 m / min.
37. Match **List I** with **List II** correctly and select your answer using the codes given below :

List I

- a) Card
b) Draw frame
c) Speed frame
d) Blowing room

List II

- 1) open loop autoleveller
2) planofeed regulation
3) closed loop autoleveller
4) bobbin lead mechanism

Codes :

- | | a | b | c | d |
|----|----------|----------|----------|----------|
| A) | 3 | 1 | 2 | 4 |
| B) | 3 | 4 | 1 | 2 |
| C) | 1 | 3 | 4 | 2 |
| D) | 3 | 1 | 4 | 2. |

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38. Fibres first reach the "Single fibre" state when they have been processed into
- A) blowing room lap
 - B) card sliver
 - C) first passage draw frame sliver
 - D) second passage draw frame sliver.
39. Combing efficiency is a measure of
- A) increase in 50% span length of fibre
 - B) increase in 2.5% span length of fibre
 - C) decrease in 50% span length of fibre
 - D) decrease in 2.5% span length of fibre.
40. Aprons are not used in the drafting system of
- A) ring frame
 - B) draw frame
 - C) speed frame
 - D) air jet spinning machine.
41. The nipl % removal at the comb increases with
- A) increase in feed/nip in forward feed
 - B) decrease in detaching distance
 - C) increase in feed / nip in backward feed
 - D) lower short fibre content in the feed lap.
42. The overall cleaning efficiency of blowing room having 3 machines with individual cleaning efficiencies of 25% , 30% and 25% is
- A) 80%
 - B) 20%
 - C) 61%
 - D) 53%.
43. During processing of cotton in the blowing room line, the neps present in the output compared to input
- A) increase by about 100%
 - B) decrease by about 50%
 - C) decrease by about 100%
 - D) decrease by about 75%.

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44. The amount of belt shift on the cone drum of speed frame builder motion per roving layer formation on bobbin is
- higher for coarser roving
 - lower for coarser roving
 - higher for finer roving
 - independent of fineness of roving.
45. The detaching roller of comber
- rotates in one direction intermittently
 - rotates in both directions intermittently
 - rotates in one direction continuously
 - does not rotate.
46. The trash present in the raw cotton is 5%. If the cleaning efficiency of blowing room line is 60% and card is 90%, the trash present in the card sliver is
- 0.2%
 - 0.1%
 - 0.75%
 - 0.4%
47. Which is the correct relationship, where P is waste % removed ?
- Draft = Attenuation $\times \frac{100}{100 - P}$
 - Attenuation = Draft $\times \frac{100}{100 - P}$
 - Attenuation = Draft $\times P$
 - Attenuation = $\frac{\text{Draft}}{P}$.
48. The carding angle, "the inclination of the leading face of the tooth to vertical" increases in the sequence of
- cylinder, licker-in, doffer
 - licker-in, cylinder, doffer
 - cylinder, doffer, licker-in
 - doffer, cylinder, licker-in.
49. The process sequence for comber preparatory is
- ribbon lap machine – sliver lap machine
 - draw frame – sliver lap machine – ribbon lap machine
 - draw frame – super lap forming machine
 - super lap forming machine – draw frame.

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50. The hank (N_e) of the draw frame output sliver for 8 numbers of feed having input sliver hank of 0.12 N_e and draft at the draw frame of 7.8 is

- A) 0.117 B) 0.120
C) 0.123 D) 0.126.

51. Consider the following statements :

The formation of drafting wave in the ring frame drafting can be reduced by

- I. proper selection of spacing between the aprons
II. proper selection of break draft
III. proper selection of roller settings

Of the statements :

- A) (I) alone is correct B) (I) and (II) are correct
C) all are correct D) (I) and (III) are correct.

52. Number of fibres in the cross-section of yarn of linear density 59 tex and spun using 4.0 micronaire fibre is

- A) 62 B) 75
C) 125 D) 375.

53. Select the odd one from the following :

- A) Low crown ring B) Orbit ring
C) Anti-wedge ring D) Double flange ring.

54. Running-in process is carried out when

- A) new rings are used B) new travellers are used
C) new spindles are used D) new ring cops are used.

55. The shore hardness of rubber coats of drafting top roller lies in the range of

- A) 10° to 30° B) 30° to 60°
C) 60° to 90° D) 90° to 100°.

56. The tube to ring diameter ratio has to be in which of the following limits to reduce yarn tension variations ?

- A) 1 : 2 to 1 : 2.2 B) 2 : 1 to 2.2 : 1
C) 1 : 1 to 1 : 1.2 D) 1 : 1.2 to 1 : 1.

57. In ring frame
- A) Winding speed = Spindle speed + Traveller speed
 - B) Winding speed = Traveller speed - Spindle speed
 - C) Winding speed = Spindle speed - Traveller speed
 - D) Winding speed = Spindle speed + Delivery rate.
58. The twist multiplier (in English count system) used while spinning the following yarns decreases in the sequence of
- A) Cotton carded yarn, Cotton combed yarn, Polyester yarn
 - B) Cotton combed yarn, Cotton carded yarn, Polyester yarn
 - C) Polyester yarn, Cotton carded yarn, Cotton combed yarn
 - D) Polyester yarn, Cotton combed yarn, Cotton carded yarn.
59. The limit unevenness (U_{lim}) for the yarn having 100 fibres in cross-section is approximately
- A) 8.0
 - B) 10.0
 - C) 0.8
 - D) 1.0.
60. Select the wrong statement (in ring frame) :
- A) Production per spindle shift of coarser yarn is higher than finer yarn
 - B) Production per spindle shift of combed yarn is higher than carded yarn for the same fibre and yarn fineness
 - C) Production per spindle shift of carded yarn is higher than combed yarn for the same fibre and yarn fineness
 - D) Production per spindle shift of hosiery yarn is higher than weaving yarn for the same fibre and yarn fineness.
61. Which one of the following elements does not give false twist effect ?
- A) Flyer cap in the flyer of speed frame
 - B) Twisting nozzle of air jet spinning machine
 - C) Navel of rotor spinning machine
 - D) Transport tube of rotor spinning machine.

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62. Berkolisation is the process done on
- A) rubber cots of top rollers of drafting system
 - B) aprons of drafting system
 - C) bottom fluted rollers of drafting system
 - D) spindles.
63. The maximum traveller speed in ring spinning system is about
- A) 40 m / min
 - B) 40 m / sec
 - C) 40 m / hour
 - D) 40 km / hour.
64. The winding tension on yarn in ring spinning system is not directly proportional to
- A) mass of the traveller
 - B) spindle speed
 - C) ring diameter
 - D) mass of ring tube.
65. Three 60 Ne single yarns are plied to produce a ply yarn. The resultant count of three-ply yarn is
- A) 30 Ne
 - B) 20 Ne
 - C) 60 Ne
 - D) 16.7 Ne.
66. The drafting force
- A) increases linearly with draft
 - B) decreases linearly with draft
 - C) initially increases with draft upto certain level, then decreases
 - D) initially decreases with draft upto certain level, then increases.
67. Which of the following systems is not working on open end spinning principle ?
- A) Rotor spinning
 - B) Electrostatic spinning
 - C) Bobtex ICS
 - D) DREF 2 spinning.

68. Superfine yarns can be produced using
- A) Rotor spinning system B) DREF 2 spinning system
C) Ring spinning system D) DREF 3 spinning system.
69. Which of the following systems has highest production rate ?
- A) Ring spinning
B) Double rove spinning
C) Electrostatic spinning
D) Rotor spinning.
70. Select the wrong statement for the similar yarn :
- A) Tensile strength of ring yarn is higher than rotor yarn
B) Tendency to snarl is higher for rotor yarn compared to ring yarn
C) Stiffness of air jet yarn is higher than rotor yarn
D) The packing density of ring yarn is higher than friction spun yarn.
71. The range of fineness of yarn that can be produced using DREF 2 spinning system is
- A) 0.2 - 5 Ne B) 10 - 20 Ne
C) 10 - 30 Ne D) less than 0.2 Ne.
72. Which one of the following systems is not based on adhesive principle ?
- A) Twilo process B) Pavena process
C) Bobtex process D) Plyfil process.
73. The back doubling in the rotor with diameter of 40 mm and for 20 twist per inch is
- A) 6 B) 99
C) 800 D) 2512.
74. Combining of two fibre strands with a phase shift is applied in
- A) Plyfil system B) Parafil system
C) Repco self-twist spinning system D) Twilo system.

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75. The yarn spun using compact spinning system has which one of the following differences in characteristics compared to the yarn spun using normal ring frame ?
- A) More hairiness
B) Lower tensile strength
C) Higher tensile strength
D) No difference.
76. Which one of the following spinning systems is generally applied for woollen spinning ?
- A) Rotor spinning system
B) DREF 3 system
C) SIRO system
D) Twilo system.
77. Which one of the following raw materials are used for wrap spinning system ?
- A) Cotton fibres alone
B) Synthetic fibres alone
C) Synthetic fibres and cotton fibres
D) Synthetic fibres and filament.
78. Coarser yarn cannot be produced using
- A) Ring spinning system
B) Rotor spinning system
C) Friction spinning system
D) Air jet spinning system.
79. Fasciated yarn can be produced using
- I. DREF 3 system
II. Air jet spinning system
III. Twilo spinning system.
- Of these :
- A) (I) alone is correct
B) (II) alone is correct
C) (I) and (II) are correct
D) All are correct.
80. The pre-wet sizing technique
- A) increases size adhesion
B) reduces abrasion resistance
C) increases hairiness
D) reduces tensile strength.
81. The SIRO optical clearer in winding machine clears
- A) long thick faults present in the yarn
B) slubs present in the yarn
C) contaminations present in the yarn
D) neps present in the yarn.

82. In sizing, PVA adhesive is used for sizing
- A) cotton yarn
 - B) polyester / cotton yarn
 - C) worsted yarn
 - D) silk yarn.
83. Single end sizing technique is used to size
- A) multifilament yarn
 - B) rotor yarn
 - C) silk yarn
 - D) ply yarn.
84. Sectional warping is used to prepare
- A) silk warp
 - B) synthetic yarn warp
 - C) coloured warp
 - D) sized warp.
85. The breaking strength of ring spliced cotton yarns to a parent yarn is
- A) 70% - 80%
 - B) 54% - 70%
 - C) 80% - 90%
 - D) 50% - 60%.
86. In drum winding, which of the following drums gives maximum winding angle and minimum package density ?
- A) 1-0 scroll
 - B) 1-5 scroll
 - C) 2-0 scroll
 - D) 2-5 scroll.
87. In the surface driven machines as the package builds up, the traverse ratio
- A) steadily decreases
 - B) steadily increases
 - C) no change
 - D) none of these.
88. Magazine creel is used in warping for
- A) synthetic yarn
 - B) continuous production
 - C) to minimize end breaks
 - D) easy unwinding.
89. Precision winder is used to wind
- A) rotor yarn
 - B) ring yarn
 - C) synthetic yarn
 - D) worsted yarn.

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90. Object of sizing is
- A) to improve the yarn strength
 - B) to bind hair fibres
 - C) to improve yarn abrasion resistance
 - D) to improve the yarn elongation at break.
91. Accelerated drum is used to prepare cone for
- A) knitting
 - B) weaving
 - C) sizing
 - D) warping.
92. In winding yarn, thin place is removed at
- A) clearer
 - B) tensioner
 - C) balloon breaker
 - D) none of these.
93. The objective of pick finding device is
- A) sensing the pick
 - B) sensing and stopping the loom if the weft yarn breaks
 - C) sensing, stopping the loom and removing the broken pick from the fabric
 - D) none of these.
94. The increase in warp tension
- A) increases the warp crimp and decreases the weft crimp
 - B) decreases the warp crimp and increases the weft crimp
 - C) increases both warp and weft crimps
 - D) decreases both warp and weft crimps.
95. The beat-up is done on an open shed for
- A) worsted yarn
 - B) rotor yarn
 - C) filament yarn
 - D) compact yarn.

96. The most widely used non-shuttle loom in India is of the
- A) Projectile type B) Air jet type
C) Rapier type D) Water jet type.
97. The advantage of asymmetric shedding is
- A) to improve the cloth cover B) to weave fancy threads
C) to weave low dense fabric D) none of these.
98. Which of the following sheds is used to weave gauze and leno fabrics ?
- A) Open shed B) Semi-open shed
C) Centre closed shed D) bottom closed shed.
99. Late shedding is used in weaving
- A) plain weave fabrics B) heavy weight fabrics
C) lighter and fancier type fabrics D) twill fabrics.
100. In wide width looms, sley eccentricity ratio is
- A) high B) low
C) no relationship D) none of these.
101. In a Sulzer type projectile weaving machine the projectile's movement comes from
- A) a pneumatic device B) a cam based picking stick
C) a torsion based picker D) a fly-wheel based picker.
102. Consider the following statements :
- I. Sulzer type projectile looms have the option of both 2 weft and 4 weft change motions.
- II. Sulzer type projectile looms use compressed air to pre-accelerate the weft so as to reduce picking tension on the yarn.

Of the statements :

- A) Both are false B) (I) is true, but (II) is false
C) (I) is false, but (II) is true D) Both are true.

QETE

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103. The fastest rate of weft insertion is achieved by
- A) Multiphase looms B) Projectile looms
C) Rapier looms D) none of these.
104. Dobby shedding controls heald frames upto
- A) 12 B) 24
C) 40 D) 16.
105. The waste of weft at the selvages is highest in
- A) Multiphase loom B) Air jet loom
C) Projectile loom D) Rapier loom.
106. The weaving machine with the lowest energy consumption per metre of weft inserted is
- A) Air jet loom B) Rapier loom
C) Projectile loom D) Multiphase loom.
107. Rotary dobby is used in
- A) non-automatic loom B) high speed shuttle loom
C) high speed shuttleless loom D) none of these.
108. In knitting, the term 'plating' refers to
- A) tucking alternate courses
B) missing alternate courses
C) knitting two separate coloured threads
D) knitting with fancy yarn.
109. In flat bed knitting machine, the term 'racking' indicates
- A) removal of needle in one bed
B) shifting of one bed with respect to other bed
C) knitting with one bed only
D) none of these.

110. The advantage of bearded needle is
- A) knitting speed can be improved B) finer gauge is possible
C) less needle breakage D) high quality fabric is possible.
111. The tuck loop in the Rib fabric
- A) increases the thickness of the fabric
B) decreases the thickness of the fabric
C) increases the elongation of the fabric
D) none of these.
112. The objective of loop transfer stitch in knitting is
- A) to produce fancy effects
B) to increase the dimensional stability
C) to increase the thickness
D) none of these.
113. The connecting loop in the warp knitted fabric is called
- A) sinker loop B) overlap
C) underlap D) needle loop.
114. Which of the following needles is used in tricot warp knitting machine ?
- A) Compound needle B) Latch needle
C) Bearded needle D) Double headed needle.
115. Loop length of the knitted fabric is varied by
- A) changing the needle stroke
B) increasing the distance between feeder and needle
C) increasing the speed of the machine
D) none of these.

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116. Which of the following knit fabrics has more coursewise elongation ?

- A) Plain fabric
B) Interlock fabric
C) Purl fabric
D) Rib fabric.

117. Long and short needles are used in

- A) Weft knitting machine
B) Interlock machine
C) Rib machine
D) Single jersey machine.

118. The disadvantage of delayed timing is

- A) more end breaks during knitting
B) resultant fabric is not stable
C) rib jacquard design is not possible
D) needle breakage is high.

119. Which of the following needles is used in high speed knitting machine ?

- A) Latch needle
B) Compound needle
C) Bearded needle
D) None of these.

120. Which of the following structures is not produced in weft knitting machine ?

- A) Swiss pique
B) Lock knit
C) Cardigan
D) Purl.

121. The most commonly used method for predicting a colour mix recipe is known as

- A) the reflective curve matching method
B) the Kubelka-Munk method
C) the C. I. E. method
D) the absorption curve matching method.

122. The dissociation constant of Hydrogen peroxide is

- A) 200
B) 2.4×10^{-12}
C) 1.0×10^{-2}
D) 0.8×10^{-4}

123. dyes are used for dyeing of PET.

- A) Vat
B) Sulphur
C) Reactive
D) Disperse.

124. Young-Dupre equation is given by (γ - surface tension)

- A) $\gamma_{SV} = \gamma_{SL} + \gamma_{LV} \cos \theta$
B) $\gamma_{SL} = \gamma_{SV} + \gamma_{LV} \cos \theta$
C) $\gamma_{LV} = \gamma_{SV} + \gamma_{SL} \cos \theta$
D) $\gamma_{SV} = \gamma_{SL} \cos \theta + \gamma_{LV}$

125. The surface tension of water γ_{LV} is

- A) 5 dynes / cm
B) 73 dynes / cm
C) 120 dynes / cm
D) 15 dynes / cm.

126. The most common defect faced during beam dyeing of polyester is

- A) Bulking
B) Moire effect
C) Blinding
D) Matt effect.

127. The pH at which H_2O_2 can be stored is

- A) 3.5
B) 6.5
C) 7.5
D) 10.5

128. Triazinyl type reactive dye reacts with cellulose by

- A) ring opening reaction
B) nucleophilic substitution reaction
C) nucleophilic addition reaction
D) salt linkage reaction.

129. The most commonly used sequestering agent is

- A) EDTA
B) NaOH
C) Na_2CO_3
D) $Ca(OH)_2$.

QETE

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130. Which one of the following is a universal bleaching agent ?

- A) NaOCl
 B) NaClO₂
 C) H₂O₂
 D) Na₂SO₃.

131. The enzyme that is used as peroxide killer is

- A) catalase
 B) amylase
 C) maltase
 D) cellulase.

132. Biopolishing is done

- A) to remove protruding fibres
 B) to increase strength of fibres
 C) to remove stains
 D) to decrease dyeability.

133. Which one of the following is used as oil / stain repellent finish in fabrics ?

- A) Vinyl ester resin
 B) Polyester resin
 C) Fluoro-polymer
 D) Epoxy resin.

134. Kubelka-Munk relation is given by

- A) $\frac{K}{S} = \frac{2R}{(1-R)^2}$
 B) $\frac{K}{S} = \frac{(1-R)^2}{2R}$
 C) $\frac{S}{K} = \frac{(1-R)^2}{2R}$
 D) $\frac{K}{S} = \frac{(1-R)}{2R}$.

135. Class A direct dyes have properties.

- A) good migration and poor levelling
 B) poor migration and good levelling
 C) good migration and good levelling
 D) poor migration and poor levelling.

136. The difference in standard potential ($\Delta\mu'$) between the two phases is given by

- A) $\Delta\mu' = RT \ln \frac{[D]_s}{[D]_f}$
 B) $\Delta\mu' = RT \ln \frac{[D]_f}{[D]_s}$
 C) $-\Delta\mu' = RT \ln \frac{[D]_s}{[D]_f}$
 D) $-\Delta\mu' = RT \ln \frac{[D]_f}{[D]_s}$.

137. isotherm is applicable to the adsorption of direct and vat dyes by cellulosic fibres.
- A) Nernst
B) Langmuir
C) Freundlich
D) Minch.
138. The distance between the conducting elements of Shirley moisture meter is
- A) equal for both fibres and yarns
B) more for fibres than yarns
C) less for fibres than yarns
D) in the ratio of 4 : 1 for fibre to yarn.
139. The modal length in a frequency distribution of fibres is
- A) the maximum length
B) the average length
C) the length of maximum frequency
D) the lower quartile length.
140. The breaking strength of nylon parachute cloth in kgs / cm width is
- A) 2 to 3
B) 7 to 10
C) 25 to 30
D) 50 to 100.
141. The twist measurement in single yarns involves which one of the following factors ?
- A) Elasticity
B) Contraction
C) Rigidity
D) Bending.
142. The rubbing surface employed in ICI Box type pilling tester is
- A) cork sheet of 1 mm thickness
B) cork sheet of 3 mm thickness
C) neoprene based rubberized cork sheet of 3 mm thickness
D) rubberized cork sheet of 2 mm thickness.

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143. The duration of creasing time applied in the continental method of crease recovery measurements in fabrics is
- | | |
|---------------|----------------|
| A) 2 minutes | B) 1 hour |
| C) 30 seconds | D) 60 seconds. |
144. The bending angle of fabric tested in Shirley fabric stiffness measurement is
- | | |
|----------|---------|
| A) 41.5° | B) 45° |
| C) 46.5° | D) 47°. |
145. The tension applied in the crimp measurement of woollen yarn of 100 tex is
- | | |
|------------|----------|
| A) 1 gm | B) 19 gm |
| C) 16.5 gm | D) 3 gm. |
146. The light weight applied in the measurement of crimp rigidity of texturized yarns by HATRA method is
- A) 0.1 gm / denier
B) 0.002 gm / denier
C) 1 gm / denier
D) 10 gm / denier.
147. The unit of mass of the cotton (continental) counting system is
- | | |
|-----------|------------|
| A) 100 gm | B) 1 ounce |
| C) 0.5 kg | D) 1 kg. |
148. The Shirley fibre micronaire test requires cotton fibre weighing
- | | |
|-----------|-------------|
| A) 50 gm | B) 1 kg |
| C) 2.6 gm | D) 3.24 gm. |
149. The speed of testing normally applied in lea strength measurement is
- | | |
|--------------------|----------------------|
| A) 100 mm / minute | B) 300 mm / minute |
| C) 175 mm / minute | D) 1 metre / minute. |

150. The U% means

- A) uniformity percentage B) evenness percentage
C) unevenness percentage D) nep content percentage.

151. In stelometer the fibres are loaded at the rate of

- A) 10 gms / sec B) 1 kg / min
C) 10 kg / sec D) 1 kg / sec.

152. The Wheatstone bridge electrical circuit is applied in

- A) Lea strength tester B) Bursting strength tester
C) Shirley trash analyzer D) Instron tensile tester.

153. As the amount of twist in a staple yarn increases, the strength of the yarn

- A) decreases B) does not change significantly
C) increases and then decreases D) increases without limit.

154. In the English system for yarn count the formula for 'Twist factor' is

- A) $\text{Count} \times \sqrt{\text{Twist per inch}}$ B) $\sqrt{\text{Count}} \times \text{Twist per inch}$
C) $\text{Count} / \sqrt{\text{Twist per inch}}$ D) $\text{Twist per inch} / \sqrt{\text{Count}}$

155. Consider the following statements :

- I. As a given cotton is spun in coarser counts the twist per inch at which the maximum strength occurs decreases.
II. As coarser cottons are spun into the same count the twist per inch at which the maximum strength occurs goes up.

Of the statements :

- A) Both are false B) (I) is true, but (II) is false
C) Both are true D) (I) is false, but (II) is true.

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156. As multi-filament yarns are twisted
- A) the strength drops continuously
 - B) the strength first falls and then rises
 - C) the strength first rises and then falls
 - D) the strength rises continuously.
157. Some cotton fibres are said to be "Immature". This means that
- A) the fibres are too short
 - B) the fibres lack strength
 - C) the fibres are too thick
 - D) the cell walls of the fibres are not complete.
158. If ' K_1 ' is the yarn cover factor from the warp and ' K_2 ' is the yarn cover factor from the weft then the fabric cover factor is given by the formula
- A) $K_1 + K_2$
 - B) $K_1 + K_2 - \left(\frac{K_1 K_2}{28}\right)$
 - C) $K_1 - K_2$
 - D) $K_1 - K_2 + \left(\frac{K_1 K_2}{28}\right)$
159. Yarn crimp (warp and weft) is defined as
- A) ratio of fabric length to length of yarn in the fabric running in that direction
 - B) extent of shortening of a fabric in use
 - C) extent of shortening of a fabric on first wash
 - D) extent of change in the fabric on treating with live steam.
160. The continuing stretch of a fabric under a steady load is known as
- A) creep
 - B) elastic stretch
 - C) shear
 - D) elastic recovery.

161. Fabrics with long lengths of floating yarns are unstable. Stitching picks are used to stabilize such structures. The maximum float length without a stitching pick is

- A) thirty picks
- B) fifteen picks
- C) seven picks
- D) three picks.

162. Which of the following weaves is most stable ?

- A) 6-end twill weave
- B) plain weave
- C) mock leno weave
- D) gauze weave.

163. Consider the following statements :

- I. Bevel gears can change the direction of rotation of shafts.
- II. An epicyclic gear train can add or subtract the rotational speed of shafts.

Of the statements :

- A) Both are false
- B) (I) is true, but (II) is false
- C) (I) is false, but (II) is true
- D) Both are true.

164. An "edge cam" is

- A) a cam with a sharp edge
- B) a cam with tapered edges
- C) a cam whose plane of rotation is parallel to the direction of motion of the follower
- D) a cam whose plane of rotation is perpendicular to the direction of motion of the follower.

165. Introducing an extra 'Idler' gear into a gear train

- A) changes the speed and direction of the final gear
- B) changes the speed but not the direction of the final gear
- C) does not change the speed but changes the direction of the final gear
- D) does not change the speed or direction of the final gear.

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166. "Simple Harmonic Motion" is a term used to define

- A) motion where the acceleration is proportional to displacement
- B) patterns of vibrations in a musical instrument
- C) patterns of waves in liquid
- D) the way in which the picker accelerates the shuttle.

167. The power that can be transmitted by a cone clutch of radius R_1 and R_2 , and coefficient of friction μ , where the plates are kept in contact with an axial force of W and cone angle 2α is

- A) $\frac{2}{3} W \left(\frac{R_1^3 - R_2^3}{R_1^2 - R_2^2} \right)$
- B) $\frac{2}{3} \mu W \left(\frac{R_1^3 - R_2^3}{R_1^2 - R_2^2} \right)$
- C) $\frac{2}{3} \mu \alpha \left(\frac{R_1^3 - R_2^3}{R_1^2 - R_2^2} \right)$
- D) $\frac{2}{3} \mu W \operatorname{cosec}(\alpha) \left(\frac{R_1^3 - R_2^3}{R_1^2 - R_2^2} \right)$

168. Consider the following statements :

When the sley's connecting arm length is reduced while keeping the crank radius unchanged

- I. the beat-up force increases
- II. the time for picking increases
- III. the wear and tear on the loom decreases.

Of the statements :

- A) (I) is true, but (II) & (III) are false
- B) (I) is false, but (II) & (III) are true
- C) (I) & (II) are true, but (III) is false
- D) (I) & (II) are false, but (III) is true.

169. An external block brake whose pivot is in line with the point of application of the normal reaction is

- A) self-locking onto a clockwise rotating shaft
- B) self-locking onto a counter clockwise rotating shaft
- C) self-locking with both types of shafts
- D) self-locking with neither type of shaft.

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170. The kinetic energy in a rotating object of mass m , radius of gyration k and angular velocity ω is

A) $\frac{1}{2} m k^2 \omega^2$

B) $\frac{1}{2} m \omega^2$

C) $\frac{1}{2} m k^2$

D) $\frac{1}{2} m^2 k^2 \omega^2$.

171. Cam surfaces are strengthened to enable them to resist frictional wear. The treatment used is called

A) Case hardening

B) Bakelisation

C) Anode polishing

D) Plasma treatment.

172. The feeler gauges used to set up a card, typically have tolerances measured in

A) tenth of an inch

B) hundredth of an inch

C) thousandth of an inch

D) ten thousandth of an inch.

173. Rotational balancing is an operation carried out on

A) cams

B) gear wheels

C) card cylinders

D) ring frame tin rollers.

174. Tempering is a process that is applied to

A) roving flyers

B) card clothing wire

C) cots and aprons

D) nylon pickers in looms.

175. The spacing of the drafting rollers is set to a tolerance of a

A) millimetre

B) tenth of a millimetre

C) hundredth of a millimetre

D) thousandth of a millimetre.

176. The grinding of card wire is carried out to

A) sharpen the edges of the wire

B) polish off corroded outer layers

C) bring worn and broken points to a uniform height

D) adjust gap settings between different parts.

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177. The compressed air used to propel yarn in air jet looms must be dry because
- A) water vapour will reduce the speed of the yarn
 - B) water will condense in the yarn and affect the beat-up operation
 - C) water vapour and atmospheric oxygen will corrode the compressed air tank and lines
 - D) adiabatic cooling in the jets will condense water droplets which will damage them.

178. Consider the following statements :

- I. The main advantages of single jet air-loom over multi-jet air-loom is the ability to weave a wider fabric and use a denser warp sheet.
- II. In a multi-jet air-loom the auxiliary jets consume most of the air.

Of the statements :

- A) Both are true
- B) Both are false
- C) (I) is true, but (II) is false
- D) (I) is false, but (II) is true.

179. Air jet looms usually use air from an oil-free compressor. This is because

- A) oil-free compressors give more air at higher pressure
- B) oil droplets in the air damage the air jets and even stain the fabric
- C) expanding air containing oil fumes is inflammable and explosive
- D) the 'run-time' between maintenance of an oil-free compressor is longer than that of an ordinary compressor.

180. Consider the following statements :

- I. Air discharged into an open space slows to 4% of its initial speed at a distance of one and a half metres from the jet.
- II. When air is discharged into a confuser system it retains 14% to 23% of its initial speed at a distance of a metre and half from the jet (depending on the confuser diameter).

Of the statements :

- A) Both are true
- B) Both are false
- C) (I) is true, but (II) is false
- D) (I) is false, but (II) is true.

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181. The typical pattern of air flow in an air jet loom is
- A) steady and laminar B) steady and turbulent
C) unsteady and laminar D) unsteady and turbulent.
182. During picking in an air jet loom the typical average tension and maximum tension are
- A) 3 gms and 20 gms B) 6 gms and 30 gms
C) 12 gms and 80 gms D) 20 gms and 200 gms.
183. The primary purpose of Job Evaluation and Performance Rating is
- A) to find the best way of doing a job
B) to find the best worker doing the job
C) to determine how a job can be done better
D) to determine the pay ranges for various types of jobs.
184. Time Study allowances are classified as
- A) Machine and Interference allowances
B) Personal, Fatigue and Delay allowances
C) Internal and External allowances
D) Scheduled, Unscheduled and Unplanned for allowances.
185. When measuring frequencies of occurrence of various events over short time periods, the data is best described in terms of
- A) Gaussian distributions B) Chi-square distributions
C) Poisson's distributions D) F-distributions.
186. The two most commonly used methods of making a stopwatch time study are
- A) the continuous method and the snap back method
B) the multwatch method and the interference free method
C) the frequency method and the cyclic method
D) the basic time method and the allowance time method.

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187. When combining the various variances that go up to make the total variance in a process, the proper procedure is to
- A) add all the variances
 - B) take the N th root of the product of N variances
 - C) add the squares of the various variances and take the square root of the total
 - D) add the inverses of the various variances and invert the final total.
188. Resource allocation can be systematically undertaken by
- A) R and \bar{x} charts
 - B) Linear programming and Network analysis
 - C) Motion time analysis
 - D) Job evaluation analysis.
189. The "ABC" model for Inventory Material Handling
- A) classifies materials alphabetically and processes each letter in rotation with the same priority
 - B) divides materials into "fast", "medium" and "slow" moving classes and processes them with different priorities
 - C) divides the production lines into three sections and processes the material for each separately
 - D) divides materials into three classes according to safety of handling and prepares different rules to handle each.
190. In a mass production plant and a process plant, the ratio of supervisors to workers is about
- A) 1 : 50 and 1 : 15
 - B) 1 : 30 and 1 : 20
 - C) 1 : 20 and 1 : 30
 - D) 1 : 15 and 1 : 50.

191. The term "Balancing of Machinery" refers to
- A) the act of making sure that all the card cylinders are mechanically balanced
 - B) making sure that at each stage of a process, the number of machines is sufficient to deal with the production of the previous stage
 - C) making sure that the electrical motors of the machines are balanced *i.e.* allocated equally between the 3 phases of the electric supply
 - D) making sure that the machines allotted to the various tenders in each stage of the process is in balance with the number of works assigned to that stage.
192. A 1960^s 2-head blowing room would produce sufficient lap for
- A) 160 modern cards
 - B) 80 modern cards
 - C) 40 modern cards
 - D) 20 modern cards.
193. Ring rail guide bar is
- A) lubricated by solid lubricant
 - B) lubricated by semi-solid lubricant
 - C) lubricated by liquid lubricant
 - D) not lubricated.
194. Which one of the following is solid lubricant ?
- A) Grease
 - B) Spindle oil
 - C) Steel wool
 - D) Graphite.
195. Which one of the following is not the method for calculating depreciation ?
- A) Sinking fund method
 - B) Internal Rate of Return method
 - C) Reducing balance method
 - D) Annuity method.
196. The reason for fitting condensers to older AC motors is to
- A) provide protection in cases of over-voltage
 - B) improve the power factor of the motor
 - C) prevent damage if the power is abruptly cut off
 - D) allow the motors to run at constant speeds when the power flickers.

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197. The purpose of Star / Delta connections for AC motors is

- A) to limit the starting current and thus prevent overheating of the motors
- B) allow the motors to rotate at constant speeds in spite of voltage variations
- C) to regulate the power factor, allowing high efficiency
- D) to allow the motors to start even when the line voltage is low.

198. Consider the following statements :

- I. Microprocessor based power control of electric motors can enable a motor to run at almost 100% power factor.
- II. Most modern textile machines use multiple motors and microprocessor based timing to coordinate them.

Of the statements :

- A) Both are true
- B) (I) is true, but (II) is false
- C) (I) is false, but (II) is true
- D) Both are false.

199. The rating of a motor should be based on

- A) average load of the task
- B) maximum load of the task
- C) the speed of rotation required
- D) the range of power required.

200. The relative humidity range applied in carding room for processing man-made fibre is

- A) 50 - 55%
- B) 30 - 35%
- C) 80 - 90%
- D) 70 - 80%.