GENERAL APTITUDE

Q. 1- Q.5 Carry one mark each

1. A number is as much greater than 75 as it is smaller than 117. The number is:

(A) 91   (B) 93   (C) 89   (D) 96

Answer: (D)

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2. The professorordered tothe students to goout of the class.

     I   II   III IV

Which of the above underlined parts of the sentence is grammatically incorrect?

(A) I   (B) II   (C) III   (D) IV

Answer: (B)

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3. Which of the following options is the closest in meaning to the word given below:

Primeval

(A) Modern   (B) Historic   (C) Primitive   (D) Antique

Answer: (C)

---

4. Friendship, no matter how _____it is, has its limitations.

(A) cordial   (B) intimate   (C) secret   (D) pleasant

Answer: (B)

---

5. Select the pair that best expresses a relationship similar to that expressed in the pair:

Medicine: Health

(A) Science: Experiment   (B) Wealth: Peace

(C) Education: Knowledge   (D) Money: Happiness

Answer: (C)

Q. 6- Q. 10 carry two marks each.

6. X and Y are two positive real numbers such that $2X + Y \leq 6$ and $X + 2Y \leq 8$. For which of the following values of (X, Y) the function $f(X, Y) = 3X + 6Y$ will give maximum value?

(A) (4/3, 10/3)　　　　　　　　　　　　　(B) (8/3, 20/3)

(C) (8/3, 10/3)　　　　　　　　　　　　　(D) (4/3, 20/3)

Answer:　(A)

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7. If $|4X - 7| = 5$ then the values of $2|X| - |-X|$ is:

(A) 2, 1/3　　　　　(B) 1/2, 3　　　　　(C) 3/2, 9　　　　　(D) 2/3, 9

Answer:　(B)

----

8. Following table provides figures (in rupees) on annual expenditure of a firm for two years 2010 and 2011.

Category	2010	2011
Raw material	5200	6240
Power & fuel	7000	9450
Salary & wages	9000	12600
Plant & machinery	20000	25000
Advertising	15000	19500
Research & Development	22000	26400

In 2011, which of the following two categories have registered increase by same percentage?

(A) Raw material and Salary & wages

(B) Salary & wages and Advertising

(C) Power & fuel and Advertising

(D) Raw material and Research & Development

Answer:　(D)

9.   A firm is selling its product at Rs. 60 per unit. The total cost of production is Rs. 100 and firm isearning total profit of Rs. 500. Later, the total cost increased by 30%. By what percentage the priceshould be increased to maintained the same profit level.

(A) 5   (B) 10   (C) 15   (D) 30

Answer: (A)

- -

10.   Abhishek is elder to Savar.

Savar is younger to Anshul.

Which of the given conclusions is logically valid and is inferred from the abovestatements?

(A) Abhishek is elder to Anshul

(B) Anshul is elder to Abhishek

(C) Abhishek and Anshul are of the same age

(D) No conclusion follows

Answer: (D)

- -

TEXTILE ENGINEERING

Q. 1- Q.25 Carry one mark each

1.   The fibre that contains nitrogen and sulfur is

(A) Polyester   (B) Wool   (C) Nylon 6   (D) Kevlar

Answer: (B)

- -

2.   Condensation polymerization is not used to produce

(A) Polyester   (B) Nylon 6   (C) Nylon 66   (D) Polypropylene

Answer: (D)

- -

3.   Wet spinning technique is commercially used to produce filament yarn of

(A) Polypropylene   (B) Polyester   (C) Nylon 66   (D) Acrylic

Answer: (D)

4. The fibre that dissolves in 59% (w/w) sulfuric acid solution is

(A) Wool   (B) Polypropylene

(C) Cotton   (D) Viscose

Answer: **(D)**

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5. Surface features of a fibre can be obtained by

(A) Transmission electron microscope   (B) Scanning electron microscope

(C) Small angle X-ray diffractometer   (D) Sonic modulus tester

Answer: **(B)**

----

6. Birefringence of filament yarn is related to its

(A) Crystallinity   (B) Orientation

(C) Individual filament denier   (D) Density

Answer: **(B)**

----

7. A machine that does not improve the mass evenness is

(A) Drawframe   (B) Ring doubler

(C) Speedframe   (D) Ribbon lap

Answer: **(C)**

----

8. Fibre individualization in a card will increase by increasing

(A) Licker-in to cylinder setting   (B) Doffer speed

(C) Licker-in speed   (D) Cylinder speed

Answer: **(D)**

----

9. Softer cots on drafting rollers result in

(A) An increase in drafting wave   (B) Less fibre slippage at roller nip

(C) Change in draft   (D) Reduced roller lapping

Answer: **(B)**

10. 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

Answer: **(A)**

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11. Amongst the following, the suitable technology for producing core spun yarn is

(A) Air vortex spinning
(B) Rotor spinning
(C) Friction spinning
(D) Air-jet spinning

Answer: **(C)**

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12. Increase in taper angle on sectional warping drum will normally require

(A) Higher warping speed
(B) Lower warping speed
(C) Increase in traverse speed
(D) Decease in traverse speed

Answer: **(D)**

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13. Increase in the ratio of the length of crank to the length of connecting rod leads to

(A) Increase in sley eccentricity
(B) Decrease in sley eccentricity
(C) No change in sley eccentricity
(D) Initial increase and then decrease in sley eccentricity

Answer: **(A)**

---

14. Shuttle remains on the race board during its flight in the shed because of

(A) Forward positive acceleration of the sley
(B) Backward positive acceleration of the sley
(C) Constant forward velocity
(D) Constant backward velocity

Answer: **(A)**

15. In weft knitted fabrics of the same mass per unit area produced from the same yarns, the structurewhich will give the highest thickness is

(A) Plain   (B) Rib   (C) Purl   (D) Interlock

Answer: (D)

----

16. The nonwoven process which has the highest production rate is

(A) Needle punching   (B) Hydroentangling

(C) Melt blowing   (D) Spunbonding

Answer: (D)

----

17. During bleaching of cotton with H_2O_2, the stabilizer used is

(A) Sodium hydroxide   (B) Sodium silicate

(C) Acetic acid   (D) Sodium carbonate

Answer: (B)

----

18. The highest washing fastness in a dyed cotton fabric would be obtained if the dye-fibre bond is

(A) Ionic   (B) Hydrogen

(C) Covalent   (D) Van der Waal's force

Answer: (C)

----

19. Disperse dye cannot generally be fixed on polyester by

(A) Superheated steam at$180^{o}C$ (B) Saturated steam at $130^{o}C$

(C) Dry heat at $200^{o}C$ (D) Saturated steam at $100^{o}C$

Answer: (D)

----

20. 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

Answer: (C)

21. Two yarn samples have standard deviation of strength σ_1 and σ_2. If $\sigma_1 < \sigma_2$, the 'F' ratio would be

(A) σ_1/σ_2 (B) σ_2/σ_1 (C) σ_1^2/σ_2^2 (D) σ_2^2/σ_1^2

Answer: **(D)**

----

22. Nep count in a cotton fibre sample is measured by

(A) AFIS   (B) HVI   (C) Uster tester   (D) Stelometer

Answer: **(A)**

----

23. In a given woven fabric the extension at break in weft direction is higher than that in warp direction. During bursting strength test, the threads that will always break first are

(A) Warp   (B) Weft

(C) Both warp and weft simultaneously   (D) Those with lower strength

Answer: **(A)**

----

24. CSP of yarn is equal to the product of

(A) Yarn tex and lea strength (N)   (B) Yarn count (Ne) and lea strength (lbf)

(C) Yarn tex and lea strength (lbf)   (D) Yarn count (Ne) and lea strength (kgf)

Answer: **(B)**

----

25. If the moisture regain of a fibre is 10%, its moisture content (%) is _____ .

Answer: **(9.08 to 9.1)**

Q. 26- Q.55 Carry Two mark each

26. A market survey by a garment manufacturing company revealed that the chest width of their target customers had normal distribution with a mean of 54 cm. If 18% of customers surveyed have chest width greater than 58 cm and 75% of customers surveyed have chest width greater than 52 cm, the percentage of customers having chest width between 56 cm and 58 cm is _____.

Answer: **(7)**

----

27. The relationship between load (y) in N and elongation (x) in mm of a cotton fabric is $y = \sqrt{x}$

If the breaking elongation of the fabric is 9 mm, the work of rupture, in N.mm, is_____.

Answer: (18)

----

28. On twisting, the denier of a multifilament yarn consisting of 300 filaments of 3 denier each becomes 1100. If 11 km of untwisted filament yarn is twisted, its length in km will be _____.

Answer: (9)

----

29. A loom is producing 2 m wide grey fabric with 8% weft crimp. Assuming that the loom is running at 570 rpm with 90% efficiency, the weft consumption in kg/hr of 30 texyarn will be _____.

Answer: (1.99 to 2)

----

30. The strength of 100 g/m^2 fabric obtained by testing 4 cm wide strip is 0.4 kN. The tenacity (cN/tex) of the fabric is _____.

Answer: (10)

----

31. Out of 100 textile companies, 10 companies are involved in spinning, weaving and chemicalprocessing, 25 companies are involved in spinning and chemical processing, and 30 companies are involved in weaving and chemical processing. If 65 companies are involved in chemical processing, the number of companies involved ONLY in chemical processing is_____.

Answer: (20)

----

32. In a card the probability of fibre transfer from cylinder to doffer in one revolution of cylinder is 0.2. The probability that a particular fibre will be transferred to the doffer within the first three revolutions of cylinder is _____.

Answer: (0.48 to 0.49)

33. The particular integral of $\dfrac{d^2y}{dx^2} + 5\dfrac{dy}{dx} + 6y = e^{2x}$ is

   (A) $e^{2x}/20$ (B) $e^{2x}/12$ (C) $2e^{2x}$ (D) $4e^{2x}$

Answer: **(A)**

---

34. The inverse of the matrix $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ is

   (A) $\begin{bmatrix} \sin\theta & \cos\theta \\ \cos\theta & -\sin\theta \end{bmatrix}$ (B) $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$

   (C) $\begin{bmatrix} -\sin\theta & \cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$ (D) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$

Answer: **(B)**

---

35. Consider the following assertion [a] and reason [r] and choose the most appropriate answer

   [a] Nylon 6 is polymerized using only single monomer caprolactum

   [r] Synthesis of Nylon 6 is basically an addition polymerization

   (A) [a] is right [r] is wrong   (B)   [a] is right [r] is right

   (C) [a] is wrong [r] is wrong (D)   [a] is wrong [r] is right

Answer: **(A)**

---

36. Consider the following assertion [a] and reason [r] and choose the most appropriate answer

   [a] Sodium cellulose xanthate formation is an essential unit operation in the production of viscose rayon

   [r] It helps to reduce the degree of polymerization of cellulose

   (A) [a] is right [r] is wrong   (B) [a] is right [r] is right

   (C) [a] is wrong [r] is wrong   (D) [a] is wrong [r] is right

Answer: **(A)**

---

37. Consider the following assertion [a] and reason [r] and choose the most appropriate answer

[a] In false-twist friction texturing, the ratio of input to output tension is kept close to one

[r] Broken filaments and tight spots are within the acceptable limits at this condition

(A) [a] is right [r] is wrong   (B) [a] is right [r] is right

(C) [a] is wrong [r] is wrong   (D) [a] is wrong [r] is right

Answer: (B)

---

38. Consider the following assertion [a] and reason [r] and choose the most appropriate answer

[a] Heat setting increases the dimensional stability of synthetic fabrics

[r] The free energy reduces as a result of heating

(A) [a] is right [r] is wrong   (B) [a] is right [r] is right

(C) [a] is wrong [r] is wrong   (D) [a] is wrong [r] is right

Answer: (B)

---

39. The advantage of flyer leading over bobbin leading speed-frame is

(A) Lower roving stretch

(B) Lesser chance of unwinding after breakage

(C) Lower power requirement

(D) Power requirement remains fairly constant during the bobbin build up

Answer: (C)

---

40. The daily production of a mill is 1200 kg of 30 tex and 1200 kg of 20 tex yarns. The average yarn tex produced by this mill is

(A) 23   (B) 24   (C) 25   (D) 26

Answer: (B)

---

41. A square plain jammed woven fabric of 0.5 mm thickness is to be produced from polyester yarns. Assuming circular yarn cross-section, the number of picks per cm in the fabric on the loom is approximately

(A) 13   (B) 18   (C) 23   (D) 28

Answer: (C)

42. On a winding machine, if the winding speed is increased from 1000 m/min to 1200 m/min, the percentage increase in the yarn tension will be approximately

(A) 12   (B) 24   (C) 36   (D) 44

Answer: **(D)**

----

43. Choose the correct alternative from amongst A, B, C and D

Mercerization of cotton results in

P. Increase in tensile strength

Q. Increase in dye uptake

R. Modification of crystal structure

S. Decrease in moisture regain

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

Answer: **(A)**

----

44. In the case of reactive dyeing of cotton, the exhaustion is 70% and reaction efficiency is 80%.

Assuming that the initial dye concentration is 2% on the weight of fabric, the amount of unreacteddye on the fabric expressed as a percentage of fabric weight would be

(A) 0.14   (B) 0.28   (C) 0.35   (D) 0.42

Answer: **(B)**

----

45. Consider the following assertion [a] and reason [r] and choose the most appropriate answer

[a] Controlled reduction treatments are commercially used for shrink resist finishing of wool

[r] Reduction disrupts the disulphide bonds, which are responsible for wool shrinkage

(A) [a] is right [r] is wrong   (B) [a] is right [r] is right

(C) [a] is wrong [r] is wrong   (D) [a] is wrong [r] is right

Answer: **(C)**

46. The principle which cannot be used to measure hairiness of yarn is

(A) Light scattering

(B) Image analysis

(C) Photoelectric

(D) Capacitance

Answer: **(D)**

----

47. The abrasion cycles on a flat abrasion tester increase with an increase in

(A) Pressure applied during abrasion

(B) Speed of abrasion

(C) Area of abraded surface

(D) Specimen tension during abrasion

Answer: **(C)**

Common Data for Questions: 48 & 49

A winding machine without anti-patterning device has the following particulars:

Cylindrical winding drum diameter: 75 mm

Number of crossing on drum : $2\frac{1}{2}$

Rotational speed of the drum : 2860 rev/min

Traverse length: 150 mm

A 3.5 degree constant taper cone is built on the above cone winder with no movement of the point of drive during the package build up. At mean cone diameter of 150 mm the package rev/min is 1375.

48. The number of times major patterning will occur in producing 200 mm mean diameter package on 40 mm mean diameter core is

(A) 5
(B) 7
(C) 9
(D) 11

Answer: **(B)**

----

49. Distance in mm of point of drive from the base of the cone along the traverse is approximately

(A) 26
(B) 30
(C) 36
(D) 40

Answer: **(A)**

Common Data for Questions: 50 & 51

Consider the following particulars for a spinning line producing 30 texyarn from 150 militex polyester fibre.

Mass CV of card sliver   : 3%

Mass CV added at draw-frame: 2%

Mass CV added at speed-frame: 3%

Mass CV added at ring-frame : 7%

Number of doubling at draw-frame: 6

Number of draw-frame passage: 1

50. The mass CV% of roving is approximately

(A) 3.4 　　　　　(B) 3.8 　　　　　(C) 4.2 　　　　　(D) 4.6

Answer: (B)

----

51. Index of irregularity of yarn is approximately

(A) 0.88 　　　　　(B) 1.13 　　　　　(C) 1.33 　　　　　(D) 1.53

Answer: (B)

Linked Answer Questions: 52 & 53

The angle subtended by the half-lap on the cylinder comb is 90°. The time taken by the half-lap to comb a fringe is 0.04 s.

52. The speed of the comber in nips/min is

(A) 325 　　　　　(B) 350 　　　　　(C) 375 　　　　　(D) 400

Answer: (C)

53. From the following data, calculate approximate production rate in kg/hr

Length of lap fed per nip : 6 mm

Lap linear density : 60 ktex

Noil : 20%

Efficiency : 80%

Number of heads : 6

(A) 21   (B) 26   (C) 31   (D) 36

Answer: (C)

Linked Answer Questions: 54 & 55

Viscose fabric is to be resin finished with DMDHEU by pad-dry-cure method. Assume that

Mass of fabric per unit area : $200 g/m^2$

Width of fabric : 100 cm

Speed of the machine : 50 m/min

Concentration of pad liquor : 100 g/l

Wet pick up : 100%

Specific gravity of padding liquor : 1.0

Molecular weight of anhydroglucose unit : 162

54. The resin add-on after padding in kg per kg of fabric will be

(A) 0.1   (B) 0.2   (C) 0.3   (D) 0.4

Answer: (A)

----

55. Assuming that the reaction takes place in amorphous region only and that the fabric crystallinity is 33%, the number of cross links formed per anhydroglucose unit after curing would be approximately

(A) 0.07   (B) 0.14   (C) 0.28   (D) 0.35

Answer: (B)