

Seat No. _____

SUB: TEXTILE ENGINEERING (TE)

Time: 1 Hour 30 minutes

Instructions:

1. Ensure that all pages are printed.
2. Use Black ball pen only
3. Change in option is not allowed
4. There is no negative marking
5. Use of non-programmable scientific calculator is allowed

1. A fibre with extremely high stretch ability is
A Viscose B Spandex
C Nylon D Wool
2. Which of the following fibre has the odour of burning paper when subjected to burning test?
A Silk B Wool
C Jute D Cotton
3. Density of cotton fibre is approximately
A 1520 kg/m^3 B 1.52 g/m^3
C 1.52 kg/cm^3 D 1.52 g/tex
4. Nylon 6, Nylon 66, wool and silk can all be classified as
A Polyethers B Polyamides
C Polyolefins D Polyurathanes
5. Functional group and orientation can be characterized respectively by using
A Scanning electron microscope and Infrared spectrophotometer B Scanning electron microscope and Differential scanning calorimeter
C Infrared spectrophotometer and Sonic modulus tester D Differential scanning calorimeter and Infrared spectrophotometer
6. By introducing microgrooves in polyester filament
A Moisture absorption improves B Dye penetration improves
C Handle improves D All of the above
7. Absorption regain percentage of mercerized cotton is
A Less than cotton B More than cotton but less than wool
C More than wool D Less than wool and cotton
8. Which of the following amino acids is responsible for relatively higher wet strength in wool
A Threonine B Serine
C Cystine D Tyrosine
9. The chemical used in the steeping process in the manufacture of viscose rayon is
A Sodium hydroxide B Calcium Hydroxide
C Nitric acid D Carbon disulphide
10. The fibre which has a mineral origin is
A Flax B Kapok
C Ramie D Asbestos
11. Among the following, strength/weight ratio is highest for
A Polyester B Nylon
C Polypropylene D Kevlar

12. The gum in the raw silk filament is
 - A Wax
 - B Lignin
 - C Sericin
 - D Fibroin
13. With reference to carding, long nose feed plate is suitable for
 - A Short fibres
 - B Long fibres
 - C Cotton fibres
 - D Synthetic fibres
14. During spinning of a yarn on ring frame, the yarn tension is maximum at
 - A Lappet guide
 - B Maximum balloon radius
 - C Traveller
 - D Front roller nip
15. The weight of material on a roving bobbin is 2.4 kg. The roving hank is 600 tex. If delivery rate is 20 m/min, the time (min) required to build the bobbin is
 - A 180
 - B 190
 - C 200
 - D 210
16. Which of the following types of fibres tend to stay in core of the ring spun yarn?
 - A Short Fibres
 - B Long Fibres
 - C Course Fibres
 - D More crimped fibres
17. Compared to the spinning of finer cotton yarns, the preferred rotor diameter for the production of very coarse cotton yarns would
 - A Be higher
 - B Be lower
 - C Remain the same
 - D Change depending on fibre strength
18. Carding action takes place between
 - A Cylinder & licker in
 - B Flats & doffer
 - C Doffer & doffer roller
 - D Cylinder & doffer
19. One of the objective of drawing is to
 - A Remove neps in sliver
 - B Remove entanglements between fibres
 - C Crush large size dust particles
 - D Remove short fibres
20. Autoleveller performance is affected by
 - A Moisture
 - B Draft
 - C Fibre fineness
 - D Fibre length
21. While working synthetic fibres in card, the height of licker-in teeth is
 - A Greater than that of cotton
 - B Same as that of cotton
 - C Same but point density is less
 - D Shorter than that of cotton
22. DREF spinning belongs to
 - A Self-twist spinning
 - B Friction spinning
 - C Twistless spinning
 - D Air jet spinning
23. As the fibres land on the rotor, the fibres are in groups of
 - A More than 500 fibres
 - B 100-500 fibres
 - C 10-50 fibres
 - D 1-5 fibres
24. With increase in draft, drafting force
 - A Continuously rises
 - B Continuously decreases
 - C Increase first and then decreases
 - D Does not change at all
25. Bang-off is associated with
 - A Fast reed warp protection
 - B Loose reed warp protection
 - C Warp stop motion
 - D Side weft fork stop motion
26. With increased taper angle on a sectional warping machine, one could require to
 - A Increase traverse speed
 - B Decrease traverse speed
 - C Increase warping speed
 - D Decrease warping speed

27. A precision winder has to wind 4 kg of 40 tex yarn. If the machine winds at 800 m/min, without any interruption, the time taken(min) for winding would be
 A 125 B 100
 C 25 D 12.5
28. In over-pick loom, the shuttle velocity can be increased by
 A Increasing the length of picking B Rotating the picking cam on strap bottom shaft
 C Using a large nosebit of the picking cam D By increasing the swell pressure
29. A double lift double cylinder jacquard would normally produce
 A Bottom closed shed B Centre closed shed
 C Semi open shed D Open shed
30. While weaving a cloth on an automatic shuttle loom bumping can be avoided by
 A Changing the shedding timing B Increasing picks per unit length
 C Decreasing warp tension D Increasing warp tension
31. A conjugate cam driven sley
 A Moves along the horizontal plane B Can be moved as per a desired displacement function
 C Has an adjustable eccentricity D Does not need a rocking shaft
32. Split drying system is employed on sizing machines for drying
 A Very dense warp sheet B Very wide warp sheet
 C Warp sheet with very high wet pick up D Multi coloured warp sheet
33. With reference to winding technology, wind is defined as
 A Number of coils per traverse B Number of coils in double traverse
 C Number of grooves in the drum D Winding speed in m/min
34. During shedding operations, negative cams actually control
 A Raising and lowering of B Raising of the heald
 C Lowering of the heald D Either raising or lowering of the heald
35. The actual production of an automatic loom for 2 hours, running at 230 RPM with 48 PPI is 11.68 m. What will be the percent efficiency of the loom?
 A 80 B 81
 C 82 D 83
36. Length of yarn in a bunch on a pirn of automatic loom approximately equals
 A Half the reed width B The reed width
 C Twice the reed width D Four times the reed width
37. Dyeing of silk is carried out by using
 A Disperse dyes B Acid dyes
 C Pigment colours D Any one of the above
38. Crock meter is used to measure following property of a dyed fabric.
 A Rubbing fastness B Perspiration fastness
 C Laundry fastness D Fastness to gas fading
39. During bleaching of cotton with H₂O₂, the stabilizer used is
 A Sodium hydroxide B Sodium silicate
 C Acetic acid D Sodium carbonate
40. Crease resist finishing of cotton fabric does not lead to
 A Reduction in tensile strength B Increase in dimensional stability
 C Increase in moisture regain D Increase in bending length

41. The fibre that dissolves in 59% (w/w) sulfuric acid solution is
 A Wool B Polypropylene
 C Cotton D Viscose
42. A typical curve between equilibrium dye uptake and dyeing temperature goes through a maximum. After the maximum, the dye uptake decreases because
 A Dyeing is an exothermic process B Pressure in the dye bath increases
 C Saturation value is reached D Kinetic energy increases rapidly
43. Sodium persulphate is used in
 A Bleaching B Scouring
 C Desizing D Mercerization
44. The highest rates of production in printing is obtained by
 A Flat bed printing B Rotary printing
 C Roller printing D Block printing
45. Sodium formaldehyde sulfoxylate is
 A Reducing agent B Mild oxidizing agent
 C Thickener D Hygroscopy agent
46. The efficacy of the wash-n-wear treatment can be estimated by measuring its
 A Bending length B Tensile strength
 C Dye uptake D Crease recovery
47. Which, out of the following, is not a surfactant
 A Detergent B Dispersing agent
 C Wetting agent D Reducing agent
48. Softener reduces the bending rigidity of fabrics by decreasing
 A Inter-fibre and inter-yarn friction B Modulus of the fibres
 C Glass transition temperature of the fibres D Packing coefficient of yarns
49. In a flat bed knitting machine, the loop length is controlled by
 A Raising cam B Clearing cam
 C Stitch cam D Guard cam
50. A plain single jersey fabric
 A Exhibits curling from technical back to technical front along course line B Exhibits curling from technical back to technical front along wale line
 C Exhibits curling from technical front to technical back along wale line D Exhibits curling from technical back to technical front along course line and curling from technical front to technical back along wale line
51. In fully relaxed state, the loop shape factor (defined as a ratio of courses per unit length to wales per unit length) of a plain weft knitted cotton fabric will be approximately
 A 5.5 B 4.2
 C 1.3 D 0.3
52. The underlap of warp knitted fabric is basically equivalent to
 A Closed loop B Sinker loop
 C Needle loop D Open loop
53. In weft knitted fabrics of the same mass per unit area produced from the same yarn, the structure which will give the highest thickness is
 A Plain B Rib
 C Purl D Interlock

54. The instrument which works on CRE as well as CRL principle is
 A Stelometer B Pressley fibre strength tester
 C Cambridge extensometer D Inclined plane principle
55. What is the resultant count of a 3 ply yarn in Ne, when a 100 Nm worsted yarn, 90 denier polyester and 59.05 text cotton yarn are twisted together?
 A 8.1 B 7.4
 C 6.6 D 5.2
56. Uniformity ratio is
 A 50% span length/2.5 span length B 2.5 span length/50% span length
 C Mean length/upper half mean length D Upper half mean length/ Mean length
57. Shirley yarn hairiness tester
 A Usually measures fiber longer than 10 mm B Usually measures total length of hairs per cm of yarn
 C Usually measures number of hairs of multiple lengths together D Usually measures number of fiber longer than 3 mm
58. In Classimat results which among the following is longest and thinnest
 A H1 B H2
 C I1 D I2
59. Cotton fibre maturity is indicated by
 A Increase in thickness of lumen B Increase in thickness of primary wall
 C Increase in thickness of secondary wall D All of the above
60. A higher value of drape coefficient indicates
 A Stiffer fabric B Limpy fabric
 C Highly compressible fabric D Very flexible fabric
61. Bursting strength is indicative of
 A Warp way strength B Weft way strength
 C Multi directional strength D Wale wise strength
62. CV% is approximately equal to
 A $U\%/1.25$ B $U\%/1.25$
 C $1.25/U\%$ D $1.25*U\%$
63. The ratio of weight of water present in textile material to oven dry weight of textile material indicates
 A Moisture content B Moisture Regain
 C Absolute humidity D Relative humidity
64. Assuming race-tracked cross section of threads, the ratio of major to minor diameters of yarns for a jammed plain woven fabric will be
 A 0.13 B 0.31
 C 1.3 D 3.1
65. In an ideally 5 layered open packed yarn, the number of fibres in 5th layer and total fibres will be respectively
 A 6, 7 B 12, 19
 C 25, 62 D 31, 93
66. The relationship between cloth cover and air permeability is
 A Exponential B Hyperbolic
 C Parabolic D Linear
67. In ideal migration, the numerical value for the fibre mean position in yarn is
 A 0 B 0.5

- C 1.0 D Indeterminate
68. Statistical analysis of variation in yarn count can be carried out by
A Binomial Distribution B Poisson Distribution
C Normal Distribution D Chi – Square Distribution
69. Statistical analysis of report of defective cloth rolls can be carried out by
A Binomial Distribution B Poisson Distribution
C Normal Distribution D Chi – Square Distribution
70. For 60s reed count(stockport) and 3 ends per dent denting, the total ends in the 160 cm width will be
A 5760 B 5670
C 5067 D 5076
71. Diameter of a 50 denier polyester yarn (in cms) approximately will be
A 0.072 B 0.027
C 0.0072 D 0.0027
72. For weaving a plain woven fabric with 6 heald shafts and skip draft, how many minimum cams are needed?
A 2 B 3
C 4 D 6
73. A design repeating on 45 cm along the length & 30 cm across the width of the fabric having 40 ends/cm & 35 picks/cm will require a jacquard capacity of
A 1800 B 1350
C 1400 D 1200
74. If the barrel of a dobby has 12 grooves then minimum no. of lags needed in a chain for a weave repeating on 18 picks is
A 12 B 18
C 36 D 48
75. If d is the yarn diameter, then the closest thread spacing attainable without thread distortion in a square set plain weave made from same set of yarns in both direction will be
A $1.237 * d$ B $1.327 * d$
C $1.723 * d$ D $1.732 * d$
76. Polypropylene is not preferred for agro textile as
A It is very expensive B It has poor elongation
C It has poor UV protection D It does not have enough strength
77. Wet spinning technique is commercially used to produce filament yarn of
A Polypropylene B Polyester
C Nylon 66 D Acrylic
78. An example of a coagulant used in textile effluent treatment is
A Activated carbon B Ferrous sulphate
C Hydrogen peroxide D Sodium chloride
79. The major pollutant found in flame retardant finish is
A Antimony B Nickel
C Copper D Zinc
80. Which technique is more useful to separate salts and organic compounds from textile effluents?
A Reverse Osmosis B Micro filtration
C Ultra-filtration D Nano filtration
81. For the matrix $A = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$

- A $A^2 + 4A - 3I = 0$ B $A^2 - 4A + 3I = 0$
 C $A^2 - 4A - 3I = 0$ D $A^2 + 4A + 3I = 0$
82. For an elementary matrix E
 A $E^T = E$ B $\det(E) \neq 0$
 C $E^T = -E$ D $E^{-1} = E$
83. Which of the following functions does not satisfy the hypothesis of Roll's theorem?
 A $f(x) = x(1-x); [0, 1]$ B $f(x) = \frac{x^2-2x}{x-3}; [0, 2]$
 C $f(x) = x^2 - 5x + 6; [2, 3]$ D $f(x) = x^2 - 3x + 2; [1, 3]$
84. The critical points of $f(x) = x^{5/2} - 5x^{1/2}$ are
 A $0, \pm\sqrt{5}$ B ± 1
 C $0, \pm 1$ D $\pm\sqrt{5}$
85. $f(x) = x^3 - 2x + 5$ has a root in interval
 A $[0, 1]$ B $[2, 3]$
 C $[-1, 0]$ D $[-3, -2]$
86. $x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$; $k = 0, 1, 2, \dots$ is the iteration scheme for
 A Bisection method B Secant method
 C Regula-Falsi method D Newton-Raphson method
87. For homogeneous function $u = \frac{x^3+y^3}{x-y}$
 A $u_x + u_y - 2u = 0$ B $xu_x + yu_y - 2u = 0$
 C $xu_x + yu_y - 3u = 0$ D $u_x + u_y - 3u = 0$
88. For the differential equation $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} - 6y = e^{2x} + e^{3x}$, its complementary function (C.F.) is
 A $c_1e^{-x} + c_2e^{6x}$ B $c_1e^{2x} + c_2e^{3x}$
 C $c_1e^{-2x} + c_2e^{-3x}$ D $c_1e^x + c_2e^{-6x}$
89. For $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$, $\text{curl}(\vec{r})$ is
 A rotational B irrotational
 C solenoidal D compressible
90. If $L\{f(t)\} = \bar{f}(s)$ then $L\{tf(t)\}$ is
 A $\int_s^\infty \bar{f}(u) du$ B $\frac{\bar{f}(s)}{s}$
 C $-\frac{d}{ds}\bar{f}(s)$ D $s\bar{f}(s)$

91. The polar form of Cauchy-Riemann equations for $f(z) = u(r, \theta) + iv(r, \theta)$ is
 A $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = \frac{1}{r} \frac{\partial u}{\partial \theta}$ B $\frac{\partial u}{\partial r} = -\frac{1}{r} \frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = \frac{1}{r} \frac{\partial u}{\partial \theta}$
 C $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -\frac{1}{r} \frac{\partial u}{\partial \theta}$ D $\frac{\partial u}{\partial r} = -\frac{1}{r} \frac{\partial v}{\partial \theta}$ and $\frac{\partial v}{\partial r} = -\frac{1}{r} \frac{\partial u}{\partial \theta}$
92. If $I = \oint_{|z|=2} \frac{dz}{z-1}$ over the circle $|z| = 2$, then
 A $I = 0$ B $I = 2\pi$
 C $I = 2\pi i$ D $I = 1$
93. For $0 < |z - 1| < 1$, the Laurent series of $f(z) = \frac{1}{(1-z)^2(2-z)}$ about $z = 1$ is $\frac{1}{(z-1)^2} + \frac{1}{z-1} + 1 + (z-1) + (z-1)^2 + \dots$. Which of the statements given below is incorrect?
 A $z = 1$ is a singular point of multiplicity 2 B $z = 1$ is a simple pole
 C $z = 2$ is a simple pole D $z = 2$ is a simple singular point
94. In an experiment of tossing a coin three times the probability of getting at least two HEAD is.....
 A $\frac{1}{8}$ B $\frac{1}{4}$
 C $\frac{3}{8}$ D $\frac{1}{2}$
95. $\frac{P(A/B)}{P(B/A)} = \frac{P(A \cap B)}{P(A)}$: $\frac{P(A)}{P(B)}$
 A $\frac{P(B)}{P(A)}$ D $P(A \cup B)$
96. $\int_0^1 \frac{(\sin^{-1} x)^2}{\sqrt{1-x^2}} dx =$ _____
 A $\pi^3/8$ B $\pi^3/24$
 C $\pi^3/12$ D $\pi^3/6$
97. $\lim_{x \rightarrow 0} \left[\frac{1}{x} - \frac{1}{\sin x} \right] =$ _____
 A 0 B ∞
 C -1 D $-1/2$
98. The differential equation $\frac{d^2 y}{dt^2} + \frac{3}{t} \frac{dy}{dt} + \frac{2y}{t^2} = \sin t$ is
 A a nonlinear differential equation B Bessel's equation
 C Legendre's homogeneous equation D Jacobi equation
99. For the forward difference operator Δ , what is $\Delta^2(x^2)$, with step size 1?
 A 0 B $x + 2$
 C $2x$ D 2
100. If a random variable has the probability density $f(x) = \begin{cases} x, & \text{for } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$; the mean of the given probability density is
 A 1 B $1/3$
 C $1/2$ D $3/4$