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**Memory Based Paper
(Section I + II) 20 March
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110 Questions

Que. 1 The present ratio of ages of P and Q is 6 : 7. 12 years ago, this ratio was 3 : 4. Find the sum of total of their present ages.

1. 48 years
2. 52 years
3. 24 years
4. 28 years

Correct Option - 2

Que. 2 If there is a loss of 30% after selling a pen for Rs. 56, then in what price will it be sold to get a profit of 20% ?

1. Rs. 96
2. Rs. 84
3. Rs. 72
4. Rs. 48

Correct Option - 1

Que. 3 The speed of a boat in still water is 18 km/hr. If the speed of stream is 4 km/hr, then how much time will it take to cover a distance of 44 km in downstream?

1. 4 hours
2. 5 hours
3. 3 hours
4. 2 hours

Correct Option - 4

Que. 4 Radha borrows Rs. 20000 from a bank on simple interest, find the rate of interest if she receives Rs. 3600 as interest after 2 years.

1. 18%
2. 9%
3. 27%
4. 4.5%

Correct Option - 2

Que. 5 A man spends 25% of his income on food, 20% of his income on rent, and 15% of his income on traveling. After this, the remaining income of a man is Rs. 6000. Find the total income of man.

1. Rs. 15000
2. Rs 12000
3. Rs 1500
4. Rs 25000

Correct Option - 1

Que. 6 A train passes a platform in 42 seconds and a man standing on the platform in 25 seconds. If the speed of the train is 72 km/hr, what is the length of the platform?

1. 300 m
2. 270 m
3. 340 m
4. 370 m

Correct Option - 3

Que. 7 A completes a work in 12 days and B completes the same work in 30 days. In many days will they complete the work together?

1. 10 days
2. 8 days
3. $40/7$ days
4. $60/7$ days

Correct Option - 4

Que. 8 What is the ratio of the LCM to HCF of the 76, 114 and 304.

1. 24
2. 42
3. 48
4. 54

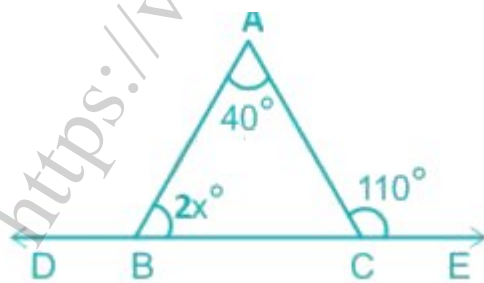
Correct Option - 1

Que. 9 If the mean and median of a statistical data be 5 and 6 respectively, then the value of mode is

1. 11
2. 9
3. 8
4. None of the above

Correct Option - 3

Que. 10 Find the value of x.



1. 70°
2. 55°
3. 45°
4. 35°

Correct Option - 4

Que. 11 If $a : b = 5 : 2$, $b : c = 8 : 9$ and $c : d = 9 : 4$, then find the value of $a : d$.

1. 1 : 5
2. 5 : 1

3. 2 : 3

4. 3 : 1

Correct Option - 2

Que. 12 The average runs scored by a batsman in eleven matches is 73 runs. After playing the twelfth match his new average got reduced by 5 runs. Find the runs scored by the batsman in the twelfth match.

1. 13

2. 18

3. 23

4. 26

Correct Option - 1

Que. 13 What is the simplified value of $(\cos A + \sin A)(\cot A + \tan A)$?

1. $\sec A + \operatorname{cosec} A$

2. $\sin A + \cos A$

3. $\tan A + \cot A$

4. $\sec A - \operatorname{cosec} A$

Correct Option - 1

Que. 14 P and Q together earn Rs. 250 per day. Q and R together earn 220 per day. P, Q, and R when working together earn Rs 350 per day. How much does Q earn daily?

1. Rs. 120

2. Rs. 240

3. Rs. 180

4. Rs. 200

Correct Option - 1

Que. 15 The diagonal of a rectangular field is 10 metre and the perimeter is 28 metre, then what will be the area of the field?

1. 96 m^2

2. 28 m^2

3. 48 m^2

4. 72 m^2

Correct Option - 3

Que. 16 Find the volume of a sphere of diameter 21 cm.

1. $4,637 \text{ cm}^3$

2. $4,481 \text{ cm}^3$

3. $4,851 \text{ cm}^3$

4. $4,257 \text{ cm}^3$

Correct Option - 3

Que. 17 Rs. 1,800 is shared between A, B, and C. If A gets thrice of B, and B gets twice of C, then what is the share of A?

1. Rs. 1400
2. Rs. 1200
3. Rs. 1300
4. None of these

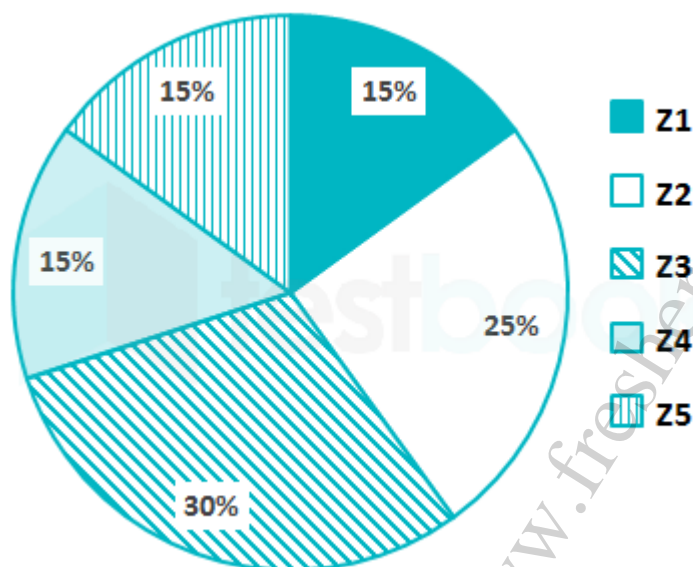
Correct Option - 2

Que. 18 If sum of Rs. 3000 lent on compound interest becomes Rs.3993 in 3 years. Find the rate of interest.

1. 10%
2. 12%
3. 13%
4. 7%

Correct Option - 1

Que. 19 The pie chart given below shows the number of tigers in different zoos. The number of tigers in a particular zoo are shown as a percentage of total number of tiger in all the zoos together.

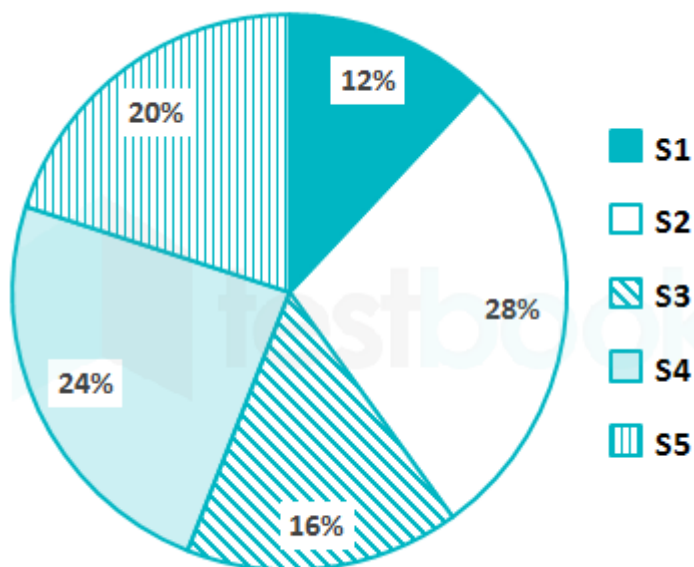


What is the difference in central angle of the sectors for Z1 and Z3?

1. 18°
2. 72°
3. 36°
4. 54°

Correct Option - 4

Que. 20 The pie chart given below shows the number of female students in different subjects. The number of female students in a particular subject is shown as a percentage of a total number of female students in all the subjects together.



If the total number of female students is 3600, then what is the difference in the number of female students in subjects S1 and S4?

1. 412
2. 400
3. 432
4. 456

Correct Option - 3

Que. 21 Change the Voice -

His colleague took him to the hospital.

1. He was taken to the hospital by his colleague.
2. He is taken to the hospital by his colleague.
3. He was being to the hospital by his colleague.
4. Hospital was taken him by his colleague.

Correct Option - 1

Que. 22 Select the correct passive form of the given sentence.

Had I completed the assignment?

1. Has the assignment been completed by me?
2. Had the assignment completed by me?
3. Had the assignment been complete by me?
4. Had the assignment been completed by me?

Correct Option - 4

Que. 23 Choose the option that is the indirect form of the sentence.

She said, "I will be there at 3 pm."

1. She said that she will be there at 3 pm.
2. She said to she would be there at 3 pm.
3. She said if she would be there at 3 pm.
4. She said that she would be there at 3 pm.

Correct Option - 4

Que. 24 **Direction: Change the Narration-**

She said to me, "Will you buy the book?"

1. She asked me whether I will buy the book.
2. She asked me whether I would buy the book.
3. She asked me that I would buy the book.
4. She asked me I would buy the book.

Correct Option - 2

Que. 25 **Direction: The sentence is divided into four parts. Find out which part has an error and mark it as your answer. If there is no error, mark 'No error' as your answer.**

I think a animal is (A)/ in the garage and (B)/ they all gather to see that animal. (C)/ No error (D)

1. (A)
2. (B)
3. (C)
4. (D)

Correct Option - 1

Que. 26 **Select the correct one-word for the given group of words.**

The scientific study of the material remains of past human life and activities.

1. Ornithology
2. Speleology
3. Archaeology
4. Epigraphy

Correct Option - 3

Que. 27 **Direction: Select the most appropriate meaning of the given idiom.**

Kick around

1. arrange in rows
2. hit someone angrily
3. break a queue
4. treat someone roughly or without respect.

Correct Option - 4

Que. 28 **Direction: Choose the correctly spelt word from the given option.**

1. Separate
2. Saparate
3. Seperate
4. Separait

Correct Option - 1

Que. 29 **Which one of the following alternatives has the correct spelling?**

1. Supprise
2. Surprise

3. Surprize
 4. Suprise
- Correct Option - 2

Que. 30 **Direction:** Select the synonym of the given word.

FANATIC

1. Enthusiast
2. Fantastic
3. Famed
4. Great

Correct Option - 1

Que. 31 In the following question, out of the given alternatives, choose the best one which expresses the meaning of the given word.

Prejudice

1. Advantage
2. Tolerance
3. Bias
4. Justice

Correct Option - 3

Que. 32 **Direction:** Choose the word MOST SIMILAR in meaning to the given word.

Barren

1. Infertile
2. Bold
3. Berserk
4. Bide

Correct Option - 1

Que. 33 **Direction:** Select the ANTONYM of the given word.

LAVISH

1. Laudable
2. Meagre
3. Liberal
4. Excessive

Correct Option - 2

Que. 34 **Direction:** Select the correct antonym of the given word.

Allure

1. Repulse
2. Attract
3. Rewind
4. Revive

Correct Option - 1

Que. 35 **Direction:** Select the most appropriate antonym for the given word.

Sever

1. Detach
2. Cleave
3. Bind
4. Disconnect

Correct Option - 3

Que. 36 A series is given in the following question. Find the term that will replace the question mark.

0, 8, 31, 74, 142, ?

1. 240
2. 230
3. 260
4. 300

Correct Option - 1

Que. 37 If "FRAME" is coded as 53972 and "BOOK" is coded as 4881, then how is "MORE" coded?

1. 4381
2. 3287
3. 5872
4. 7832

Correct Option - 4

Que. 38 If MNOP is written as QRST in a code language, then what will ABCD be written in that code language?

1. MNOP
2. FGHI
3. EFGH
4. PQRS

Correct Option - 3

Que. 39 A word with letters jumbled has been given. Choose the correct order of letters which are required to form the correct word.

Jumbled word: SPTRECE

1. 4, 3, 6, 5, 7, 2, 1
2. 4, 3, 2, 7, 6, 5, 1
3. 4, 7, 1, 6, 2, 5, 3
4. 4, 7, 1, 2, 5, 6, 3

Correct Option - 4

Que. 40 Find the odd word from the given alternatives.

1. Skin
2. Eye
3. Teeth

4. Nose

Correct Option - 3

Que. 41 In the following question, select the related word from the given alternatives.

Archeology : History :: Paleontology : ?

1. Fish
2. Rock
3. Fossil
4. Animals

Correct Option - 3

Que. 42 Select the number which can be placed at the sign of the question mark (?) from the given alternatives.

12	4	24
21	8	84
25	8	?

1. 100
2. 125
3. 150
4. 75

Correct Option - 1

Que. 43 Rubi runs 5 km towards south then 7 km towards east then she takes a right turn and walks 7 km. Again takes a left turn and moves 8 km. Finally she walks 8 km towards south. How far and in which direction is she from the starting point?

1. 32 km, South West
2. 21 km, North East
3. 34 km, South East
4. 25 km, South East

Correct Option - 4

Que. 44 Which of the following sets of letters will be placed sequentially in the given alphabetical series to complete the given letter series?

b _ dc _ efd _ f _ he _ ghi

1. cedgf
2. cdefg
3. cdegf
4. bcdef

Correct Option - 3

Que. 45 A cube is made by folding the given sheet. In the cube so formed, which number will be on the face opposite to the face having the number '6'?

1. 3
2. 5
3. 2
4. 1

Correct Option - 4

Que. 46 Who is the author of the book, 'Citizen and Society'?

1. Manmohan Singh
2. Pranab Mukherjee
3. LK Advani
4. Hamid Ansari

Correct Option - 4

Que. 47 What is the name of the first Indian missile?

1. Agni
2. Sagarika
3. Prithvi
4. Dhanush

Correct Option - 3

Que. 48 Where is the National War Memorial of India located?

1. New Delhi
2. Kochi
3. Rajkot
4. Andaman

Correct Option - 1

Que. 49 In March 2021, which of the following union territories announced to set up its own school education board?

1. Ladakh
2. Jammu and Kashmir
3. Delhi
4. Puducherry

Correct Option - 3

Que. 50 Who led the revolt of 1857 in the city of Kanpur?

1. Rani Lakshmi Bai
2. Nana Sahib
3. Begum Hazrat Mahal
4. Kunwar Singh

Correct Option - 2

Que. 51 Growth hormone is secreted by:

1. Liver gland
2. Pituitary gland
3. Thyroid gland
4. Adrenal gland

Correct Option - 2

Que. 52 Blue colour of the sky and the reddish appearance of the Sun at the sunrise or sunset is due to

1. Interference
2. Reflection
3. Refraction
4. Scattering

Correct Option - 4

Que. 53 Weber is the unit of _____.

1. electric conductance
2. magnetic flux
3. magnetic flux density
4. capacitance

Correct Option - 2

Que. 54 Polygraph is a device commonly used by law enforcement agencies for:

1. launching tear gas shells
2. lie detection
3. firing pellets
4. throwing water with high pressure

Correct Option - 2

Que. 55 The electron was first identified by _____.

1. James Chadwick
2. D. Rutherford
3. JJ Thomson
4. J. Kepler

Correct Option - 3

Que. 56 Which of the following is used in soda-acid fire extinguishers?

1. Sodium chloride
2. Sodium hydrogen carbonate
3. Calcium hydroxide
4. Acetic acid

Correct Option - 2

Que. 57 Which acid is present in sour milk?

1. Citric Acid
2. Acetic Acid
3. Glycolic Acid
4. Lactic Acid

Correct Option - 4

Que. 58 The orbital speed of a satellite revolve very near to earth surface is

1. $v = \sqrt{2gR}$
2. $v = 2gR$
3. $v = \sqrt{gR}$
4. $v = gR$

Correct Option - 3

Que. 59 A current of 0.5 A is drawn by a filament of an electric bulb for 20 minutes, find the amount of electric charge that flows through the circuit.

1. 300 Coulomb
2. 600 Coulomb
3. 2400 Coulomb
4. 20 Coulomb

Correct Option - 2

Que. 60 What is the chemical name of Vitamin-B7

1. Thiamine
2. Riboflavin
3. Pyridoxine
4. Biotin

Correct Option - 4

Que. 61 An electric bulb of 100 Watt operates 10 hour a day. What is the cost of energy to operate it for one day at Rs. 6 per kWh?

1. Rs. 60
2. Rs. 600
3. Rs. 0.6
4. Rs. 6

Correct Option - 4

Que. 62 Unit of dipole moment is:

1. amp-m
2. coulomb-m
3. amp-m²
4. coulomb-m²

Correct Option - 2

Que. 63 SI unit of permittivity is _____

1. $C^2 m^2 N^{-1}$
2. $C^{-1} m^2 N^{-2}$
3. $C^2 m^2 N^2$
4. $C^2 m^{-2} N^{-1}$

Correct Option - 4

Que. 64 In Youngs experiment, when the distance between slit and screen is doubled, while separation of slit is halved, then fringe width will be:

1. 4 times
2. 1/4
3. doubled
4. unchanged

Correct Option - 1

Que. 65 Rutherford's alpha (α) particle scattering experiment resulted into the discovery of

1. proton
2. nucleus in the atom
3. electron
4. atomic mass

Correct Option - 2

Que. 66 When the distance between the two charges remains the same and the charges on them are increased by two times, then the force between the two charges

1. remains the same
2. becomes four times
3. Reduced to one-fourth
4. becomes double

Correct Option - 2

Que. 67 When the distance between the two charges is reduced by half without changing the magnitude of charges. Then the force between the two charges

1. remains the same
2. becomes four times
3. becomes double
4. Reduced to one-fourth

Correct Option - 2

Que. 68 If a dielectric is inserted between the parallel plate capacitor then capacitance will _____.

1. remains the same
2. increase
3. decrease
4. increase initially and then decrease

Correct Option - 2

Que. 69 If the distance between the plates of a parallel plate capacitor is halved keeping other parameters unchanged. The new capacitance will become-

1. Two times of the initial capacitance
2. One third of the initial capacitance
3. Nine times of the initial capacitance
4. Remains unchanged

Correct Option - 1

Que. 70 Five capacitors of capacitance C are connected (I) in series and then (II) in parallel. The ratio of equivalent capacitance in case (I) to that in case (II) is:

1. 1 : 5
2. 5 : 1
3. 1 : 25
4. 25 : 5

Correct Option - 3

Que. 71 If the mass of a body is doubled then what'll happen to its acceleration if the same force is applied?

1. It will become half
2. It will become double
3. It will remain the same
4. It will be reduced to one-fourth

Correct Option - 1

Que. 72 When the number of turns per unit length of a solenoid is doubled, its self inductance becomes:

1. 4 times
2. 8 times
3. Same
4. Doubled

Correct Option - 1

Que. 73 Which of the following options is correct regarding a transformer?

1. It can convert AC voltage into DC voltage and vice versa.
2. It can convert low voltage to high voltage and vice versa.
3. Both 1 and 2
4. Neither 1 nor 2

Correct Option - 2

Que. 74 A ball is thrown vertically upwards with a velocity of 29.5 m/s. How high will the ball rise (in meters)? (use $g = 10 \text{ m/s}^2$)

1. 20.5 m
2. 31.5 m
3. 43.5 m
4. 56.5 m

Correct Option - 3

Que. 75 A charge Q is placed at the centre of a cube. Find the flux of the electric field through the surfaces of the cube.

1. $Q/6\epsilon_0$
2. $6Q/\epsilon_0$
3. Q/ϵ_0
4. $5Q/6\epsilon_0$

Correct Option - 3

Que. 76 The ratio of the drift velocity to the magnitude of electric field in a conductor is equal to the _____.

1. conductivity of the material
2. mobility of the electrons
3. resistivity of the material
4. permittivity of the material

Correct Option - 2

Que. 77 When the length of the solenoid is doubled without any change in the number of turns and the area of the coil. Then its self-inductance will

1. Nine times
2. Half times
3. Doubled
4. Unchanged

Correct Option - 2

Que. 78 In a moving coil galvanometer, if the current flowing through it is increased, then the deflection in the coil will

1. increase
2. decrease
3. remains the same
4. None of the above

Correct Option - 1

Que. 79 Capacitive reactance is equal to _____.

1. $2\pi\nu C$
2. $\frac{1}{(2\pi\nu)C}$
3. ωL
4. $\frac{C}{(2\pi\nu)}$

Correct Option - 2

Que. 80 A man standing on a revolving platform spreading his hands outward. Then:

1. angular velocity increase
2. angular velocity decrease
3. angular momentum increase
4. angular momentum is zero

Correct Option - 2

Que. 81 The equation of a wave is given by $y = 2 \sin (314t - 2x + \pi/2)$ m the wave length of the wave is:

1. 2.0 m
2. 1.57 m
3. 6.28 m
4. 3.14 m

Correct Option - 4

Que. 82 Zener diode is used as:

1. an amplifier
2. a rectifier
3. a oscillator
4. a voltage regulator

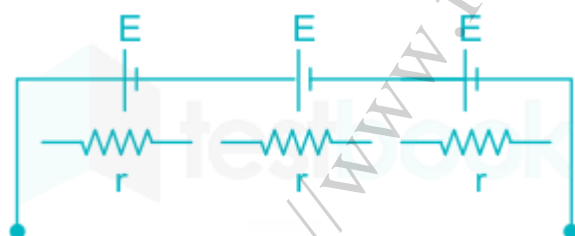
Correct Option - 4

Que. 83 Which of the following statement is INCORRECT about necessary conditions for a geostationary satellite?

1. It should revolve in an orbit concentric and coplanar with the equatorial plane of the earth.
2. Its direction of rotation is from east to west.
3. Its period of revolution around the earth should be exactly same as that of the earth about its own axis is., 24 hours.
4. It should revolve at a height of nearly 36,000 km above the earth's surface.

Correct Option - 2

Que. 84 Find the equivalent internal resistance and potential of the given circuit.



1. r and E
2. $r/3$ and $E/3$
3. $3r$ and $3E$
4. $r/3$ and $3E$

Correct Option - 3

Que. 85 If a wire of resistance R is stretched to double of its length, then the new resistance will be

1. $R/2$
2. $2R$
3. $4R$
4. $16R$

Correct Option - 3

Que. 86 The domain of $\cos^{-1}(2x + 1)$ is:

1. $[-2, 1]$
2. $[-1, 1]$
3. $[-1, 0]$
4. None of these

Correct Option - 3

Que. 87 What is the value of λ for which the vectors $\hat{i} - \hat{j} + \hat{k}$, $2\hat{i} + \hat{j} - \hat{k}$, $\hat{i}\lambda - \hat{j} + \hat{k}\lambda$ are coplanar

1. 5
2. 4
3. 2
4. 1

Correct Option - 4

Que. 88 The solution of the differential equation $y \frac{dy}{dx} = x + 1$ is

1. $y^2 - x^2 + 2x - c = 0$
2. $y^2 + x^2 - 2x - c = 0$
3. $y^2 - x^2 - 2x - c = 0$
4. None of these

Correct Option - 3

Que. 89 In a ΔABC , if $a = 13$, $b = 14$ and $c = 15$ then find the value of $\tan(C/2)$?

1. $1/3$
2. $2/3$
3. $4/3$
4. None of these

Correct Option - 2

Que. 90 If AB^T is defined as a square matrix then what is the order of the matrix B, where matrix A has order 2×3 .

1. 3×3
2. 2×3
3. 4×2
4. 3×2

Correct Option - 2

Que. 91 The value of 'a' such that the vector $2\hat{i} - \hat{j} + \hat{k}$, $\hat{i} + 2\hat{j} - 3\hat{k}$ and $3\hat{i} + a\hat{j} + 5\hat{k}$ are coplanar, is

1. 1
2. -2
3. 4
4. -4

Correct Option - 4

Que. 92

Find the values of k so the line $\frac{x-2}{2k} = \frac{y-3}{3} = \frac{z+2}{-1}$ and $\frac{x-2}{8} = \frac{y-3}{6} = \frac{z+2}{-2}$ are parallel.

1. -2
2. 2
3. 1/2
4. 4

Correct Option - 2

Que. 93 If $6\sin^2x - 2\cos^2x = 4$, then find the value of $\tan x$?

1. $\sqrt{3}$
2. $\sqrt{2}$
3. 2
4. None of these

Correct Option - 1

Que. 94 If α, β are the roots of the equation $3x^2 + 57x - 5 = 0$, then what is $\frac{\alpha^3 + \beta^3}{\alpha^{-3} + \beta^{-3}}$ equal to ?

1. -27/125
2. 81/125
3. 27/125
4. -125/27

Correct Option - 4

Que. 95 The difference of focal distances of any point on a hyperbola is equal to the length of

1. latus rectum
2. semi-transverse axis
3. transverse axis
4. semi-latus rectum

Correct Option - 3

Que. 96 $\int \frac{x}{1+x^2} dx =$

1. $\log(1 + x^2) + c$
2. $\log \sqrt{(1 + x^2)} + c$
3. $2\log(1 + x^2) + c$
4. None of these

Correct Option - 2

Que. 97 What is the value of $\log_9 27 + \log_8 32$?

1. 7/2
2. 19/6
3. 4
4. 7

Correct Option - 2

Que. 98 $\int_{-1}^1 x|x| dx$ is equal to

1. 0
2. $\frac{2}{3}$
3. 2
4. -2

Correct Option - 1

Que. 99 If $y = x^x$, what is $\frac{dy}{dx}$ at $x = 1$ equal to?

1. 0
2. 1
3. -1
4. 2

Correct Option - 2

Que. 100 For the data 3, 5, 1, 6, 5, 9, 5, 2, 8, 6 the mean, median and mode are x, y and z respectively. Which one of the following is correct?

1. $x = y \neq z$
2. $x \neq y = z$
3. $x \neq y \neq z$
4. $x = y = z$

Correct Option - 4

Que. 101 What is the value of $\lim_{x \rightarrow 0} \frac{(1 - \cos 2x)^2}{x^4}$

1. 1
2. 8
3. 4
4. 0

Correct Option - 3

Que. 102 If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots \infty}}}$ then $\frac{dy}{dx}$ is equal to:

1. $\frac{\cos x}{2y-1}$
2. $\frac{-\cos x}{2y-1}$
3. $\frac{\sin x}{1-2y}$
4. $\frac{-\sin x}{1-2y}$

Correct Option - 1

Que. 103 The constraints $-x + y \leq 1$, $-x + 3y \leq 9$ and $x, y \geq 0$ defines on

1. Bounded feasible space
2. Unbounded feasible space
3. Both unbounded and bounded feasible space

4. None of the above

Correct Option - 2

Que. 104 Evaluate: $\int \frac{1-\cos 2x}{1-\sin^2 x} dx$

1. $\tan x - 2x + c$
2. $2 \tan x - x + c$
3. $2 \tan x - 2x + c$
4. $2 \tan x + 2x + c$

Correct Option - 3

Que. 105 Find dy/dx when $y = x^2 e^x$

1. $e^x x(x+2)$
2. $2xe^x$
3. $e^x(x+2)$
4. $e^x x$

Correct Option - 1

Que. 106 Which of the differential equation satisfy $y = me^x - ne^{-x}$ as a solution?

1. $\frac{d^2 y}{dx^2} + y = 0$
2. $\frac{d^2 y}{dx^2} - y = 0$
3. $\frac{d^2 y}{dx^2} = \frac{dy}{dx} + y$
4. $\frac{d^3 y}{dx^3} = y$

Correct Option - 2

Que. 107 If $(2-i)(x-iy) = 3+4i$ then $5x$ is

1. 2
2. 3
3. 4
4. 5

Correct Option - 1

Que. 108 The points $(5, -2)$, $(8, -3)$ and $(a, -12)$ are collinear if the value of a is

1. 31
2. 32
3. 34
4. 35

Correct Option - 4

Que. 109 If the coefficient of x in $(x^2 + k/x)^5$ is 270, then k is

1. 4
2. 3

3. 2

4. 5

Correct Option - 2

Que. 110 Find the range of the real function $f(x) = \frac{x+1}{x-3}$

1. $\mathbb{R} - \{3\}$

2. $\mathbb{R} - \{1\}$

3. \mathbb{R}

4. $\mathbb{R} - \{-3\}$

Correct Option - 2

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