THE MOST POPULAR **DEFENCE EXAM** APP OF ALL TIME

Prepare for defence exams like NDA, CDS, AFCAT, INET, TA, GROUP X&Y, MNS, ACC and more.

ANDROID APP ON
Google play

CDS Exam OTA 2020 Online Course

BEST FEATURES

SSBCrackExams is the exclusive online platform for the candidates aspiring to make the Nation proud.

DETAILED LECTURES

Start enjoying your learning experience by the rock-solid video lessons specially designed for your easy understanding & higher scores in the exam.

PYQAs & TEST SERIES

Get ready for your D-Day with unlimited practice papers & previous years' questions made easy with our insightful video classes & extra notes prepared

SMART ANALYTICS

Get your own personalized Performance Tracker where you can check your Learning Footprints, Digital Notes, All-India Ranking, Timed Tests, Mind-blowing Quizzes, Prompt Videos, quick & accurate Mock Test Results, Self-Analytic Progress Reports and more.

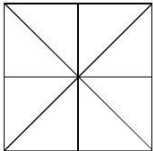**SSBCrack** EXAMS

support@ssbcrackexams.com

www.ssbcrackexams.com

TERRITORIAL ARMY
SOLVED PAPER – JULY 2017
PAPER: 1. REASONING & ELEMENTARY MATHEMATICS

PART I : REASONING

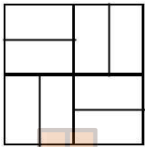**Q 1**. How many triangles are there in the given figure?

(a) 16　　　　　(b) 14　　　　　(c) 8　　　　　(d) 12

Answer: (a)

On counting it is clear that, the given figure has 16 numbers of triangles.

Q 2. How many rectangles are there in the given figure?

(a) 24　　　　　(b) 16　　　　　(c) 21　　　　　(d) 14

Answer: (b)

On counting it is clear that, the given figure has 16 numbers of rectangles.

Q3. In a row of girls, Kamla is 9th from the left and veena is 16th from the right. If they interchange their positions. Kamla becomes 25th from the left. How many girls are there in the row?

(a) 34　　　　(b) 40　　　　(c) 36　　　　(d) 41

Answer: (b)

According to their standing arrangement,

Total number of students in the row = 16 + 25 − 1 = 40.

Q4. Five students are standing one behind the other in the playground facing the instructor. Malini is behind Anjana, but in front of Gayatri. Meena is in front of Sheena, but behind Gayatri. What is the position of Meena?

(a) Second from Last　(b) Extreme First　　　(c) Extreme Last　　　　　(d) Second from first

Answer: (a)

While imagining the positions of each and every girl and their order is

Anjana – Malini – Gayatri – Meena - Sheena

It is clear that Meena is second from last.

Q5. Sita is elder than Swapna. Lavanya is elder than Swapna but younger than Sita. Suvarna is younger than both Hari and Swapna. Swapna is elder than Hari. Who is the youngest?

(a) Sita　　　　　(b) Lavanya　　　(c) Suvarna　　　(d) Hari

Answer: (c)

According to their age, the order from elder to younger is

Sita > Lavanya > Swapna > Hari > Suvarna.

It is clear that everyone is elder than Suvarna. So, Suvarna is the youngest.

Q6. C is A's father's nephew. D is A's Cousin but not brother of C. How is D related to C?

(a) Father   (b) Sister   (c) Mother   (d) Aunt

Answer: (b)

From this statement "C is A's father's nephew. D is A's Cousin but not brother of C". It is clear that D is the sister of C.

Q7. Deepak said to Nitin, "That Boy playing football is the younger of the two brothers of the daughter of my father's wife" How is the boy playing football related to Deepak?

(a) Son   (b) Nephew   (c) Brother   (d) Cousin

Answer: (c)

From this line "That Boy playing football is the younger of the two brothers of the daughter of my father's wife" it is clear that Deepak is talking about his father and his family only so that boy is his own brother.

Q8. Which diagram depicts relationship between Nitrogen, Ice, Air?

Answer: (d)

All these three elements are different from each other, but nitrogen and air can be mixed so diagram (d) is the exact answer.

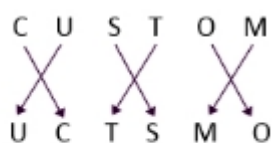**Q9**. Which diagram depicts relationship between Bus, Car, Vehicle?

Answer: (c)

Because people taking car and vehicle completely belong to category of travelers and public mode of transport is bus.

Q10. If CUSTOM is written as UCTSMO then how PARENT will be written in the same code?

(a) ERAPTN   (b) TNERAP   (c) RAPTNE   (d) APERTN

Answer: (d)

Similarly,

Q11. If CAT is coded as 3120, what code number can be given to NAVIN?

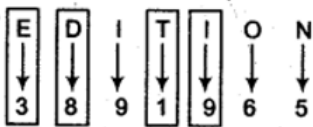(a) 14122914   (b) 49274654   (c) 73957614   (d) 43245654

Answer: (a)

Here the alphabets are numbered respectively as A=1, B=2, C=3, D=4,……….. respectively thus, CAT 3120 and NAVIN is coded as 14122914
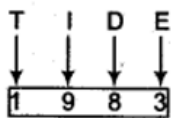
Q 12. If in a certain code EDITION is written as 3891965, then how TIDE will be written in that code?

(a) 3819   (b) 1983   (c) 1839   (d) 1586

Answer: (b)

Therefore,

The above representation clearly states that why tide is coded as 1983.

Q 13. If FADE is coded as 3854 then how can GAGE be coded?

(a) 1824   (b) 2834   (c) 2824   (d) 2814

Answer: (c)

Given that fade is coded as 3854 then

we have to find the code of gage.

F, A, D, E are given

A - 8, B - 7, C - 6, D - 5, E - 4, F - 3, G - 2, H - 1

Thus, GAGE can be coded as 2824

Directions: In each of the following questions, four words are given, out of which three are alike in some manner and the fourth one is different. Choose the odd one.

Q 14. (a) Wood   (b) Cork   (c) Stone   (d) Paper

Answer: (c)

Except stone all others belong to products of tree only stone is different here.

Q 15. (a) Commander (b) Commodore   (c) Admiral   (d) Brigadier

Answer: (d)

All except Brigadier are ranks in navy, while Brigadier is a rank in army.

Directions: In each of the following questions, certain pairs of words are given, out of which the words in all pairs except one, bear a certain common relationship. Choose the pair in which the words are differently related.

Q 16.   (a) Steel : Utensils   (b) Bronze : Statue

        (c) Duralumin : Aircraft   (d) Iron : Rails

Answer: (d)

In all other pairs, first is the alloy used to make the second. Iron is not an alloy, but a metal.

Q 17.   (a) Tongue : Taste   (b) Eye : Blind

        (c) Ear : Deaf   (d) Leg : Lame

Answer: (a)

In all other pairs, second indicates a state of non-functioning of the first

Directions: In each of the following questions, four numbers are given, out of which three are alike in some manner while the fourth one is different. Choose the one different from the rest.

Q 18. (a) 25631   (b) 33442   (c) 34424   (d) 52163

Answer: (b)

Except (b) in all others, the sum of digits of the number is 17.

Q 19. (a) 2468   (b) 2648   (c) 4826   (d) 6482

Answer: (a)

All other numbers contain first four consecutive even numbers but not in proper order.

Q 20.   (a) 3:12   (b) 4:20   (c) 6:42   (d) 7:63

Answer: (d)

In all other pairs, (1st number) × (1st number + 1) = 2nd number.

Directions: In each of the following questions, a number series is given with one term missing. Choosing the correct alternative that will continue the same pattern.

Q 21. 3,20, 63, 144, 275, _____

(a) 554   (b) 548   (c) 468   (d) 354

Answer: (c)

$1 \times 3 = 3$.
$(1+3) \times 5 = 4 \times 5 = 20$.
$(4+5) \times 7 = 9 \times 7 = 63$.
$(9+7) \times 9 = 16 \times 9 = 144$.
$(16+9) \times 11 = 25 \times 11 = 275$
$(25+11) \times 13 = 36 \times 13 = 468$.

So, the answer is 468.

Q22. 8, 12, 18,   27,_____

(a) 36   (b) 44   (c) $37\frac{1}{2}$ (d) $40\frac{1}{2}$

Answer: (d)

As far seeing the sequence is going like

$\frac{8 \times 3}{2} = 12$

$\frac{12 \times 3}{2} = 18$

$\frac{18 \times 3}{2} = 27$

$\frac{27 \times 3}{2} = 40.5$

Thus, the answer is $40\frac{1}{2}$.

Q 23. 8, 29, 113, 449, _____

(a) 673   (b) 984   (c) 1484   (d) 1793

Answer: (d)

$8 \times 4 = 32 - 3 = 29$

$29 \times 4 = 116 - 3 = 113$

$113 \times 4 = 452 - 3 = 449$

$449 \times 4 = 1796 - 3 = 1793$

Thus, the answer is 1793.

Q 24. $\frac{2}{3}, \frac{4}{7}, ?, \frac{11}{21}, \frac{16}{31}$

(a) $\frac{5}{9}$ (b) $\frac{6}{11}$ (c) $\frac{7}{13}$ (d) $\frac{9}{11}$

Answer: (c)

The difference in the numerator increases by 1

            2, 4, 7, 11, 16

Difference: 2, 3, 4, 5

The difference increases by 2

            3, 7, 13, 21, 31

Difference: 4, 6, 8, 10

So, the correct answer is $\frac{7}{13}$

Directions: In each of the following questions, various terms of an alphabet series are given with one missing term as shown by (?) choose the missing term out of the given alternatives.

Q 25. N5V, K7T, ? , E14P, B19N

(a) H9R   (b) H10Q   (c) H10R   (d) I10R

Answer: (c)

N-3=K, **K-3=H,** H-3=E, E-3=B

5+2=7, **7+3=10**, 10+4=14, 14+5=19

V-2=T, **T-2=R**, R-2=P, P-2=N

Thus, the missing term is H10R.

Q 26. J2Z, K4X, I7V, ? , H16R, M22P

(a) I11T   (b) L11S   (c) L12T   (d) L11T

Answer: (d)

The first letters in odd numbered terms from series J, I, H and in even numbered terms from the series K, L, M.

The sequence followed by the numbers is + 2, + 3, + 4, + 5, + 6.

The third letter of each term is moved two steps backward to obtain the third letter of the next term.

Thus, the missing term is L11T.

Q 27. C4X, F9U, I16R, ?

(a) K25P   (b) L25Q   (c) L25O   (d) L27P

Answer: (c)

The first letter of each term is moved three steps forward and the last letter is moved three steps backward to obtain the corresponding letters of the next term.

The numbers from the sequence $2^2, 3^2, 4^2, 5^2$.

Thus, the missing term is L25O.

Directions: In each of the following questions, various terms of an alphabet series are given with one missing term as shown by (?)– choose the missing term out of the given alternatives.

Q 28. AB, DEF, HIJK, ?, STUVWX

(a) LMNO   (b) LMNOP   (c) MNOPQ   (d) QRSTU

Answer: (c)

The number of letters in the terms goes on increasing by 1 at each step.

Each term consists of letters in alphabetical order.

The first letter of the next term is one step forward of last letter of its previous term.

Thus, the missing term is MNOPQ.

Q 29.   AYBZC, DWEXF,   GUHVI, JSKTL, ?

(a) MQORN   (b) MQNRO   (c) NQMOR   (d) QMONR

Answer: (b)

MQNRO

Last term of previous and first term of next are consecutive. So after L its M, then 1st term is M

The sequence is next alphabet which is in the alternate places.

So M--N--O fixed. for the blanks Y-2=W,W-2=U like that S-2=Q... similarly T-2=R

So, answer is MQNRO.

Q 30. I am facing in Southern Direction I turn Right and walk 20 m. Then I turn right and walk 10 m. Then again, I turn left and walk 10 m. Then again, I turn right and walk 20 m. Once again, I turn right and walk 60 m. In which direction I am from (starting) initial point?
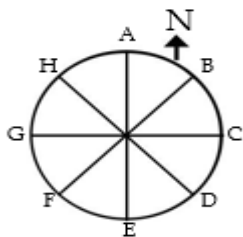
(a) North   (b) North West   (c) East   (d) North East

Answer: (d)

The movements of the person are shown in Fig. Clearly, the final position is to the North-east of the starting point.
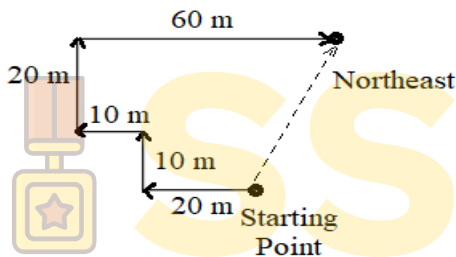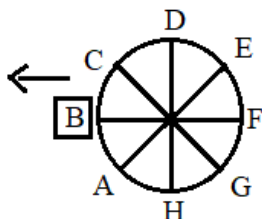

Q 31. Eight people A, B, C, D, E, F, G and H placed as shown in the diagram. All are facing in the outward direction. If all of them move anticlockwise to three places then.

(a) B is facing West   (b) E is facing East

(c) H is facing North West   (d) A is facing South

Answer: (a)

After the rearrangement of their positions, their new positions will be as shown in fig.

Thus, B is facing West.

Q 32. On what dates of March, 2013 did Wednesdays fall?

(a) 6, 13, 20, 27   (b) 5, 12, 19, 26   (c) 4, 11, 18, 25   (d) 7, 14, 21, 28

Answer: (d)

We need to find out the day of 01-Apr-2013

01-Apr-2013 = (2012 years + period from 1-Jan-2013 to 01-Apr-2013)

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

Hence the number of odd days in 2012 years = 0 (Since 2000 is a perfect multiple of 400)

Days from 1-Jan-2013 to 01-Apr-2013 = 31 (Jan) + 28 (Feb) + 31 (Mar) + 1(Apr) = 91

91 days = 13 weeks = 0 odd day

Total number of odd days = (0 + 0) = 0 odd days

0 odd day = Sunday. Hence 01-Apr-2013 is Sunday.

Hence first Wednesday of Apr 2013 comes in 04th and successive Wednesdays come in March 7, 14, 21, 28th.

Q 33. A watch which gains uniformly is 4 minutes low at 9 A.M. on Sunday, and is 4 minutes 15 sec. fast at 9 P.M. on next Friday. When was it correct?

(a) 2 A.M. Thursday   (b) 6 P.M. Wednesday(c) 1 A.M. Wednesday(d) 6 P.M.

Answer: (c)

Time from 9 a.m. on Sunday to 9 p.m. on the next Friday = 5 days 12 hours = 132 hours

In 132 hours the clock gains 8.25 minutes, or 0.0625 minutes per hour.

To be "on time" the clock must gain 4 minutes.

That takes 64 hours (4 ÷ 0.0625).

Thus, it was correct at 1 A.M. Wednesday.

Q 34. The minute hand of a clock overtakes the hour hand at interval of 64 minutes of correct time. How much a day does the clock gain or lose?

(a) $43\frac{9}{11}$ Minutes loss (b) $32\frac{8}{11}$ minute gain (c) $33\frac{9}{11}$ minute gain (d) $32\frac{8}{11}$ minute loss

Answer: (b)

In a correct clock, the minute hand gains 55 min. spaces over the hour hand in 60 minutes.

To be together again, the minute hand must gain 60 minutes over the hour

hand.

55 min. are gained in 60 min.

60 min are gained in $\left(\frac{60}{55}\right) \times 60\ min\ = \frac{720}{11}min.$

But, they are together after 65 min.

Gain in 65 min $= \left(\frac{720}{11}\right) - 65\ = \frac{5}{11}min.$

Gain in 24 hours $= \left(\frac{5}{11} \times \frac{60 \times 24}{65}\right) min\ = \frac{1440}{143}$

The clock gains $\frac{1440}{143}$ minutes in 24 hours.

$32\frac{8}{11}$ minute gain.

Directions: Each of the following questions is based on the following alphabet series

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Q 35. Which letter is sixteenth to the right of the letter which is fourth to the left of I?

(a) S   (b) T   (c) U   (d) V

Answer: (c)

Clearly, the fourth letter to the left of I is E. The sixteenth letter to the right of E is U.

Q 36. Which letter is exactly midway between G and Q in the given alphabet?

(a) K   (b) L   (c) M   (d) N

Answer: (b)

L is the exactly midway between G and Q in the given alphabet.

Q 37. Which letter is midway between the eighteenth letter from the left end and tenth letter from the right end of the given alphabet?

(a) No letter   (b) K   (c) Q   (d) R

Answer: (a)

18th letter from the left is R and 10th letter from the right end is Q.

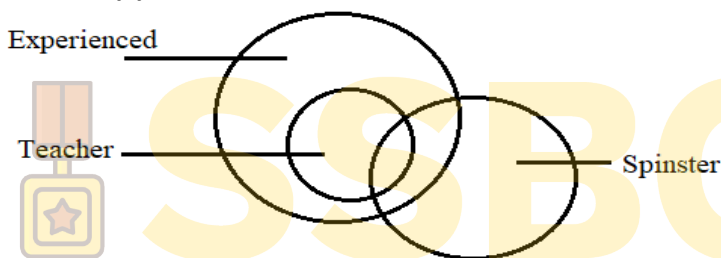There is no letter between Q and R.

Q 38. Statements

(a) All teachers are experienced.

(b) Some teachers are spinsters.

Conclusions

(I) Some experienced are spinsters

(II) Some spinsters are experienced.

(a) Only conclusion I or II follow   (b) Either conclusion I or II follow

(c) Both conclusion I and II follow   (d) Only conclusion I follows

Answer: (c)

Both the conclusions I and II are appropriate for the given statements.
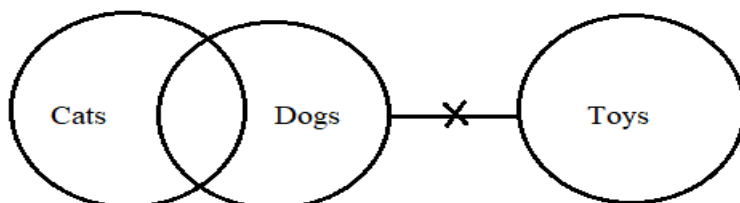
Q 39. Statements

(a) Some cats are dogs.

(b) No dog is a toy.

Conclusions:

(I) Some dogs are cats.

(II) Some toys are cats.

(III) Some cats are not toys.

(IV) All toys are cats.

(a) Only conclusion I and III follow   (b) Only conclusion II and III follow

(c) Only conclusion I and II follow   (d) Only conclusion I follows

Answer: (d)

Conclusion I follows the given statements.

Conclusion II and III are complementary pair.

Conclusion IV does not follow.

Thus, the conclusion 1 only supports the above given statements.

Q 40. Find Missing Term.

2	9	11	7
8	5	13	-3
7	?	10	(-4)
6	4	10	?

(a) 3 and 2   (b) (-3) and 2   (c) 3 and (-2)   (d) (-3) and (-2)
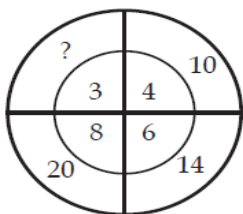
Answer: (c)

As First row: 2 + 9 = 11, 9 – 2 = 7 and

Second row: 8 + 5 = 13, 5 – 8 = -3

Similarly, 7 + 3 = 10, 3 – 7 = -4 and

6 + 4 = 10, 4 – 6 = - 2.

Thus, the missing terms are 3 and -2.

Q 41. Find Missing number.
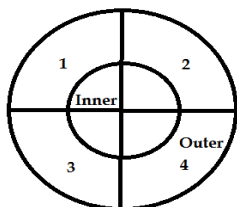

(a) 19   (b) 18   (c) 24   (d) 12

Answer: (a)

$2 \times 3 = 6 + 4 = 10$

The number in the first segment of the inner circle is multiplied with 2. The answer is then added with the number in the inner circle of the second segment. Then the answer is found in the respective segment of the outer circle.

$2 \times 4 = 8 + 6 = 14$

$2 \times 6 = 12 + 8 = 20$

The number 8 is multiplied with 2, then the product 16 is added with 3 which is 19.

$\therefore 2 \times 8 = 16 + 3 = 19$

Thus, option a is the correct answer.

Q 42. Find the Missing Term.

67	91	45
78	90	36
?	81	27

(a) 95   (b) 98   (c) 105   (d) 111

Answer: (b)

$(67 + 91) - 45 = 113$
$(78 + 90) - 36 = 132$
$(98 + 81) - 27 = 152$

The difference of 113 and 132 is 19

The difference of 132 and 152 is 20

Thus, option b is the correct answer.

Q 43. Find Missing Term.

7	9	8
2	4	3
5	7	6
16	30	?

(a) 17　　　　　　(b) 23　　　　　　(c) 47　　　　　　(d) 73

Answer: (b)

$(7 + 9) \div 2 = 8$

$(2 + 4) \div 2 = 3$

$(5 + 7) \div 2 = 6$

$(16 + 30) \div 2 = 23$

Thus, the correct answer is option b.

Directions: In each of the following questions, a letter number series is given with one or more terms missing as shown by (?). Choose the missing term out of the given alternatives.

Q 44. $\sqrt{AFI} : 13 :: \sqrt{ADD} = ?$

(a) 12　　　　　　(b) 22　　　　　　(c) 21　　　　　　(d) 24

Answer: (a)

In the alphabetical order, we know that,

$A = 1$

$F = 6$

$I = 9$

Thus,

AFI = 169

On taking square root, we get,

$\sqrt{AFI} = \sqrt{169} = 13$

In the alphabetical order, we know that,

$A = 1$

$D = 4$

$D = 4$

Thus,

ADD = 144

On taking square root, we get,

$\sqrt{ADD} = \sqrt{144} = 12$

Thus, option a is the correct answer.

Q 45. RUST : 9687 :: TSUR

(a) 7896　　　　　　(b) 7869　　　　　　(c) 7689　　　　　　(d) 6789

Answer: (b)

From the question, we can understand that,

R = 9

U = 6

S = 8

T = 7

Similarly, on substituting the number in the other side of analogy, we get,

T = 7

S = 8

U = 6

R = 9

Thus, option b is the correct answer.

Directions: In the following questions you have to identify the correct response from the given premises stated according to following symbols.

Q 46. If ÷ means +, - means ÷, × means -, and + means ×

Then $\frac{(36\times4)-8\times4}{4+8\times2+16\div1}$

(a) 0   (b) 8   (c) 12   (d) 16

Answer: (a)

First, we will do one thing that is convert the above symbol in real form.

$$\frac{(36 \times 4) - 8 \times 4}{4 + 8 \times 2 + 16 \div 1} = \frac{(36 - 4) \div 8 - 4}{4 \times 8 - 2 \times 16 + 1}$$

We should not forget to apply the BODMAS rule which some people do as a common mistake.

$$\Rightarrow \frac{(36 - 4) \div 8 - 4}{4 \times 8 - 2 \times 16 + 1} = \frac{(32) \div 8 - 4}{32 - 32 + 1}$$

$$\Rightarrow \frac{4 - 4}{32 - 33}$$

$$\Rightarrow \frac{0}{-1}$$

$$\Rightarrow \frac{(36 - 4) \div 8 - 4}{4 \times 8 - 2 \times 16 + 1} = 0$$

$$\therefore \frac{(36 \times 4) - 8 \times 4}{4 + 8 \times 2 + 16 \div 1} = 0$$

Thus, option a is the correct answer.

Q47. If → stands for 'additions', ← stands for 'subtraction', ↑ stands for 'division', ↓ stands for 'multiplication', ↓ 'equal to', then which of the following alternatives is correct?

(a) 7 ← 43 ↑ 6 ↓ 1↓4   (b) 3 ↓ 6 ↑ 2→ 3 ← 6↓4

(c) 5 → 7 ← 3 ↑ 2 ↓4   (d) 2 ↓ 5 ← 6 → 2↓6

Answer: (d)

On substituting the arrows with operators, we get,

$$2 \times 5 - 6 + 2 = 6$$

The earlier down arrow is substituted with multiplication and latter down arrow is substituted with equal to sign.

On using the BODMAS, we get,

$$10 - 6 + 2 = 6$$

$$4 + 2 = 6$$

$$\Rightarrow 6 = 6$$

Thus, option d is the correct answer.

Directions: In each of the following questions, various terms of an alphabet series are given with one or more terms missing as shown by – choose the missing terms out of the given alternatives.

Q 48. a c b _ c e _ f _

(a) dde   (b) cde   (c) dee   (d) ddg

Answer: (a)

On dividing the question into three parts, we get,

a c b (series given in the question) = a b c (alphabetical series)

The third letter in the alphabetical series is brought in between rest of the two letter.

d c e (series given in the question) = c d e (alphabetical series)

The second letter according to the alphabetical series is brought to the front.

d f e (series given in the question) = d e f (alphabetical series)

Again, third letter according to the alphabetical series is brought in between rest of the two letter.

Therefore, d, d, and e letters will fill the blank spaces.

Thus, option a is the correct answer.

Q 49. r t x_ s x_z_txy_ _yz

(a) yy r x s   (b) y y s x r   (c) y y r s x   (d) y y x r s

Answer: (c)

On dividing the given question into two parts, we get,

r t x _ s x _ z

_ t x y _ _ y z

We can understand that, both the statement are same.

On comparing both the statement, we can find all the missing letters.

Therefore,

r t x y s x y z

r t x y s x y z

Therefore, y, y, r, s, and x are the letters to be filled in the blanks.

Thus, option c is the correct answer.

Q 50. Unscramble the letters to frame a meaningful word. Then find out the correct numerical position of the letters.

B C U S M E L R N A

1 2 3 4 5 6 7 8 9 10

(a) 2 1 3 4 6 8 9 7 5 10   (b) 6 1 4 3 2 5 8 7 9 10

(c) 3 1 5 7 10 4 2 6 9 8   (d) 3 9 4 2 8 10 5 1 7 6

Answer: (d)

After rearranging the alphabets, the correct word formed is

U N S C R A M B L E

Thus, the equivalent numeral for the respective letters are,

3 9 4 2 8 10 5 1 7 6

Thus, option d is the correct answer.

PART II – ELEMENTARY MATHEMATICS

Q 51. The value of $\dfrac{\cos^2 60° + 4\sec^2 30° - \tan^2 45°}{\sin^2 30° + \cos^2 30°}$

(a) $\dfrac{64}{\sqrt{3}}$ (b) $\dfrac{55}{12}$ (c) $\dfrac{67}{12}$ (d) $\dfrac{67}{10}$

Answer: (b)

$$\frac{\cos^2 60° + 4\sec^2 30° - \tan 45°}{\sin^2 30° + \cos^2 30°}$$

$$= \frac{\left(\dfrac{1}{2}\right)^2 + 4\left(\dfrac{2}{\sqrt{3}}\right)^2 - (1)^2}{\left(\dfrac{1}{2}\right)^2 + \left(\dfrac{\sqrt{3}}{2}\right)^2}$$

$$= \frac{\dfrac{1}{4} + 4\left(\dfrac{4}{3}\right) - (1)}{\dfrac{1}{4} + \dfrac{3}{4}}$$

$$= \frac{1}{4} + \frac{16}{3} - 1$$

$$= \frac{3 + 64 - 12}{12}$$

$$= \frac{55}{12}$$

Q 52. The expression $\dfrac{\tan57° + \cot37°}{\tan33° + \cot53°}$ is equal to

(a) $\tan 30° \cot 57°$ (b) $\tan 57° \cot 37°$ (c) $\tan33° \cot 53°$ (d) $\tan33° \cot 37°$

Answer: (b)

$$\frac{\tan57° + \cot37°}{\tan33° + \cot53°}$$

$$= \frac{\tan 57° + \cot 37°}{\tan(90-57)° + \cot(90-37)°}$$

$$= \frac{\tan57° + \cot37°}{\cot 57° + \tan 37°}$$

$$= \frac{\tan57° + \dfrac{1}{\tan37°}}{\dfrac{1}{\tan 57°} + \tan 37°}$$

$$= \frac{1 + \tan 57° \tan37°}{1 + \tan 37° \tan57°} \times \frac{\tan57°}{\tan37°}$$

$$= \frac{\tan57°}{\tan37°}$$

$$= \tan57° . \cot 37°$$

Q 53. If $\dfrac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = 3$ then the value of $\sin^4 \theta$ is

(a) $\dfrac{16}{25}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{1}{9}$ (d) $\dfrac{2}{9}$

Answer: (a)

$$\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = 3$$

$$\sin\theta + \cos\theta = 3(\sin\theta - \cos\theta)$$

THE MOST POPULAR DEFENCE EXAM APP OF ALL TIME
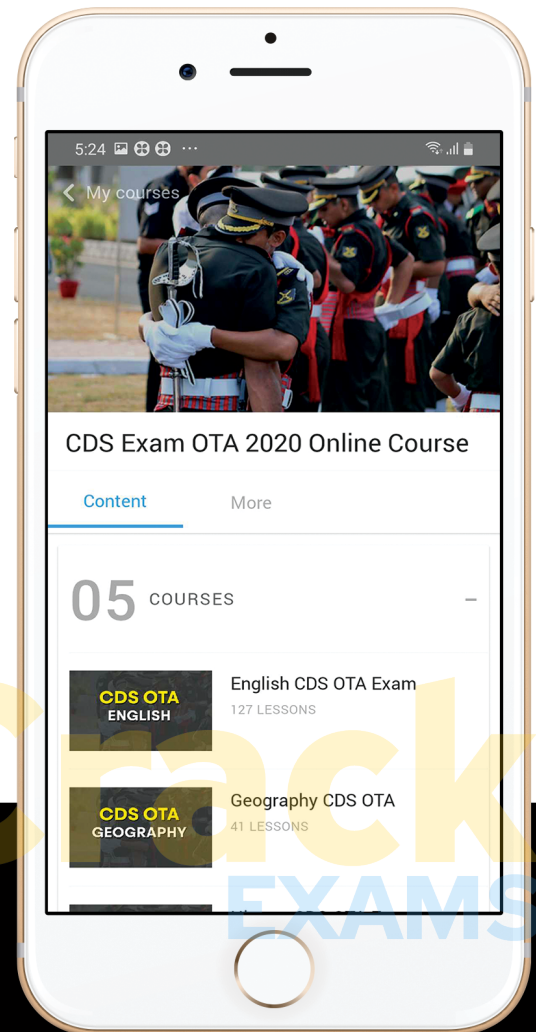
Prepare for defence exams like NDA, CDS, AFCAT, INET, TA, GROUP X&Y, MNS, ACC and more.

ANDROID APP ON
Google play

BEST FEATURES

SSBCrackExams is the exclusive online platform for the candidates aspiring to make the Nation proud.

DETAILED LECTURES

Start enjoying your learning experience by the rock-solid video lessons specially designed for your easy understanding & higher scores in the exam.

PYQAs & TEST SERIES

Get ready for your D-Day with unlimited practice papers & previous years' questions made easy with our insightful video classes & extra notes prepared

SMART ANALYTICS

Get your own personalized Performance Tracker where you can check your Learning Footprints, Digital Notes, All-India Ranking, Timed Tests, Mind-blowing Quizzes, Prompt Videos, quick & accurate Mock Test Results, Self-Analytic Progress Reports and more.

SSBCrack
EXAMS

support@ssbcrackexams.com

www.ssbcrackexams.com

$$sin\theta + cos\theta = 3sin\theta - 3cos\theta$$
$$4cos\theta = 2sin\theta$$
$$2cos\theta = sin\theta$$
$$2\sqrt{1 - \sin^2 \theta} = sin\theta$$

Squaring on both sides we get

$$4(1 - \sin^2 \theta) = \sin^2 \theta$$
$$4 - 4\sin^2 \theta = \sin^2 \theta$$
$$4 = 5\sin^2 \theta$$
$$\sin^2 \theta = \frac{4}{5}$$
$$\sin^4 \theta = \frac{16}{25}$$

Q 54. If $sin\theta - cos\theta = \frac{7}{13}$ and 0°< θ<90° then the value of sin θ + cos θ is

(a) $\frac{17}{13}$ (b) $\frac{13}{17}$ (c) $\frac{1}{13}$ (d) $\frac{1}{3}$

Answer: (a)

$$(sin\theta + cos\theta)^2 + (sin\theta - cos\theta)^2 = \sin^2 \theta + \cos^2 \theta + 2sin\theta cos\theta + \sin^2 \theta + \cos^2 \theta - 2sin\theta cos\theta$$

$$(sin\theta + cos\theta)^2 + \left(\frac{7}{13}\right)^2 = 2(\sin^2 \theta + \cos^2 \theta)$$

$$(sin\theta + cos\theta)^2 + \frac{49}{169} = 2(1)$$

$$(sin\theta + cos\theta)^2 = 2 - \frac{49}{169}$$

$$(sin\theta + cos\theta)^2 = \frac{289}{169}$$

$$(sin\theta + cos\theta) = \frac{17}{13}$$

Q 55. If $a^2 \sec^2 x - b^2 \tan^2 x = c^2$ then the value of $\sec^2 x + \tan^2 x$ is equal to (assume $b^2 \neq a^2$)

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

Answer: (b)

$$a^2 \sec^2 x - b^2 \tan^2 x = c^2$$
$$a^2(1 + \tan^2 x) - b^2 \tan^2 x = c^2$$
$$a^2 + a^2 \tan^2 x - b^2 \tan^2 x = c^2$$
$$a^2 \tan^2 x - b^2 \tan^2 x = c^2 - a^2$$
$$\tan^2 x (a^2 - b^2) = c^2 - a^2$$
$$\tan^2 x = \frac{c^2 - a^2}{(a^2 - b^2)}$$
$$\sec^2 x + \tan^2 x = 1 + \frac{2(c^2 - a^2)}{a^2 - b^2}$$
$$\because \sec^2 x + \tan^2 x = 1 + \tan^2 x + \tan^2 x = 1 + 2\tan^2 x$$
$$= \frac{b^2 + a^2 - 2c^2}{b^2 - a^2}$$

Q56. If $x + \frac{1}{x} = 5$, then $\frac{2x}{3x^2-5x+3}$ is equal to

(a) 5   (b) $\frac{1}{5}$ (c) 3   (d) $\frac{1}{3}$

Answer: (b)

If $x + \frac{1}{x} = 5$

$$\frac{x^2 + 1}{x} = 5$$
$$x^2 + 1 = 5x$$

$$\frac{2x}{3x^2 - 5x + 3} = \frac{2x}{3(x^2 + 1) - 5x} = \frac{2x}{3(5x) - 5x} = \frac{2x}{15x - 5x} = \frac{2x}{10x} = \frac{1}{5}$$

Q 57. The simplified value of $\left(1 - \frac{2xy}{x^2+y^2}\right) \div \frac{x^2+y^2-2xy}{2xy}$

(a) $\frac{2xy}{x^2+y^2}$
(b) $\frac{y}{x^2+y^2}$
(c) $\frac{2x}{x^2+y^2}$
(d) $\frac{1}{x^2+y^2}$

Answer: (a)

$$\left(1 - \frac{2xy}{x^2 + y^2}\right) \div \frac{x^2 + y^2 - 2xy}{2xy} = \left(1 - \frac{2xy}{x^2 + y^2}\right) \times \frac{2xy}{x^2 + y^2 - 2xy}$$

$$= \left(\frac{x^2 + y^2 - 2xy}{x^2 + y^2}\right) \times \frac{2xy}{x^2 + y^2 - 2xy}$$

$$= \frac{2xy}{x^2 + y^2}$$

Q 58. Find the value of $\frac{1}{5} + 999\frac{494}{495} \times 99$

(a) 90000
(b) 99000
(c) 90900
(d) 99990

Answer: (b)

$$\frac{1}{5} + 999\frac{494}{495} \times 99 = \frac{1}{5} + 999.99 \times 99$$
$$= 0.2 + 1000 \times 99 = 99000.2$$
$$= 99000$$

Q 59. If $x = 11$ then the value of $x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$ is

(a) 11
(b) 10
(c) 12
(d) -10

Answer: (b)

If $x = 11$

Substituting $x = 11$ in $x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$

$$x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1 = 11^5 - 12(11)^4 - 12(11)^3 - 12(11)^2 + 12(11) - 1$$
$$= 161051 - 12(14641) + 12(1331) - 12(121) + 132 - 1$$
$$= 161051 - 175692 + 15972 - 1452 + 132 - 1$$
$$= 10$$

Q 60. If $p = 101$, then the value of $\sqrt[3]{p(p^2 - 3p + 3) - 1}$ is

(a) 100
(b) 101
(c) 102
(d) 1000

Answer: (a)

If $p = 101$ substituting the value of p in $\sqrt[3]{p(p^2 - 3p + 3) - 1}$

$$\sqrt[3]{p(p^2 - 3p + 3) - 1} = \sqrt[3]{101(101^2 - 3(101) + 3) - 1}$$
$$= \sqrt[3]{101(10201 - 303 + 3) - 1}$$
$$= \sqrt[3]{101(9901) - 1}$$
$$= \sqrt[3]{1000001 - 1}$$

$$= \sqrt[3]{1000000} = 100$$

Q 61. If $a^{\frac{1}{3}} = 11$ then the value of $a^2 - 331a$ is

(a) 1331331   (b) 1331000   (c) 1334331   (d) 1330030

Answer: (b)

$$a^{\frac{1}{3}} = 11$$
$$a = 11^3$$
$$a = 1331$$

Therefore $a^2 - 331a = 1331^2 - 331(1331)$
$$= 1331(1331 - 331) = 1331 \times 1000$$
$$= 1331000$$

Q 62. If $11\sqrt{n} = \sqrt{112} + \sqrt{343}$ then the value of n is

(a) 3   (b)11   (c) 13   (d) 7

Answer: (d)

$$11\sqrt{n} = \sqrt{112} + \sqrt{343}$$
$$11\sqrt{n} = 4\sqrt{7} + 7\sqrt{7}$$
$$11\sqrt{n} = 11\sqrt{7}$$

Therefore, the value of n is 7

Q 63. If $x + y = \sqrt{3}$ and $x - y = \sqrt{2}$ then the value of $8xy(x^2 + y^2)$ is

(a) 6   (b) $\sqrt{6}$ (c) 5   (d) $\sqrt{5}$

Answer: (c)

$x + y = \sqrt{3}$ ......(i)

$x - y = \sqrt{2}$ ......(ii)

Solving we get

$$x = \frac{\sqrt{3} + \sqrt{2}}{2}$$

Substituting x value in equation (i) we get

$$y = \frac{\sqrt{3} - \sqrt{2}}{2}$$
$$xy = \frac{1}{4}$$
$$x^2 + y^2 = \frac{10}{4}$$

Therefore $8xy(x^2 + y^2) = \frac{8}{4}\left(\frac{10}{4}\right) = 2 \times \frac{10}{4} = 5$

Q 64. If $2^x = 3^y = 6^{-z}$ then $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is equal to

(a) 0   (b) 1   (c) $\frac{3}{2}$ (d) $-\frac{1}{2}$

Answer: (a)

Let $2^x = 3^y = 6^{-z} = k$

$$2^x = k$$
$$\therefore k^{\frac{1}{x}} = 2$$

Similarly, $k^{\frac{1}{y}} = 3$ and $k^{\frac{-1}{z}} = 6$

$$k^{-\frac{1}{z}} = 2 \times 3$$
$$k^{-\frac{1}{z}} = k^{\frac{1}{x}} \times k^{\frac{1}{y}}$$
$$-\frac{1}{z} = \frac{1}{x} + \frac{1}{y}$$
$$\therefore \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$$

Q 65. If $x = 3 + 2\sqrt{2}$, then $x^2 + \dfrac{1}{x^2}$ is equal to

(a) 36   (b) 30   (c) 32   (d) 34

Answer: (d)

Given $x = 3 + 2\sqrt{2}$

$\Rightarrow x^2 = 17 + 12\sqrt{2}$

$\Rightarrow \dfrac{1}{x^2} = \dfrac{1}{17 + 12\sqrt{2}}$
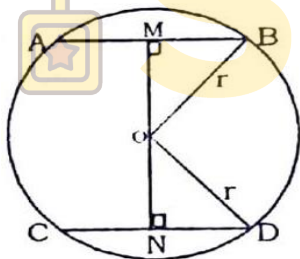
On rationalizing the denominator, we get

$$\frac{1}{x^2} = \left(17 - 12\sqrt{2}\right)$$
$$\therefore \left(x^2 + \frac{1}{x^2}\right) = (17 + 12\sqrt{2}) + (17 - 12\sqrt{2}) = 34$$

Q 66. The distance between two parallel chords of length 8 cm each in a circle of diameter 10 cm is

(a) 6 cm   (b) 7 cm   (c) 8 cm   (d) 5.5 cm

Answer: (a)

$$AB = CD = 8\, cm$$
$$r = 5\, cm$$

$\therefore In \triangle OMB, OB^2 = OM^2 + MB^2$

$$r^2 = OM^2 + (4)^2$$
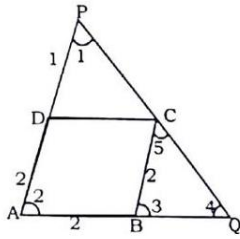$$(5)^2 = OM^2 + 16$$
$$25 - 16 = OM^2$$
$$OM^2 = 9$$
$$OM = 3$$
$$\therefore MN = 2 \times OM$$
$$MN = 2 \times 3 = 6\, cm$$

Q 67. ABCD is a rhombus. A straight line through C cuts AD produced at P and AB produced at Q. If DP of the length of BQ and AB is

(a) $2:1$ (b) $1:2$ (c) $1:1$ (d) $3:1$

Answer: (a)
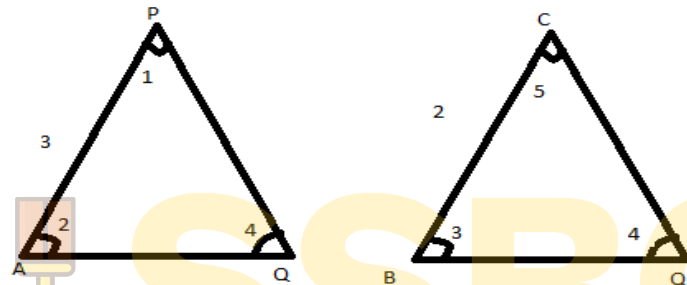
ABCD is a rhombus

$$AB = BC = CD = DA$$
$$DP = \frac{1}{2}AB$$
$$\frac{DP}{AB} = \frac{1}{2}$$

In a rhombus $\angle 2 = \angle 3$

$$\therefore \triangle APQ \sim \triangle BCQ$$
$$(\because \angle Q \text{ is common and } \angle 2 = \angle 3)$$

$$\frac{AP}{BC} = \frac{AQ}{BQ}$$
$$\frac{AQ}{BQ} = \frac{3}{2}$$
$$\frac{AB + BQ}{BQ} = \frac{3}{2} \quad (\because AQ = AB + BQ)$$
$$\frac{AB}{BQ} + 1 = \frac{3}{2}$$
$$\frac{AB}{BQ} = \frac{3}{2} - 1$$
$$\frac{AB}{BQ} = \frac{1}{2}$$
$$\therefore \frac{BQ}{AB} = \frac{2}{1}$$

Q 68. If the sides of a triangle are in the ratio $3 : 1\frac{1}{4} : 3\frac{1}{4}$ then the triangle is

(a) Right triangle   (b) Isosceles triangle   (c) Obtuse triangle   (d)Acute triangle

Answer: (d)

Given Ratio $= 3 : 1\frac{1}{4} : 3\frac{1}{4} = 3 : \frac{5}{4} : \frac{13}{4}$

Therefore, sum of the ratio $= 3x + \frac{5}{4}x + \frac{13}{4}x = 180$
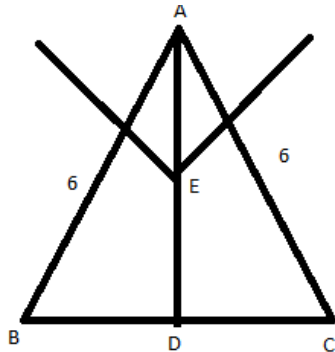
$$\frac{30x}{4} = 180$$
$$x = 24$$

Therefore, the angles are $72°, 30°, 78°$

All the angles are less than $90°$ therefore the given ratio is the acute triangle.

Q 69. An equilateral triangle of side 6 cm is inscribed in a circle. Then radius of the circle is:

(a) $2\sqrt{3}cm$ (b) $3\sqrt{2}cm$ (c) $4\sqrt{3}cm$ (d) $\sqrt{3}cm$

Answer: (a)

Because in equilateral triangle, perpendicular and median are same

ΔADC is right angle triangle

$$AC^2 = AD^2 + DC^2$$
$$6^2 = AD^2 + 3^2$$
$$36 - 9 = AD^2$$
$$AD = 3\sqrt{3}$$

E is the center of gravity

$$AE = \frac{2}{3}AD$$
$$= \frac{2}{3} \times 3\sqrt{3}$$
$$= 2\sqrt{3} \ cm$$

Q 70. If the difference between compound interest and simple interest on a certain sum of money for 2 years at 8% per annum is Rs. 768/- then the sum invested is:

(a) 1,00,000/-   (b) 1,10,000/-   (c) 1,20,000/-   (d) 1,70,000/-

Answer: (c)

We know that, the difference between C.I and S.I for 2 years = $\frac{Pr^2}{100^2}$

$$768 = \frac{P \times 8 \times 8}{100 \times 100}$$
$$P = \frac{7680000}{64}$$
$$P = Rs. 1,20,000$$

Q 71. On what sum of money will the difference between simple interest and compound interest for 2 years at 5% per annum be equal to Rs. 63/-

(a) Rs.24600/-   (b) Rs. 24800/-   (c) Rs.25200/-   (d) Rs.25500/-

Answer: (c)

Difference between C.I and S.I = $\frac{Pr^2}{100^2}$

$$63 = \frac{P \times 5 \times 5}{100 \times 100}$$

$$P = \frac{630000}{25}$$
$$P = Rs.\,25,200$$

Q 72. A sells an article to B making a profit of $\frac{1}{5}$ of his outlay. B sells it to C, gaining 20%. If C sells it for Rs. 600 and incurs a loss of $\frac{1}{6}$ of his outlay, the cost price of A is

(a) Rs.600   (b) Rs.500   (c) Rs.720   (d) Rs. 800

Answer: (b)

Let the Cost price of A = Rs.100

The profit gained by A = $\frac{1}{5}$

Profit for A in rupees $= \frac{1}{5} \times 100 = Rs.\,20$

So, the selling price of A to B = Rs.120

B sells to C gaining profit of 20%

Profit for B $= \frac{20}{100} \times 120 = Rs.\,24$

The selling price of B to C = Rs.144

C sold it for Rs.600 by incurring loss of $\frac{1}{6}$

Loss for C in rupees $= 144 \times \frac{1}{6} = 24$

C sold it for Rs.120

Actually, according to the problem C sold for Rs.600

Cost price of A $= \frac{100}{120} \times 600 = \frac{1000}{2} = Rs.\,500$

Q 73. Ramesh bought 10 cycles for Rs. 500 each. He spent Rs. 2,000 on the repair of all cycles. He sold five of them for Rs. 750 each and the remaining for Rs. 550 each. Then the total gain or loss % is

(a) Gain of $8\frac{1}{3}\%$ (b) Loss of $8\frac{1}{3}\%$ (c) Gain of $7\frac{2}{3}\%$ (d) Loss of $7\frac{1}{7}\%$

Answer: (d)

Total actual $C.P. = Rs.\,(500 \times 10 + 2000) = Rs.\,7000$

Total $S.P = Rs.\,(5 \times 750 + 5 \times 550) = Rs.\,6500$

Loss $= 7000 - 6500 = Rs.\,500$

Loss percent $= \left(\frac{500}{7000}\right) \times 100 = \frac{50}{7} = 7\frac{1}{7}\%$

Q 74. A can finish a piece of work in 18 days and B can do the same work in half of the time taken by A. Then working together what part of the same work they can finish in a day.

(a) $\frac{1}{6}$ (b) $\frac{2}{5}$ (c) $\frac{1}{9}$ (d) $\frac{2}{7}$

Answer: (a)

A can do the work = 18 days

B can do the work $= \frac{18}{2} = 9\ days$

(A + B)'s one day work $= \frac{1}{18} + \frac{1}{9} = \frac{1+2}{18} = \frac{3}{18} = \frac{1}{6}$

Q 75. The rate of working of A and B are in the ratio 2:3. The number of days taken by them to finish the work is in the ratio

(a) 2:3   (b) 4:9   (c) 3:2   (d) 9:4

Answer: (c)

Given the ratio of working of A and B is 2: 3

i.e., $\frac{2}{3}$

To find the number of days taken by them

Inverse the ratio of working of A and B $= \frac{3}{2}$

Therefore, the ratio for number of days taken by them to finish the work = 3:2

Q 76. The ratio of the number of boys and girls in the school is 3:2. If 20% of the boys and 25% of the girls are scholarship holders, the percentage of the school students who are not scholarship holders is

(a) 56   (b) 78   (c) 70   (d) 80

Answer: (b)

Let the number of boys & girls be 3x and 2x.

Number of those who are not scholarship holders

$$= (80\% \ of \ 3x \ + \ 75\% \ of \ 2x) = \left(\frac{12x}{5} + \frac{3x}{2}\right) = \frac{39x}{10}$$

Required Percentage $= \left(\frac{39x}{10} \times \frac{1}{5x} \times 100\right)\% \ = \ 78\%$

Q 77. A train passes two bridges of lengths 800 m and 400 m in 100 seconds and 60 seconds respectively. The length of the train is

(a) $80 \ m$ (b) $90 \ m$ (c) $200 \ m$ (d) $150 \ m$

Answer: (c)

Let length of the train be $x \ m$ and speed of the train is $s \ kmph$.

Speed, $s \ = \ (x + 800)/100 \ \ldots .. (i)$

Speed, $s \ = \ (x + 400)/60 \ \ldots .. (ii)$

Equating equation (i) and (ii), we get,

$\frac{x+800}{100} = \frac{x+400}{60}$

$$5x + 200 \ = \ 3x + 2400$$
$$2x \ = \ 400$$
$$x \ = \ 200 \ m$$

Q 78. In an examination, 52% students failed in Hindi and 42% in English. If 17% failed in both the subjects, what percentage of students passed in both the subjects?

(a) 38%   (b) 33%   (c) 23%   (d) 18%

Answer: (c)

Percentage of students failed in Hindi = 52

Percentage of students failed in English = 42

Percentage of students failed in both Hindi and English = 17

So, students failed in Hindi only $= 52 - 17 = 35$

Students failed in English only $= 42 - 17 = 25$

So, failures in Hindi + failures in English + failures in both $= 25 + 35 + 17$ = 77

Considering total strength as 100 passing percentage would be $100 - 77\% = 23\%$

Q79. The batting average for 40 innings of a cricket player is 50 runs. His highest score exceeds his lowest score by 172 runs. If these two innings are excluded, the average of the remaining 38 innings is 48 runs. The highest score of the player is

(a)165   (b) 170   (c) 172   (d) 174

Answer: (d)

Maximum - Minimum = 172 .....(i)

Maximum + Minimum = $50 \times 40 - 48 \times 38$

= 2000 - 1824 = 176

Maximum + Minimum = 176 ....(ii)

From eq (i) & (ii), we get

Maximum = 174

Q80. A discount of series of 15%, 20% and 30% is equal to a single discount

(a) 50%   (b) 47.6%   (c) 52.8%   (d) 52.4%

Answer: (d)

Let the amount be 100

On the first discount 15%, $100 - 15 = 85$

On the second discount 20%, $85 - \left(\frac{20}{100} \times 85\right) = 85 - 17 = 68$

On the second discount 30%, $68 - \left(\frac{30}{100} \times 68\right) = 68 - 20.4 = 47.6$

The single discount $= 100 - 47.6 = 52.4$

Q 81. A dishonest dealer defrauds to the extent of x% in buying as well as selling his goods by using faulty weight. What will be the gain percent on his outlay?

(a) $2x\%$ (b) $\left(\frac{10}{x} + x^2\right)\%$ (c) $\left(2x + \frac{x^2}{100}\right)\%$ (d) $\left(x + \frac{x^2}{100}\right)\%$

Answer: (c)

Total Profit $= x + x + \frac{x^2}{100}$

$$Gain\ percent = \left(2x + \frac{x^2}{100}\right)\%$$

Q82. A and B started a business in partnership by investing in the ratio of 7 : 9. After 3 months A withdraw $\frac{2}{3}$ of its investment and after 4 months from the beginning B withdraw $33\frac{1}{3}$ of its investment. If a total earned profit is Rs. 10201 at the end of 9 months, find the share of each in profit.

(a) Rs 3535/- and Rs 6666/-   (b) Rs 3055/- and Rs. 5555/-

(c) Rs 4503/- and Rs 1345/-   (d) Rs 3545/- and Rs. 3333/-

Answer: (a)

Total capital invested by A in 9 months $= 21x \times 3 + 7x \times 6 = 105x$

Total capital of B invested in 9 months $= 27x \times 4 + 18x \times 5$

$$= 108x + 90x = 198x$$

Capital, $A : B = 105x : 198x$

According to the question, $(105x + 198x) = Rs. 10201$

$$303x = 10201$$

$$x = Rs. \frac{10201}{303}$$

Hence, Share of A $= 105 \times \frac{10201}{303} = Rs. 3535$

Share of B $= 198 \times \frac{10201}{303} = Rs. 6666$

Q83. The mean marks of 20 students is 15. On checking it was found that two marks were wrongly copied as 3 and 6. If wrong marks obtained are replaced by correct values 8 and 4, then the correct mean is

(a) 15   (b) 15.15   (c) 15.35   (d) 16

Answer: (b)

Given that the mean of 20 students is 15

Therefore, the sum of the observation is 300

The difference between the sum of marks which are entered wrong $= 12 - 9 = 3$

Therefore, the new sum of observation is 300+3 = 303

Correct Mean $= \frac{sum\ of\ new\ observation}{number\ of\ students} = \frac{303}{20} = 15.15$

Q84. Three circles of diameter 10 cm each are bound together by rubber band, the length of the rubber band is.

(a) 30   (b) $30 + 10\pi$ (c) 10π (d) $60 + 20\ \pi$

Answer: (b)

Length of the rubber band $= 3 \times diameter + 2\pi r = 3 \times 10 + 2\pi \times 5 = 30 + 10\pi$

Q85. A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into sea in a minute?

(a) $4,00,000\ m^3$ (b) $40,00,000\ m^3$ (c) $40,000\ m^3$ (d) $4,000\ m^3$

Answer: (d)

Given, a river 3m deep and 40m wide is flowing at the rate of 2km per hour.

Area of cross section of the river $= 3 \times 40 = 120\ m^2$

Now, volume of water flowing through this cross section in every minute

$$= Area \times rate = 120 \times 2\ km/hr$$
$$= 120 \times \left(\frac{2000}{60}\right) m/min$$
$$= 2 \times 2000$$
$$= 4000\ m^3$$

Note:

Since $1\ m^3 = 1000\ litres$

So, $4000\ m^3 = 4000 \times 1000\ litres = 4000000\ litres$

So, in 1 minute, water will fall into the sea is $4000000\ litres$.

Q86. If the radius of the base and the height of a right circular cylinder is increased by 10% each then the volume of the cylinder increases by:

(a) 3.31%   (b) 14.5%   (c)33.1%   (d) 19.5%

Answer: (c)

Let the radius and height of the cylinder be 10 cm if it is increased by 10% then the radius and height be 11 cm

Volume to the right circular cylinder whose radius and height is 10 cm $= 1000\ cm^3$

Volume of the right circular cylinder whose radius and height is 11 cm$= 1331 cm^3$

$$\% \ increase = \frac{1331 - 1000}{1000} \times 100 = \frac{331}{1000} \times 100 = \frac{331}{10} = 33.1\%$$

Q87. The amount of concrete required to build a concrete cylindrical pillar whose base has a perimeter 8.8 metre and curved surface area 17.6 square metre is (Take $\pi = \frac{22}{7}$)

(a) $8.325\ m^3$ (b) $9.725\ m^3$ (c) $10.5 m^3$ (d) $12.32 m^3$

Answer: (d)

Perimeter of cylindrical pillar = circumference of circle

$$2\pi r = 8.8$$

$$2 \times \frac{22}{7} \times r = 8.8$$

$$r = \frac{8.8 \times 7}{2 \times 22} = 1.4 \; metre$$

Curved surface area = 17.6

$$2\pi rh = 17.6$$

$$h = \frac{17.6}{8.8} = 2 \; metre$$

Volume of concrete $= \pi r^2 h = \left(\frac{22}{7} \times 1.4 \times 1.4 \times 2\right) m^3$

$$= 12.32 \; m^3$$

Q88. Some bricks are arranged in an area measuring 20 m³. If the length, breadth and height of each brick is 25 cm, 12.5 cm and 8 cm respectively, then the number of bricks are:

(a) 6000 (b) 8000 (c) 4000 (d) 10000

Answer: (b)

Area where the bricks are arranged = $20m^3$

As the length of the bricks are given in cm convert the given area into cm

$$= 20 \times 100 \; cm^3$$

Volume of one brick $= l \times b \times h$

$$= 25 \times 12.5 \times 8 \; cm^3$$

Required number of bricks $= \frac{20 \times 100 \times 100 \times 100}{25 \times 12.5 \times 8} = 8000$

Q89. The length, breadth and height of a room is 5m, 4m and 3m respectively. Find the length of the largest bamboo that can be kept.

(a) 5 m (b) 60 m (c) 7 m (d) $5\sqrt{2}m$

Answer: (d)

Length of the largest bamboo $= \sqrt{l^2 + b^2 + h^2}$

$$= \sqrt{5^2 + 4^2 + 3^2}$$

$$= \sqrt{25 + 16 + 9}$$

$$= \sqrt{50}$$

$$= 5\sqrt{2}m$$

Q90. A solid metallic spherical ball of diameter 6cm is melted and re-casted into a cone with diameter of the base as 12 cm. The height of the cone is

(a) 6 cm (b) 2 cm (c) 4 cm (d) 3 cm

Answer: (d)

Volume of metallic sphere = Volume of cone

$$\frac{4}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$$

$$\frac{4}{3}\pi \times 3 \times 3 \times 3 = \frac{1}{3}\pi \times 6 \times 6 \times h$$

$$h = 3 \; cm$$

Q91. If the ratio of the diameter of two right circular cones of equal height be 3:4, then the ratio of their volume will be

(a) 3:4 (b) 9:16 (c) 16:9 (d) 27:64

Answer: (b)

Ratio of volume of cones $= \dfrac{\left(\frac{1}{3}\pi r_1^2 h\right)}{\frac{1}{3}\pi r_2^2 h} = \left(\dfrac{r_1}{r_2}\right)^2 = \left(\dfrac{3}{4}\right)^2 = \dfrac{9}{16}$

Therefore, 9:16

Q92. What is the value of $\log_2 (\log_3 81)$?

(a) 2   (b) 3   (c) 4   (d) 9

Answer: (a)

$\log_2(\log_3 81) = \log_2(\log_3 3^4)$

$= \log_2(4\log_3 3)$

$= \log_2(4 \times 1)$ $[\because \log_a a = 1]$

$= \log_2 4$

$= \log_2 2^2$

$= 2\log_2 2$

$= 2 \times 1 = 2$

Q93. Find the value of $\dfrac{0.355 \times 0.5555 \times 2.025}{0.225 \times 1.775 \times 0.2222}$ is equal to

(a) 5.4   (b) 4.58   (c) 4.5   (d) 5.45

Answer: (c)

$$\frac{0.355 \times 0.5555 \times 2.025}{0.225 \times 1.775 \times 0.2222} = 0.2 \times 2.5 \times 9 = 4.5$$

Q94. $(0.01024)^{\frac{1}{5}}$ is equal to

(a) 0.4   (b) 4.0   (c) 0.04   (d) 0.00004

Answer: (a)

$$(0.01024)^{\frac{1}{5}} = \left(\frac{1024}{10000}\right)^{\frac{1}{5}}$$

$$= \left(\frac{4^5}{10^5}\right)^{\frac{1}{5}} = \left(\frac{4}{10}\right)^{5 \times \frac{1}{5}} = 0.4$$

Q95. The value of $(243)^{0.16} \times (243)^{0.04}$ is equal to

(a) 0.16   (b) 3   (c) $\dfrac{1}{3}$ (d) 0.04

Answer: (b)

$$(243)^{0.16} \times (243)^{0.04}$$

As per power rule $a^m \times a^n = a^{m+n}$

$$243^{0.16+0.04} = 243^{0.2} = 243^{\left(\frac{2}{10}\right)}$$

$$= 243^{\frac{1}{5}} = (3^5)^{\frac{1}{5}} = 3$$

Q96. If a and b are two positive integer such that $a^2 - b^2 = 19$ then find the value of a is

(a) 19   (b) 20   (c) 9   (d) 10

Answer: (d)

$$a^2 - b^2 = 19$$
$$(a - b)(a + b) = 1 \times 19$$
$$a - b = 1 \ \dots \text{(i)}$$
$$a + b = 19 \dots \text{(ii)}$$

Adding (i) and (ii) we get

$$2a = 20$$

$$a = 10$$

Q97. $\sqrt{(0.798)^2 + 0.404 \times 0.798 + (0.202)^2} + 1$ is equal to

(a) 0   (b) 2   (c) 1   (d) 0.404

Answer: (b)

$$\sqrt{(0.798)^2 + 0.404 \times 0.798 + (0.202)^2} + 1$$
$$= \sqrt{(0.8)^2 + 0.4 \times 0.8 + (0.2)^2} + 1$$
$$= \sqrt{(0.8 + 0.2)^2} + 1 = \sqrt{1^2} + 1$$
$$= 1 + 1 = 2$$

Q98. The sum of three consecutive odd natural numbers is 147. Then the middle number is

(a) 47   (b) 48   (c) 49   (d) 51

Answer: (c)

If the sum of three consecutive odd natural number is 147

Then to find the middle number divide the total number with number of consecutive odd natural number

$$= \frac{147}{3} = 49$$

∴ 49 is a middle number.

Q99. A student was asked to find $\frac{5}{16}$ of a number. By mistake he found $\frac{5}{6}$ of that number and his answer is 250 more than found the correct answer. Find the given number

(a) 300   (b) 480   (c) 450   (d) 500

Answer: (b)

Let the original complete number be x

$$\left(\frac{5x}{16}\right) + 250 = \left(\frac{5}{6}\right)x$$
$$5x\left(\frac{1}{16} - \frac{1}{6}\right) = -250$$
$$x\left(\frac{-10}{6 \times 16}\right) = -50$$
$$x = 5 \times 6 \times 16$$
$$x = 480$$

Q100. The HCF and LCM of two numbers are 12 and 336 respectively. If one number is 84, then the other number is

(a) 48   (b) 36   (c) 72   (d)36

Answer: (a)

The HCF and LCM of two numbers are 12 and 336 respectively

Given that one number is 84

First number × second number = HCF × LCM

$$84 \times second\ number = 12 \times 336$$
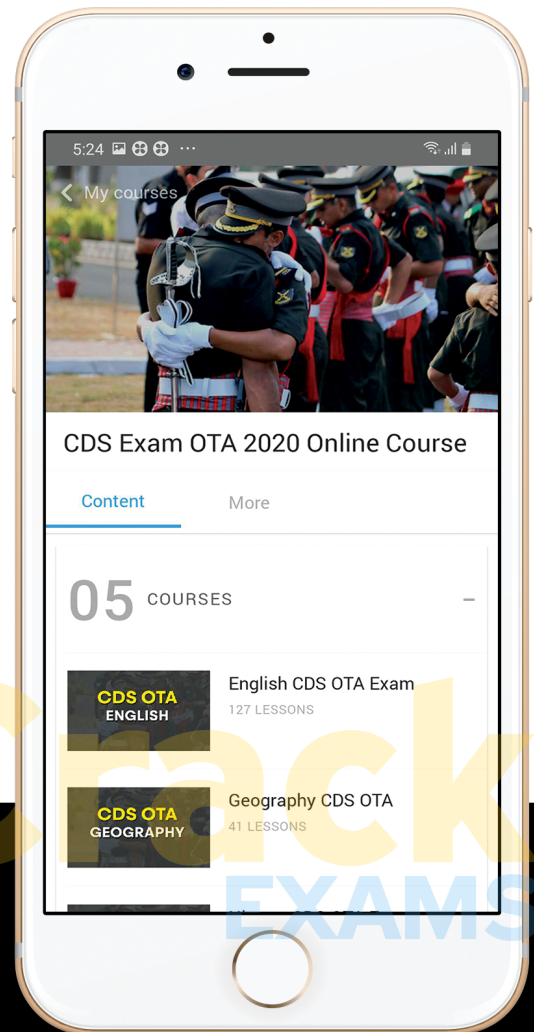$$Second\ number = \frac{12 \times 336}{84} = 48$$

THE MOST POPULAR DEFENCE EXAM APP OF ALL TIME

Prepare for defence exams like NDA, CDS, AFCAT, INET, TA, GROUP X&Y, MNS, ACC and more.

ANDROID APP ON
Google play

BEST FEATURES

SSBCrackExams is the exclusive online platform for the candidates aspiring to make the Nation proud.

DETAILED LECTURES

Start enjoying your learning experience by the rock-solid video lessons specially designed for your easy understanding & higher scores in the exam.

PYQAs & TEST SERIES

Get ready for your D-Day with unlimited practice papers & previous years' questions made easy with our insightful video classes & extra notes prepared

SMART ANALYTICS

Get your own personalized Performance Tracker where you can check your Learning Footprints, Digital Notes, All-India Ranking, Timed Tests, Mind-blowing Quizzes, Prompt Videos, quick & accurate Mock Test Results, Self-Analytic Progress Reports and more.

SSBCrack EXAMS

support@ssbcrackexams.com

www.ssbcrackexams.com