Quiz Date: 23rd July 2020

Directions (1-5): In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

Q1.
I. $5x^2 - 34x + 45 = 0$
II. $4y^2 - 19y + 21 = 0$
(a) if x < y
(b) if x ≤ y
(c) if x = y or no relation can be established
(d) if x > y
(e) if x ≥ y

Q2.
I. $15x^2 - 11x - 12 = 0$
II. $20y^2 - 49y + 30 = 0$
(a) if x < y
(b) if x ≤ y
(c) if x = y or no relation can be established
(d) if x > y
(e) if x ≥ y

Q3.
I. $2x^2 + 28 = 15x$
II. $-17y + 36 = -2y^2$
(a) if x < y
(b) if x ≤ y
(c) if x = y or no relation can be established
(d) if x > y
(e) if x ≥ y

Q4.
I. $12x^2 - 17x + 6 = 0$
II. $y^2 - 16y + 63 = 0$
(a) if x < y
(b) if x ≤ y
(c) if x = y or no relation can be established
(d) if x > y
(e) if x ≥ y

Q5.
I. $2x^2 - 21x + 54 = 0$
II. $y^2 - 14y + 49 = 0$
(a) if x < y
(b) if x ≤ y

(c) if x = y or no relation can be established
(d) if x > y
(e) if x ≥ y

Q6. Sum of length, breadth and height of cuboid is 12 cm and length of its diagonal is $5\sqrt{2}$. Then find the total surface area of cuboid.
(a) 94 cm²
(b) 84 cm²
(c) 72 cm²
(d) 64 cm²
(e) 90 cm²

Q7. A cylindrical jar, whose base has a radius of 15 cm is filled with water up to a height of 20 cm. A solid iron spherical ball of radius 10 cm is dropped in the jar to submerge completely in water. Find the increase in the level of water (in cm) is
(a) $5\frac{17}{27}$
(b) $5\frac{5}{7}$
(c) $5\frac{8}{9}$
(d) $5\frac{25}{27}$
(e) None of these
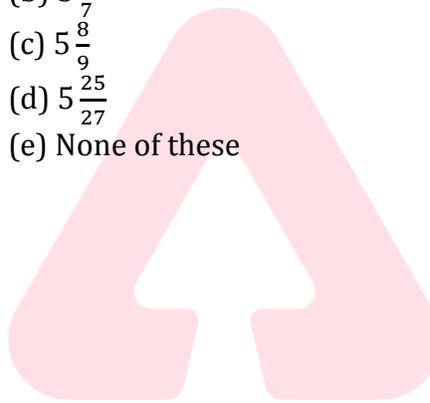
Q8. If the ratio of curved surface area to the volume of cylinder 1 : 7 while the ratio of diameter to the height of cylinder is 4 : 3. Find total surface area of cylinder?
(a) 3100
(b) 3180
(c) 3000
(d) 3080
(e) None of these

Q9. The dimensions of a field are 20 m and 9 m. A pit 10 m long, 4.5 m wide and 3 m deep is dug in one corner of the field and the earth (mud) removed has been evenly spread over the remaining area of the field. What will be the rise the height of field as a result of this operation ?
(a) 1.5 m

(b) 2 m
(c) 3 m
(d) 4m
(e) 1 m

Q10. In a square plot with 21 cm side a horse is tied at one corner of the square with rope which has length $2/3^{rd}$ of the one side of square. Find the area which horse can graze when tied with the rope. [in cm^2]
(a) 154
(b) 164
(c) 144
(d) 184
(e) None of these

Directions (11-15): Bar graph given below shows number of students passed in an exam from school A and B in five different years. Study the bar graph carefully and answer the following questions.
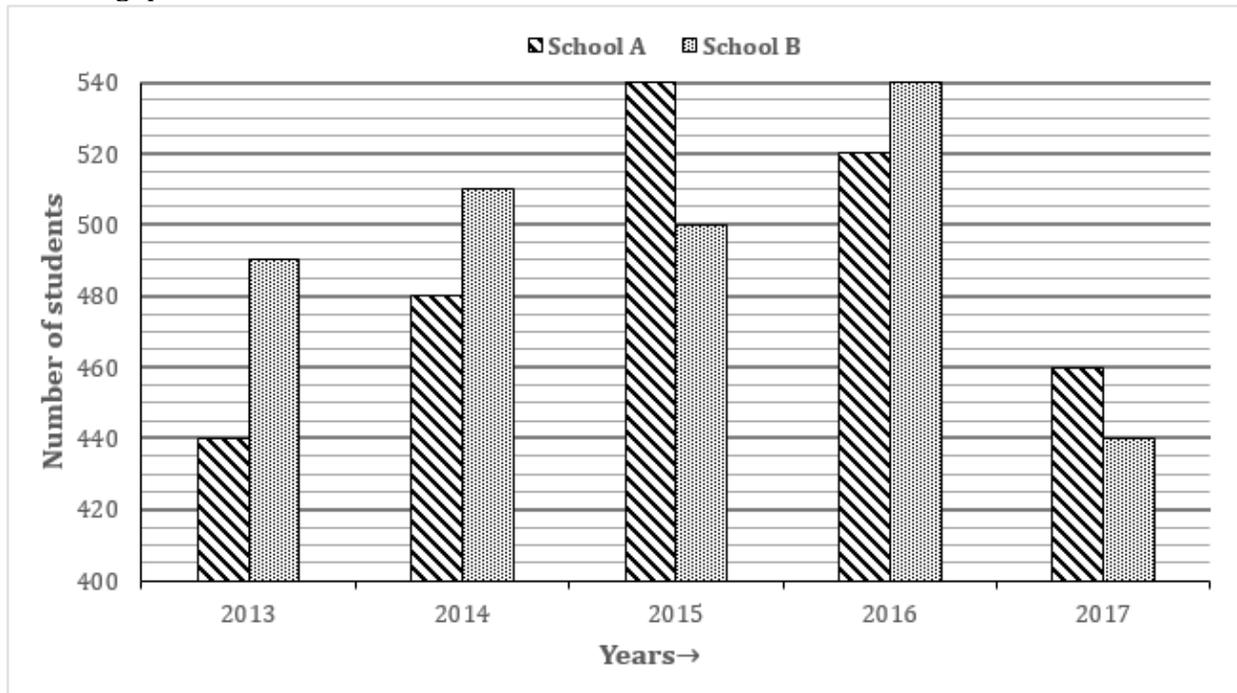
Q11. In 2016, ratio between boys passed to girls passed from school 'A' and School 'B' are 8 : 5 and 16 : 11 respectively. Find the ratio between boys passed from school 'A' and 'B' together in 2016 to girls passed from school 'A' and 'B' together in 2016.
(a) 23 : 31
(b) 32 : 21
(c) 29 : 17
(d) 25 : 37
(e) 3 : 4

Q12. If in 2014, 96% and 85% students passed from school A and B respectively out of total students appeared, then find the average number of failed students from school A and B together in 2014.
(a) 20
(b) 60
(c) 75
(d) 55
(e) 50

Q13. Students passed from school 'A' in 2013, 2015, 2017 together is how much less than students passed from school B in 2014, 2016, 2017 together.
(a) 50
(b) 40
(c) 60
(d) 70
(e) 80

Q14. In 2014, total 600 students appeared from school 'A' for exam in which ratio between boys and girls is 7 : 5. If out of total girls appeared in exam 90% of girls passed, then find the number of boys passed from school 'A' is what percent of the total number of boys appeared in the exam?
(a) $84\frac{1}{2}\%$
(b) $95\frac{3}{8}\%$
(c) $72\frac{6}{7}\%$
(d) 76%
(e) $75\frac{3}{7}\%$

Q15. Find the ratio between total number of students passed from school 'A' in 2014 and 2015 together to total number of students appeared from school B in 2016 and 2017 together.
(a) 51 : 49
(b) 49 : 51
(c) 47 : 45
(d) 53 : 48
(e) Cannot be determined

Solutions

S1. Ans.(c)

I. $5x^2 - 34x + 45 = 0$

or, $5x^2 - 25x - 9x + 45 = 0$

or, $5x(x - 5) -9 (x- 5) = 0$

or, $(x- 5) (5x -9) = 0$

$\therefore x = 5, \dfrac{9}{5}$

II. $4y^2 - 19y + 21 = 0$

or, $4y^2 - 12y - 7y + 21 = 0$

or, $4y(y-3) - 7(y-3) = 0$

or, $(y-3) (4y-7)= 0$

$\therefore y= 3, \dfrac{7}{4}$

Sol. Hence no relation can be established.

S2. Ans.(c)

    I. $15x^2 - 20x + 9x - 12 = 0$

    $5x(3x - 4) + 3(3x - 4) = 0$

    $x = \dfrac{-3}{5}, \dfrac{4}{3}$

    II. $20y^2 - 25y - 24y + 30 = 0$

    $5y(4y - 5) - 6(4y - 5) = 0$

    $y = \dfrac{6}{5}, \dfrac{5}{4}$

Sol. No relation can be established

S3. Ans.(b)

    I. $2x^2 - 7x - 8x + 28 = 0$

    $x(2x - 7) - 4(2x - 7) = 0$

    $x = 4, \dfrac{7}{2}$

    II. $2y^2 - 8y - 9y + 36 = 0$

    $2y(y - 4) - 9(y - 4) = 0$

    $y = 4, \dfrac{9}{2}$

Sol. $x \leq y$

S4. Ans.(a)

I. $12x^2 - 17x + 6 = 0$

$12x^2 - 9x - 8x + 6 = 0$

$3x(4x - 3) - 2(4x - 3) = 0$

$x = \frac{2}{3}, \frac{3}{4}$

II. $y^2 - 16y + 63 = 0$

$y^2 - 7y - 9y + 63 = 0$

$y(y - 7) - 9(y - 7) = 0$

$(y - 9)(y - 7) = 0$

$y = 9, 7$

Sol. $x < y$

S5. Ans.(a)

I. $2x^2 - 12x - 9x + 54 = 0$

$2x(x - 6) - 9(x - 6) = 0$

$x = 6, \frac{9}{2}$

II. $y^2 - 7y - 7y + 49 = 0$

$y(y - 7) - 7(y - 7) = 0$

$y = 7, 7$

Sol. $x < y$

S6. Ans.(a)

Sol.

Length + breadth + height = 12 cm

and

$\sqrt{\ell^2 + b^2 + h^2} = 5\sqrt{2}$

$\ell^2 + b^2 + h^2 = 50$ cm

$l + b + h = 12$

Square both sides

$(l + b + h)^2 = 12^2$

$l^2 + b^2 + h^2 + 2(\ell b + bh + h\ell) = 12^2$

$12^2 = 50 + 2(\ell b + bh + h\ell)$

$2(\ell b + bh + h\ell) = 94$ cm²

S7. Ans.(d)

Sol.

Let level of water will be increased by h.

$\pi \times (15)^2 \times h = \frac{4}{3}\pi(10)^3$

$\Rightarrow h = \frac{4}{3} \times \frac{10 \times 10 \times 10}{15 \times 15}$

$= 5\frac{25}{27}$ cm

S8. Ans.(d)

Sol.

$2\pi rh : \pi r^2 h = 1 : 7$ (where r is radius and h is height)

$2 : r = 1 : 7$

$\Rightarrow r = 14$

$\Rightarrow$ diameter : Height $\Rightarrow 2r : h = 4 : 3$

$\Rightarrow h = 21$

Total surface area of cylinder $= 2\pi r(r + h) = 2 \times \frac{22}{7} \times 14\,(14 + 21)$

$= 88 \times 35$

$= 3080$

S9. Ans.(e)

Sol.

Volume of earth removed $= 10 \times 4.5 \times 3$

$= 135 m^3$

Remaining area $= [20 \times 9 - 10 \times 4.5] = 180 - 45 = 135$

Let, rise in height be h m

Therefore,

$h \times 135 = 135$

$h = 1m$

S10. Ans.(a)

Sol.

Size of rope $= \frac{2}{3} \times 21 = 14$ cm

$\therefore$ Area which horse can graze

$= \frac{\pi r^2}{4} = \frac{22}{7} \times \frac{14}{4} \times 14$

$= 154$ cm^2

S11. Ans.(b)

Total students passed from school A in 2016 = 520

Total students passed from school B in 2016 = 540

So, required ratio

$= \dfrac{\frac{8}{13} \times 520 + \frac{16}{27} \times 540}{\frac{5}{13} \times 520 + \frac{11}{27} \times 540} = \dfrac{320 + 320}{200 + 220} = \dfrac{640}{420} = 32 : 21$

Sol.

S12. Ans.(d)

Sol.

In 2014 total students passed from school 'A' = 480
Percentage of passed students from school 'A' = 96%
So, number of failed students from school 'A' in 2014
$= \frac{480}{96} \times 4 = 20\ students$
In 2014, total students passed from school 'B' = 510
Percentage of passed students from school B = 85%
So, number of failed students from school B in 2014
$= \frac{510}{85} \times 15 = 90\ students$
So, average number of failed students from both
school in 2014 $= \frac{20+90}{2} = 55$

S13. Ans.(a)
Sol. Students passed from school A in 2013, 2015, 2017 = 440 + 540 + 460 = 1440
Students passed from school B in 2014, 2016 and 2017 = 510 + 540 + 440 = 1490
Required difference = 1490 – 1440 = 50

S14. Ans.(c)

Sol.

Total number of students appeared from school
'A' in 2014 = 600
Total number of students passed from school
'A' in 2014 = 480
Boys students appeared $= \frac{7}{12} \times 600 = 350$
Girls student appeared $= \frac{5}{12} \times 600 = 250$
Girls students passed from A in 2014
$= \frac{90}{100} \times 250 = 225$
So, Boys students passed = 480 – 225 = 255
Required percentage $= \frac{255}{350} \times 100 = 72\frac{6}{7}\%$

S15. Ans.(e)
Sol. Total number of students from school B cannot be determined as data is not given.

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