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		D	ate of To	est:	06/07/	202	23		
ANSW	er key	>							
1.	(b)	7.	(d)	13.	(d)	19.	(b)	25.	(c)
2.	(c)	8.	(d)	14.	(b)	20.	(d)	26.	(c)
3.	(b)	9.	(c)	15.	(c)	21.	(d)	27.	(d)
4.	(c)	10.	(d)	16.	(c)	22.	(a)	28.	
									(a)
5.	(a)	11.	(b)	17.	(b)	23.	(c)	29.	(a) (b)

DETAILED EXPLANATIONS

1. (b)

Number of balls = 6 + 8 = 14Number of white balls = 8 $P(\text{drawing a white ball}) = \frac{8}{14} = \frac{4}{7} = 0.57$

2. (c)

Suppose first tap alone takes x hours to empty the tank. Then, second and third taps will take (x - 5) and (x - 9) hours respectively to empty the tank.

$$\therefore \qquad \frac{1}{x} + \frac{1}{(x-5)} = \frac{1}{(x-9)}$$

$$\Rightarrow \qquad \frac{x-5+x}{x(x-5)} = \frac{1}{(x-9)}$$

$$\Rightarrow \qquad (2x-5)(x-9) = x(x-5)$$

$$\Rightarrow \qquad x^2 - 18x + 45 = 0$$

$$\Rightarrow \qquad (x-15)(x-3) = 0$$

$$\Rightarrow \qquad x = 15, 3$$

For x = 3, (x - 5) and (x - 9) will be negative. \therefore answer is 15 hours.

3. (b)

The word WORKSPACE contains 9 different letters.

When the vowels (OAE) are always together. They can be supposed to form one letter.

Then, we have to arrange the letters WRKSPC (OAE).

Now, 7 letters can be arranged in 7! = 5040 ways.

The vowels (OAE) can be arranged among themselves in 3! = 6 ways.

 \therefore Required no. of ways = $(5040 \times 6) = 30240$

4. (c)

Let the number of trucks to be used initially = x

Let capacity of one truck = y

$$xy = 60$$

 $(x + 4)(y - 0.5) = 60$
 $xy + 4y - 0.5x - 2 = 60$
 $4y - 0.5x - 2 = 0$
 $4\left(\frac{60}{x}\right) - 0.5x - 2 = 0$
 $240 - 0.5x^2 - 2x = 0$
 $x^2 + 4x - 480 = 0$
 $x = 20, -24$

By neglecting the negative value, we get, x = 20.

5. (a)

Let Pradeep alone can do the work in *x* days.

$$\frac{1}{24} + \frac{1}{30} + \frac{1}{x} = \frac{1}{12}$$

 $\therefore xy = 60$

$$\frac{1}{x} = \frac{1}{12} - \frac{1}{24} - \frac{1}{30}$$
$$x = 120$$

Payment is in inverse ratio of number of days they required to do the work alone. Ratio of payment

	Ajay			y	Pradeep	
	1		1		1	
	24	:	30	:	120	
	5	:	4	:	1	
Pradeep	p gets the	amou	$ant = \frac{1}{5}$	1+4+	$\frac{1}{1} \times 200 = 3$	₹ 20

6. (a)

 \Rightarrow

The number of digits possible



7. (d)

Change in consumption = $\frac{\text{Percentage change in rate} \times 100}{100 + \text{Percentage change in rate}}$

$$= \frac{20 \times 100}{100 + 20} = \frac{2000}{120} = 16\frac{2}{3}\%$$

8. (d)

304, 314 394 (except 344) =	9 numbers
340, 341 349 (except 344) =	9 numbers
400, 401 409 (except 404) =	9 numbers
410, 411 419 (except 414) =	9 numbers
420, 421 429 (except 424) =	9 numbers
430, 431 439 (except 434) =	9 members
440, 441 449 (all excepted) =	0 numbers
450, 451 459 (except 454) =	9 numbers
460, 461 469 (except 464) =	9 numbers
470, 471 479 (except 474) =	9 numbers
480, 481 489 (except 484) =	9 numbers
490, 491 499 (except 494) =	9 numbers
504, 514 594 (except 544) =	9 numbers
540, 541 549 (except 544) =	9 numbers
Total =	117 numbers

9. (c)

As water of a river flows, similarly water of a pool is stagnant. Option (c) is the most appropriate option. Though the other three options are close, but they are not used while talking about a still body of water like a pool.

10. (d)

"Which" is used in relative clauses to refer to animals and to things. Also, in this question the other three options can be easily eliminated. The correct answer is (d).

11. (b)

A 4 O'clock, the hands of the watch are 20 minute spaces apart.

To be in opposite directions, they must be 30 min spaces apart.

 \therefore Minute hand will have to gain 50 minute spaces

55 minute spaces are gained in 60 min

50 minute space are gained in
$$\left(\frac{60}{55} \times 50\right)$$
 min or $54\frac{6}{11}$ min

 $\therefore \qquad \text{Required time} = 54 \frac{6}{11} \text{min past 4}$

The answer is (b).

12. (d)

There is an increase in gold reserves during the years 1982-1983, 1984-1985, 1986-1987, 1987-1988 as compared to previous year as shown by bar-graph.

The percentage increase in reserves during these years compared to previous year are:

For 1982-1983 =
$$\left[\frac{(3720 - 2640)}{2640} \times 100\right]$$
% = 40.91%
For 1984-1985 = $\left[\frac{(3360 - 2520)}{2520} \times 100\right]$ % = 33.33%
For 1986-1987 = $\left[\frac{(4320 - 3120)}{3120} \times 100\right]$ % = 38.46%
For 1987-1988 = $\left[\frac{(5040 - 4320)}{4320} \times 100\right]$ % = 16.67%

Clearly, the percentage increase over previous year is highest for 1982-1983. The answer is (d).

13. (d)

Volume of the large cube =
$$(6^3 + 8^3 + 10^3)$$

= 216 + 512 + 1000 = 1728 cm³
Let the edge of the large cube be x
So, $x^3 = 1728$
 \Rightarrow $x = 12 \text{ cm}$
 \therefore Required ratio = $\left(\frac{6 \times 12^2}{6 \times (6^2 + 8^2 + 10^2)}\right) = \frac{12^2}{36 + 64 + 100}$
= $\frac{144}{200} = 18 : 25$

The answer is (d).

14. (b)

Female population below poverty line for Punjab = 2.1 million Let the male population below poverty line for Punjab be *x* million 5:6 = x:2.1Then

 \Rightarrow

$$x = \frac{2.1 \times 5}{6} = 1.75$$
 million

Population between poverty line for Punjab = (2.1 + 1.75) million = 3.85 million *.*.. Let the population above poverty line for Punjab be *y* million.

Since, 35% of population of Punjab is below poverty line, therefore, 65% of the total population of Punjab is above poverty line i.e. the ratio of population below poverty line to that above poverty line for Punjab is 35 : 65.

$$:$$
 35 : 65 = 3.85 : y

$$\Rightarrow$$

$$y = \frac{65 \times 3.85}{35} = 7.15$$

:. Population above poverty line for Punjab = 7.15 million.

So, male population above poverty line for Punjab = $\left(\frac{6}{13} \times 7.15\right)$ million = 3.3 million The answer is (b).

15. (c)



So the required alphabets have to start with P and the common difference in terms is 3. Hence, PSVY is the answer.

km/sec

The answer is option (c).

16. (c)

17.

Let, The full fare
$$= ₹ x$$

The reservation charge $= ₹ y$
 $x + y = 362$
 $\frac{3}{2}x + 2y = 554$
From here, $x = 340$ and $y = 22$
 \Rightarrow Reservation charge is ₹ 22.
(b)
Let the speed of planes are v_1 and v_2 ($v_1 > v_2$) in
 $(v_1 + v_2) \times 15 = 1.2$

 $(v_1 - v_2) \times 60 = 1.2$

From solving these equations, we get,

 $v_1 = 0.05 \text{ km/s} = 50 \text{ m/s}$ $v_2 = 0.03 \text{ km/s} = 30 \text{ km/s}$

[:: h = diameter = 2r]

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18. (a)

Volume of total wood = $\pi r^2 \times h$ = $\pi r^2 \times 2r$



The radius of largest sphere possible = r

volume of sphere = volume of wood used

$$=\frac{4}{3}\pi r^3$$

Volume of wood wasted = $2\pi r^3 - \frac{4}{3}\pi r^3 = \frac{2}{3}\pi r^3$

Required ratio =
$$\frac{4}{3}\pi r^3 : \frac{2}{3}\pi r^3 = 2:1$$

19. (b)

From figure (i), (ii) and (iii), we conclude that *B*, *C*, *D*, *F* are adjacent to *E* and *A* both. So face opposite to *A* is *E*.

20. (d)

Let the integers r, s and t are n - 2, n and n + 2 respectively (a) rs = t

· /					
	LHS	$(n-2) \times n$	=	$n^2 - 2n \neq n + 2$	[not true]
(b)		r + t	=	2t – s	
	LHS	n - 2 + n + 2	=	2 <i>n</i>	
	RHS	$2 \times (n + 2) - n$	=	<i>n</i> + 4	[not true]
(c)		r + s	=	<i>t</i> – 2	
	LHS	(n - 2) + n	=	2 <i>n</i> – 2	
	RHS	n + 2 - 2	=	п	[not true]
(d)		r + t	=	2s	
	LHS	n - 2 + n + 2	=	2 <i>n</i>	
	RHS	$2 \times n$	=	2 <i>n</i>	[true]

21. (d)

In ΔPOS ,



Drop a perpendicular from *R* on *x*-axis at point *T*. ΔPOS and ΔRST are similar



$$OS + ST = \sqrt{3} + 1$$
$$RT = \sqrt{3}$$

 \therefore Coordinates of point $R = (1 + \sqrt{3}, \sqrt{3})$

22. (a)

At the end of year,

Rahul's money = 100 × 1.12 = ₹112

Sonia's money = $100\left(1 + \frac{12}{4 \times 100}\right)^4$ = 100 (1.03)⁴ = ₹112.55 Difference = ₹0.55

The formula we used for Sonia is :

$$V = P \left(1 + \frac{r}{100n} \right)^{nt}$$

where V = Total value, P = Principal, r = Annual interest rate, n = number of times per year invested, t = number of years.

23. (c)



	$\angle ABC =$	90°
: .	$AB^2 + BC^2 =$	AC^2
_	$r^{2} + (12\sqrt{3})^{2} =$	$(2r)^2$

$$\Rightarrow r + (12\sqrt{3}) = (2r)^{3}$$

$$\Rightarrow \qquad 432 = 3r^2$$
$$\Rightarrow \qquad r = 12$$

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Now, area of equilateral triangle = $\frac{\sqrt{3}}{4}$ (side)²

Area =
$$\frac{\sqrt{3}}{4}(12)^2 = \frac{\sqrt{3}}{4}(144) = 36\sqrt{3}$$
 unit²

24. (c)

Let the number is 10x + ynumber obtained by reversing the digits is 10y + x (10x + y)(10y + x) = 2430 $100 xy + 10 y^2 + 10x^2 + xy = 2430$ $101xy + 10(x^2 + y^2) = 2430$ Since unit digit of product is a single zero, \Rightarrow either x or y is 5 and another is multiple of two Let x = 5 $505y + 10(y^2 + 25) = 2430$ $10y^2 + 505 y - 2180 = 0$ y = 4 or -54.5 \Rightarrow The number is either 54 or 45, of which 45 is smaller.

25. (c)

Let the average salary of managers be 'S'.

$15 \times 40000 + 82 \times 12500$	$) + 3 \times S =$	= 100 × 22250
\Rightarrow	3S = 22	25000 - 600000 - 1025000
\Rightarrow	3S = 60	0000
\Rightarrow	<i>S</i> = ₹2	00000

26. (c)

With no restrictions, the six children can be arranged in 6! ways i.e. 720 ways.

In all these arrangements it is just as likely for *E* to be on the left of *F* as it is for *E* to be on the right of *F*.

Therefore, exactly half must have *E* to the right of *F*, and exactly half must have *E* to the left of *F*.

Therefore, exactly $\frac{720}{2} = 360$ of the arrangements have *E* to the left of *F*.

27. (d)

QR : PR = 2 : 5 i.e. PQ : PR = 3 : 5 or we can simply say PQ = 3 and PR = 5 then QS = PQ = 3 The diameter of the larger semicircle PR = 5 The sum of the diameters of two smaller semicircles PQ + QS = 3 + 3 = 6Ratio of diameters = 5 : 6 This will be the same as the ratio of circumferences i.e 5 : 6. 28. (a)

Ways to select 2 females =
$${}^{5}C_{2}$$

Ways to select 1 male = ${}^{7}C_{1}$
 \therefore Required probability = $\frac{{}^{5}C_{2} \times {}^{7}C_{1}}{{}^{12}C_{3}} = \frac{7}{22}$

29. (b)



30. (a)

Let *C* = number of questions answered correctly

I = number of questions answered incorrectly or unanswered

Total score =
$$18C - 14I$$

 $18C - 14I = 0$
 $18C = 14I$
 $C = \frac{7I}{9}$

 \Rightarrow

Now, *C* has to be an integer, this is possible only if *I* is divisible by 9.

If
$$I = 9, C = 7$$
 i.e. $I + C = 16$

If
$$I = 18, C = 14$$
 i.e. $I + C = 32$

It is given that the test has fewer than 30 questions Thus, answer is 16.

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