CLASS TEST

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GENERAL APTITUDE

CIVIL ENGINEERING

Date of Test : 30/08/2024

ANSWER KEY ➤

1.	(a)	7.	(a)	13.	(c)	19.	(c)	25.	(b)
2.	(c)	8.	(a)	14.	(b)	20.	(d)	26.	(a)
3.	(a)	9.	(d)	15.	(c)	21.	(a)	27.	(b)
4.	(a)	10.	(a)	16.	(d)	22.	(b)	28.	(a)
5.	(b)	11.	(a)	17.	(a)	23.	(a)	29.	(d)
6.	(b)	12.	(b)	18.	(b)	24.	(b)	30.	(d)

DETAILED EXPLANATIONS

1. (a)

Let Q joined the business after x months.

$\therefore$ Q invested his money for $(12-x)$ months

$$\frac{64000\times 12}{48000\times(12-x)} = \frac{2}{1}$$

$$48000\,(12-x)\times 2 = 64000\times 12$$

$$6\,(12-x) = 4\times 12$$

$$x = \frac{24}{6} = 4 \text{ months}$$

2. (c)

The least number completely divisible by 21, 24 and 27 is LCM of 21, 24 and 27 = $2^3\times 3^3\times 7$

$\therefore$ Least perfect cube completely divisible by 21, 24 and 27 is

$$2^3\times 3^3\times 7^3 = \text{LCM}\times 7^2$$

$$= \text{LCM}\times 49$$

$$= 74088$$

3. (a)

$$12\times 2+2^2 = 28$$

$$28\times 3-3^2 = 75$$

$$75\times 4+4^2 = 316$$

$$316\times 5-5^2 = 1555$$

$$1555\times 6+6^2 = 9366$$

4. (a)

Let the total distance the x km

$$\text{Time taken at 60 km/h speed} = \frac{x}{60}\text{hour}$$

$$\text{Time taken at 40 km/h speed} = \frac{x}{40}\text{hour}$$

$$\text{Time taken to rest} = \frac{x}{40}-\frac{x}{60}$$

$$= \frac{3x-2x}{120} = \frac{x}{120}\text{hour}$$

$$\text{Rest/hour} = \frac{x}{120}+\frac{x}{40}$$

$$= \frac{x}{120}\times\frac{40}{x} = \frac{1}{3}\text{hour} = 20\text{ min}$$

5. (b)

Let the quantity of wine originally in the cask be x litres.

Quantity of wine left in the cask after 4 operations

$$= x\left(1-\frac{8}{x}\right)^4 \text{ litres}$$

$$\frac{x\left(1-\frac{8}{x}\right)^4}{x} = \frac{16}{81}$$

$$\left(1-\frac{8}{x}\right)^4 = \frac{16}{81} = \left(\frac{2}{3}\right)^4$$

$$\left(1-\frac{8}{x}\right) = \frac{2}{3}$$

$$\frac{8}{x} = \frac{1}{3}$$

$$x = 24 \text{ litres}$$

6. (b)

9 O′ clock the hour hand is at 9 and the minute hand is at 12 i.e. two hands are 15 minutes space apart. To be in same straight wine but pointing in the opposite direction they will be at 30 min space apart. Minute hand will have to gain (30 – 15) = 15 min space over the hour hand.

55 minutes space is gained in 60 minutes 15 minutes, space will be gained in $\left(\frac{60}{55}\times 15\right)$ minutes

$$= \frac{180}{11} = 16\frac{4}{11} \text{ minutes}$$

The hands will be in same straight line but pointing in opposite direction at $16\frac{4}{11}$ min past 9.

7. (a)

27th March 2002 to 27th March 2005 = 3 years
= 2 ordinary year + 1 leap year
= 2 + 2 = 4 odd days
∴ Day on which 27th March 2002 falls = Monday – 4 = Thursday

8. (a)

Let CP of 1 pen be ₹ x

CP of 12 pens = SP of 8 pens = ₹ 12 x
Profit = SP of 4 pen
= CP of 6 pen = ₹ 6 x

∴ Gain % $= \frac{\text{CP of 6 pens}}{\text{CP of 12 pens}}\times 100$

$$= \frac{6x}{12x}\times 100 = 50\%$$

9. (d)

$\sqrt{1.3}+\sqrt{1300}+\sqrt{0.013} = 1$

$= \sqrt{10^{-2}\times 130}+10\sqrt{13}+\sqrt{10^{-4}\times 130}$

$= 0.1\sqrt{130}+10\sqrt{13}+0.01\sqrt{130}$

$= 10\sqrt{13}+0.11\sqrt{130}$

Given, $\sqrt{13} = 3.065$, $\sqrt{130} = 11.4$

∴ $10\sqrt{13}+0.11\sqrt{130} = 10 \times 3.605 + 0.11 \times 11.4$
$= 36.05 + 1.254 = 37.304$

10. (a)

Let man's upstream speed be x km/hr and downstream speed be $3x$ km/hr.

$$\text{Rate in still water} = \frac{1}{2}(x+3x) = 2x \text{ km/hr}$$

$$2x = 24$$

$$x = 12 \text{ km/hr}$$

$$\text{Upstream speed} = 12 \text{ km/hr}$$

$$\text{Downstream speed} = 3x = 36 \text{ km/hr}$$

$$= \frac{1}{2}(36-12) = 12 \text{ km/hr}$$

11. (a)

P's 2 day's work + *Q*'s 2 day's work + Boy's 2 day's work = 1

$$\therefore \quad \frac{2}{13}+\frac{2}{7}+\text{Boys 2 day's work} = 1$$

$$\text{Boy's 2 day's work} = 1-\left(\frac{2}{13}+\frac{2}{7}\right)$$

$$= 1-\left(\frac{14+26}{91}\right)$$

$$= \frac{91-40}{91} = \frac{51}{91}$$

$$\text{Ratio of shares} = \frac{2}{13}:\frac{2}{7}:\frac{51}{91}$$

$$= 2\times 7 : 2\times 13 : 51$$

$$= 14 : 26 : 51$$

$$\text{Boy's share} = \frac{51}{14+26+51}\times 91$$

$$= \frac{51}{91}\times 91 = ₹\ 51$$

12. (b)

Time interval between today 9 AM and tomorrow 2 PM = 29 hours.

24 hours 10 minute of the clock = 24 hours of correct clock

$$\therefore \quad \text{29 hours of this clock} = \left(24\times\frac{6}{145}\times 29\right) \text{ hours of correct clock}$$

$$\text{28 hours 48 minutes after 9 am} = 32 \text{ hours 48 min}$$

i.e. time is 48 minute past 1 PM.

13. (c)

$$\text{Ratio of their speeds} = \frac{\frac{300}{7.5}}{\frac{450}{9}} = \frac{40}{50} = \frac{4}{5}$$

14. (b)

Average age of boys = 16.4 years

Average age of girls = 15.4 years

Let m be number of boys and n be number of girls.

$$\frac{m\times16.4+n\times15.4}{m+n} = 15.8$$

$$16.4\,m + 15.4\,n = 15.8\,m + 15.8\,n$$

$$0.6\,m = 0.4\,n$$

$$\frac{m}{n} = \frac{0.4}{0.6}=\frac{2}{3}$$

15. (c)

Part of cistern that was filled by A, B and C together in 1 hour = $\frac{1}{6}$.

$\therefore$ For the first 2 hours, filled portion = $2\times\frac{1}{6}=\frac{1}{3}$

Part of cistern that was filled by A and B together in 1 hour = $\frac{1}{8}$.

$\therefore$ $1-\frac{1}{3} = \frac{2}{3}$ part should be filled in 8 hours

$\therefore$ $A + B$ can fill the cistern in $\frac{8\times3}{2}$ = 12 hours

$\therefore$ Time in which cistern can be filled by pipe C alone

$$= \frac{12\times6}{12-6} = 12 \text{ hours}$$

16. (d)

Assume that 4 women are together.

$\therefore$ Total number of persons seated = 5 + 1 = 6

$\therefore$ Number of ways in which six person can be seater = 6! = 720 ways

4 women can be arranged among themselves in 4! ways = 24 ways

$\therefore$ Total number of arrangement = 720 × 24 = 17280 ways

17. (a)

Let the time taken to complete the work by 100 men be t days.

$\therefore$ Work done by 100 men in 35 days + work done by 200 men in (40 – 35) = 5 days = 1

$$\Rightarrow \frac{100\times35+200\times5}{100t} = 1$$

$$\frac{45}{t} = 1$$

$$\Rightarrow t = 45 \text{ days}$$

$\therefore$ If additional men were not employed, the work would have completed in (45 – 40) = 5 days behind the schedule.

18. (b)

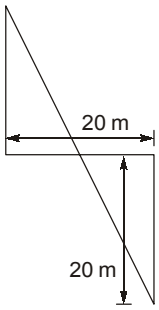
$$\% \text{ effect} = 25 - 10 - \frac{25 \times 10}{100}$$
$$= 15 - 2.5 = 12.5\%$$

$\therefore$ His income is increased by 12.5%.

19. (c)

$$\text{Sixth result} = (6 \times 63 + 6 \times 67 - 11 \times 65)$$
$$= 378 + 402 - 715 = 65$$

20. (d)



Distance between his initial & final position is

$$\sqrt{(40)^2 + (20)^2} = 44.71 \approx 45 \text{ m}$$

21. (a)

Number of candidate who failed in at most two subjects = Candidates failed in one subject + candidates failed in two subjects

$$= (25 + 50 + 25) + (12 + 15 + 15) = 142$$

$$\text{Required percentage} = \left(\frac{142}{300} \times 100\right)\% = 47 \times \frac{1}{3}\% = 47.33\%$$

22. (b)

Here,
$$48 - 33 = 15$$
$$78 - 63 = 15$$
$$126 - 111 = 15$$

The remainder in each case is less than the divisor by 15. Therefore, if 15 is added to required number, the resulting number will become exactly divisible by 48, 78 and 126 i.e. required number is 15 less than LCM of 48, 78 and 126.

$\therefore$ LCM of 48, 78 and 126 = 13104

Required number = 13104 – 15 = 13089

23. (a)

Since, there are 4 routes from *A* to *B* and 6 routes from *B* to *C*. Thus, the number of possible routes from *A* to *C* = 4 × 6 = 24.

24. (b)

$$\text{Required percentage} = \frac{70 + 80}{95 + 110} \times 100 = \frac{150}{205} \times 100 = 73.17$$

25. (b)

Average sales of branches = B_1, B_2 and B_3 in 2001

$$= \frac{1}{3}\times(105+65+110) = \frac{280}{3}$$

Average sales of branches = B_1, B_3 and B_6 in 2000

$$= \frac{1}{3}\times(80+95+70) = \frac{245}{3}$$

$$\text{Required percentage} = \frac{245/3}{280/3}\times 100 = \frac{700}{8} = 87.5\%$$

26. (a)

$$\text{Amount due in 3 years} = 3P$$

$$\text{Simple Interest} = 3P - P = 2P$$

$$\text{Time} = \frac{SI\times 100}{P\times R}$$

$$\frac{2P\times 100}{P\times 16} = \frac{25}{2} = 12\frac{1}{2}\text{years}$$

27. (b)

According to the question, "Amit can give a head start of 20 meter to Bishan in a race of 100 meters and still both finish the race at the same time".

Hence ratio of speeds of

Amit : Bishan = 100 : 80 = 5 : 4 ... (i)

Similarly, Bishan : Chandan = 100 : 75 = 4 : 3 ... (ii)

From (i) and (ii) we will get;

Amit : Chandan = 5 : 3

It means when Amit can run 5 meters then in the same time Chandan can run 3 meters.

Or when Amit can run 100 m then Chandan can only run 60 m.

Hence it is clear that Amit can give a head start of 40 m to Chandan.

28. (a)

Prateek and Urvashi together in 1 day do

$$\frac{1}{10}+\frac{1}{15} = \frac{1}{6} \text{ part of the work.}$$

Prateek and Urvashi together completed $\frac{4}{6}$ or $\frac{2}{3}$ part of the work.

At last Urvashi does the work for 2 days, Urvashi does $\frac{2}{15}$ part of the work.

Amount of work done by Shashank $= 1-\left(\frac{2}{15}+\frac{2}{3}\right) = \frac{1}{5}$ part of the work = 0.2 part of the work.

29. (d)

Let the length be a and breadth be b

$$a = 2b$$

$$\frac{ab}{2(a+b)} = \frac{10}{3}$$

a = 20 m, b = 10 m

Cost of fencing along the length = ₹15 per meter.

Net cost of fencing along the total length = 40 × 15 = ₹600
Net cost of fencing along the total breadth = 20 × 30 = ₹600
Total cost = ₹1200

30. (d)

1st card can be drawn in 12 out of 52 ways (4 Ace, 4 King and 4 Queen). 2nd card can be drawn in 5 out of 51 ways. Suppose Diamond Ace is picked as a first card, then we have choices for Heart Ace, 2 Kings and Queens, so total 5 choices out of 51 cards.
3rd card can be drawn in 4 out of 50 ways.
Hence, probability that all three cards are Ace, King or Queen of same color

$$= \frac{12}{52} \times \frac{5}{51} \times \frac{4}{50} = \frac{2}{1105}$$

Hence, option (d).

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