Graduate Aptitude Test in Engineering

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name: TF: TEXTILE ENGINEERING AND FIBRE SCIENCE 1st Feb Shift2
Number of Questions: 65
Total Marks: 100.0

Wrong answer for MCQ will result in negative marks, (-1/3) for 1 mark Questions and (-2/3) for 2 marks Questions.

General Aptitude

Number of Questions: 10
Section Marks: 15.0

Q.1 to Q.5 carry 1 mark each & Q.6 to Q.10 carry 2 marks each.

Question Number : 1 Question Type : MCQ

Choose the appropriate word/phrase, out of the four options given below, to complete the following sentence:

Apparent lifelessness _____ dormant life.

(A) harbours (B) leads to (C) supports (D) affects

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 2 Question Type : MCQ

Fill in the blank with the correct idiom/phrase.

That boy from the town was a _____ in the sleepy village.

(A) dog out of herd (B) sheep from the heap
(C) fish out of water (D) bird from the flock

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 3 Question Type : MCQ

Choose the statement where underlined word is used correctly.

(A) When the teacher eludes to different authors, he is being elusive.
(B) When the thief keeps eluding the police, he is being elusive.
(C) Matters that are difficult to understand, identify or remember are allusive.
(D) Mirages can be allusive, but a better way to express them is illusory.

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 4 Question Type : MCQ

Tanya is older than Eric.
Cliff is older than Tanya.
Eric is older than Cliff.

If the first two statements are true, then the third statement is:

(A) True
(B) False
(C) Uncertain
(D) Data insufficient

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 5 Question Type : MCQ

Five teams have to compete in a league, with every team playing every other team exactly once, before going to the next round. How many matches will have to be held to complete the league round of matches?

(A) 20 (B) 10 (C) 8 (D) 5

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 6 Question Type : MCQ

Select the appropriate option in place of underlined part of the sentence.

Increased productivity necessary reflects greater efforts made by the employees.

(A) Increase in productivity necessary
(B) Increase productivity is necessary
(C) Increase in productivity necessarily
(D) No improvement required

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 7 Question Type : MCQ

Given below are two statements followed by two conclusions. Assuming these statements to be true, decide which one logically follows.

Statements:

I. No manager is a leader.
II. All leaders are executives.

Conclusions:

I. No manager is an executive.
II. No executive is a manager.

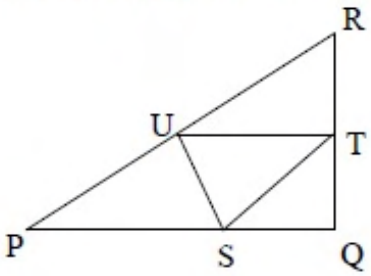
(A) Only conclusion I follows.
(B) Only conclusion II follows.
(C) Neither conclusion I nor II follows.
(D) Both conclusions I and II follow.

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 8 Question Type : NAT

In the given figure angle Q is a right angle, PS:QS = 3:1, RT:QT = 5:2 and PU:UR = 1:1. If area of triangle QTS is 20 cm^2, then the area of triangle PQR in cm^2 is _____.



Correct Answer :

280

Question Number : 9 Question Type : MCQ

Right triangle PQR is to be constructed in the xy - plane so that the right angle is at P and line PR is parallel to the x-axis. The x and y coordinates of P, Q, and R are to be integers that satisfy the inequalities: $-4 \le x \le 5$ and $6 \le y \le 16$. How many different triangles could be constructed with these properties?

(A) 110 (B) 1,100 (C) 9,900 (D) 10,000

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 10 Question Type : MCQ

A coin is tossed thrice. Let X be the event that head occurs in each of the first two tosses. Let Y be the event that a tail occurs on the third toss. Let Z be the event that two tails occur in three tosses. Based on the above information, which one of the following statements is TRUE?

(A) X and Y are not independent
(B) Y and Z are dependent
(C) Y and Z are independent
(D) X and Z are independent

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Textile Engineering and Fibre Science

Number of Questions:	55
Section Marks:	85.0

Q.11 to Q.35 carry 1 mark each & Q.36 to Q.65 carry 2 marks each.

Question Number : 11 Question Type : NAT

If 3 and 4 are two eigen values of $A = \begin{bmatrix} 3 & a & b \\ c & 2 & d \\ e & f & 4 \end{bmatrix}$ for some real numbers a, b, c, d, e, and f, then the third eigen value of A is _____

Correct Answer :

2

Question Number : 12 Question Type : NAT

If a continuous random variable X has probability density function

$$f(x)=\begin{cases} ax^2, & 0\le x\le 1 \\ 0, & otherwise \end{cases}$$

then the value of a is _____

Correct Answer :

3

Question Number : 13 Question Type : NAT

The value of $\lim_{x\to 0}\frac{\sin x}{x}$ is _____

Correct Answer :

1

Question Number : 14 Question Type : NAT

If $A=\begin{bmatrix} 3 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & \frac{1}{12} \end{bmatrix}$, then determinant of A^{-1} is _____

Correct Answer :

1

Question Number : 15 Question Type : NAT

The number of linearly independent eigen vectors of the matrix $\begin{bmatrix} 1 & 0 \\ 3 & 4 \end{bmatrix}$ is _____

Correct Answer :

2

Question Number : 16 Question Type : MCQ

The gum in the raw silk filament is

(A) Wax (B) Lignin (C) Sericin (D) Fibroin

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 17 Question Type : MCQ

For production of dry-spun acrylic fibre, the suitable solvent for dope preparation is

(A) Acetone
(B) *N,N'* Dimethyl formamide
(C) Formic acid
(D) Aqueous sodium thiocyanate (55 wt%)

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 18 Question Type : MCQ

Adipic acid is a monomer for the production of

(A) Poly(ethylene terephthalate)
(B) Nylon 66
(C) Nylon 64
(D) Nylon 610

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 19 Question Type : MCQ

In melt spinning line, the melting of solid polymer and its homogenization takes place in

(A) Manifold
(B) Extruder
(C) Metering pump
(D) Quench duct

Options :

1. ✖ A
2. ✔ B
3. ✖ C

4. ✖ D

Question Number : 20 Question Type : MCQ

The blending technique that gives the most homogeneous mixing of fibres is

(A) Lap blending (B) Tuft blending (C) Sliver blending (D) Roving blending

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 21 Question Type : MCQ

In a cotton comber, noil extraction increases

(A) With a decrease in detachment setting
(B) With an increase in pre-combing draft
(C) If majority of hooks are presented in leading direction
(D) With an increase in short fibres

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 22 Question Type : MCQ

The bottom roller surface used for driving aprons in ringframe drafting system is

(A) Knurled
(B) Axially fluted
(C) Spirally fluted
(D) Smooth

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 23 Question Type : MCQ

If the numerical value of yarn linear density expressed in Tex and that in English system is the same, this value to the nearest integer is

(A) 30 (B) 28 (C) 24 (D) 22

Options :

1. ✖ A
2. ✖ B
3. ✔ C

4. ✖ D

Question Number : 24 Question Type : MCQ

Patterning is most likely to occur in

(A) Precision winding
(B) Random winding
(C) Step-precision winding
(D) Pirn winding

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 25 Question Type : MCQ

In cotton yarn sizing, the starch primarily acts as

(A) Binding agent (B) Lubricating agent (C) Antistatic agent (D) Antimicrobial agent

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 26 Question Type : MCQ

Purl is a

(A) Woven structure
(B) Nonwoven structure
(C) Braided structure
(D) Knitted structure

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 27 Question Type : MCQ

The technology/ies used for producing SMS fabric is/are

(A) Spunlace
(B) Spunlace and Meltblown
(C) Needlepunch
(D) Spunbond and Meltblown

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 28 Question Type : MCQ

Jigger **CANNOT** be used for

(A) Dyeing
(B) Printing
(C) Washing
(D) Scouring

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 29 Question Type : MCQ

In the context of effluent discharge, BOD means

(A) Bio-oxidative degradation
(B) Bio oxygen distress
(C) Biological oxygen demand
(D) Bacteria observed on disc

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 30 Question Type : MCQ

Milling is associated with the processing of

(A) Cotton fabric
(B) Silk fabric
(C) Jute fabric
(D) Wool fabric

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 31 Question Type : MCQ

Dyed wool fabric standards are used for the evaluation of

(A) Wash fastness
(B) Perspiration fastness
(C) Sublimation fastness
(D) Light fastness

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 32 Question Type : MCQ

The yarn tenacity (gf/tex) measured in lea form, compared to that measured in single yarn form is

(A) Always lower
(B) Always higher
(C) Always equal
(D) Higher or lower depending on yarn count

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 33 Question Type : MCQ

The property that Kawabata Evaluation System (KES) **DOES NOT** measure is

(A) Shear rigidity
(B) Bending rigidity
(C) Compressional resilience
(D) Tensile strength

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 34 Question Type : MCQ

On absorption of moisture, the thermal insulation of cotton fabric will

(A) Decrease
(B) Increase
(C) Remain the same
(D) First increase and then decrease

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 35 Question Type : MCQ

For meeting the criterion of number of defects in a product, the relationship between upper control limit (UCL) and upper specification limit (USL) should be

(A) UCL < USL
(B) UCL > USL
(C) UCL = 2USL
(D) UCL = $(USL)^3$

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 36 Question Type : NAT

The maximum value of $f(x)=\sqrt{2}(\sin x+\cos x)$ for x in $[0,\pi]$ is _____

Correct Answer :

2

Question Number : 37 Question Type : MCQ

Out of the following, the exact differential equation is

(A) $-ydx+xdy=0$ (B) $ydx+xdy=0$ (C) $ydx-xdy=0$ (D) $dx+xdy=0$

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 38 Question Type : NAT

Let $f:[1,4]\to\Re$ be a continuous function such that $f(1)=0.32$, $f(2)=0.125$, $f(3)=0.025$ and $f(4)=0.05$. The value of the integral $\int_1^4 f(x)dx$, accurate up to three decimal places, obtained by Trapezoidal rule with n=3 is _____

Correct Answer :

0.335

Question Number : 39 Question Type : MCQ

The normal vector to the surface $z = \sqrt{x^2 + y^2}$ at (1,1,1) is

(A) $\hat{i} + \hat{j} + \hat{k}$ (B) $\hat{i} - \hat{j} + \hat{k}$ (C) $-\hat{i} - \hat{j} + \hat{k}$ (D) $-\hat{i} + \hat{j} + \hat{k}$

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 40 Question Type : MCQ

Consider the analytical techniques in the **Column I** and the properties in **Column II**. Choose the correct alternative from amongst A, B, C, and D

	Column I		**Column II**
P	FTIR	1	Orientation
Q	Differential scanning calorimetry	2	Functional groups
R	Density	3	Crystallinity
S	Birefringence	4	Crystallization temperature

(A) P-2, Q-4, R-3, S-1
(B) P-2, Q-1, R-4, S-3
(C) P-3, Q-4, R-1, S-2
(D) P-3, Q-2, R-4, S-1

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 41 Question Type : MCQ

If T_g, T_m, and T_c represent the glass transition, melting and crystallization temperature, respectively, the correct relationship is

(A) $T_g < T_c < T_m$
(B) $T_g < T_m < T_c$
(C) $T_c < T_g < T_m$
(D) $T_m < T_g < T_c$

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 42 Question Type : MCQ

The correct sequence of unit operations employed in production of viscose rayon is

(A) Ageing - Steeping - Xanthation - Ripening
(B) Ageing - Steeping - Ripening - Xanthation
(C) Steeping - Ageing - Ripening - Xanthation
(D) Steeping - Ageing - Xanthation - Ripening

Options :

1. ✖ A
2. ✖ B
3. ✖ C
4. ✔ D

Question Number : 43 Question Type : MCQ

Consider the following assertion [a] and reason [r] and choose the correct alternative from amongst A, B, C, and D.

[a] After polymerization of caprolactum, thorough washing of polymer with water is necessary to remove unreacted monomer and its oligomers.
[r] Otherwise, hydrolytic degradation of polymer would occur during melt spinning.

(A) [a] is right and [r] is wrong
(B) [a] is right and [r] is right
(C) [a] is wrong and [r] is wrong
(D) [a] is wrong and [r] is right

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 44 Question Type : MCQ

Consider the fibres in **Column I** and the applications in **Column II.** Choose the correct alternative from amongst A, B, C, and D

	Column I		**Column II**
P	Acrylic	1	Chemical filtration
Q	Jute	2	Tire cord
R	Nylon	3	Precursor for carbon fibre
S	Polypropylene	4	Biodegradable sacks

(A) P-1, Q-4, R-2, S-3
(B) P-2, Q-4, R-3, S-1
(C) P-3, Q-4, R-2, S-1
(D) P-3, Q-4, R-1, S-2

Options :

1. ✖ A

2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 45 Question Type : NAT

Two polyester and six viscose rayon slivers of same count are blended on a drawframe. In the second passage, four slivers from first passage are further blended with two combed cotton slivers of the same count. The viscose (%) in the final sliver to the nearest integer is _____

Correct Answer :
50

Question Number : 46 Question Type : MCQ

In ring spinning, the tension in yarn is the maximum

(A) Between the lappet guide and front roller
(B) Where the balloon radius is the maximum
(C) In winding zone
(D) Just below the lappet guide

Options :
1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 47 Question Type : NAT

A core spun yarn of 30 tex is to be produced with 10% core by weight. If the cotton roving count is 540 tex, the required draft on the ringframe will be _____

Correct Answer :
20

Question Number : 48 Question Type : NAT

If the spindle speed of ringframe is 15000 rpm and the traveler speed at the maximum bobbin diameter of 50 mm is 0.8% less than that of the spindle. The yarn delivery rate (m/min), to the nearest integer, will be _____

Correct Answer :

19

Question Number : 49 Question Type : NAT

A rotor of 2 inch diameter is spinning a yarn of 16^s Ne. If the twist multiplier is 5 and the fibre linear density is 0.1 tex, the average fibre flow through the transport channel, to the nearest integer, will be _____

Correct Answer :

3

Question Number : 50 Question Type : NAT

The groove drum in a random winder makes five revolutions for one double traverse. If the drum and package diameters are 10 cm and 5 cm, respectively, the wind per double traverse would be_____

Correct Answer :

10

Question Number : 51 Question Type : MCQ

A 500-end double-lift, single-cylinder jacquard has

(A) 500 hooks and 500 needles
(B) 500 hooks and 1000 needles
(C) 1000 hooks and 500 needles
(D) 1000 hooks and 1000 needles

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 52 Question Type : NAT

A shuttle loom is running at 240 picks per minute. The angular velocity of bottom shaft in radian per second is $n\pi$. The value of n is _____

Correct Answer :

4

Question Number : 53 Question Type : NAT

In an air-jet loom, if the weft yarn diameter is increased by 10%, keeping the linear density constant, the percent increase in the drag force would be _____

Correct Answer :
10

Question Number : 54 Question Type : NAT

For a fully relaxed knitted fabric, the wale constant (K_w) and course constant (K_c) are 4.2 and 5.5, respectively. If the loop length is 0.5 cm, the loop density per cm^2, to the nearest integer, would be _____

Correct Answer :
92

Question Number : 55 Question Type : MCQ

Consider the following assertion [a] and reason [r] and choose the correct alternative from amongst A, B, C, and D.

[a] Cross-laid needlepunched nonwoven fabrics demonstrate higher tensile strength in machine direction.
[r] In cross-laid nonwoven fabrics, the fibres are randomly oriented.

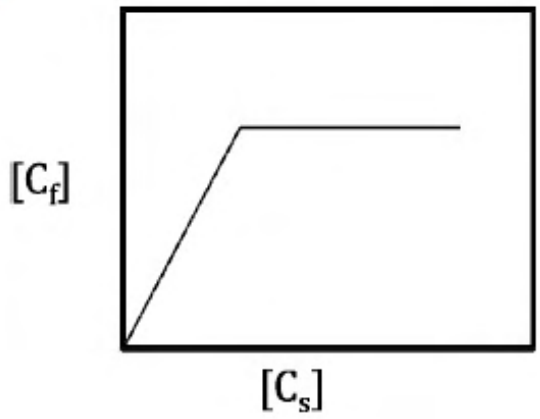
(A) [a] is right and [r] is wrong
(B) [a] is right and [r] is right
(C) [a] is wrong and [r] is wrong
(D) [a] is wrong and [r] is right

Options :
1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

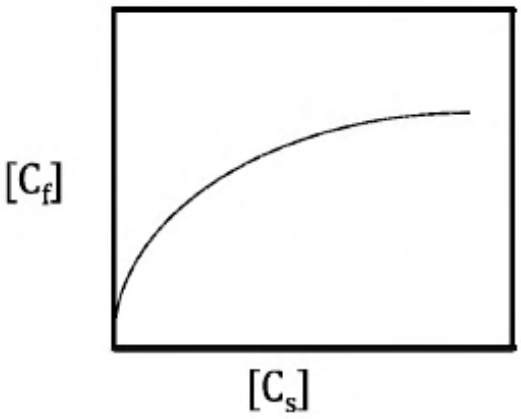
Question Number : 56 Question Type : MCQ

If $[C_s]$ and $[C_f]$ represent dye concentration in the bath and in the fibre, respectively, the isotherm for dyeing of polyester with disperse dyes is represented by the figure

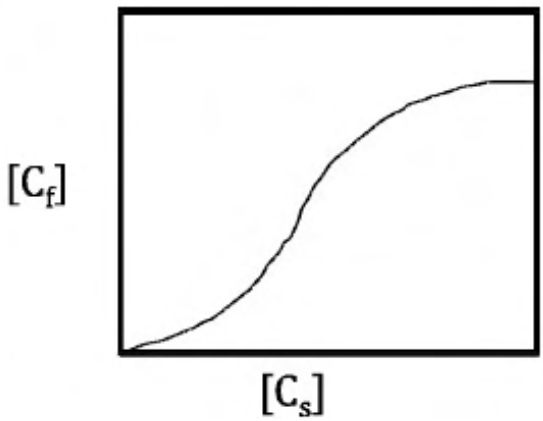
(A)



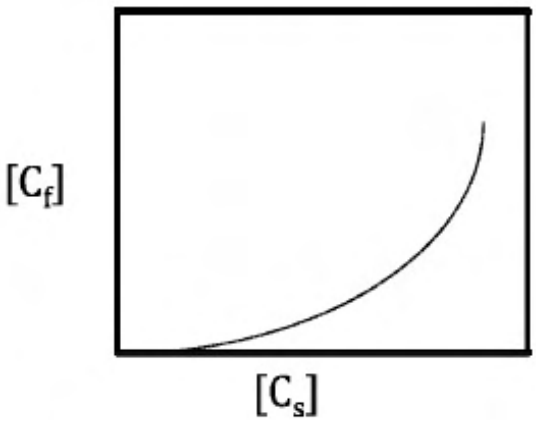
(B)



(C)



(D)



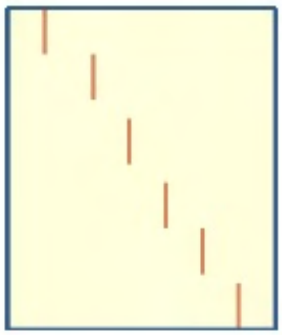
Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

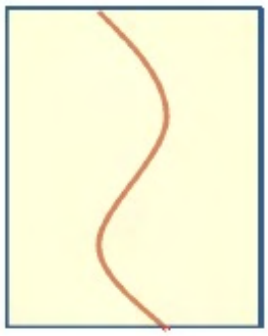
Question Number : 57 Question Type : MCQ

A small hard particle is stuck in the doctor blade of a roller printing machine. The printing fault on the fabric, as a result of this, is represented by the figure

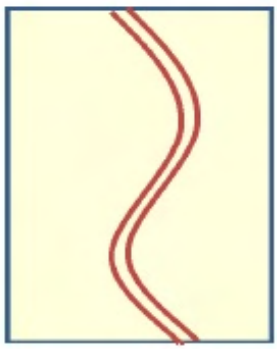
(A)



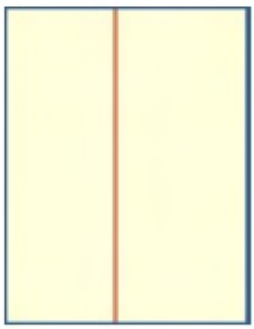
(B)



(C)



(D)



Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 58 Question Type : MCQ

Consider the following assertion [a] and reason [r] and choose the correct alternative from amongst A, B, C, and D.

[a] Millions of shades can be produced through ink-jet printing with only four basic colours.
[r] The colours get mixed in appropriate proportions before jetting onto the fabric.

(A) [a] is right and [r] is wrong
(B) [a] is right and [r] is right
(C) [a] is wrong and [r] is wrong
(D) [a] is wrong and [r] is right

Options :

1. ✔ A
2. ✖ B
3. ✖ C
4. ✖ D

Question Number : 59 Question Type : MCQ

Consider the following assertion [a] and reason [r] and choose the correct alternative from amongst A, B, C, and D.

[a] Fluorochemicals impart very high water repellency.
[r] Fluorochemicals significantly reduce the surface energy of the treated substrate.

(A) [a] is right and [r] is wrong
(B) [a] is right and [r] is right
(C) [a] is wrong and [r] is wrong
(D) [a] is wrong and [r] is right

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 60 Question Type : MCQ

Consider the following assertion [a] and reason [r] and choose the correct alternative from amongst A, B, C, and D.

[a] In the context of foam finishing, the narrow size distribution of foam cells increases the half life of foam.
[r] The rate of coalescing and collapsing of foam cells is low in this case.

(A) [a] is right and [r] is wrong
(B) [a] is right and [r] is right
(C) [a] is wrong and [r] is wrong
(D) [a] is wrong and [r] is right

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 61 Question Type : NAT

For a typical yarn tensile test, force (F) in Newton and elongation (e) in cm are related as under

$$F = 2 + 4\,e + 3\,e^2$$

If the yarn fails at an elongation of 3 cm, the work of rupture in N-m, accurate up to first decimal place is_____

Correct Answer :

0.5

Question Number : 62 Question Type : MCQ

Choose the **INCORRECT** statement from amongst the A, B, C, and D

(A) Crease recovery is higher for thick and dense fabric
(B) Tear strength of fabric improves with greater float length
(C) Strength CV of yarn does not affect the weaveability
(D) Higher drape coefficient indicates stiffer fabric

Options :

1. ✖ A
2. ✖ B
3. ✔ C
4. ✖ D

Question Number : 63 Question Type : MCQ

The unique ability of woven fabric to drape in multiple curvatures is mainly due to

(A) High tensile modulus
(B) Low shear rigidity
(C) Low compressibility
(D) High bending rigidity

Options :

1. ✖ A
2. ✔ B
3. ✖ C
4. ✖ D

Question Number : 64 Question Type : NAT

The relationship between 50% span length of fibre (L_1) and 2.5% span length of fibre (L_2) for a given cotton variety is given by

$$L_1 = \frac{L_2}{2} + 5$$

If standard deviation (SD) of L_2 is 4 mm, that of the L_1 , in mm, would be_____

Correct Answer :

2

Question Number : 65 Question Type : NAT

The correlation coefficient (r) between two variables is 0.9. The unexplained variation (%) is _____

Correct Answer :