

# CLASS TEST

S.No. : 09 SP\_ME\_U+I\_160719

Reasoning & Aptitude



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# CLASS TEST 2019-2020

## MECHANICAL ENGINEERING

Date of Test : 16/07/2019

### ANSWER KEY > Reasoning & Aptitude

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

## DETAILED EXPLANATIONS

1. (b)

$$\begin{aligned} \text{Value of consignment} &= \frac{\text{total profit} \times 100}{\% \text{ profit} \times \frac{1}{2} - \% \text{ loss} \times \frac{1}{2}} = \frac{900 \times 100}{\frac{1}{2} \times 12 - \frac{1}{2} \times 6} \\ &= \frac{900 \times 100}{3} = ₹ 30,000 \end{aligned}$$

2. (b)

Because Sohan eats more than Mohan and Raghav eats more than Sohan. Hence, Raghav eats more than Mohan.

3. (b)

$$\begin{array}{cccc} \text{Ratio,} & A & : & B & :: & B & : & C \\ & 1000 & & 920 & & 1000 & & 900 \end{array}$$

$$\begin{array}{ccc} A & : & B & : & C \\ 1000 & & 920 & & 828 \end{array}$$

$$\text{In } 3/2 \text{ km} = 1000 \times 3/2$$

$$1500 \quad : \quad 920 \times \frac{3}{2} \quad : \quad 828 \times \frac{3}{2}$$

$$1380 \quad : \quad 1242$$

$$\text{difference} = 1500 - 1242 = 258$$

4. (a)

Because 4 + 7 + 7 + 7 means Monday so after Monday is Tuesday.

5. (b)

$$\text{LCM of } (15, 30, 60, 90) \text{ min} = 180 \text{ min} = 3 \text{ hr.}$$

6. (c)

$$N(\text{Frontline } U \text{ Filmfare } U \text{ Sportstar}) = 45 + 55 + 40 - 30 - 15 - 25 + 10 = 80$$

∴ Percentage who do not read any magazine

$$= 100 - 80 = 20$$

7. (d)

In given code, first half of the word and second half of the word are reversed. NAGENDGA will be written as EGANAGDN.

8. (d)

$$u + v = 6$$

$$u - v = 2$$

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$$2u = 8$$

$$u = 4 \text{ km/hr}$$

$$v = 2 \text{ km/hr}$$

9. (b)

$$\begin{aligned}x + y &= 80 && \dots(i) \\3x &= 5y \\x &= \frac{5y}{3}\end{aligned}$$

Now putting the value of  $x$  in equation (i)

$$\begin{aligned}\frac{5y}{3} + y &= 80 \\ \frac{8y}{3} &= 80 \\ y &= 30 \\ x &= \frac{5 \times 30}{3} = 50\end{aligned}$$

Then numbers are 50, 30.

10. (d)

Because in the given question Sima is niece of that person.

11. (a)

Formula  $a\left(\frac{a-b}{a}\right)^n$

$$\text{Amount of milk left} = 90\left(\frac{90-9}{90}\right)^3 = 90\left(\frac{81}{90}\right)^3 = 65.61 \text{ kg}$$

12. (b)

Let  $B$  be closed after  $x$  minute, then part filled by  $(A + B)$  in  $x$  minute + part filled by  $A$  in  $(9 - x)$  min = 1

$$\begin{aligned}x\left(\frac{1}{12} + \frac{1}{16}\right) + (9-x) \times \frac{1}{12} &= 1 \\ \frac{7x}{48} + \frac{9-x}{12} &= 1 \\ 7x + 36 - 4x &= 48 \\ \therefore x &= 4 \text{ min}\end{aligned}$$

13. (b)

Because in each row first  $\times$  third + 1 = second.

$$\text{So } 9 \times 4 + 1 = 37$$

14. (c)

By assuming any of the two statements to be true, we can conclude that  $C$  is youngest.

15. (c)

$$\begin{aligned}\text{Area of walls} &= 2(l + b)h \\ &= 2(16 + 12)6 = 336 \text{ m}^2\end{aligned}$$

Area of two window and door

$$\begin{aligned}&= 2 \times 3 \times 2 + 4 \times 3 \\ &= 24 \text{ m}^2 \\ \text{Area to be covered} &= 336 - 24 = 312 \text{ m}^2\end{aligned}$$

$$\text{Length of paper} = \frac{312 \times 100}{100} = 312 \text{ m}$$

$$\text{Cost} = \frac{312 \times 50}{100} = ₹156$$

16. (d)

$$A + B + C = 620$$

$$1. B = 32 + C$$

$$2. A = 6 + C$$

$$3. A = B - 26$$

17. (b)

**First sentence**, this can be the possibility –  $PQ$  or  $QP$ , but not  $RPQ$  or  $QPR$

**Second sentence**,  $RS$  or  $SR$  is not possible.

So,  $R$  has to be next to  $Q$ , and  $S$  next to  $P$ .

It can be either  $SPQR$  or  $RQPS$

18. (b)

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

$$8 + 3 = 11 + 4 = 15 + 5 = 20 + 6 = 26,$$

$$X - 3 = U - 3 = R$$

$$C - 3 = F, \text{ hence, } ? = 19R26$$

19. (a)

$$\text{Income } 5 : 4$$

$$\text{Expenditure } 4 : 3$$

$$\text{Diffence } 1 : 1$$

$$1 = 7000$$

$$\text{Raj's Income} = 5 \times 7000 = 35000$$

$$\text{Rahul's Income} = 4 \times 7000 = 28000$$

20. (c)

$$\text{Let Son's present age be } x \text{ year, Father} = (4x + 4)$$

$$4x + 4 + 4 = 3(x + 4) + 8$$

$$4x + 8 = 3x + 12 + 8$$

$$x = 12$$

$$\text{Father} = 52 \text{ years}$$

21. (c)

Of all the smaller cubes obtained, only the inner cubes (i.e. those which had none of their 6 faces exposed) will have no face painted. Number of such inner cubes =  $(n - 2)^3$ , where  $n$  is the number of smaller cubes on each edge, which is 4 in this case.

Hence, the required number of cubes

$$= (4 - 2)^3 = 2^3 = 8$$

22. (a)

	American	Chinese	Mediterranean	Continental
A	y	y		
B	y		y	
C		y	y	y
D	y	y		y

B and C feel sick and both of them ate Mediterranean. So, it must be Mediterranean which made them sick.

23. (b)

Number of guests in function is  $n$

$$\begin{aligned} \frac{n(n-1)}{2} &= 78 \\ n^2 - n &= 156 \\ n^2 - n - 156 &= 0 \\ n^2 - 13n + 12n - 156 &= 0 \\ n(n-13) + 12(n-13) &= 0 \\ (n+12)(n-13) &= 0 \\ n &= 13 \end{aligned}$$

24. (d)

**As per statement 5:** The number of males equals that of females, i.e. there must be 3 males and 3 females in the family.

Now, **as per statements 4 and 2:**  $P$  and  $T$  are sons of  $U$  and  $Q$  is the son of  $P$ .

We can see  $P$ ,  $Q$  and  $T$  are males. Hence,  $R$ ,  $S$  and  $U$  must be females.

**As per statement 3:**  $S$  is the mother of two, one boy and one girl.

Now,  $U$  cannot be the daughter of  $S$ , as otherwise  $R$  must be her son. But we already know that  $R$  is a female. Hence,  $R$  must be the daughter of  $S$ .

**As per statement 1,** there's only one married couple in the family at present. The only possibility is that  $P$  is married to  $S$ . We can only infer that  $P$  is the husband of  $S$ .

25. (c)

Since roads are either North-South or, East-West, it can be seen that Vettel can reach his original location by first travelling 6 km east and then 2 km north as given in option (c).

26. (d)

Let height of the first cylinder be  $2h$

Then height of the second cylinder is  $3h$

Let radius of the first and second cylinders be  $r_1$  and  $r_2$  respectively

$$\therefore \text{Volume of the first cylinder} = \pi r_1^2 \cdot 2h$$

$$\text{and volume of the second cylinder} = \pi r_2^2 \cdot 3h$$

$$\pi r_1^2 \cdot 2h = \pi r_2^2 \cdot 3h$$

$$2r_1^2 = 3r_2^2$$

$$\frac{r_1^2}{r_2^2} = \frac{3}{2}$$

$$\frac{r_1}{r_2} = \frac{\sqrt{3}}{\sqrt{2}}$$

$$r_1 : r_2 = \sqrt{3} : \sqrt{2}$$

27. (a)

$$x^3 - \frac{1}{x^3} = 14$$

$$\left(x - \frac{1}{x}\right)^3 + 3x \times \frac{1}{x} \left(x - \frac{1}{x}\right) = 14$$

$$\text{Put } x - \frac{1}{x} = z$$

$$z^3 + 3z - 14 = 0$$

Now,  $z = 2$ , satisfies the equation, hence  $(z - 2)$  is a factor. i.e.,

$$z = 2$$

$$x - \frac{1}{x} = 2$$

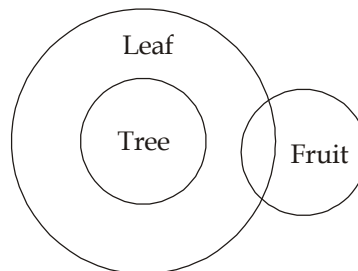
28. (c)

$$13 + 5 - 5 = 13 \times 5 + 5 \times 2 = 75,$$

$$11 + 7 - 3 = 11 \times 7 + 3 \times 2 = 83$$

$$\text{so } 18 + 6 - 8 = 18 \times 6 + 8 \times 2 = 124$$

29. (b)



30. (b)

$$\text{Difference} = \text{CI} - \text{SI} = \frac{Pr^2}{100^2}$$

$$72 = 5000 \times \frac{r^2}{100 \times 100}$$

∴

$$r = 12\% \text{ per annum}$$

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