GATE 2016 Solution

5) Which of the following amino acids is responsible for relatively higher wet strength in wool fiber?

(A) Threonine

(B) Serine

(C) Cystine

(D) Tryosine

CORRECT ANSWER- (C)

Explanation

Wool has H-bonds, cross-linkages. Cystine are cross-linkages or disulfide bridge. In wet condition H- bond weakens, so cysteine cross-linkages which are strong bonds gives relatively wet strength to wool fibre.

6) Which one of the following stereo structures of polypropylene is (are) used for commercial fibre manufacture?

(A) Atactic

(B) Syndiotactic

(C) Isotactic & Syndiotactic

(D) Isotactic

CORRECT ANSWER- (D)

Explanation

Isotactic polypropylene is most crystalline, strong among isotactic, atactic, syndiotactic.

7) Acrylic fibre has high glass transition temperature (Tg ≈ 100oC) primarily due to

(A) Presence of polar side groups

(B) Presence of bulky side groups

(C) High crystallinity

(D) Main chain stiffness

CORRECT ANSWER- (A)

Explanation

Acrylic fibre has polar side groups. Due to polar side groups, intermolecular forces are developed which restricts the movement of polymer chain so T_g increases.

8) In which of the following polymerization methods the rate of reaction is very high and leads to uncontrolled polymerization?

(A) Solution polymerization

(B) Suspension polymerization

(C) Bulk polymerization

(D) Emulsion polymerization

CORRECT ANSWER- (C).

Explanation

In bulk polymerization rate of reaction is very high due to high monomer concentration and viscosity of reaction system increases rapidly so it leads to uncontrolled polymerization

9) Which of the following textile strands is the finest?

(A) 30s Ne

(B) 30 denier

(C) 30 tex

(D) 30s Nm

CORRECT ANSWER- (B)

Explanation

Denier = 5315/Ne

30 denier = 177.16s Ne

Tex = 591/Ne

30 Tex = 19.7s Ne

Nm = 1.69 x Ne

30s Nm = 50.7s Ne

Higher the Ne, finer the strand so 30 denier is finest.

10) In a carding machine, in which of the following zones the fibre alignment is negatively affected to the maximum extent?

A. Cylinder to flats carding region
B. Licker-in to cylinder transfer region
C. Cylinder to doffer transfer region
D. Doffer to calendar roller region

CORRECT ANSWER- (C).

Explanation

Cylinder to doffer region has negative draft. Surface speed of cylinder is higher as compare to doffer so fibre alignment is negatively affected to maximum extent in cylinder to doffer transfer region.

11) Which of the following is the correct sequence of events which happen in a roller drafting zone?

A. Fibre elongation-fibre decrimping- fibre sliding
B. Fibre sliding-fibre elongation-fibre decrimping
C. Fibre decrimping- fibre sliding- fibre elongation
D. Fibre decrimping- fibre elongation- fibre sliding

CORRECT ANSWER- (D)

Explanation

Before drafting fibres are not straight. In roller drafting, first crimp is removed, after becoming straight there is fibre elongation. If the force applied beyond this point then fibre sliding happens.

12) In which region of ring spinning, Coriolis force acts?

A. Lappet to ring cop

B. Delivery pair of drafting rollers to lappet

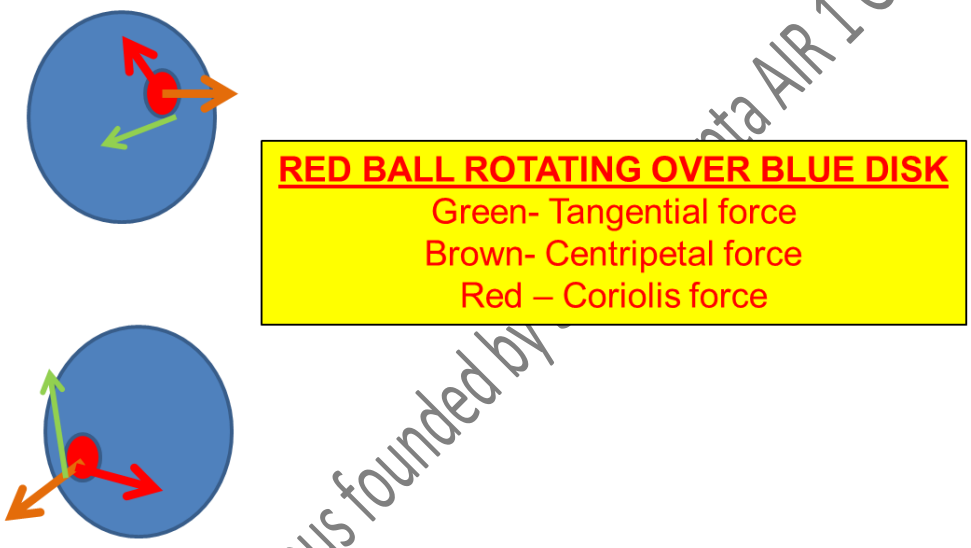
C. Back pair of drafting rollers to delivery pair of drafting rollers

D. Feed bobbin to back pair of drafting rollers

CORRECT ANSWER- (A)

Explanation

The **Coriolis force** is an inertial **force** that acts on objects that are in motion relative to rotating reference frame.



13) Which of the following shuttleless weaving systems can offer maximum fabric width ? (A) Air jet

(B) Water jet

(C) Projectile

(D) Rapier

CORRECT ANSWER- (C)

Explanation

Fluid velocity decreases along the width of loom, so width of fluid carrier loom is not as higher as projectile. In flexible rapier loom, buckling of belt happens. In rigid rapier loom, width can't be higher, If loom width is equal to 100 unit then length of rod used to move rapier head will be equal to approx. 50 unit on both side of loom so loom width will become approx. 200 unit (100 unit wastage) which is not meaningful.

14) The filling yarn density at selvage is doubled in case of

(A) Fringe selvage

(B) Tucked-in selvage

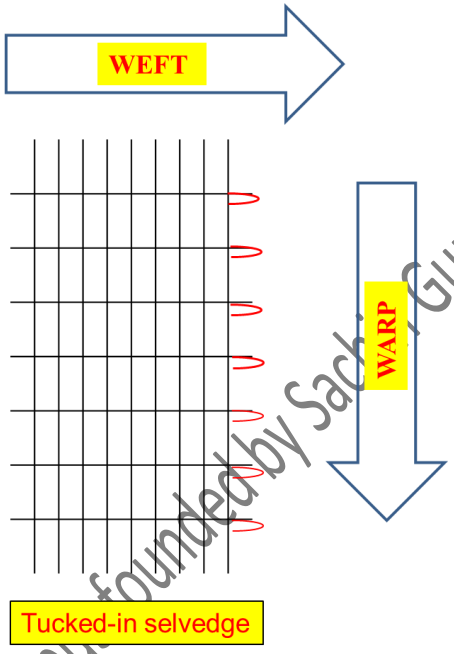
(C) Shuttle selvage

(D) Leno selvage

CORRECT ANSWER (B)

Explanation

Tucked-in selvedge is formed by tucking the end of pick into cloth selvedge.



15) Which of the following shedding mechanisms provides control of individual warp thread during weaving?

(A) Crank

(B) Tappet

(C) Dobby

(D) Jacquard

CORRECT ANSWER- (D)

Explanation

In jacquard shedding, every warp thread is controlled separately by means of harness cords, hooks and needles.

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

CORRECT ANSWER- (277.77)

Explanation

Given

Winding speed = 1000 m/min

Efficiency = 90%

Yarn to be wind = 10 kg of 40 tex

Calculation

Actual winding speed = 90 % of 1000 = 900 m/min

Length of yarn to be wind =

40 tex means- 40 gm yarn = 1000 m length of yarn

So 10 kg = 10000 gm yarn = 250,000 m length of yarn

Time required to wind 900 m = 1 min

So Time required to wind 250,000 m = 277.77 min

17) The test statistic to be used for carrying out a test of hypothesis on the mean of a normal distribution with unknown variance is

(A) Z

(B) T

(C) $\chi 2$

(D) F

CORRECT ANSWER- (B)

Explanation

T test when variance of population is unknown.

Z test when variance of population is known.

18) If the length of a confidence interval on the mean of a normal distribution with known variance is to be halved, the sample size must

(A) Increase by 2 times

(B) Decrease by 2 times

(C) Increase by 4 times

(D) Decrease by 4 times

CORRECT ANSWER- (C)

Explanation

$$Confidence\ interval\ \alpha \frac{1}{\sqrt{sample size}}$$

20) A fabric specimen of original length 75 mm is stretched to a length of 120 mm and after removal of the load the length reduces to 95 mm. The elastic recovery (%) of the fabric specimen is _____

CORRECT ANSWER (55.55)

Explanation

Given

Original length of fabric specimen = 75 mm

After stretching length = 120 mm

After removal of load, length = 95 mm

Calculation

Extension after application of load = 120 – 75 = 45 mm

Remaining extension after removal of load = 20 mm

Recovered length = 25 mm

$$\text{Elongation \%} = \frac{\text{Recovered length}}{\text{Extension after application of load}} \text{x } 100$$

$$= \frac{25}{45} \text{x } 100$$

$$= 55.55$$

21) A sector-shaped, falling-pendulum type apparatus is suitable for measurement of

(A) Elmendorf tear strength

(B) Tongue tear strength

(C) Trapezoidal tear strength

(D) All of them

CORRECT ANSWER- (A)

Explanation

Tongue tear strength = CRE type tensile testing instrument

Trapezoidal tear strength = CRT & CRE both type tensile testing instrument

Elmendorf tear strength = Falling pendulum type appratus

22) Sodium persulphate is used in

(A) Bleaching

(B) Scouring

(C) Mercerization

(D) Desizing

CORRECT ANSWER (D)

Explanation

Sodium persulphate is used in oxidative desizing

23) CORRECT ANSWER- (B)

Explanation

Max equilibrium adsorption capacity of disperse dye on polyester increased with rising experimental temperature. Higher temperature gives more swelling of fibres and thermal motion of disperse dye molecules, and the dye molecule can overcome an energy barrier to diffuse into the polyester fibre.

24) A dye with dischargeability rating of 1 (one) WILL NOT be suitable for

(A) Resist printing

(B) Direct printing

(C) Discharge printing

(D) Melt transfer printing

CORRECT ANSWER- (C)

Explanation

Dischargeability rating scale ranges from 1-5. As rating increases dischageability increases

25) The enzyme used for biopolishing of cotton is

(A) Cellulase

(B) Pectinase

(C) Amylase

(D) Lipase

CORRECT ANSWER- (A)

Explanation

Lipase – scouring

Pectinase – scouring

Amylase – scouring

Cellulase – biopolishing

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