



TF 2005

EXPONENTIAL CAREER CAMPUS
SACHIN GUPTA AIR 1 GATE 2016

1. Cotton cellulose has
 - A. α -1,4 glycosidic linkages and branched polymer chain
 - B. α -1,4 glycosidic linkages and linear polymer chain
 - C. β -1,4 glycosidic linkages and branched polymer chain
 - D. β -1,4 glycosidic linkages and linear polymer chain
2. Nylon 6 and Nylon 66 are
 - A. Both homopolymers
 - B. Both copolymers
 - C. Homopolymer & copolymer respectively
 - D. Copolymer & homopolymer respectively
3. The typical value of breaking elongation of wool under standard atmospheric conditions is
 - A. 5%
 - B. 10%
 - C. 25%
 - D. 40%
4. Polymer for acrylic fibre production is manufactured using
 - A. Emulsion polymerization
 - B. Suspension polymerization
 - C. Ring opening polymerization
 - D. Condensation polymerization
5. The cellulosic fibre obtained from leaf is
 - A. Hemp
 - B. Kenaf
 - C. Ramie
 - D. Sisal
6. Fibrograph is used to obtain
 - A. Average fibre length
 - B. Fibre fineness
 - C. Span length
 - D. Short fibre percentage
7. Nep identification on AFIS is based on
 - A. Pneumatic principle

- B. Optical principle
- C. Gravimetric principle
- D. Capacitance principle

8. Unit of specific work of rupture is

- A. cN
- B. cN/tex
- C. cN.tex
- D. cN.m

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

- A. \sqrt{n}
- B. $100\sqrt{n}$
- C. $100/n$
- D. $100/\sqrt{n}$

10. Elmendorf tear tester directly measures

- A. Tearing force
- B. Energy required to tear
- C. Tearing force x number of broken threads
- D. Tearing force per broken thread

11. The typical value of waste percentage generated at flats while processing normal polyester fibre on a modern card is

- A. 0.1%
- B. 0.5%
- C. 1.0%
- D. 2.5%

12. Modern blow room with contaminant removal attachment based on optical scanning principle cannot detect

- A. Jute threads
- B. Leafy matters
- C. White plastic materials
- D. Black fabric pieces

13. Speed of a modern comber is around

- A. 100 nips/min

- B. 200 nips/min
- C. 400 nips/min
- D. 800 nips/min

14. 'Barkolising' is a treatment associated with

- A. Ring
- B. Traveller
- C. Flyer
- D. Cots

15. With increase in yarn twist, the strength of a staple fibre yarn

- A. Decreases initially and then increases
- B. Increases initially and then decreases
- C. Continuously decreases
- D. Continuously increases

16. For a twofold increase in reed width, the picking power of a shuttle loom needs to be increase by

- A. 2 times
- B. 4 times
- C. 8 times
- D. 16 times

17. If the barrel of a dobby has 12 grooves then the number of lags needed in a chain for a weave repeating on 18 picks is

- A. 12
- B. 18
- C. 36
- D. 48

18. Split drying system is employed on sizing machines for drying

- A. Very wide warp sheet
- B. Warp sheet with very high wet pick up
- C. Very dense warp sheet

D. Multi-colored warp sheet

19. The knitted structure showing two layers of loops in each wale line is

- A. 1x1 Rib

- B. Purl
- C. Interlock
- D. Lacoste

20. The range of fibre length for web formation by aerodynamic method is

- A. Low atomic size of sodium
- B. Very slow penetration of fibre
- C. No interaction with cellulose
- D. Easy availability at economical cost

21. During carbonization of wool, the impurities removed are

- A. Fatty matters
- B. Compounds containing sulphonic acid groups
- C. Compounds containing carboxylic acid groups
- D. Vegetable matters

22. The terms “scouring” and “souring” indicate mainly the difference in treatment of fabric in terms of

- A. Temperature
- B. Time
- C. Pressure
- D. pH

23. Sodium hypochlorite bleaching of cotton is carried out

P – at alkaline conditions

Q – at 90°C

- A. Both P and Q are correct
- B. Both P and Q are wrong
- C. P is correct and Q is wrong
- D. Q is correct and P is wrong

24. Jet dyeing machine is based on principle of

- A. Dye liquor stationary – Fabric moving
- B. Dye liquor moving – Fabric stationary
- C. Both dye liquor and fabric moving
- D. Both dye liquor and fabric stationary

25.

Group I

- P Single heater machine
- Q Double heater machine
- R Friction discs
- S Cooling plate

Group II

- 1 Better crimp stability
- 2 Bulked yarn
- 3 Stretch Yarn
- 4 BCF yarn
- 5 Set yarn
- 6 Surging

- A. P3-Q5-R6-S1
- B. P5-Q3-R2-S4
- C. P4-Q6-R2-S1
- D. P6-Q2-R1-S3

26.

Group I

- P Glass transition temp
- Q Molecular weight
- R Surface characteristics
- S Thermal stability

Group II

- 1 DSC
- 2 IR Spectrophotometer
- 3 X ray
- 4 SEM
- 5 TGA
- 6 Ubbelohde viscometer

- A. P5-Q6-R4-S1
- B. P1-Q6-R4-S5
- C. P6-Q4-R3-S2
- D. P4-Q2-R1-S3

27. The addition of heat and light stabilizers is critical in the production of polypropylene fibre due to

- A. Low density
- B. Low melting temperature
- C. High molecular weight
- D. Presence of tertiary hydrogen

28. The correct sequence of major steps for production of viscose rayon fibre is

- A. Steeping – Shredding – Xanthation – Ageing – Dissolution – Ripening – Spinning
- B. Steeping – Shredding – Ageing – Xanthation – Dissolution – Ripening – Spinning

C. Steeping – Shredding – Ageing – Dissolution – Xanthation – Ripening – Spinning

D. Steeping – Shredding – Xanthation – Ageing – Ripening – Dissolution – Spinning

29. As spun nylon6 filaments contain a mixture of α and γ forms. On subsequent drawing, which of the following change occurs

A. γ crystal phase changes into more stable α crystal phase

B. α crystal phase changes into more stable γ crystal phase

C. There is no change in the crystal forms

D. Both α and γ forms change to β crystal form

30. The birefringence value of a fibre depends on

P Degree of orientation of molecules

Q Degree of polymerization

R Degree of asymmetry of molecules

S Melting point of polymer

The set of correct statement is

A. P, Q

B. P, R

C. Q, R

D. R, S

31. Compared to the conventional two stage spinning method. PET filament spun by high speed spinning technique have

P Larger, more perfect crystals and high crystallinity

Q Smaller crystals and low crystallinity

R High crystalline orientation and low amorphous orientation

S Low crystalline orientation and High amorphous orientation

The set of correct statement is

A. P, Q

B. P, R

C. Q, R

D. P, S

32. In a solution spinning line, if Q_0 , Q_L and d_0 , d_L refer to the volumes of polymer flow in unit time and diameters of filament at the spinneret and take up unit, respectively, the spin ratio is given by

- A. $(Q_L d_o^2)/(Q_o d_L^2)$
- B. d_o^2/d_L^2
- C. $(Q_o d_o^2)/(Q_L d_L^2)$
- D. $(Q_o d_L^2)/(Q_L d_o^2)$

33. Consider the following statements in connections with the production of cellulose triacetate

P – The fibre is produced by dry spinning technique

Q – Polymer degrades before melting

- A. Both P and Q are true
- B. Both P and Q are false
- C. P is true and Q is false
- D. Q is true and P is false

34. Thickness testing of woven fabrics is carried out under a pressure of 20 gf/cm². Pressure on fabric during the thickness test is approximately equal to

- A. 20 Pa
- B. 200 Pa
- C. 2000 Pa
- D. 20000 Pa

35. Uniformity ration of fibres of equal length is approximately equal to

- A. 0.51
- B. 0.71
- C. 0.91
- D. 1.00

36. On examination of 200 cotton fibres, 120 normal, 60 semi mature and 20 dead fibres are observed. Maturity ratio of this cotton is

- A. 0.90
- B. 0.95
- C. 1.00
- D. 1.20

37. The coarsest yarn among the following is

- A. 10 Tex
- B. 81 Denier

- C. 60 Ne
- D. 90 Nm

38. A yarn breaks at time t on both CRE and CRL tensile testers. If L_1 and L_2 is the average load on the yarn during the first half of time t on CRE and CRL tester respectively, then for polyester yarn L_1 and L_2 are related as

- A. $L_1 = L_2$
- B. $L_1 > L_2$
- C. $L_1 < L_2$
- D. Both $L_1 > L_2$ and $L_1 < L_2$ are possible

39. Projected area of a 45 cm diameter fabric placed on 30 cm anvil is 600 cm². Drapage coefficient for this fabric is

- A. 0.48
- B. 0.58
- C. 0.68
- D. 0.78

40. In connection with air permeability testing of fabric, consider the following

P Air permeability is linearly proportional to the air pressure

Q Air permeability is linearly proportional to the square of the air pressure

R Air permeability has a linear relationship with the reciprocal of the number of fabric layers

S Air permeability decreases with an increase in fabric cover

The set of correct statement is

- A. P, Q, S
- B. P, R, S
- C. P, Q, S
- D. Q, R, S

41. In connection with bursting strength testing, higher values of bursting strength can be attributed to

P higher warp and weft yarn strengths

Q higher warp and weft yarn elongations

R equal extensions in warp and weft directions at the time of bursting

S higher crimp removal without jamming the structure

The set of correct statement is

- A. P, Q, S
- B. P, R, S
- C. P, Q, R
- D. Q, R, S

42.

Group I

- P High fibre transfer from cylinder to doffer
- Q Holes in card wed
- R Nep formation in card
- S High card sliver mass variation

Group II

- 1 More immature fibres in mixing
- 2 Higher web tension draft
- 3 Higher feed roller pressure
- 4 More acute wire point angle on doffer
- 5 Higher coiler calendar roller pressure
- 6 Wider cylinder to licker in setting

- A. P1-Q5-R2-S3
- B. P4-Q5-R6-S1
- C. P4-Q6-R1-S2
- D. P1-Q6-R2-S3

43.

Group I

- P Crackers in the yarn
- Q High yarn hairiness
- R High count variation within bobbin
- S High yarn unevenness

Group II

- 1 Excessive short fibres in mixing
- 2 High lap weight CV%
- 3 Wider front zone setting on ring frame
- 4 Too close front zone setting on ring frame
- 5 Incorrect bobbin diameter
- 6 Roller slippage on draw frame

- A. P4-Q3-R2-S5
- B. P4-Q1-R6-S3
- C. P3-Q5-R2-S6
- D. P3-Q1-R4-S6

44. A bobbin leading speed frame running at 1000 rpm spindle speed is producing a roving with 2.5 turns per inch. The diameter of empty bobbin is 5 cm. When the bobbin attains to cm diameter, the percentage change in the bobbin speed will be approximately

- A. 1 %

- B. 3 %
- C. 5 %
- D. 7 %

45. The permissible minimum angle of lead is 30° . For a ring of 40mm diameter, the minimum bobbin diameter is

- A. 15 mm
- B. 18 mm
- C. 20 mm
- D. 21 mm

46. In folded yarns, the folding twist is in opposite direction to the spinning twist. The twist ratio (folding twist/spinning twist) required to make the yarn free from the snarling tendency is approximately

- A. 0.55
- B. 0.66
- C. 0.77
- D. 1.0

47. The yarn manufacturing technologies have been arranged in ascending order with respect to twisting potential per unit time. The correct set is

- A. Ring – Rotor – Friction – Jet
- B. Rotor – Ring – Jet – Friction
- C. Ring – Rotor – Jet – Friction
- D. Rotor – Friction – Ring – Jet

48. The actual twist in a rotor yarn produced with rotor diameter of 40 mm, rotor speed of 90000 rpm and delivery speed of 100m/min will be approximately

- A. 892 tpm
- B. 900 tpm
- C. 908 tpm
- D. 918 tpm

49. In a friction spinning process, the diameter of the perforated drum and the average yarn tail diameter resting on the drum are 44 mm and 0.22 mm respectively. The drum and the yarn delivery speeds are 5000 rpm and 250 m/min respectively. The actual twist in the yarn with 20% twist efficiency is

- A. 400 tpm
- B. 600 tpm
- C. 800 tpm
- D. 1000 tpm

50. Determine the correctness or otherwise of the following assertion (a) & reason (r)

Assertion: The strength of a pneumatically spliced joint of a single cotton yarn results out of the load bearing capacity of the largely parallel fibers in the central section of the joint

Reason: The central section is surrounded by densely clustered groups of fibres, which are highly twisted and intermingled. On application of tensile load, these fibers slip and progressively grip the central section tightly, enhancing in the process their load bearing capacity

- A. Both (a) and (r) are true and (r) is the correct reason for (a)
- B. Both (a) and (r) are true and (r) is not the correct reason for (a)
- C. Both (a) and (r) are false
- D. (a) is true but (r) is false

51. In a sectional warping system

P A drum of fixed capacity ensures same length of each thread within a section

Q For a drum of fixed conicity the number of sections per unit width of warp sheet is independent of volume of each section

R A drum of variable conicity results in varying tension levels in the warp threads

S For a drum of variable conicity the number of sections per unit width of warp sheet goes down with rise in volume of sections

The set of correct statement is

- A. P, Q
- B. P, R
- C. Q, R
- D. Q, S

52. For weaving a plain poplin fabric

P Reed marks can be improved by differential tensioning of shed lines

Q Side lever underpick is preferred to side shaft underpick

R Picks per inch is set nearly equal to the ends per inch

S Ring temples are preferred to roller temples

The set of correct statement is

A. Q, S

B. P, S

C. P, R

D. Q, R

53.

Group I

P Air jet weaving

Q Rapier weaving

R Gripper shuttle weaving

S Water jet weaving

Group II

1 Torsion bar

2 Tension compensator

3 Tip transfer

4 Swing nozzle

5 Suction nozzle

6 Booster nozzle

A. P4-Q3-R2-S6

B. P6-Q3-R1-S4

C. P4-Q2-R3-S5

D. P5-Q2-R1-S6

54. Determine the correctness or otherwise of the following assertion (a) & reason (r)

Assertion: The positive let off motion maintains the free length of warp and the tension on warp sheet at constant levels

Reason: The fluctuation of free warp length due to take up causes change in warp tension, which is sensed by the system, and the correction in both warp tension and in free warp length is carried out through the let off system automatically

A. Both (a) and (r) are true and (r) is the correct reason for (a)

B. Both (a) and (r) are true and (r) is not the correct reason for (a)

C. Both (a) and (r) are false

D. (a) is true but (r) is false

55. Choose the correct set of statements

P Denim is a weft faced twill cloth made from dyed warp and grey weft yarn

Q Leno weaves are made from doup and standard threads, which are made to cross each other between picks

R Sateen is a warp faced fabric

S Repp is a plain weave fabric with a prominently weft way rib made from two warps and two wefts

- A. Q, S
- B. P, S
- C. P, R
- D. Q, R

56. Determine the correctness or otherwise of the following assertion (a) & reason (r)

Assertion: Although in a multiphase loom the energy consumed per square meter of fabric produced is higher than that of a modern air jet loom, the productivity is also 2-3 times higher

Reason: There are many oscillating components in a multiphase loom causing high energy consumption. However the shed forming rotor rotates continuously at an even speed and 4 picks are inserted at any instant

- A. Both (a) and (r) are true and (r) is the correct reason for (a)
- B. Both (a) and (r) are true and (r) is not the correct reason for (a)
- C. Both (a) and (r) are false
- D. (a) is true but (r) is false

57. With the rise in the punching density

P The tenacity of needle punched fabric rises steadily

Q The effect of rise in tenacity as function of punching density is less pronounced for fibres of shorter length

R The breaking extension of the punched fabric keeps on rising steadily

S The change in tenacity and breaking extension shows similar pattern in both machine and cross directions for a cross laid web

The set of correct statement is

- A. P, Q
- B. P, S
- C. Q, R
- D. R, S

58.

Group I

Group II

P Improvement in crease recovery angle **1** Phosphorus based compounds

Q Limiting oxygen index

2 Cross linking

R Water repellency

3 Silicon based compounds

S Oil repellency

4 Hydrophilic compounds

5 Fluorochemicals

6 Aliphatic alcohols

A. P2-Q1-R3-S5

B. P5-Q3-R2-S1

C. P4-Q5-R1-S3

D. P3-Q4-R5-S6

59. For color discharge printing on cotton, identify the combination of the most appropriate dye class and dye structure

Group I

Group II

P Vat dyes

1 Azo structure

Q Reactive Dyes

2 Anthraquinone structure

R Direct Dyes

3 Any structure containing sulphur

S Acid Dyes

4 Any structure containing $-\text{COOH}$ groups

A. P2

B. Q1

C. R3

D. S4

60.

Group I

Group II

P Effect of heat setting temperature on dye uptake

1 Jet dyeing machine

Q Principle of dye fixation during thermosol

2 Sublimation

R The most commonly used machine for dyeing in rope form followed by an increase

3 Initial decrease in dye uptake

S The most appropriate dye class

4 Disperse dye

5 Direct Dye

6 HTHP dyeing machine

A. P2-Q1-R3-S5

B. P6-Q3-R2-S1

C. P3-Q2-R1-S4

D. P3-Q4-R6-S5

61.

Group I

P Bleaching of cotton

Q Discharge printing

R Water repellency

S Wash and wear finishing

A. P2-Q1-R3-S5

B. P1-Q5-R2-S3

C. P4-Q5-R1-S3

D. P3-Q4-R2-S6

Group II

1 Oxidation

2 Difference in the surface energy

3 Cross linking

4 Static charge generation

5 Dye destruction

6 Hydrolysis

62.

Group I

P Removal of natural gum from silk

Q Control the rate of adsorption of cationic dye on acrylic fibre

R Resist printing of cotton under reactive dye

S Improve the luster of cotton yarn

A. P2-Q1-R3-S5

B. P5-Q3-R2-S1

C. P4-Q5-R1-S3

D. P1-Q6-R2-S5

Group II

1 Olive oil soap

2 Citric acid

3 Halogen compound

4 Sodium hydrosulphite

5 Sodium hydroxide

6 Retarder

63. Which set of following factors will enhance the dye bath exhaustion on fire

P pH

Q High affinity

R Low material to liquor ratio

S Absence of salt in dye bath

A. P, Q

B. P, S

C. Q, R

D. R, S

64. Extremely good fastness properties of vat dyes on cotton are due to following factors

P Dye aggregation within fibre during soaping

Q Insolubilization of dye within fibre

R Application of dye in soluble form

S Low molecular weight of vat dyes

The most appropriate set of factors is

A. P, Q

B. P, S

C. Q, R

D. R, S

65.

Group I

P Balancing

Q Flocculation

R Adsorption

S Oxygen consumption During biological decomposition

Group II

1 BOD

2 pH adjustment

3 Activated carbon bed

4 Polyelectrolyte

5 Addition of sulphur compound

6 Evaporation of water

A. P2-Q4-R3-S1

B. P5-Q3-R2-S1

C. P4-Q5-R1-S3

D. P3-Q4-R5-S6

Statement for Linked Answer Questions 66, 67:

The apparent crystallinity of a PET sample by density method is found to be 45%.

The density of amorphous and crystalline PET sample is 1.335 and 1.455 g/cm³ respectively.

66. The density of the sample in g/cm³ will be

A. 1.335

B. 1.366

C. 1.386

D. 1.455

67. If the void volume of the above sample is 0.5%, the true crystallinity of the sample is

- A. 40%
- B. 45%
- C. 50%
- D. 60%

Statement for Linked Answer Questions 68, 69:

A 36 Ne cotton yarn has an average strength of 300 cN with a CV of 12.5%.

68. The minimum number of samples which must be tested to obtain the average value of yarn strength with less than 5% error 95% of the times is

- A. 10
- B. 16
- C. 25
- D. 36

69. The 95% confidence range based on twice the number of samples tested will be approximately

- A. ± 5.4
- B. ± 7.4
- C. ± 10.4
- D. ± 13.4

Statement for Linked Answer Questions 70, 71:

In an idealized helical yarn of 20 tex, the twist is 10 turns/cm. The surface twist angle is 32°

70. The approximate yarn diameter is

- A. 0.1 mm
- B. 0.2 mm
- C. 0.3 mm
- D. 0.4 mm

71. The approximate specific volume (cc/g) of the above yarn is

- A. 1.37
- B. 1.47
- C. 1.57
- D. 1.67