

# 6545, SOLUTION , SSC CGL

Ques 1. ANS (A) Solution:

People study a subject that is science, similarly, they do play 'badminton' and it's sports. So, there is a direct relationship between them. No other option possesses this relationship. Hence, option (a) is correct.

Ques 2. ANS (D) Solution:

Option (d):

Interchange '÷' and '+'

$$249 - 180 \div 36 \times 45 + 15 = 39$$

$$249 - 5 \times 45 + 15$$

$$249 - 225 + 15$$

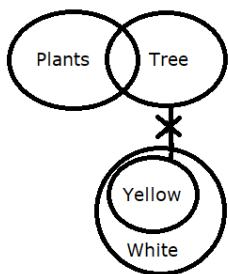
$$249 - 210$$

$$39 = 39$$

Here, LHS is equal to RHS.

Ques 3. ANS (D) Solution:

Venn diagram:



I: No tree is White ---- Does not follow

II: Some plants are Yellow ---- Does not follow

III: No Plant is white ---- Does not follow

So, none of the conclusion follows.

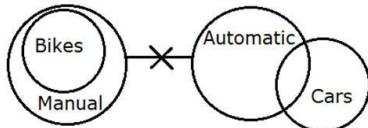
Ques 4. ANS (B) Solution:

Statements:

Some cars are automatic

No automatic is manual

All bikes are manual



Some cars are bikes: As there is no direct relation between cars and bikes. So, conclusion I is false.

No bike is automatic: All bikes are manual. No automatic is manual. Thus, no bike is automatic. So, conclusion II is true.

Hence, only conclusion II follows.

Ques 5. ANS (B) Solution:

$$23 + 3^3 = 23 + 27 = 50$$

$$50 + 4^2 = 50 + 16 = 66$$

$$66 + 5^3 = 66 + 125 = 191$$

$$191 + 6^2 = 191 + 36 = 227$$

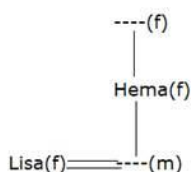
$$227 + 7^3 = 227 + 343 = 570$$

$$570 + 8^2 = 570 + 64 = 634$$

Ques 6. ANS (C) Solution:

Lisa introduces Hema by saying, "She is the only daughter of the maternal grandmother of my husband".

Thus, Hema is the only daughter of the maternal grandmother of Lisa's husband.



Thus, Hema is the mother-in-law of Lisa.

Ques 7. ANS (B) Solution:

We know that number of odd days in 400 years = 0

Thus, in first 400 year, number of odd days = 0

In the next 400 years, number of odd days = 0

In the next 400 years, number of odd days = 0

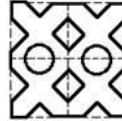
Thus, from years 1 to 1200, the number of odd days = 0

So, day on 1st January 1201 was Monday.

Therefore, 2nd January 1201 was Tuesday.

Ques 8. ANS (B) Solution:

The correct form of paper after unfolding is:



Ques 9. ANS (A) Solution:

Circle figure is shifting its position from corner to corner in an anticlockwise direction in each step.

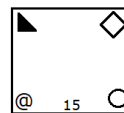
Rhombus figure is shifting its position diagonally in each step.

Triangle figure is shifting its position from corner to corner in an anticlockwise direction in each step. Also, the triangle figure is flipped horizontally in each alternate step.

Symbol '@' is shifting its position from corner to corner in an anticlockwise direction in each step.

The number is shifting its position in a clockwise direction in each step. Also, 5 is getting added to the number in each step.

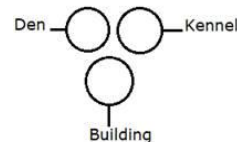
Thus, the answer is figure (I) -



(I)

Ques 10. ANS (B) Solution:

House of dog is known as kennel. House of Lion is known as Den and house of human being is known as building. Building is a manmade structure that can be used for either commercial or residential purpose.



Ques 11. ANS (B) Solution:

The order of jubilees is silver jubilee (25 years) < Ruby jubilee (40 years) < golden jubilee (50 years) < diamond jubilee (60 years) < sapphire jubilee (65 years) < platinum jubilee (70 years)

Ques 12. ANS (D) Solution:

From the above given four different positions of the same dice, it can be concluded that,

Face having number '3' is not opposite to faces with numbers 2, 6, 1 and 5 because these numbers are adjacent to the face with number '3'.

So, the face having number '3' is opposite to the face having number '4'.

Ques 13. ANS (D) Solution:

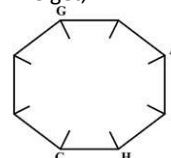
It is given that,

The eight people are A, B, C, D, E, F, G and H.

C is sitting third to the left of A and is sitting adjacent to H.

Only three people are sitting between G and H.

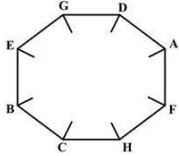
We get,



E is sitting immediately to the left of B.

More than two people are sitting between B and F, when counted from the left of B.

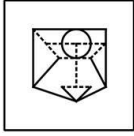
The final arrangement is,



Here, B is sitting fifth to the left of D.

Ques 14. ANS (A) Solution:

The given figure is embedded in option figure I.



Ques 15. ANS (B) Solution:

S (tuv) W (xy) Z (a) B (cde) F (gh) I (j) K

Ques 16. ANS (B) Solution:

Soft is the antonym for loud, similarly rigid is the antonym for flexible.

Ques 17. ANS (C) Solution:

The gap between the neighbouring alphabets is 2.

J \_ \_ G \_ \_ D \_ \_ A

C \_ \_ Z \_ \_ W \_ \_ T

S \_ \_ P \_ \_ M \_ \_ J

Except,

E \_ \_ B \_ \_ X \_ \_ U

Ques 18. ANS (B) Solution:

It is given that:

Option a)  $369 + 9 \div 6 - 19 \times 39$

$= 369 + 1.5 - 741$

$= 370.5 - 741 = -370.5$

So, option (a) is incorrect.

Option b)  $369 \div 9 + 6 \times 19 - 39$

$= 41 + 114 - 39$

$= 155 - 39 = 116$

So, option (b) is correct.

Option c)  $369 + 9 - 6 \times 19 \div 39$

$= 369 + 9 - 6 \times 0.48$

$= 378 - 2.88$

$= 375.12$

So, option (c) is incorrect.

Option d)  $369 + 9 \times 6 \div 19 - 39$

$= 369 + 9 \times 0.31 - 39$

$= 369 + 2.79 - 39$

$= 332.79$

So, option d) is incorrect.

Ques 19. ANS (D) Solution:

The word CURIOUS cannot be formed as there are two U's present in it while the given word has only one.

Ques 20. ANS (D) Solution:

the sum of the first and third terms is equal to the second term

$456 + 187 = 643$ .

Option (a):  $100 + 345 = 445 \neq 786$

Option (b):  $654 + 189 = 843 \neq 120$

Option (c):  $876 + 178 = 1054 \neq 996$

Option (d):  $389 + 256 = 645 = 645$

Hence Option(d) is the Answer.

Ques 21. ANS (C) Solution:

what they feel == 961

feel is real == 138

they like real == 658

they = 6

feel = 1

real = 8

what = 9

is = 3

like = 5

The phrase coded as '593' is 'like what is'.

Ques 22. ANS (A) Solution:

$112 * 2 - 100 = 224 - 100 = 124$

$124 * 2 - 100 = 248 - 100 = 148$

$148 * 2 - 100 = 296 - 100 = 196$

$196 * 2 - 100 = 392 - 100 = 292$

$292 * 2 - 100 = 584 - 100 = 484$

$484 * 2 - 100 = 968 - 100 = 868$

Alternatively:

$112 + 12 = 124$

$124 + 12 * 2 = 124 + 24 = 148$

$148 + 12 * 4 = 148 + 48 = 196$

$196 + 12 * 8 = 196 + 96 = 292$

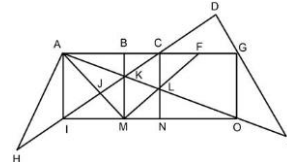
$292 + 12 * 16 = 292 + 192 = 484$

$484 + 12 * 32 = 484 + 384 = 868$

Ques 23. ANS (C) Solution:

The letters at odd-numbered positions from the left end are replaced by the immediate next letter in the alphabetical series while the letters at even-numbered positions from the left end are replaced by the immediate previous letter in the alphabetical series.

Ques 24. ANS (D) Solution:



Triangles are - ABK, ABM, ACH, ACI, ACJ, ACK, ACL, AEG, AFL, AFM, AGO, AHI, AHJ, AHK, AIJ, AIK, AIM, AIO, AJK, AKM, ALM, AMO, BCK, CDG, CFL, CIN, CKL, DEK, EGO, IJM, IKM, IKO, JKM, KLM, LMN, LMO, LNO.

37 triangles are there.

Ques 25. ANS (A) Solution:

Here, the positional values of the letters are considered in alphabetical order.

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
14	15	16	17	18	19	20	21	22	23	24	25	26
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

KNIGHT ==  $11 + 14 + 9 + 7 + 8 + 20 = 69$ ;  $69 + 6$  (No of letters) = 75.

ROOK ==  $18 + 15 + 15 + 11 = 59$ ;  $59 + 4 = 63$ .

Similarly, BISHOP ==  $2 + 9 + 19 + 8 + 15 + 16 = 69$ ;  $69 + 6 = 75$

Ques 26. ANS (C) Solution:

Being noble metals, Gold, Silver and Platinum do not easily react with oxygen, air, water and acid.

Noble metals are a group of metals that are less prone to oxidation and corrosion in moist air.

Iron readily reacts with Oxygen to form Iron Oxide.

Ques 27. ANS (A) Solution:

Kilowatt-hour (kWh) is a commercial unit of electric energy.

A kilowatt-hour is an amount of energy consumed by a machine working at a steady rate of one kilowatt for one hour.

As a result, Joule is a SI unit of energy, but Kilowatt-hour is a Commercial unit.

Ques 28. ANS (B) Solution:

There were sixteen Mahajanapadas out of which some were monarchial in nature and some were republics. The sixteen mahajanapadas are - Anga, Magadha, Kasi, Kosala, Yajji, Malla, Chhedi, Yamsa, Kuru, Pancala, Maccha, Surasena, Assaka, Avanti, Gandhara, and Kamboja.

Mahajanapadas which were monarchial in nature- Gandhara, Kamboja, Kashi, Vatsa, Avanti, Chedi, Kuru, Panchala, Matsya, Anga, Kosala, Magadha and Surasena.

Mahajanapadas which were republics -Assaka, Malla & Vajji.

Ques 29. ANS (B) Solution:

आईटीसी लिमिटेड के शेयरों में रिकॉर्ड वृद्धि के बाद कंपनी ने कारोबार के दौरान ₹5 लाख करोड़ का बाज़ार पूंजीकरण हासिल करने वाली भारत की 11वीं कंपनी बन गयी है. इससे पहले देश की 10 बड़ी कंपनियों ने ₹5 लाख करोड़ का बाज़ार पूंजीकरण हासिल कर चुकी है.

After the record increase in the shares of ITC Limited, the company has become the 11th company in India to achieve a market capitalization of ₹ 5 lakh crore during the business. Earlier, 10 big companies of the country have achieved market capitalization of ₹ 5 lakh crore.

Ques 30. ANS (B) Solution:

If the net external force on the body is zero, then its acceleration is zero.

Newton's 1st Law of Motion states an object continues its uniform motion or stays at its original position unless it is acted by a force. This theory also gives us the concept of Inertia.

Ques 31. ANS (C) Solution:

Ice hockey: National Hockey League hockey is typically played on a standard-size rink shaped like a round-cornered rectangle that is 200 feet (61 metres) long and 85 feet (26 metres) wide.

International rinks are usually 184 - 200 feet by 85 - 98 feet, and U.S. college rinks are typically.

Ques 32. ANS (C) Solution:

Indian team's star hockey player Rani Rampal has become the first woman in the sport to have a stadium named after her, in Rae Bareilly.

The MCF Rae Bareilly has renamed the hockey stadium as 'Rani's Girls Hockey Turf'.

Ques 33. ANS (C) Solution:

India is the largest democracy with a federal polity. The 7th schedule of the constitution of India contains the Legislative powers, which have a Union list, a state list and a concurrent list. At present, the Union List consists of 100 subjects, the State List consists of 61 subjects and the Concurrent List contains 52 subjects. Both the Centre and the states have the power to make laws concerning the concurrent list, but in case of a conflict, the Central law prevails.

Additional Information: The Residuary subjects (i.e., subjects which are not in any other list ) are under the Center.

Ques 34. ANS (B) Solution:

World's longest platform was dedicated to the nation by Prime Minister Narendra Modi on March 12, 2023. The platform is situated at Shree Siddharoodha Swamiji Hubballi Station of Karnataka. It falls under the South Western Railway zone. On March 2, 2023, the Guinness Book of World Records recognized this as the longest railway platform globally. The 1,507 metre long platform has been built at a cost of about Rs 20.1 crores.

Ques 35. ANS (B) Solution:

Relativity is a theory given by Albert Einstein. It states that space and time are relative to each other and that all motion must be relative to a reference system. It is an assumption which states that the laws of physics are the same everywhere. The principle is simple but difficult to understand. It says:

If the object or momentum is only with respect to other objects then there is no absolute reference frame for measuring velocity. The speed of light is constant, regardless of who measures it or how fast the person measuring it is.

Ques 36. ANS (A) Solution:

The International Hockey Federation (FIH) has its main office in Lausanne, Switzerland. Since it is the headquarters of the International Olympic Committee (IOC) and several other international sports federations, Lausanne, a city in the French-speaking region of Switzerland, is sometimes referred to as the Olympic City. The FIH is the international governing organisation for both men's and women's field hockey, and it is in charge of overseeing and promoting the sport globally.

Ques 37. ANS (A) Solution:

India Energy Week is being organised from the 6th to the 8th of February and aims to showcase India's rising prowess as an energy transition powerhouse. . The Prime Minister launched the uniforms under the 'Unbottled' initiative of Indian Oil. These uniforms are made of recycled PET bottles.

The Prime Minister informed that the government is working on mission mode to increase the consumption of natural gas in our

energy mix from 6% to 15% by 2030 where all the needed infrastructure will be provided by 'One Nation One Grid'.

"The government is trying to increase the capacity of LNG Terminal regasification", the Prime Minister said. He further added that the terminal regasification capacity of 21 MMTPA has doubled in 2022 while efforts are being made to increase it even more.

He also added that the number of CGDs in the country has gone up 9 times and the number of CNG stations has gone up to 5000 from 900 in 2014. The Prime Minister also touched upon the gas pipeline network which has increased to 22,000 kilometres from 14,000 in 2014 and pointed out that the network will expand to 35,000 kilometres in the next 4-5 years.Â Â

Ques 38. ANS (B) Solution:

The resistance of a conductor depends on the cross sectional area of the conductor, the length of the conductor, and its resistivity. It is important to note that electrical conductivity and resistivity are inversely proportional, meaning that the more conductive something is the less resistive it is.

Resistance of a conductor also depends on temperature of conductor and resistance increases on raising the temperature and decreases on lowering the temperature.

Resistance of a conductor does not depend on the current flowing through the conductor.

Ques 39. ANS (A) Solution:

An important part of the Muharram celebrations of Muslims as well as non-Muslims, taziya, made in numerous forms and types, is a replica of the mausoleum of Imam Hussain , the grandson of Prophet Muhammad Taziya can be brought home on any day between the eve of the first day of Muharram and the ninth day and buried on the tenth day known as Ashoora, when Imam Hussain was martyred in AD 680 along with over 100 of his companions in the battle of Karbala fought against the army of Yazid, the then ruler of Syria,

Ques 40. ANS (A) Solution:

All legislation require consent of both the Houses of Parliament. In the case of money bills, however, the will of the Lok Sabha prevails.

Ques 41. ANS (A) Solution:

Business enterprises constantly face two types of risk: speculative and pure. Speculative risks involve both the possibility of gain, as well as, the possibility of loss. Speculative risks arise due to changes in market conditions, including fluctuations in demand and supply, changes in prices or changes in fashion and tastes of customers. Favourable market conditions are likely to result in gains, whereas unfavourable ones may result in losses. Pure risks involve only the possibility of loss or no loss. The chance of fire, theft or strike are examples of pure risks. Their occurrence may result in loss, whereas, non-occurrence may explain absence of loss, instead of gain.

Ques 42. ANS (D) Solution:

The first Education Minister of India, Abul Kalam Azad, is an Indian independence activist, a scholar, poet, and many more.

Ques 43. ANS (A) Solution:

Dibru-Saikhowa National Park is located in Assam. Dibrus-Saikhowa National Park is considered as one of the 19 biodiversity hotspots in the world and a biosphere reserve consists of semi-wet evergreen forests, tropical moist deciduous forest, bamboo, cane and grasslands. It is primarily meant for the conservation of White-Winged Wood Duck, this park is also famous for its bright coloured Feral Horses which are its prime attraction.

Ques 44. ANS (C) Solution:

The science fiction comedy, Everything Everywhere All at Once, was very successful at the 95th Academy Awards, receiving seven awards, which included the Best Picture award.

Ques 45. ANS (C) Solution:

Palace of Illusions

Chitra Banerjee Divakaruni's award-winning novel retells the Hindu mythological epic Mahabharata from the perspective of Draupadi, its lead female character.

Ques 46. ANS (A) Solution:

The first Battle of Panipat was fought in 1526 between Babur and Ibrahim Lodhi.

The Battle of Khanwa was fought between Babur and Rana Sanga in 1527.

The Battle of Chanderi was fought between Babur and Medini Rai in 1528.

Battle of Ghaghra was fought between Babur and Muhammad Lodhi in 1529.

Ques 47. ANS (C) Solution:

The Tapti follows a parallel course to the South of Narmada, flowing through the states of Maharashtra and Gujarat on its way into the Gulf of Khambhat. Its three major tributaries are Purna, Girna, and Panjhra.

Ques 48. ANS (D) Solution:

The functions of the ecosystem include:

Provision of food, fuel and fibre.

Provision of shelter and building materials.

Purification of air and water.

Detoxification and decomposition of wastes.

Stabilization and moderation of the Earth's climate.

Moderation of floods, droughts, temperature extremes.

Generation and renewal of soil fertility.

Nutrient recycling of soil, etc.

Ques 49. ANS (B) Solution:

River Thames

London is situated in south-eastern England, lying astride the River Thames some 50 miles (80 km) upstream from its estuary on the North Sea.

Ques 50. ANS (D) Solution:

Chhath Puja-Bihar

Jallikattu and Pongal - Tamil Nadu

Bihu-Assam

Other important festivals are: -

Uttar Pradesh - Ram Navami, Ganga Mahotsav, Navaratri, Khichdi, Ram Leela.

West Bengal - Durga Puja.

Telangana - Bonalu, Bathukamma.

Rajasthan - Gangaur, Teej.

Punjab - Lohri, Baisakhi, Guru Parab.

Odisha - Rath Yatra, Raja Parba, Akshaya Tritiya, Konark Festival.

Nagaland - Hornbill festival.

Maharashtra - Ganesh Utsav, GudiPadva, Nag Panchami, Navratri.

Kerala - Onam, Vishu, Pooram.

Gujarat - Navratri, Janmashtami, Uttarayana, Diwali.

Andhra Pradesh - Dasara, Ugadi.

Ques 51. ANS (D) Solution:

Percentage decrease in the number of books sold by shopkeeper A from April to May =  $(2500 - 2100) \times 100/2500 = 400/25 = 16\%$

Percentage decrease in the number of books sold by shopkeeper B from April to May =  $(2800 - 2464) \times 100/2800 = 336/28 = 12\%$

Required ratio = 16: 12 = 4: 3

Ques 52. ANS (C) Solution:

$(2x + 5)(3x - 4) = kx^2 + tx + h$

$\Rightarrow 6x^2 + 7x - 20 = kx^2 + tx + h$

So,  $k = 6$ ,  $t = 7$  and  $h = -20$

Hence,  $(h^2 - 4t)/k = (400 - 28)/6 = 62$

Ques 53. ANS (B) Solution:

प्रतिशत वृद्धि :

वर्ष 2011

$$\Rightarrow \left( \frac{350 - 260}{260} \right) \times 100 = \frac{900}{26} = 34.6\%$$

$$\text{वर्ष 2014} \Rightarrow \left( \frac{340 - 350}{250} \right) \times 100 = \frac{900}{25} = 36\%$$

Ques 54. ANS (B) Solution:

Total distance to be covered =  $210 + 180 + 110 = 500$  m

Relative speeds =  $124 + 92 = 216$  kmph =  $216 \times 5/18 = 60$  m/sec

Required time =  $500/60 = 25/3 = 8.33$  seconds

Ques 55. ANS (B) Solution:

Given,

$$\cos(A - B) = \frac{\sqrt{3}}{2}$$

$$\text{So, } A - B = 30^\circ \dots (1)$$

Given,

$$\cos(A + B) = 0$$

$$\text{So, } A + B = 90^\circ \dots (2)$$

From equation (1) and (2),

$$2A = 120$$

$$A = 60^\circ$$

$$B = 30^\circ$$

Ques 56. ANS (B) Solution:

अभीष्ट प्रतिशत

$$= \left( \frac{102 - 68}{68} \right) \times 100 = \frac{3400}{68} = 50\%$$

Ques 57. ANS (C) Solution:

Required average =  $(180 + 350 + 180 + 200 + 250)/5 = 1160/5 = 232$ .

Ques 58. ANS (B) Solution:

Sum of marks obtained by Ram in all the five subjects =  $56 \times 3 + 64 + 73 = 305$

Average marks obtained by Ram in all the five subjects =  $305/5 = 61$

Ques 59. ANS (D) Solution:

It is given that;  $x = 2 + \sqrt{3}$

$$\Rightarrow x - 2 = \sqrt{3}$$

$$\Rightarrow x^2 + 4 - 4x = 3$$

$$\Rightarrow x^2 - 4x = -1$$

$$\Rightarrow x(x - 4) = -1$$

Ques 60. ANS (B) Solution:

$$1/K + 1/L = 1/51$$

Let leakage will empty the tank in T minutes

According to the question,

$$1/K + 1/L - 1/T = 1/81.6$$

$$\Rightarrow 1/51 - 1/81.6 = 1/T$$

$$\Rightarrow T = 136 \text{ minutes} = 2 \text{ hours } 16 \text{ minutes}$$

Ques 61. ANS (B) Solution:

$$(x/y) + (y/x) = P$$

$$(x^2 + y^2) = Pxy$$

$$x^2 + y^2 - Pxy = 0 \dots (1)$$

$$\text{Now, } (x^3 + y^3) = 0$$

$$\Rightarrow (x + y)(x^2 + y^2 - xy) = 0$$

$$\Rightarrow x^2 + y^2 - xy = 0 \dots (2) \quad [(x + y) \neq 0]$$

Compare equation (1) and (2)-

$$\Rightarrow x^2 + y^2 - Pxy = x^2 + y^2 - xy$$

$$\Rightarrow P = 1$$

Ques 62. ANS (A) Solution:

Profit ratio of X, Y, and Z =  $15000 \times 24 : 18000 \times 24 : 22000 \times 14$   
=  $360 : 432 : 308$

=  $90 : 108 : 77$

Z's share in profit =  $55000 \times 77/275 = 200 \times 77 = \text{Rs. } 15400$

Ques 63. ANS (A) Solution:

$$\begin{aligned}
& 3\sec^2\theta \tan^2\theta + \tan^6\theta - \sec^6\theta \\
&= 3\sec^2\theta \tan^2\theta + (\tan^2\theta)^3 - (\sec^2\theta)^3 \\
&= 3\sec^2\theta \tan^2\theta + (\tan^2\theta - \sec^2\theta)(\tan^4\theta + \sec^4\theta + \tan^2\theta \sec^2\theta) \\
&= 3\sec^2\theta \tan^2\theta + (-1)(\tan^4\theta + \sec^4\theta + \tan^2\theta \sec^2\theta) \\
&= 3\sec^2\theta \tan^2\theta + (-1)(\tan^4\theta + \sec^4\theta - 2\tan^2\theta \sec^2\theta + 3\tan^2\theta \sec^2\theta) \\
&= 3\sec^2\theta \tan^2\theta + (-1)((\tan^2\theta - \sec^2\theta)^2 + 3\tan^2\theta \sec^2\theta) \\
&= 3\sec^2\theta \tan^2\theta + (-1)((-1)^2 + 3\tan^2\theta \sec^2\theta) \\
&= 3\sec^2\theta \tan^2\theta - 1 - 3\tan^2\theta \sec^2\theta \\
&= -1
\end{aligned}$$

Alternate method:

$$3\sec^2\theta \tan^2\theta + \tan^6\theta - \sec^6\theta$$

$$\text{put } \theta = 45^\circ$$

$$= 3(\sqrt{2})^2 \times 1 + 1 - (\sqrt{2})^6$$

$$= 6 + 1 - 8$$

$$= 1 - 2$$

$$= -1$$

Ques 64. ANS (C) Solution:

$$28 + 40 + 22 = 90^\circ$$

We know that if  $A + B + C = 90^\circ$  then  $\tan A \tan B + \tan B \tan C + \tan C \tan A = 1$

So, the value of  $\tan 28^\circ \tan 40^\circ + \tan 22^\circ \tan 40^\circ + \tan 22^\circ \tan 28^\circ = 1$

Ques 65. ANS (B) Solution:

$\Delta PQR$  is an isosceles right triangle.

So,  $R = \text{Hypotenuse}/2 = 24/2 = 12 \text{ cm}$

Let the length of each equal side be  $X \text{ cm}$ .

By Pythagoras theorem,

$$2X^2 = 576$$

$$X^2 = 288$$

$$X = 12\sqrt{2}$$

Now,  $r = (\text{Perpendicular} + \text{base} - \text{hypotenuse})/2$

$$r = (24\sqrt{2} - 24)/2$$

$$r = (12\sqrt{2} - 12) \text{ cm}$$

Now,

$$(r + R) = 12\sqrt{2} - 12 + 12 = 12\sqrt{2} \text{ cm}$$

Ques 66. ANS (A) Solution:

Let the number is  $X$ .

Then,

$$X = 9A + 1 \dots (1)$$

$$A = 2B + 1 \dots (2)$$

$$B = 5C + 3 \dots (3)$$

$$A = 2 * (5C + 3) + 1$$

$$A = 10C + 7 \dots (4)$$

Substitute the value of  $A$  from equation (4) to (1).

$$X = 9 * (10C + 7) + 1$$

$$X = 90C + 63 + 1$$

$$X = 90C + 64$$

When  $X$  is divided by 90, we get 64 as remainder.

Ques 67. ANS (C) Solution:

We know that,

$$a^3 + b^3 + c^3 - 3abc = (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca) = \frac{a+b+c}{2} [(a-b)^2 + (b-c)^2 + (c-a)^2]$$

$$\text{So, } (a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca) = \frac{a+b+c}{2} [(a-b)^2 + (b-c)^2 + (c-a)^2]$$

$$(a^2 + b^2 + c^2 - ab - bc - ca) = \frac{[(a-b)^2 + (b-c)^2 + (c-a)^2]}{2}$$

$$= \frac{2.5^2 + 2.5^2 + 5^2}{2}$$

$$= \frac{37.5}{2}$$

$$= \frac{75}{4}$$

Ques 68. ANS (B) Solution:

Let selling price be Rs.  $X$ .

$$\text{Loss} = X * 30/100 = \text{Rs. } 3X/10$$

So,

$$3X/10 = 1573 - X$$

$$13X/10 = 1573$$

$$X = \text{Rs. } 1210$$

Ques 69. ANS (A) Solution:

$$\text{Required ratio} = (1120 * 4/7 + 960 * 5/12) : (1120 * 3/7 + 960 * 7/12) = 1040 : 1040 = 1 : 1$$

Ques 70. ANS (C) Solution:

$$4 \frac{2}{3} - 9 \frac{7}{9} \div \frac{2}{3} \times 4 \frac{1}{11} + \frac{2}{3} \text{ of } 2 \frac{1}{3} \div \frac{2}{3}$$

$$= \frac{14}{3} - \frac{88}{9} \times \frac{3}{2} \times \frac{45}{11} + \frac{2}{3} \text{ of } \frac{7}{3} \times \frac{3}{2}$$

$$= \frac{14}{3} - 60 + \frac{14}{9} \times \frac{3}{2}$$

$$= \frac{14}{3} - 60 + \frac{7}{3}$$

$$= \frac{14 - 180 + 7}{3}$$

$$= \frac{-159}{3}$$

$$= -53$$

Ques 71. ANS (A) Solution:

Side of cube = Diameter of sphere

$$(2)8 = 2 * \text{radius}$$

$$\text{Radius} = 1.4 \text{ cm}$$

$$\text{Volume of sphere} = (4\pi r^3)/3 = (4/3) * (22/7) * 1.4 * 1.4 * 1.4 = 11.50 \text{ cm}^3$$

Ques 72. ANS (B) Solution:

We know that,

$$\angle W + \angle X + \angle Y + \angle Z = 360$$

$$\angle W + 100 + \angle Z = 360$$

$$\angle W + \angle Z = 260$$

$$\angle W/2 + \angle Z/2 = 130^\circ \dots (1)$$

In  $\Delta WOZ$ ,

$$\angle W/2 + \angle Z/2 + \angle WOZ = 180$$

$$130 + \angle WOZ = 180 \text{ [from equation (1)]}$$

$$\angle WOZ = 50^\circ$$

Ques 73. ANS (A) Solution:



According to the question,

$$\angle MOP = 48^\circ \text{ and } \angle NOQ = 32^\circ$$

$$\text{So, } \angle POQ = 180 - 48 - 32 = 100^\circ$$

Thus, angle subtended by an arc at any point on circumference is half the angle subtended by it at centre.

$$\text{So, } \angle MOP = 2 * \angle MQP \text{ and } \angle NOQ = 2 * \angle NPQ$$

$$\Rightarrow \angle MOP + \angle NOQ = 2(\angle MQP + \angle NPQ)$$

And by exterior angle rule of triangle, in  $\Delta PQR$ ,

$$\angle RPQ + \angle RQP = \angle NRQ$$

$$\Rightarrow \angle MOP + \angle NOQ = 2\angle NRQ$$

$$\Rightarrow \angle NRQ = (48 + 32)/2 = 40^\circ$$

Ques 74. ANS (C) Solution:

$$(x^2 - 25) = (x - 5)(x + 5)$$

$$(x^2 - 4x - 45) = (x + 5)(x - 9)$$

$$\text{HCF of } (x^2 - 25) \text{ and } (x^2 - 4x - 45) = (x + 5)$$

Ques 75. ANS (B) Solution:

$$P = 1 \text{ hour } 20 \text{ minutes} = 60 \text{ minutes} + 20 \text{ minutes} = 80 \text{ minutes}$$

$$Q = 30 \text{ minutes}$$

Part of task finished by P and Q together in 20 minutes

$$= 20 * (1/80 + 1/30)$$

$$= 11/12$$

$$\text{Remaining part of task} = 1 - 11/12 = 1/12$$

Therefore, time taken by P alone to finish the remaining part of task

$$= (1/12) * 80$$

$$= 6(2/3) \text{ minutes}$$

Ques 76. ANS (D) Solution:

Option (a)- The incorrectly spelt word is 'aberrant' and 'aberrant' is the correct word. 'Aberrant' means departing from an accepted standard.

Option (b)- The incorrectly spelt word is 'oponents' and 'opponents' is the correct word.

Option (c)- The incorrectly spelt word is 'habbits' and 'habits' is the correct word.

So, only option (d) has no spelling errors.

Hence, option (d) is correct.

Ques 77. ANS (D) Solution:

Let's look at the meanings of the given options.

live off: depend on someone as a source of income or support.

laid down: put something down.

live on: have a particular amount of money with which to buy food and other necessities.

laid off: discharge a worker temporarily or permanently because of a shortage of work.

The use of 'laid off' is completely justified to talk about 'termination of employees as a part of budget cut'.

Hence, option (d) is the correct answer.

Ques 78. ANS (B) Solution:

After reading all the sentences, we can say that sentence C should be the opening sentence because it states that the author was not yet on the stage while all other sentences describe the stage events. Sentence A should come after sentence C as the author was then called on the stage. Sentence D should come next as the author went on the stage. Sentence B should be at the last as it describes the reaction of the author after the song started to play. So, the correct order is CADB. Hence, (b) is the correct answer.

Ques 79. ANS (B) Solution:

The given sentence is in direct speech. In the indirect speech, the reporting verb (said) will be joined to the reported sentence (I might visit her in the hospital if time permits) by the conjunction 'that'. The modal verb 'might' will not change in the reported speech. 'I' changes to 'he'. Thus, option B is the correct answer.

Ques 80. ANS (C) Solution:

Gallantry - It means courageous behaviour, especially in battle.

Gallery - It means a room or building for the display or sale of works of art.

Garrison - It means a group of troops stationed in a fortress or town to defend it.

Gun point - It means the act or an instance of shooting with gun.

From the given options, one that is closer or similar to the meaning of the given phrase is option (c), 'Garrison'.

Hence, the correct answer is option (c).

Ques 81. ANS (A) Solution:

'Impervious' is something that does not allow to penetrate. Option A is the correct answer.

Ques 82. ANS (A) Solution:

'Abbreviate' means to shorten. 'Ameliorate' means to make something better. 'Alleviate' means to make less severe. Option A is the correct answer.

Ques 83. ANS (A) Solution:

The subject of the Passive Voice is changed into the object of the Active Voice. Also, the object of the Passive Voice is changed into the subject of the Active Voice.

The removal of the helping verb 'was' and the preposition 'by' is necessary while changing the voice of the sentence from Passive to Active.

In Active voice, the sentence should be in Infinitive form.

Infinitive sentence is: To + V1 form.

The format in Passive voice is: Subject (Objective case) + was/were + to + be + V3 + by + Object (Subjective case).

Thus, the format in Active voice is: Subject + was/were + to + V1 + Object.

For example:

She is to be helped by you. (Passive)

You are to help her (Active)

From the given options, the sentence that follows the above mentioned conditions for Active voice is option (a) "He was to choreograph the skit."

Hence, the correct answer is option (a).

Ques 84. ANS (A) Solution:

The meaning of the word 'conceit' is 'excessive pride in oneself'. Let's look at the meanings of the given options.

Vanity: excessive pride in or admiration of one's own appearance or achievements.

Modesty: the quality of not being too proud or confident about yourself or your abilities.

Shyness: the quality or state of being shy.

Direction: a course along which someone or something moves.

Among the given options, 'vanity' is the most appropriate synonym of the given word.

Hence, option (a) is the correct answer.

Ques 85. ANS (D) Solution:

'Ruefully' means 'In a way that expresses sorrow or regret, especially in a wry or humorous manner.'. Options b) and c) can be rejected as they are unrelated to the word. 'Bitterly' means 'In an angry, hurt, or resentful way.'. Hence, option a) can also be rejected as it is the same meaning as the word. 'Cognizant' means 'Having knowledge or awareness.'. 'Cogitate' means 'Think deeply about something; meditate or reflect.'. Hence, option d) is the correct answer.

Ques 86. ANS (D) Solution:

Be saved by the bell - Escape from a difficult situation narrowly or by an unexpected intervention. So, option C is the right answer.

"They were saved by the bell when a courtly looking man showed up out of nowhere and promptly announced that there was a bomb threat on the building."

Ques 87. ANS (A) Solution:

The passage in general talks about the pleasant smell of rain. So, we can eliminate option (b) as it is a misfit in the sentence. 'Nose' as a noun cannot be used to describe an instinctive ability for detecting something. It is also eliminated. 'Noise' cannot be used to describe a smell. So, it is also eliminated. Among the given options, 'fragrance' (a pleasant, sweet smell) is the most appropriate choice.

Hence, option (a) is the correct answer.

Ques 88. ANS (B) Solution:

We usually use the preposition 'with' after the verb 'associated'. The phrase 'be associated with' means 'to be connected with something in some way'.

Hence, option (b) is the correct answer.

Note:

A Preposition is a word placed before a noun or a pronoun or a noun equivalent (pronoun, adverb, gerund, infinitive, adverbial clause, or any clause that can be used as the object of the preposition) and shows a relationship in space or time or a logical relationship between two or more people, places, or things in a sentence.

Examples

I. The teacher scolded the child for being late.

II. We're going to a party.

· The words in bold are called prepositions because they normally take position before (pre) a noun/pronoun or a noun equivalent (pronoun, adverb, gerund, infinitive, adverbial clause, or any clause that can be used as the object of the preposition.

· The noun/pronoun which is used with a preposition is called its Object.

Ques 89. ANS (D) Solution:

Let's look at the meanings of the given words.

Vexatious: causing or tending to cause annoyance, frustration, or worry.

Amiable: having or displaying a friendly and pleasant manner.

Savour: taste (good food or drink) and enjoy it to the full.

Pleasant: giving a sense of happy satisfaction or enjoyment.

The word 'savour' is a verb which cannot be used to describe rain smells. So, it can be eliminated. As discussed earlier, the smell of

rain is pleasing. So, the correct adjective in the blank would be 'pleasant'.

Hence, option (d) is the correct answer.

Ques 90. ANS (C) Solution:

The blank requires a noun which is modified by the adjective 'deep'. The noun 'logs' means 'a part of the trunk or a large branch of a tree that has fallen or been cut off'. Option (b) is eliminated as it is a misfit in the sentence. Of the remaining three options, 'woods' (an area of trees, smaller than a forest) is the most appropriate choice. Other nouns with the adjective 'deep' don't provide a coherent sentence.

Hence, option (c) is the correct answer.

Ques 91. ANS (D) Solution:

When it rains, the soil becomes wet. So, 'rigid' (unable to bend or be forced out of shape; not flexible), 'crisp' (firm, dry, and brittle) and 'dry' are eliminated as they don't provide a coherent sentence. Among the given options, 'damp' (slightly wet) is the most appropriate choice.

Hence, option (d) is the correct answer.

Ques 92. ANS (C) Solution:

The word 'demolish' means 'pull or knock down (a building)'.

Let's look at the meanings of the given options.

Create: bring (something) into existence.

Fabricate: invent (something) in order to deceive.

Ruin: reduce (a building or place) to a state of decay, collapse, or disintegration.

Shape: give a particular shape or form to.

Among the given options, the word 'ruin' is the most appropriate synonym of the given word.

Hence, option (c) is the correct answer.

Ques 93. ANS (C) Solution:

IDIOM	MEANING
Cost an arm and a leg	Very expensive
Speak of the devil	The person you're just talking about actually appears at that moment
Let the cat out of the bag	Reveal a secret
See eye to eye	Agreeing with someone

So, the correct idiom is 'let the cat out of the bag'.

Hence, option (c) is correct.

Ques 94. ANS (D) Solution:

Option d) is incorrectly spelt. The correct spelling should be 'grateful'. 'Memento' means 'something that you keep to remind you of somebody/something'. 'Plagiarize' means 'to steal and pass off (the ideas or words of another) as one's own'.

Hence, option d) is the answer.

Ques 95. ANS (C) Solution:

'Everyone' is a singular pronoun and should be followed by a singular verb. The plural verb 'come' is incorrect and should be replaced by 'comes'. The phrase 'comes forward' means 'to offer help'. Options A and B are eliminated as the phrase 'come towards' means 'to move towards a specified person or place' and changes the meaning of the sentence.

Hence, option (c) is the answer.

Ques 96. ANS (C) Solution:

Cynosure - the centre of attention. Crusade - a war or campaign for religious, political or social change. Convalescent - a person recovering from a disease or medical treatment. Almanac - an annual calendar containing important dates and statistical information.

Hence, option (c) is the answer.

Ques 97. ANS (D) Solution:

When we compose a sentence, the verb must agree with or match the subject. This means if we have a singular subject, we use a singular verb. If we have a plural subject, we use a plural verb. So, 'likes' should be replaced by 'like' because 'dogs' is the plural subject.

The correct sentence is: The dogs like their new toy, which was bought by one of the cousins of the owner in Delhi.

Hence, (d) is the correct answer.

Ques 98. ANS (A) Solution:

"broke into" is a phrasal verb that is suitable here.

Broke into: enter by force.

It is in context to the special forces that entered by force into the house of the opposition minister.

"broke into" should replace "broke down".

Therefore, the correct answer is:(a) broke into.

The corrected form of the sentence is: The special forces broke into the house of the opposition minister and discovered a huge amount of unaccounted money and weapons.

Ques 99. ANS (B) Solution:

The verb 'remember' is not used in the progressive tense (-ing form). These types of verbs are called 'Stative verbs'. The given sentence is conveyed in the past tense. Therefore, 'he remembering' is replaced with 'he remembered' to make the sentence contextually and grammatically correct. Hence, option (b) is the correct answer.

The correct sentence is: Pankaj was overwhelmed with joy when he remembered his early life.

Ques 100. ANS (B) Solution:

'As soon' is incorrect. The correct conjunction is 'as soon as'. It is used when something happens immediately after some other event. Therefore, the error is in the part in option (b).

The correct sentence is: The official details will be released as soon as the ministry gives the approval.

Hence, option (b) is the correct answer.

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