AP ICET 26th April 2019 Shift-2

Analytics Ability

Instructions [1 - 20]

Note:In the following 20 questions ,each questionis followed bydata in the formof two statements labeled as I and II. You must decide whether the data given in the statements are sufficient to answer the questions. Using the data make an appropriate choice from (a) to (d) as per the following guidelines:

1. **What is the value of** $\frac{x^3+8y^3-z^3}{xyz}$

   I. $x + 2y = z$

   II. $x > y > z$

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

2. **Is n a prime?**
   I. p is a prime and $p < \sqrt{n} \Rightarrow p \mid n$

   II. $2 \mid n$

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

3. **Can you construct the** $\triangle ABC$ **withsides a, b and c?**
   I. a > b > c
   II. a = 2, b = 6, c = 9

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: B

4. **What is the length of the train?**
   I. The train crosses a lamp post in 10 seconds.
   II. The train crosses another train standing on the platform in 16 seconds.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

5. **How much canvas is required to erect a tent in the shape of a cylinder surmounted by a cone having the base radius same as that of the cylinder?**
   I. Height of the cylinderis 5 meters.
   II. Radius of the cone is 3 meters

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

6. **What is the 3 digit number?**
   I. $\frac{1}{3^{rd}}$ **of that numberis 27 less than half of that number.**
   II. One-fifth of that number is 20% of that number.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

7. **If the arithmetic mean of 14, 20, 40, 52 and x is m then. what is the value of m?**
   II. $\overset{m}{x} - 5 = 9$
   II. $x < m$

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

8. **What is the salary of C in a group of A, B, C, D, E and F whose average salary is Rs. 60,000?**
   I. Total salary of A and E is Rs. 64,500.
   II. Total salary of B and F is Rs. 52,600.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

9. **The ages of Tanishk and Sunil are in the ratio 5:6. Whatis the age of Sunil?**
   I. The ages of Tanishk and Deepuare in the ratio 3:2
   II. After 6 years. the ratio of the ages of Deepu and Sunil will be 6:7

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: C

10. **What is the smaller angle in the parallelogram?**
I. Ratio between the angles of a triangle is 3 : 5 : 4 and the largest angle of the triangle is 34° less than the larger angle of the parallelogram.
II. The sum of the larger and smaller angle of the parallelogram is 180°

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

11. **What is the minimum pass mark inthe test?**
I. Anil scored 25% marks in the test and Sunil scored 288 marks which is 128 marks more than Anil.
II. Anil scored 64 marks less than the minimum pass mark.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: C

12. **Karunais in which direction with respect to Aruna?**
I. Yamuna is to the south of Aruna and Karuna is to the East of Padma who is to the North of Yamuna
II. Padma is to the south of Aruna.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: C

13. **Which train did Amar catchto go to his office?**
I. Amar missed his usual train scheduled at 10.25 am. A train comes in every 15 minutes.
II. Amar could not get into the 10.40 a.m train.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

14. **Among the five friends P, Q, R, S, T who earns more than only the least earner among them?**
I. Q earns more than P and S but less than R only.
II. P earns more than S who earns less than T.

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

15. **How is A related to B?**
I. L who has only two kids A and B. is the mother-in-law of M whois the sister-inlaw of B.
II. N who is the sister-in-law of A. is the daughter-in-law of T who has only two kids A and B.

A if the statement I alone is sufficient to answer the question.

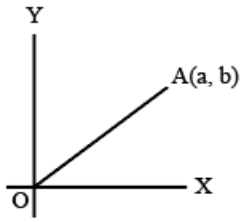
B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

16. **What is the slope of the line OA?**
I. a = b
II. b = 6 cm



A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

17. **If P, Q, R are 3 points on a circle, then what is** $\angle PQR$
I. $\angle PQR = 60^\circ$
II. PR is a diameter of the circle

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: B

18. **What is the value of** $\frac{a^4-b^4}{a^2b^2}$ **?**
I. $a + b = 4$
II. $a - b = 2$

A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: C

19. **What is the sum of the two positive integers a and b?**
I. The LCM of a and b is 52
II. One of a and b is 13

A if the statement I alone is sufficient to answer the question.

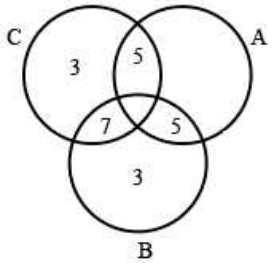
B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: D

20. **What is** $n(A \cup B \cup C)$**?**
I. $n(A \cup B) = 36$
II. $n(C) = 28$



A if the statement I alone is sufficient to answer the question.

B if the statement II alone is sufficient to answerthe question.

C if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.

D if both the statements I and II together are not sufficient to answer the question and additional data is required.

Answer: A

Instructions [21 - 30]

In each of the Following questions a sequence of numbers or letters that follow a definite pattern is given. Each question has a blank space. This has to be filled by the correct answer from the four given options to complete the sequence without breaking the pattern.

21. **AB : 144 :: BE : .....**

A 625

B 121

C 169

D 196

Answer: A

22. **CG : 73 :: LS : .....**

A 1911

B 1912

C 1812

D 1910

Answer: B

23. $5 \parallel 3 : 34 :: 6 \parallel 3 :$ .....

A 46

B 47

C 45

D 44

Answer: C

24. **ACE : ZXV :: KID : .....**

A PRX

B PRY

C PRZ

D PRW

Answer: D

25. **RAT : ..... :: AXE : ZCV**

A IZF

B IZG

C IZH

D IZJ

Answer: B

26. **15, 35, 77, 143, 221, ...**

A 245

B 256

C 484

D 323

Answer: D

27. **Fast : Hunger :: Run : .....**

A Win

B Voice

C Ftigue

D Choke

Answer: C

28. **Askew : Straight :: Rough : .....**

A Tall

B Smooth

C Tough

D High

Answer: B

29. $\begin{matrix} C \\ L \end{matrix}$: $\begin{matrix} 180 \\ 27 \end{matrix}$ :: $\begin{matrix} E \\ N \end{matrix}$: .....

A $\frac{266}{45}$

B $\frac{126}{45}$

C $\frac{190}{50}$

D $\frac{216}{50}$

Answer: A

30. **ACFT : ZXUQ :: ..... : VTQM**

A EGJN

B EUQN

C EFKM

D FHJL

Answer: A

Instructions [31 - 35]

In the Following questions pick the odd thing out.

31.

A 77

B 187

C 35

D 15

Answer: B

32.

A PIT

B SIT

C FIT

D HIT

Answer: A

33.

A 37

B 39

C 42

D 48

Answer: A

34.

A X

B F

C W

D T

Answer: C

35.

A ABEC

B IDOF

C UGAH

D JEKI

Answer: D

Instructions [36 - 45]

The following question follow a definite pattern. Observe the same and fill in the blanks with suitable answers.

36. **1, 1, 2, 8, 3, 27, 4, 64, 5, ...**

A 81

B 100

C 121

D 125

Answer: D

37. **1, 4, 10, 20, 35, 56, ...**

A 65

B 72

C 84

D 96

Answer: C

38. **3, 9, 27, 81, 243, ...**

A 486

B 729

C 972

D 693

Answer: B

39. **2, 6, 20, 42. 110, 156, ...**

A 178

B 216

C 272

D 344

Answer: C

40. **17, 37, 65, 82. 101, 145, ...**

A 170

B 197

C 226

D 257

Answer: B

41. $10, 11\frac{1}{9}, 12\frac{1}{2}, 14\frac{2}{7}, 16\frac{2}{3}, \ldots\ldots\ldots\ldots$

A 20

B $18\frac{1}{5}$

C $19\frac{4}{6}$

D 25

Answer: A

42. $1\frac{5}{6}, 2\frac{1}{6}, 2\frac{5}{6}, 3\frac{1}{6}, 3\frac{5}{6}, 4\frac{5}{6}, \ldots\ldots\ldots$

A $5\frac{5}{6}$

B $5\frac{1}{6}$

C $6\frac{1}{6}$

D $6\frac{5}{6}$

Answer: B

43. **B, C, E, G, K, M, ...**

A O

B P

C Q

D R

Answer: C

44. **(2, Y), (3, X), (5, V), (7, T), (11, P), ...**

A (13, Q)

B (13, N)

C (13, R)

D (13, L)

Answer: B

45. $\frac{2}{2}, \frac{5}{9}, \frac{10}{28}, \frac{17}{65}, \frac{26}{126}, ...$

A $\frac{29}{147}$

B $\frac{33}{179}$

C $\frac{35}{199}$

D $\frac{37}{217}$

Answer: D

Instructions [46 - 48]

The following table gives information about the production of wheat in million tons of 4 major states A, B, C, D from 2014 to 2018. Based on this information given in the table answer the following questions.

Year → / State ↓	2014	2015	2016	2017	2018
A	248	271	312	295	328
B	235	285	307	315	323
C	261	243	251	267	280
D	206	228	272	280	291

46. **In 2017 the states each of which have produced more than 20% of the total production of that year is**

A A, B, C only

B A, C, D only

C B, C, D only

D A, B, C, D

Answer: D

47. **The state which has registered highest growth percentage in the production of wheatin the given period is**

A D

B C

C B

D A

Answer: A

48. **The percentage increase of wheat by state D corrected to two decimals in the year 2017 over the year 2015 is**

A 22.68

B 22.72

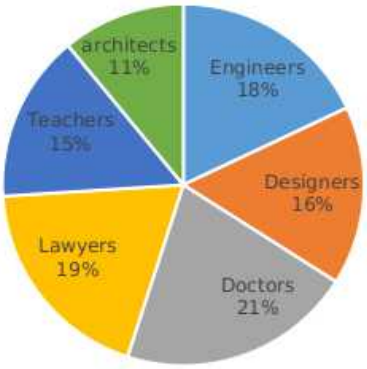
C 22.81

D 22.93

Answer: C

Instructions [49 - 53]

Study the following Pie-chart carefully and answer the following questions.
A survey is conducted on 10,500 people of the town to find the various professionals and percentage of female professionals amongst them.



Percentage of female professionals	
engineers	60%
designers	35%
doctors	20%
lawyers	40%
teachers	80%
architects	40%

49. **The difference between the total number of female and other professional of the town is**

A 1134

B 1164

C 1204

D 1224

Answer: A

50. **Female architects, female teachers and female designers are what percent of other doctors, other engineers. and other lawyers?**

A 62.1%

B 63.5%

C 63.9%

D 64.2%

Answer: A

51. **Female doctors are what percent of the female teachers in that town ?**

A 20

B 25

C 28

D 35

Answer: D

52. **The ratio of the number of non-female architects to the number of female teachers is**

A 9 : 13

B 10 : 17

C 11 : 20

D 13 : 18

Answer: C

53. **The ratio between the total strength of female architects and female lawyers to that of the other doctors and other engineers is**

A 2 : 3

B 3 : 5

C 1 : 2

D 5 : 9

Answer: C

Instructions [54 - 55]

In a group of hundred people each person speaks at least one of the languages Telugu, Kannada or Hindi. The numberof persons speaking only Teluguis 25, only Kannada is 15 and only Hindi is 35. 7 persons speak Telugu and Hindi only, 8 speak Telugu and Kannada only and 5 speak Kannada and Hindi only. Basing on this information answer the following questions.

54. **How many persons in the group speak all the three languages**

A 6

B 2

C 3

D 5

Answer: D

55. **The percentage of persons in the group who can speak at least two languages**

A 20

B 35

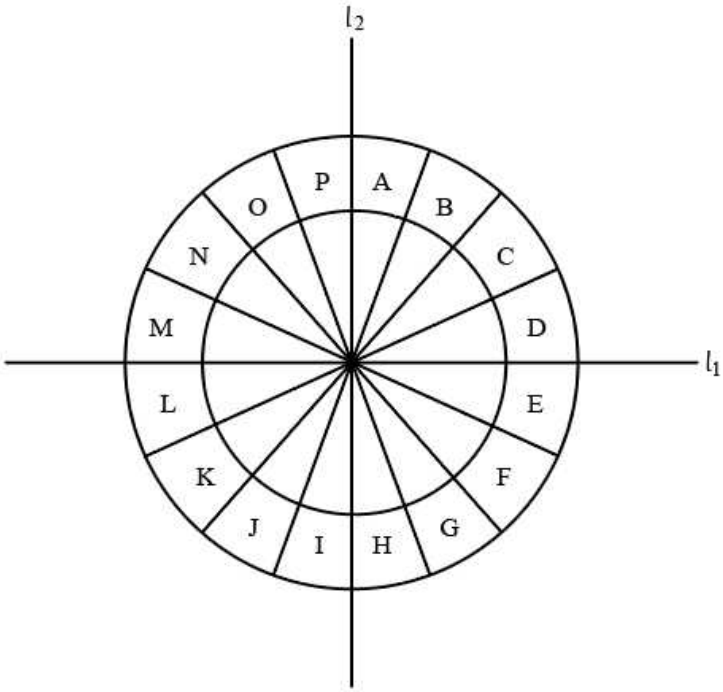
C 25

D 30

Answer: C

Instructions [56 - 60]

Arrange the letters from A to P as shown in the following figure. Then these letters are coded as follows: Reflect the circle about the line l_1 and then about l_2 The resulting new positions ofthe letters are codes of A to P respectively i.e., A coded as I, B coded as J, G ceded as C etc. Using this coding process answer the following questions.



56. **Code for CODE is**

A KGLN

B KGLM

C KGLO

D KGLP

Answer: B

57. **Code for POEM**

A HGME

B HGMF

C HGMI

D HGMK

Answer: A

58. **Code for LOAD**

A DGIM

B DGIN

C DGIL

D DGIJ

Answer: C

59. **Which string of letters is coded as LION ?**

A DAGE

B DAGJ

C DAGK

D DAGF

Answer: D

60. **Which string of letters is coded as BAKE ?**

A JICN

B JICM

C JICO

D JICL

Answer: B

61. **If DESIRE is coded as GIKUGF then the code word for GALORE is**

A GTQMCI

B GTQNCJ

C GTQNCI

D GTQNCK

Answer: C

62. **If GOEL is coded as HOEM, then CORE is coded as**

A DESO

B DOSE

C EDOS

D SODE

Answer: B

63. **If POND is coded as 16151404 then LAKEis coded as**

A 12011106

B 12011104

C 12011105

D 12011103

Answer: C

64. **In a certain code language if WPSLPIMFHA is coded as SOLID theninthat language ATEXXQIBVO is coded as**

A WATER

B EAGER

C WIPER

D WIDER

Answer: A

65. **If in a code BLINK is coded as 23952 then in that code CREAK is coded as**

A 39512

B 38513

C 37514

D 35812

Answer: A

66. **The day on 29^{th} August 2008 is ?**

A Monday

B Wednesday

C Friday

D Sunday

Answer: C

67. **If a clock takes 22 seconds to strike 12 how much time will it take to strike 6 ?**

A 11 sec

B 10 sec

C 9 sec

D 12 sec

Answer: B

68. **The time after 5 p.m. when the two hands in a clock makes an angle of 60° between them for first time is**

A $5.15\frac{7}{11}$ p.m.

B $5.16\frac{1}{11}$ p.m.

C $5.16\frac{4}{11}$ p.m.

D $5.17\frac{3}{11}$ p.m.

Answer: C

69. **P is mother of V, V is sister of B, A is son of B, D is brother of A, S is mother of D, G is grand daughter of P. T has only two children V and B. Then which one of the following is true?**

A G is daughter of B

B G is daughter of V

C D is the son of T’s son

D There are 5 females and 3 males in that family

Answer: C

70. **A meeting is scheduled at 11.00 a.m. for which a person P who is away 100 kms from the venue has to attend. If P starts at 9.45 a.m. in a car which moves with a speed of 60 kmph, then P is late to the meeting by how may minutes.**

A 5

B 15

C 25

D 35

Answer: C

71. **Anil left home on his cycle to his school t minutes later than the normal time with $\frac{4}{3}$ of his usual speed and arrived at school t minutes early. Next day he left home t minutes earlier than the previous day and travelled with $\frac{8}{11}$ of his usual speed. Then he arrived his school.**

A Exactly in time

B t minutes late

C $\frac{t}{10}$ minutes earlier

D 3t minutes late

Answer: D

72. **A, B, C, D, E, F, G, H are eight friends sitting around a circulartable facing the center as follows**
1. His on the immediate left of A but is not a neighbor of D or E
2. Fis on the immediate right of B and G is neighborof E
3. Cis in between E and F
Which of the following is true?

A E is in between F and B

B F is neighbor of G

C G is in between H and E

D H is in between A and D

Answer: C

73. $\&x\& = 5x - 7, *y * z* = \frac{3y}{z} \Rightarrow \&(*7 * 15*)\& = ?$

A $\frac{176}{7}$

B 15

C 2

D 0

Answer: D

74. **If x stands for addition , < for subtraction, + for division, > for multiplication. - for equal to, $\div$ for greater than and = for less than, then which one of the followingis true**

A $5 + 2 > 2 = 10 < 4 \times 8$

B $5 \times 2 < 7 \div 8 > 4 \times 1$

C $3 \times 2 < 5 \div 15 > 2 + 4$

D $3 \times 4 > 2 - 9 + 3 < 3$

Answer: A

75. **If + means division, - means addition, x means subtraction, / means multiplication then the value of the expression**
$[\{(17 \times 12) - (4/2)\} + (23 - 3)]/6$ **is**

A 1

B 2

C 3

D 4

Answer: C

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76. $9^x = 27^y = 81$, **then** $\frac{1}{x} + \frac{1}{y} =$

A $\frac{3}{4}$

B $\frac{5}{4}$

C $\frac{7}{4}$

D $\frac{1}{4}$

Answer: B

77. **If** 3^n **divides** $(72)^9 . (24)^7 . (48)^{11}$**, then the largest integral value of n is**

A 36

B 24

C 48

D 78

Answer: A

78. **If p : q = 7 : 9, then (4p - 2q) : (3p + q) =**

A 1 : 2

B 2 : 1

C 1 : 3

D 3 : 1

Answer: C

Explanation:
As per the given question,

$p : q = 7 : 9$

Now, p=7x and q=9x

$$\Rightarrow \frac{(4p - 2q)}{(3p + q)} = \frac{4 \times 7x - 2 \times 9x}{3 \times 7x + 9x}$$

$$\Rightarrow \frac{(4p - 2q)}{(3p + q)} = \frac{28x - 18x}{21x + 9x}$$

$$\Rightarrow \frac{(4p - 2q)}{(3p + q)} = \frac{10x}{30x} = \frac{1}{3}$$

79. **If an amount of Rs 7380 is divided among 3 persons A, B, C in the ratio 5 : 6 : 7, then the difference of the amounts received by A and C, in rupees is**

A 1640

B 2460

C 820

D 410

Answer: C

Explanation:
As per the given question,

A, B and C are in the ratio $5 : 6 : 7$

Hence, A received $= 5x$

B received $= 6x$

And C received $= 7x$

As per the question, $5x + 6x + 7x = 7380$

$\Rightarrow 18x = 7380$

$\Rightarrow x = \frac{7380}{18} = 410$

Hence, A will receive $$=410\times 5=2050$Rs.

C will receive $= 410 \times 7 = 2870$Rs.

Hence, the required difference $= 2870 - 2050 = 820$

80. **If $x = 4 - \sqrt[3]{7}$, then $x^3 - 12x^2 + 48x - 21 =$**

A 36

B 50

C 64

D 71

Answer: A

81. **If $x = \frac{17+12\sqrt{2}}{17-12\sqrt{2}}$, then $x + \frac{1}{x} = ?$**

A 577

B 1154

C $204\sqrt{2}$

D 1682

Answer: B

82. **Sum of all the two-digit numbers that are divisible by 4 is**

A 1188

B 1096

C 1200

D 1048

Answer: A

Explanation:

Two digit number $= 12, 16, 20, 24.....96$

Hence, it is making the AP series $12 + 16 + 20 + ...96$

$n = 24 - 2 = 22$

$d = 4$

$a = 12$

$$S_n = \frac{n(2a + (n-1)d)}{2}$$

Hence, the required sum $S_n = \frac{22(2 \times 12 + (22-1) \times 4)}{2}$

$\Rightarrow S_n = 11 \times (24 + 84)$

$\Rightarrow S_n = 11 \times 108$

$\Rightarrow S_n = 1188$

83. **The number of divisors excluding 1 and itself of the number 8625 is**

A 16

B 14

C 12

D 13

Answer: B

Explanation:
As per the given question,

$8625 = 3 \times 5 \times 5 \times 5 \times 23$

$8625 = 3^1 \times 5^3 \times 23^1$

Hence the number of divisors $= (3+1)(1+1)(1+1) = 4 \times 2 \times 2 = 16$

After excluding 1, the number of divisors $16 - 2 = 14$

84. **The smallest positive integer, when increased by 9, is exactly divisible by 3, 4, 10, 15, 24 is**

A 129

B 120

C 111

D 231

Answer: C

Explanation:

The LCM of 3, 4, 10, 15 and 24

LCM= 120

Hence ,the smallest positive integer is 120.

Hence the required integer is $= 120 - 9 = 111$

85. **If the positive integer 1541, 2444, 2659 leave the same remainder when divided by a positive integer m, then the largest value of m is**

A 27

B 39

C 43

D 55

Answer: C

Explanation:
As per the given data in the question,

When these number are divided by m, then 1541, 2444, 2659 it is leaving the same remainder.

Now, (2444-1541=903) and (2659-2444=215) and (2659-1541=1118)

HCF, of these numbers, $903 = 43 \times 7 \times 3$

$215 = 5 \times 43$

And $1118 = 43 \times 13 \times 2$

Hence, from the above it is clear that 43 is the largest value of m.

86. **If** $\left| 2\frac{3}{4} - 3\frac{4}{5} - 4\frac{5}{6} + 5\frac{6}{7} \right| = \frac{p}{q}$ **where and if (p, q) = 1, then p + q =**

A 341

B 431

C 521

D 651

Answer: B

87. **Let r be a rational number such that, if 2 is added to the denominator its value is equal to** $\frac{1}{2}$ **and if 5 is subtracted from the numerator then its value is equal to** $\frac{1}{3}$ **then** $\frac{1+r}{1-r} =$

A $\frac{37}{11}$

B $\frac{17}{32}$

C $\frac{15}{28}$

D $\frac{13}{24}$

Answer: A

88. **The ascending order of the numbers $3^{\frac{1}{3}}, 5^{\frac{1}{4}}, 7^{\frac{1}{5}}$ is**

A $3^{\frac{1}{3}}, 5^{\frac{1}{4}}, 7^{\frac{1}{5}}$

B $5^{\frac{1}{4}}, 7^{\frac{1}{5}}, 3^{\frac{1}{3}}$

C $3^{\frac{1}{3}}, 7^{\frac{1}{5}}, 5^{\frac{1}{4}}$

D $5^{\frac{1}{4}}, 3^{\frac{1}{3}}, 7^{\frac{1}{5}}$

Answer: C

89. **If $x > x^2 > x^3$ then a possible value of x among the following is**

A -2

B $-\frac{1}{2}$

C $\frac{3}{4}$

D 1

Answer: C

90. **From the salary of a person 10% is paid for house rent. 15%of the rest of the amount was spent on provisions and 10% of the remaining amount was spent for children's education. After this expenditure. if he is left with Rs. 24786/-, then his salary in rupees is**

A 18,000

B 24,000

C 32,000

D 36,000

Answer: D

Explanation:
Let his salary was Rs x.

Amount paid for the house rent $= 0.1x$Rs.

Amount spent on the provisions $\frac{90x}{100} \times \frac{15}{100} = 0.9 \times 0.15x$

Amount spent on the children's education $= \frac{0.90 \times 0.85x \times 10}{100} = 0.9 \times 0.85 \times 0.1x$

The left amount $= 24786Rs.$

Hence, his salary $0.1x + 0.9 \times 0.15x + 0.9 \times 0.85 \times 0.1x + 24786 = x$

$\Rightarrow 0.3115x + 24786 = x$

$\Rightarrow x - 0.3115x = 24786$

$\Rightarrow 0.6885x = 24786$

$\Rightarrow x = \frac{24786}{0.6885} = 36000Rs.$

91. **If the length of a rectangle is increased by 15% and its breadth is decreased by 20%, then it area**

A decreases by 8%

B decreases by 6%

C increases by 8%

D increases by 6%

Answer: A

Explanation:
Let the length and breadth of the rectangle is a and b.

Area of the rectangle $= ab$

As per the condition given in the question, new length of the rectangle = 1.15a and 0.8b

Hence, new area of the rectangle $= 1.15a \times 0.8b = 0.92ab$

So, the required area $= \frac{(ab - 0.92ab) \times 100}{ab} = 8\%$

Hence the area of the new rectangle decreased by 8%.

92. **If cost price of 10 pens is equalto the selling price of 8 pens, thenthe trader gets**

A 15% profit

B 20% profit

C 25% profit

D 30% profit

Answer: C

Explanation:
Let the cost price of one pen = 1Rs.

So, cost price of 10 pens = 10Rs.

Selling price of 8pens = cost price of 10 pens

So, selling price of one pen$= \frac{10}{8} = 1.25$Rs.

Hence profit earned by the trader $= \frac{(1.25-1)\times 100}{1} = 25\%$

93. **A trader marksanarticle 25%aboveits cost price. He sells it by giving a discount of 15%. If the selling price ofthis article is Rs. 9350, then its cost price, in rupees, is**

A 7800

B 8800

C 9600

D 9200

Answer: B

Explanation:
Let the cost price of the article is x Rs.

As per the condition, the marked price of article $= \frac{125x}{100} = 1.25x$Rs.

The price of the article after the discount $= \frac{1.25x \times 85}{100} = 1.25 \times 0.85 \times x$

The selling price of the article $1.25 \times 0.85 \times x = 9350$Rs.

$x = \frac{9350}{1.25 \times 0.85} = 8800$Rs.

94. **A person A started a business with a capital of Rs. 3.5 Lakhs and after few months B joined him with a capital of 3 Lakhs. At the end of the year A and B shared the profit in the ratio 2 : 1. Then the number of months B's capital is used in the business is**

A 8

B 7

C 6

D 5

Answer: B

Explanation:
Amount invested by A=3.5 lakhs

Amount invested by B=3 lakh

Ratio in the profit = 2:1

Let B started after x months.

So, $3.5 \times 12 : 3 \times x = 2 : 1$

$$x = \frac{3.5 \times 12}{3 \times 2}$$

$x = 7 months$

95. **Two persons P and Q entered into a partnership with capitals of Rs. 4 lakhs and Rs6 lakhs respectively. After 4 months they invested another 40,000 each. Thenthe difference of their shares . in Rupees. in the annual profit of Rs 1,12,180 is**

A 18,500

B 20,250

C 21,300

D 22,500

Answer: C

Explanation:
Total amount invested by $P = 400000 \times 4 + 440000 \times 8 = 5120000$Rs.

Total amount invested by $Q = 600000 \times 4 + 640000 \times 8 = 7520000$Rs.

Hence the ratio in the investment $= \frac{5120000}{7520000} = \frac{512}{752} = \frac{32}{47}$

Hence, the share of P in the investment $= \frac{32 \times 112180}{79} = 45440$Rs.

The share of Q $= \frac{47 \times 112180}{79} = 66740$Rs.

Hence the required difference $= 66740 - 45440 = 21300 Rs.$

96. **Two taps A and B can fill an empty tank in 8 hours and 12 hours respectively. But due to leak at the bottomthe two taps together took 1 hour 12 min moretimeto fill the tank. Then the time. in hours, in which the leak alone can empty a full tank of water is**

A 12

B 18

C 21

D 24

Answer: D

Explanation:
As per the question,

A can empty tank in 8 hour and B can empty the tank in 12 hour.

If A and B both open at a time, then tank will be fill in one hour $\frac{1}{8}+\frac{1}{12}=\frac{3+2}{24}=\frac{5}{24}$

Hence tank will be filled, together by A and B $\frac{24}{5}\ hour$

Let C can empty the tank in in x hour.

Hence, it will be filled $\frac{5}{24}-\frac{1}{x}=\frac{1}{6}$

$\frac{1}{x}=\frac{5-4}{24}=\frac{1}{24}$

Hence, leak can empty the tank in 24 hour.

97. **Tap A can fill a tank in 6 hours and another tap B can empty that full tank of water in 4 hours. If tap A is opened at 6 AM and after 3 hours tap B is opened, then the time by which the tank will be empty is**

A 1 P.M

B 2 P.M

C 3 P.M

D 4 P.M

Answer: C

Explanation:
As per the question,

A can fill the tank in 6 hour.

So, A can fill the tank in one hour $=\frac{1}{6}$

Tap is open for 3 hour, so tank filled in 3 hour $=\frac{3}{6}=\frac{1}{2}$

Tap B can empty the tank in 4 hour. So, tap B can empty the tank in one hour $= \frac{1}{4}$

Hence, tank will be empty in one hour $= \frac{1}{4} - \frac{1}{6} = \frac{3-2}{12} = \frac{1}{12}$

Hence, it will empty in $\frac{12}{2} = 6 hour$

Time by which tank will be empty is 3:00PM

98. **If a person goes to his office at $\frac{3}{4}$ of his usual speed, he reaches the office late by 15 minutes. If he goes at usual rate. then the time taken to reachhis office, in hours, is**

A $\frac{3}{4}$

B $\frac{5}{4}$

C $\frac{1}{2}$

D 1

Answer: A

Explanation:
Let the usual speed of the man is v, the distance between the home and office is d and time taken by the man is t min.

$$t = \frac{d}{v} - - - - - (i)$$

As per the condition given in the question,

$$\Rightarrow t + 15 = \frac{d}{\frac{3v}{4}}$$

$$\Rightarrow t + 15 = \frac{4d}{3v} - - - - - - - - - - - - (ii)$$

From the equation (i) and (ii)

$$\Rightarrow t + 15 = \frac{4t}{3}$$

$$\Rightarrow 3t + 45 = 4t$$

$$\Rightarrow t = 45 min$$

$$\Rightarrow t = \frac{45}{60} hour = \frac{3}{4} hour$$

99. **If a train crosses a pole in 30 seconds and a platform of length 100 min 50 seconds, then the length of the train, in meters, is**

A 50

B 100

C 150

D 175

Answer: C

Explanation:

As per the given condition,

Let the length of the train =x

Let the speed of the train =v m

Hence, $t = \frac{x}{v}$

$\Rightarrow v = \frac{x}{30} - - - - - - - - - (i)$

Train crosses the platform in $50 = \frac{x + 100}{v} - - - - - - - - - - - - - - - - - - - (ii)$

From equation (i) and (ii)

$\Rightarrow v = \frac{30v + 100}{50}$

$\Rightarrow 50v - 30v = 100$

$\Rightarrow 20v = 100$

$\Rightarrow v = 5m/sec$

So, length of the train $x = 30 \times v = 30 \times 5 = 150m$

00. **Mr. A can do a piece of work in 24 days. After he had worked for 4 days, B joined him and together they completed the remaining work in 8 days. Then the numberof days in which B alone can complete the same work is**

A 16

B 20

C 24

D 30

Answer: A

Explanation:

Let B alone can finish the work in x days.

A alone can finish the work in 24 days.

Hence A can finish the work in one day $= \frac{1}{24}$

So, A can finish the work in 4 days $= \frac{4}{24} = \frac{1}{6}$

The remaining work $= \frac{5}{6}$

A and B together can finish the work in one days $\frac{1}{24} + \frac{1}{x} = \frac{5}{8 \times 6}$

$\Rightarrow \frac{1}{x} = \frac{5}{48} - \frac{1}{24} = \frac{3}{48}$

So, $x = 16$days

Hence, B alone can finish the work in 16 days.

01. **A and B can complete a piece of work in 24 days while B and C can complete the same work in 30 days. If A works twice as much as C, then the numberof days required for B alone to complete the work is**

A 40

B 35

C 30

D 25

Answer: A

Explanation:
Let A can finish a work in x days, B can finish the work in y days.

A and B can finish the work in one days $= \frac{1}{24}$

$\frac{1}{2x} + \frac{1}{y} = \frac{1}{24} - (i)$

A works twice as much as C.

Hence C can finish the work in $= 2x$

Hence C can finish the work in one days $= \frac{1}{2x}$

B and C can finish the work $= 30 days$

Hence, B and C can finish the work in one days $\frac{1}{y} + \frac{1}{2x} = \frac{1}{30} - - - - - - - - - - - - (ii)$

From the equation (i) and (ii)

$$\Rightarrow 24 - \frac{1}{x} + \frac{1}{2x} = \frac{1}{30}$$

$$\Rightarrow 24 - \frac{1}{2x} = \frac{1}{30}$$

$$\Rightarrow \frac{1}{2x} = 24 - \frac{1}{30}$$

$$\Rightarrow \frac{1}{2x} = \frac{5-4}{120} = \frac{1}{120}$$

$$\Rightarrow x = 60\text{days}$$

Hence, $y = 24 - \frac{1}{60} = \frac{5-2}{120} = \frac{3}{120}$

$$\Rightarrow y = 40\text{days}.$$

02. **The area of a trapeziumis $\frac{1}{2}(a^2 - b^2)$ sq. units. where a and b are lengths of the parallel sides. Then, the distance between its parallel sides is**

A $a^2 + b^2$

B 2a

C a + b

D a - b

Answer: D

Explanation:

As per the question,

The area of the trapezium is $\frac{1}{2}(a^2 - b^2)$ sq. units.

We know that, the area of the trapezium $= \frac{(a+b)(d)}{2}$

Hence,

$$\Rightarrow \frac{(a+b)(d)}{2} = \frac{1}{2}(a^2 - b^2)$$

$$\Rightarrow d = \frac{2(a^2 - b^2)}{2(a+b)}$$

$$\Rightarrow d = \frac{(a+b)(a-b)}{(a+b)} = (a-b)$$

Hence the distance between the parallel sides $d = (a - b)$

03. **The length of a rectangular field is three times its width. Inside the field there is a square shaped pond of side 12 m long. If the area of the pond is $\frac{1}{12}$, vk the area of the field, then the length of the field, in meters, is**

A 24

B 48

C 72

D 96

Answer: C

Explanation:
As per the condition given in the question,

Length of the field (l)$= 3\times$breadth (b)

The side length of the square$= 12m$

The area of the field $= 12\times$ area of the pond

Area of the pond $= 12 \times 12 = 144m^2$

Hence, area of the field $b \times 3b = 12 \times 144$

$\Rightarrow b^2 = 4 \times 144$

$\Rightarrow b = 2 \times 12 = 24m$

Hence, the length of the field $= 24 \times 3 = 72m$

04. **If two smaller sides of a rectangular sheet of dimensions 20m X 12mare joined to form a cylinder of maximum volume. Then the volume of that cylinder (in cubic meters) is**

A $\frac{400}{\pi}$

B $\frac{1200}{\pi}$

C $\frac{600}{\pi}$

D $\frac{800}{\pi}$

Answer: B

05. **A metallic solid sphere of radius 5 cmis melt and moulded into a long wire of radius 6 mm then the length of the wire, in meters, is**

A $\frac{25}{27}$

B $\frac{50}{27}$

C $\frac{100}{27}$

D $\frac{125}{27}$

Answer: D

06. **The area of a parallelogramis 243 sq.cm. If its altitude is $\frac{1}{3}$ of corresponding base, then the length of its base, in centimetres, is**

A 9

B 18

C 27

D 36

Answer: C

Explanation:
As per the given question,

Area of the parallelogram$= 243cm^2$

Let the length of the base$= a$

Length of the altitude $= \frac{a}{3}$

Hence, $\frac{a \times a}{3} = 243$

$a^2 = 243 \times 3$

$a = 7\sqrt{21}$

07. **If two equal cubes of side 7m are joined together to form a cuboid. Then the total surface area of that cuboid. in square meters. is**

A 49

B 245

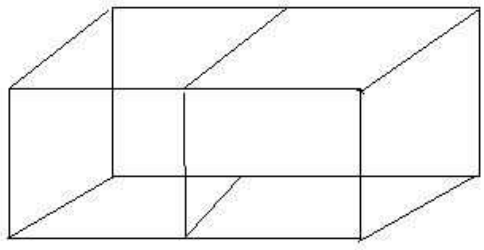
C 490

D 686

Answer: C

Explanation:
As per the given question,

We joining two cube, which formed an cuboid.



Hence new length of the cuboid $= 7 + 7 = 14cm$

Breadth of cuboid$= 7cm$

And height of the cuboid$= 7cm$

Hence, the total surface area of the cuboid $= 2(l \times b + b \times h + h \times l)$

$\Rightarrow 2(7 \times 14 + 7 \times 7 + 7 \times 14) = 2(98 + 49 + 98) = 490$

$\Rightarrow = 490m^2$

08. **If a cone of maximumvolumeis cut from a solid hemisphere of radius 8m. then the volume of that cone. in cubic meters, is**

A $\frac{128}{3}\pi$

B $\frac{256}{3}\pi$

C $\frac{512}{3}\pi$

D $\frac{1024}{3}\pi$

Answer: C

09. **If** $1285 \equiv r(mod\ 29), 0 \leq r \leq 28$**, then r =**

A 23

B 17

C 13

D 9

Answer: D

10. **Define a = b(mod m)if m divides (a-b). Then which oneis true amongthe following?**

A $100 = 1 (\text{mod } 7)$

B $100 = 2 (\text{mod } 8)$

C $100 = 3 (\text{mod } 9)$

D $100 = 4 (\text{mod } 12)$

Answer: D

11. **The contra positive of $p \to (q \to r)$ is**

A $(q \wedge \sim r) \to p$

B $(q \wedge \sim r) \to \sim p$

C $(q \to r) \to p$

D $(\sim q \wedge r) \to \sim p$

Answer: B

12. **The inverse of $p \to q$ is**

A $\sim p \to \sim q$

B $p \to \sim q$

C $\sim p \to q$

D $q \to p$

Answer: A

13. **In a certain city 90% of the population own a motor cycle, 15% own a car and every body owns a car or a motor cycle or both. What percent of the population of that city own a car but not a motor cycle?**

A 8%

B 10%

C 12%

D 13%

Answer: B

Explanation:
As per the question,

Percentage of people own motorcycle $= 90\%$

Percentage of people own car$= 15\%$

Let total population of the village =100

Total number of people who do not own the motorcycle $= 100 - 90 = 10$

As per the question, it is given that, every people of the village own either car or motorcycle or both.

But as per the above, 10% people don't own motorcycle, Hence, 10% people own Car but not motorcycle.

14. **If Q^+ denotes the set of positive rational numbers, then the relation $R = \left\{(x, y) \in Q^+ \times Q^+ : y = \frac{1}{x}\right\}$ is**

A symmetric and reflexive

B not transitive but reflexive

C not reflexive but symmetric

D transitive but not reflexive

Answer: C

15. **The number of relations from the set {2, 3, 4} to the set {5, 6} is**

A 64

B 62

C 46

D 63

Answer: A

16. **The equation of the straight line passing through the point (2, 3) and perpendicular to the line x + 2y - 3 = 0 is**

A 2x - y - 1 = 0

B x - 2y + 4 = 0

C 2x + y - 7 = 0

D 2x - 2y + 2 = 0

Answer: A

Explanation:

As per the given equation in the question,

$\Rightarrow x + 2y - 3 = 0$ the slope of the line $m_1 = \frac{-1}{2}$

Let the slop of the required line is m_2.

When two lines are perpendicular to each other, then $m_1 \times m_2 = -1$

$\Rightarrow m_2 = \frac{-1}{\frac{-1}{2}} = 2$

We know the equation of line $y = m_2 x + c$

The above mentioned line is passing through the point (2,3)

So, $3 = 4 + c$

$\Rightarrow c = -1$

Hence the equation of line $y = 2x - 1$

$\Rightarrow 2x - y - 1 = 0$

17. **If the straight lines 5x + 3y + 7 = 0 and ax - 7y + 8 = 0 are perpendicular, then the value of a is**

A 4

B $\frac{19}{5}$

C $\frac{21}{5}$

D $\frac{22}{5}$

Answer: C

Explanation:

As per the given equation in the question,

5x + 3y + 7 = 0 and ax - 7y + 8 = 0

Slope of the line 1, $m_1 = \frac{3}{5}$ and slope of line 2, $m_2 = \frac{7}{a}$

When two lines are perpendicular to each other, then $m_1 \times m_2 = -1$

Now, substituting the values $\frac{3}{5} \times \frac{-7}{a} = -1$

$a = \frac{5}{21}$

18. $\frac{1+\sin\theta}{\cos\theta} + \frac{\cos\theta}{1+\sin\theta} =$

A $2\sin\theta$

B $2\cos\theta$

C $2\sec\theta$

D 0

Answer: C

19. $\tan(-855^\circ) =$

A 1

B -1

C $\frac{1}{2}$

D $-\frac{1}{2}$

Answer: A

Explanation:
As per the given question,

$\tan(-855^\circ) = \tan(5\pi - 45)$

It will lie on the 3rd co-ordinate,

Hence $\tan(5\pi - 45) = -\tan 45^\circ = -1$

Hence, option A is the correct answer.

20. **If** $\tan\theta = \frac{3}{4}$**, then** $\tan 2\theta + \sec 2\theta =$

A $\frac{9}{16}$

B 7

C 6

D $\frac{7}{4}$

Answer: B

21. **If the angles of elevation of the top of a tower from the top and front of a pole of height 15 m are** 30° **and** 60° **respectively, then the height of the tower(in meters) is**

A 23

B $22\frac{1}{2}$

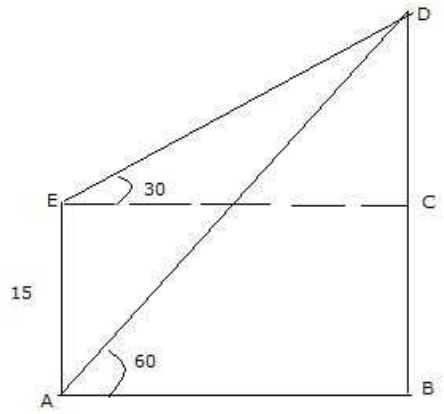
C 22

D $24\frac{1}{2}$

Answer: B

Explanation:

As per the given question,



Let the height of the tower is h.

Now, in the $\triangle$ECD,

$$\tan 30 = \frac{CD}{EC} - - - - - - - - - - - - - - - - - - (i)$$

In the $\triangle$ABD

$$\Rightarrow \tan 60 = \frac{BD}{AB}$$

$$\Rightarrow \tan 60 = \frac{15 + CD}{AB} - - - - - - - - - - - - - - - - - - (ii)$$

AB=EC

Hence from equation (i) and (ii)

$$\Rightarrow \frac{\frac{15 + CD}{EC}}{\frac{CD}{EC}} = \frac{\tan 30}{\tan 60}$$

$$\Rightarrow 15 + CD = \frac{CD}{3}$$

$$\Rightarrow 3CD = 15 + CD$$

$\Rightarrow 2CD = 15$

$$\Rightarrow CD = \frac{15}{2}$$

Hence the height of the tower $= 15 + \frac{15}{2} = \frac{45}{2} = 22\frac{1}{2}$

22. **Which one of the following is a factor of** $x^3 + 6x^2 + 11x + 6$?

A x - 1

B x - 2

C x + 3

D x - 3

Answer: C

Explanation:
As per the given equation,

$x^3 + 6x^2 + 11x + 6 = 0$

If the given options are satisfying the equation then it will give zero.
x-1=0, so x =1 putting in the equation,

$\Rightarrow x^3 + 6x^2 + 11x + 6 = 0$

$\Rightarrow 1 + 6 + 11 + 6 \neq 0$

Now, trying option b, x-2=0 , so x=2

$\Rightarrow x^3 + 6x^2 + 11x + 6 = 0$

$\Rightarrow 8 + 24 + 22 + 6 \neq 0$

Now, putting option c, x+3=0, x=-3

$\Rightarrow (-3)^3 + 6 \times (-3)^2 + 11 \times (-3) + 6 = 0$

$\Rightarrow -27 + 54 - 33 + 6 = 0$

Hence it is satisfying the condition.

Now, putting option D, x-3=0, x=3

$\Rightarrow x^3 + 6x^2 + 11x + 6 = 0$

$\Rightarrow 27 + 54 + 33 + 6 \neq 0$

Hence, option C is the correct answer.

23. **The square root of** $9x^2 + 4y^2 + z^2 + 12xy - 4yz - 6xz$ **is**

A 3x - 2y - z

B 3x - 2y + z

C 3x + 2y + z

D 3x + 2y - z

Answer: D

24. **A polynomial $\phi(x)$ leaves remainders -1 and 3 when divided by x - 3 and x + J respectively. Then the remainder, when that polynomial $\phi(x)$ is divided by $x^2 - 2x - 3$ is**

A x + 1

B 1 - x

C 2 + x

D 2 - x

Answer: D

25. **If $ax^4 + bx^3 + 2x^2 + 4$ is exactly divisible by $x^2 - x - 2$, then $(a, b) =$**

A $\left(\frac{1}{2}, -\frac{3}{2}\right)$

B $\left(\frac{3}{2}, \frac{5}{2}\right)$

C $\left(\frac{5}{2}, \frac{7}{2}\right)$

D $\left(-\frac{5}{2}, \frac{7}{2}\right)$

Answer: D

Explanation:

$x^2 - x - 2$ = (x+1)(x-2)

Let f(x) = $ax^4 + bx^3 + 2x^2 + 4$

f(-1) = 0 => a - b + 6 =0

f(2) = 0 => 16a+8b+12 = 0

Solving above two, we get a=-5/2 and b = 7/2

26. **P and Q have a certain number of Mangos. P says to Q: "If you give me 30 of your mangoes. I will have twice as many as left with you". Then Q replies as "If you give me 10 mangoes, I will have thrice as many as left with you". Then how many mangoes P had at the beginning?**

A 32

B 42

C 34

D 38

Answer: C

Explanation:
Let P have p mangos and Q have q mangoes

Condition 1: p+30 = 2(q-30)

Condition 2: q+10 = 3(p-10)

Solving both these equations we get p=34 and q=62

27. **A fraction becomes $\frac{4}{5}$ if 1 is added to both numerator and denominator. However if 5 is subtracted from both numerator and denominator the fraction becomes $\frac{1}{2}$, then the fraction is**

A $\frac{3}{8}$

B $\frac{8}{9}$

C $\frac{14}{11}$

D $\frac{7}{9}$

Answer: D

Explanation:
Let the fraction be x/y

Given, $\frac{(x+1)}{y+1} = \frac{4}{5}$

$\frac{(x-5)}{y-5} = \frac{1}{2}$

Solving both the equation, we get x=7 and y=9

28. **The sum of the first 25 terms in the progression $2, \frac{5}{2}, 3, \ldots\ldots$ is**

A $\frac{401}{2}$

B 200

C $\frac{403}{2}$

D $\frac{399}{2}$

Answer: B

Explanation:

The first 25 terms of the given series is $\frac{4}{2}, \frac{5}{2}, \frac{6}{2}, \frac{7}{2}, \ldots\ldots \frac{28}{2}$

$\therefore$ Sum of first 25 terms of the given series = $\frac{(4+5+6+7+\ldots..28)}{2}$

$= \frac{\frac{25}{2}(4+28)}{2}$

$= \frac{\frac{25}{2}(32)}{2}$

$= \frac{400}{2}$

$= 200$

Hence, the correct answer is Option B

29. **If the sum and product of three consecutive terms of a geometric progression are 13 and 27 respectively, then the middle one of the three terms is**

A 1

B 2

C 3

D 4

Answer: C

Explanation:

Let the 3 terms of the geometric progression be a/r , a , ar

Given, product of the terms = 27

$\Rightarrow \frac{a}{r} \times a \times ar = 27$

$\Rightarrow a^3 = 27$

$\Rightarrow$ a = 3

Hence middle term = 3

30. **The 9^{th} term in the binomial expansion of $\left(x - \frac{1}{x}\right)^{17}$ is**

A $-{}^{17}C_8 \frac{1}{x}$

B ${}^{17}C_8 \frac{1}{x}$

C $-17C_8 x$

D $17C_8 x$

Answer: D

Explanation:

kth term of series $(x + a)^n = {}^nC_{k-1} (x)^{n-(k-1)} (a)^{k-1}$

9^{th} term in the binomial expansion of $\left(x-\frac{1}{x}\right)^{17} = {}^{17}C_8 x^9\left(-\frac{1}{x}\right)^8 = {}^{17}C_8 x$

31. **If the expansion of $(x-3x^2)^{25}$ is a polynomial of n^{th} degree in x, then n =**

A 75

B 25

C 50

D 28

Answer: C

Explanation:

$(x-3x^2)^{25} = {}^{25}C_0 x^{25} + {}^{25}C_1 x^{24}\left(-3x^2\right) + ... + {}^{25}C_{24} x\left(-3x^2\right)^{24} + {}^{25}C_{25}\left(-3x^2\right)^{25}$

$= {}^{25}C_0 x^{25} + {}^{25}C_1 (-3) x^{26} + ... + {}^{25}C_{24}(-3)^{24} x^{49} + {}^{25}C_{25}(-3)^{25} x^{50}$

The degree of the polynomial (n) = highest power of x = 50

Hence, the correct answer is Option C

32. **If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}, B = \begin{bmatrix} x & 1 \\ y & -1 \end{bmatrix}$ and $(A+B)^2 = A^2 + B^2$, then (x, y) =**

A (-2, -2)

B (1, 4)

C (-1, 4)

D (1, -4)

Answer: B

33. **If $\begin{bmatrix} 2 & -1 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$, then $x^2 + y^2 =$**

A 11

B 12

C 22

D 13

Answer: D

34. $\lim_{x \to 0} \frac{\sqrt{1+x^3}-\sqrt{1-x^2}}{x^2} =$

A 1

B $-\frac{1}{2}$

C $\frac{1}{2}$

D -1

Answer: C

35. $\frac{d}{dx}\left(\tan^{-1}\left(\frac{1+\tan x}{1-\tan x}\right)\right) =$

A 4

B 0

C 2

D 1

Answer: D

36. **The ratio of the sides of a triangle whose angles are in the ratio $1:2:3$ is**

A $1:\sqrt{3}:2$

B $1:2:3$

C $2:3:4$

D $1:\sqrt{2}:2$

Answer: A

Explanation:
The angles will be 30,60,90
We know that, $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{SinC}$
a:b:c = $\sin A : \sin B : \sin C = \frac{1}{2} : \frac{\sqrt{3}}{2} : 1 = 1 : \sqrt{3} : 2$

37. **The perimeter (in cms) of a Rhombus whose diagonals are 9 cm and 12 cm is**

A 40

B 30

C 32

D 36

Answer: B

Explanation:
We know diagonals bisect each other perpendicularly

Hence side of the rhombus would be $\sqrt{4.5^2 + 6^2} = 7.5$

Perimeter = 4*7.5 = 30

38. **A tangent is drawn to a circle from a point 13 cm away from its centre. If the length of that tangent is 12 cm, then the radius (in cms) of the circle is**

A 4

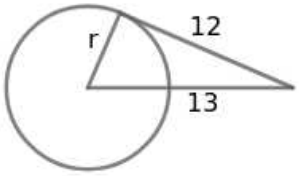
B 6

C 5

D 7

Answer: C

Explanation:



Let the radius of the circle = r

From the triangle,

$r^2 + 12^2 = 13^2$

$\Rightarrow r^2 + 144 = 169$

$\Rightarrow r^2 = 25$

$\Rightarrow$ r = 5 cm

$\therefore$ Radius of the circle = 5 cm

39. **The area (in sq. units) of the triangle formed by the points (0, 0), (2, -3) and (4, 5) is**

A 22

B 11

C 12

D 16

Answer: B

Explanation:

Area of the triangle when one vertex is origin is $\frac{1}{2}|x_2y_3 - x_3y_2|$ = $\frac{1}{2}|2 \cdot 5 - (4) \cdot (-3)| = 11$

40. **The ratio in which the X-axis divides the line segment joining the points (2, 3) and (3, -5) is**

A -2 : 3

B 3 : 2

C -3 : 5

D 3 : 5

Answer: D

41. **If the mean of the following distribution is 50. then the ratio of the missing frequencies f_1 and f_2 is**

C.I	0-20	20-40	40-60	60-80	80-100	Total
f_i	17	f_1	32	f_2	19	120

A 6:5

B 7:5

C 7:6

D 8:5

Answer: C

42. **The median of the following distribution is**

Age (in Years)	14	15	16	17	18	19	20	21
No. of Students	2	10	18	20	10	7	6	3

A 16

B 17

C 18

D 17.5

Answer: B

Explanation:

Total number of students = 2 + 10 + 18 + 20 + 10 + 7 + 6+ 3 = 76

∴ The median age will be the average of 38th and 39th students = $\frac{17+17}{2}$ = 17

Hence, the correct answer is Option B

43. **The mode of the following distribution of marks obtained by a group of students is approximately**

Marks Scored	15-25	25-35	35-45	45-55	55-65	65-75
No. of Students	8	20	28	30	10	4

A 44.7

B 45.9

C 46.4

D 46.7

Answer: B

44. **The mean of the numbers a, b, 8, 5, 10 is 6 and their variance is 6.80. Then the difference between a and b is**

A 1

B 3

C 5

D 4

Answer: A

45. **The standard deviation of the distribution (approximately) is**

C.I	0-2	2-4	4-6	6-8	8-10
f_i	1	2	3	2	1

A 2.1

B 2.3

C 2.6

D 2.9

Answer: B

46. **The rank correlation coefficient between two characteristics X and Y of a group is found to be 0.9. If the sum of the squares of the differences in their ranks is given to be 56, then the number of individuals in that group is**

A 10

B 12

C 15

D 18

Answer: C

47. **The probability that a flight arrives on time is 0.7 and the probability that a flight departs on time is 0.8. The probability that a flight neither arrives on time nor departs on time is 0.15. Then the probability that flight arrives on time and departs on time is**

A 0.65

B 0.70

C 0.75

D 0.85

Answer: A

48. **Bag B1 contains 4 white and 2 black balls. Bag B2 contains 3 white and 4 black balls. A bag is drawn at random and a ball is chosen at random from it. Then the probability that the ball drawn is white, is**

A $\frac{3}{14}$

B $\frac{2}{7}$

C $\frac{23}{42}$

D $\frac{23}{41}$

Answer: C

49. **In a construction company the probability that the workers go on strike is 0.65 and the probability that a construction job will be completed on time if there is no strike is 0.80. If the probability that the construction job is completed on time even if there is strike is**
0.32, then the probability that the construction job is completed on time is

A 0.208

B 0.488

C 0.288

D 0.512

Answer: B

50. **A bag contains 4 red and 5 black balls. Another bag contains 3 red and 6 black balls. One ball is drawn from the first bag and two balls are drawn from the second bag at random. The probability that out of the three balls. two are black and one is red is**

A $\frac{5}{18}$

B $\frac{15}{54}$

C $\frac{77}{228}$

D $\frac{25}{54}$

Answer: D

Communication Ability

Instructions [151 - 156]

Choose the correct meaning of the word given:

51. **Augment**

A Decrease

B Increase

C Pigment

D Fragment

Answer: B

52. **Ardour**

A Passion

B Hard work

C Apathy

D Difficulty

Answer: A

53. **Facile**

A arduous

B effortless

C faceless

D laborious

Answer: B

54. **Fallacy**

A creative thinking

B false reasoning

C correct policy

D exact reasoning

Answer: B

55. **Insipid**

A Witty

B dirty

C tasteless

D stupid

Answer: C

56. **Clairvoyance**

A voyage

B chivalry

C foretelling

D diligence

Answer: C

Instructions [157 - 160]

Fill in the blank choosing the correct word:

57. **A ..... person is one who readily believes others.**

A credible

B creditable

C credulous

D skeptical

Answer: C

58. **A person who talks continuouslyis said to be .....**

A vicarious

B licentious

C voracious

D loquacious

Answer: D

59. **Reproducing word for word is known as .....**

A verbatim

B verbal

C verbalizing

D verbose

Answer: A

60. **The Russian player ..... all the rest.**

A rooted

B flouted

C routed

D triumphed

Answer: C

Instructions [161 - 177]

Choose the correct answer:

61. **Data that provides information about other data is called**

A metadata

B big data

C e-data

D primary data

Answer: A

62. **The refuse created by discarded electronic devices is generally called**

A e-rubbish

B e-litter

C e-trash

D e-waste

Answer: D

63. **To add data at the end of an existing file is to**

A append

B expend

C compound

D depend

Answer: A

64. **Capital invested in a new business in which there is an element of risk is called**

A enterprise capital

B working capital

C venture capital

D equity capital

Answer: C

65. **Identify the device that is not considered a computer peripheral:**

A keyboard

B monitor

C motherboard

D printer

Answer: C

66. **A modem is the short form for**

A moderator-demonitor

B monitor-demonitor

C moderator-demoderator

D modulator-demodulator

Answer: D

67. **consensus means**

A dispute

B enumeration

C consecration

D agreement

Answer: D

68. **‘Start-up’ is a word that describes a**

A business in profits

B business in its infancy

C business in loss

D business at its peak

Answer: B

69. **Invoice means bill showing goods .....**

A to be purchased infuture

B consumed in the process of production

C consumed in the process of transport

D sold for which amount1s to be paid

Answer: D

70. **A business that has everything needed to start it immediately is called .....**

A an upstart

B a Start-up

C a turnkey business

D turnover of business

Answer: C

71. **A: Who did he invite to the party?**
B: He invited all and sundry
B feels that

A A invited people all of a sudden

B A invited everyone without any distinction

C A invited all but one

D A is inviting all the time

Answer: B

72. **The alarm ..... infra-red rays which are used to detect any intruder.**

A detects

B surrounds

C emits

D rejects

Answer: C

73. **A: Thank God. Youare saved.**
B: I don't knowhowto thank you. Had you not warned me. I would have fallen over the precipice.
B expresses

A his gratitude to 'A'

B his anger against 'A'

C his mercy for 'A'

D anger for 'A for coming nearthe precipice

Answer: A

74. **Identify the correct statement:**

A Being a tough exam, I left many questions unanswered.

B It being a tough exam, many questions left unanswered.

C It being a tough exam,I left many questions unanswered.

D Being a tough exam, many questions were left unanswered.

Answer: C

75. **The Global Financial System suffered a major .....**

A burnout

B stroke

C meltdown

D kickback

Answer: C

76. **She ate the whole of it, ...?**

A isn't it

B didn't she

C did she

D hasn't she

Answer: B

77. **A : Howis your newprincipal?**
B : He seems to be a heavy-handed person.
B implies that his principalis

A stem

B clumsy

C fat

D generous

Answer: A

Instructions [178 - 180]

Fill in the blank with the appropriate phrase/verb/preposition:

78. **He has lost the memory ofhis past, labouring undera shock. Heis suffering from .....**

A dyslexia

B amnesia

C angina

D anorexia

Answer: B

79. **Change the following sentence into passive voice:**
“Shut the door.”

A Let shut be the door.

B Shutlet be the door.

C Let be the door shut.

D Let the door be shut.

Answer: D

80. **A: Why is yourfriend pacing?**
B : He is waiting for a phonecall like a cat on a hot tin roof.
B feels that his friend is very .....

A curious

B angry

C fast

D restless

Answer: D

Instructions [181 - 183]

Choose the correct answer:

81. **He <u>faced the music</u> for failing in the examination.**
The underlined phrase means that he

A listened to his favourite music

B enjoyed himself

C trained himself in music

D experienced unpleasant consequences

Answer: D

82. **“He is very competent. But he worksbyfits and starts”.**
The speaker implies that the one referred to here, works

A slowly

B repeatedly

C irregularly

D insensitively

Answer: C

83. **Choose the passive form for the sentence.**
“I am to do this work”

A This work has to be done by me.

B This work should be done by me.

C This work 1s to be done by me

D I must do this work

Answer: C

Instructions [184 - 185]

Fill in the blank with the appropriate phrase/verb/preposition:

84. **A : Why did you deceive your enemy?**
B : Everything is fair in love and war.
B is .....

A doubtful of his action

B defending his action

C speaking of his love for the enemy

D praising both love and war

Answer: B

85. **Rajuis very studious. Every time I see him, I find him ..... books.**

A poring out on

B poring over

C pouring on

D pouring at

Answer: B

Instructions [186 - 190]

Read the below passage and answer the following questions:

Life is what you makeofit. You are the author of your ownstory, and as such.it is completely up to you to decide when to say “Yes and when to say ‘No’. Yourability to decide wisely will contribute greatly to your ability to live a less stressful life with more time to do the things youactually want to do, rather than doing the things you feel you are expected to do. However, it would also be unrealistic to expect anyone to live a completely self-centred life. telling people “No” to every request that will not be to his or her ownbenefit. Setting healthy boundaries and creating a balance between the number of ‘Yeses’ and ‘No’s’ will be the key to your success and well-being. You also must set some boundaries when deciding whether to agree to something if it goes against your moral and ethical standards, whetherit is in your personallife or your professionallife. As stated by Oprah Winfrey. “when you do not set healthy boundaries for yourself. you are inviting people to ignore your needs”.

86. **Life is shaped by**

A fate

B destiny

C others

D oneself

Answer: D

87. **What contributes to a less stressful life ?**

A wise decisions

B a self-centred existence

C a philosophical attitude

D idealism

Answer: A

88. **What happens when one continually agrees to every request?**

A others are happy

B others become more selfish

C it leads to self-contentment

D it leads to discontentment

Answer: D

89. **What does 'setting healthy boundaries' mean?**

A leading a healthy life

B using one's discretion

C avoiding confrontations

D helping others.

Answer: B

90. **The passage does not mention ..... as a consequence of setting boundaries.**

A Success and well being

B more time for ourselves

C less stressful life

D wealthy life

Answer: D

Instructions [191 - 195]

Read the below passage and answerthe following questions

The usual goals of monetary policy are to achieve or maintain full employment, to achieve or maintain a high rate of economic growth. and to stabilize prices and wages. Until the early 20th century, monetary policy was thought by most experts to be of little use in influencing the economy. Inflationary trends after World War II, however, caused governments to adopt measures that reduced inflation by restricting growth in the money supply.

Monetary policy is the domain of a nation's central bank. The Federal Reserve System (commonly called the Fed) in the United States and the Bank of England of Great Britain are two of the largest such "banks" in the world. Although there are some differences between them, the fundamentals of their operations are almost identical and are useful for highlighting the various measures that can constitute monetary policy.

The Fed uses three main instruments in regulating the money supply: open market operations. the discount rate, and reserve requirements. The first is by far the most important. By buying orselling government securities (usually bonds), the Fed or a central bank — affects the money supply and interest rates. If, for example, the Fed buys government securities, it pays with a check drawnonitself. This action creates money in
the form of additional deposits from the sale of the securities by commercial banks. By adding to the cash reserves of the commercial banks. then, the Fed enables those banks to increase their lending capacity. Consequently. the additional demand for government bonds bids up their price and thus reduces their yield (i... interest rates), The purpose of this operation is to ease the availability of credit and to reduce interest rates. which thereby encourages businesses to invest more and consumers to spend more. The selling of government securities by the Fed achieves the opposite effect of contracting the money supply and increasing interest rates.

91. **Which of the following is <u>NOT</u> usually the goal of monetary policy?**

A To achieve or maintain highinflation.

B To achieve or maintain high rate of economic growth.

C To achieve or maintain full employment.

D To stabilize prices and wages.

Answer: A

92. **Which factor promoted the governments to adopt measures for reducing inflation?**

A Early 20th century ideas about monetary policy.

B Trends of inflation after World War — II.

C Economie growthin early 20th century.

D The Federal Reserve System.

Answer: B

93. **Two of the largest central banks in the world are .....**

A Federal Reserve System and Central Bank.

B The Bank of United States and the Bank of England.

C The Fed and the Federal Reserve System.

D The Fed and the Bank of England.

Answer: D

94. **Which of the following is <u>not</u> an instrument used by the Fed in regulating money supply?**

A Reserve requirements

B Discount rate

C Open-market operations

D Increasing inflation

Answer: D

95. **If the Fed buys government securities, howdoes it pay back?**

A With a check drawn on government account.

B Witha check drawn on itself.

C With a check drawnon public money.

D With an overdraft.

Answer: B

Instructions [196 - 200]

Read the below passage and answer the following questions

The jute industry occupies an important place in the national economy.It is one of the major industries in the eastern region, particularly in West Bengal. Jute. the golden fibre. meets all the standards for safe

packaging in view of being a natural, renewable, biodegradable and eco-friendly product.

Globally, India is the largest producer and second largest exporter of jute goods and this sector supports the livelihood of about 40 lakh farm families. and provides direct and indirect employment to 4 lakh workers. There are 77 jute mills in the country. Of these 60 are in West Bengal. 3 each in Bihar and Uttar Pradesh, 7 in Andhra Pradesh, and one each in Assam, Orissa. Tripura and Chhattisgarh.

The production of jute is concentrated in 36 districts of West Bengal, Orissa. Bihar, Assam, Meghalaya, Tripura and Andhra Pradesh. In the 2008-09 jute season (July - June), the production of rawjute was 90 lakh bales (180 kgs each).

96. **According to the passage, which is NOT true about jute?**
Jute is .....

A eco-friendly

B biodegradable

C expensive

D renewable

Answer: C

97. **India is the largest ..... of jute.**

A exporter

B producer

C importer

D consumer

Answer: B

98. **Which state is not known for its production of jute?**

A Tanul Nadu

B Assam

C West Bengal

D Meghalaya

Answer: A

99. **Which state has more than one jute mill?**

A Orissa

B Chhattisgarh

C Tripura

D Uttar Pradesh

Answer: D

200. **Identify the incorrect statement:**

A Jute is also called the golden fibre.

B The measure of 180 kgs is called a bale.

C India is the largest exporter of jute.

D After West Bengal, Andhra Pradesh has the highest number of jute mills.

Answer: C