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SOLVED MATHEMATICAL SKILLS QUESTION
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Mathematical Skills

1. In a football championship, 153 matches were played. Every two teams played one match with each other. The number of teams, participating in the championship were

- (1) 18
- (2) 14
- (3) 16
- (4) 22

2. Two men undertake to do a piece of work for Rs. 600. One alone could do it in 6 days and the other in 8 days. With the assistance of a boy they finished it in 3 days. Boy's share should be

- (1) Rs.75
- (2) Rs.225
- (3) Rs.300
- (4) Rs. 100

3. A wire of length 60 m is used to enclose a field which is in the shape of a right-angled triangle. The area of the field is 150 m^2 , Then the largest side of the field has a length of

- (1) 30 m
- (2) 20 m
- (3) 25 m
- (4) 15 m

4. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If tower is 50 m, the height of the building is

- (1) $\frac{50\sqrt{3}}{3}$ m
- (2) $16\frac{2}{3}$ m
- (3) $50\sqrt{3}$ m
- (4) None of these

5. The true discount on a certain sum of money due $2\frac{2}{3}$ years hence is Rs. 150 and the simple interest on the same sum for the same time and at the same rate is Rs. 200. Interest rate per annum is

- (1) 10%
- (2) 12%
- (3) $12\frac{1}{2}\%$
- (4) $8\frac{1}{2}\%$

6. Rs. 20 is the true discount on Rs. 260 due after a certain time. What will be the true discount on the same sum due after half of the former time, the rate of interest being the same?

- (1) Rs. 15.20
- (2) Rs. 10.40
- (3) Rs. 10.83
- (4) Rs. 13

7. A wire of length 22 cm and 0.2 cm in diameter is melted and recast into small balls of diameter 0.1 cm. The number of balls made is

- (1) 1225
- (2) 1350
- (3) 1320
- (4) 1280

8. A hemispherical bowl of thickness 1 cm and external diameter 10 cm is to be painted all over. What is the cost of painting at the rate of Re. 0.70 per cm^2 ?

- (1) Rs. 200
- (2) Rs. 400
- (3) Rs. 800
- (4) Rs. 100

9. A cylindrical container is filled with ice cream. Its diameter is 12 cm and height is 15 cm. The whole ice cream is distributed among 10 children in equal cones having hemispherical tops. If the height of the conical portion is twice the diameter of its base, the diameter of the ice cream cone is

- (1) 8 cm
- (2) 5 cm
- (3) 7 cm
- (4) 6 cm

10. A person has a chemical of Rs. 25 per litre. In what ratio should water be mixed in that chemical so that after selling the mixture at Rs. 20/litre he may get a profit of 25%?

- (1) 12:15
- (2) 16:9
- (3) 13:16
- (4) 19:22

11. An oil refinery takes 100 litres of crude oil as input and after refining for 1 hour gives certain amount of output oil X litres. This can be sold in the market at a profit of Rs. 30 per litre. If this oil is further refined for $\frac{1}{2}$ hour it gives oil Y litres. This can be sold at a profit of Rs. 50 per litre.

Output and input ratio at both the stages is 90%. The maximum amount that can be earned from 1000 litres of crude input is

- (1) Rs. 40000
- (2) Rs. 30000
- (3) Rs. 27000
- (4) Rs. 40500

12. A, B, C together earn Rs. 1450 and spend 60%, 65% and 70% of their salaries respectively. If their savings are 14:21:15. The salary of B is

- (1) Rs. 500
- (2) Rs. 600
- (3) Rs. 450
- (4) Rs. 750

13. A and B are two alloys of gold and copper prepared by mixing metals in the ratio 7:2 and 7:11 respectively. If equal quantities of the alloys are melted to form a third alloy C, the ratio of gold and copper in C will be

- (1) 7 : 5

(2) 5 : 9

(3) 5 : 7

(4) 9 : 5

14. Anand travelled 300 km by train and 200 km by taxi. It took him 5 hours and 30 minutes. However, if he travels 260 km by train and 240 km by taxi, he takes 6 minutes more. The speed of the train is

(1) 100 km/h

(2) 120 km/h

(3) 80 km/h

(4) 110 km/h

15. Rs. 9000 were divided equally among a certain number of persons. Had there been 20 more persons, each would have got Rs. 160 less. The original number of persons were

(1) 30

(2) 45

(3) 25

(4) 55

16. The autorickshaw fare consists of a fixed charge together with the charge for the distance covered. For a journey of 10 km, the charge paid is Rs. 85 and for a journey of 15 km, the charge paid is Rs. 120. The fare for a journey of 25 km will be

(1) Rs. 175

(2) Rs. 190

(3) Rs. 180

(4) Rs. 225

17. In a morning walk three persons step off together, their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that they can cover the distance in complete steps?

(1) 122 m 40 cm

(2) 123 m 45 cm

(3) 122 m 45 cm

(4) 122 m 50 cm

18. A train after travelling 150 km meets with an accident and then proceeds with $\frac{3}{5}$ of its former speed and arrives at its destination 8 hours late. Had the accident occurred 360 km further, it would have reached the destination 4 hours late. What is the total distance travelled by the train?

(1) 840 km

(2) 960 km

(3) 870 km

(4) 1100 km

19. A train is scheduled to cover the distance between two stations 46 km apart in one hour. If it travels 25 km at a speed of 40 km/h, find the speed for the remaining journey to complete it in scheduled time.

(1) 66 km/h

(2) 56 km/h

(3) 46 km/h

(4) 36 km/h

20. A car covers a distance of 715 km at a constant speed. If the speed of the car had been 10 km/h more, then it would have taken 2 hours less to cover the same distance. What is the original speed of the car?

(1) 55 km/h

(2) 50 km/h

(3) 45 km/h

(4) 65 km/h

21. Two men starting from the same place walk at the rate of 5 kmph and 5.5 kmph respectively. What time will they take to be 8.5 km apart, if they walk in the same direction?

(1) 16 h

(2) 8 h 30 min

(3) 4 h 15 min

(4) 17 h

22. A man can row 40 km upstream and 55 km downstream in 13 hours. Also, he can row 30 km upstream and 4 km downstream in 10 hours. Find the speed of the man in still water.

- (1) 5 km/h
- (2) 2 km/h
- (3) 4 km/h
- (4) None of these

23. Speed of a boat in standing water is 9 kmph and the speed of the stream is 1.5 kmph. A man rows to a place at a distance of 105 km and comes back to the starting point. The total time taken by him is

- (1) 20 h
- (2) 18 h
- (3) 16 h
- (4) 24 h

24. A boat takes 19 hours for travelling downstream from point A to point B and coming back to a point C midway between A and B. If the velocity of the stream is 4 kmph and the speed of the boat in still water is 14 kmph, what is the distance between A and B?

- (1) 200 km
- (2) 180 km
- (3) 160 km
- (4) 220 km

25. A boat covers a certain distance downstream in 1 hour, while it comes back in 1.5 hours. If the speed of the stream be 3 kmph, what is the speed of the boat in still water?

- (1) 11 km/h
- (2) 10 km/h
- (3) 16 km/h
- (4) None of these

26. A man borrows Rs. 6000 at 10% compound rate of interest. He pays back Rs. 2000 at the end of each year to clear his debt. The amount that he should pay to clear all his dues at the end of third year is

- (1) Rs. 6000
- (2) Rs. 3366
- (3) Rs. 3060
- (4) Rs. 3066

27. Sharma invested one-half of his savings in a bond that paid simple interest for 2 years and received Rs. 550 as interest. He invested the remaining in a bond that paid compound interest, interest being compounded annually, for the same 2 years at the same rate of interest and received Rs. 605 as interest. What was the value of his total savings before investing in these two bonds?

- (1) Rs. 22000
- (2) Rs. 11 000
- (3) Rs. 5500
- (4) Rs. 2750

28. A, B and C enter into a partnership. 'A' contributes Rs. 320 for 4 months, 'B' contributes Rs. 510 for 3 months and 'C' contributes Rs. 270 for 5 months. If the total profit is Rs. 208, find the profit share of A, B and C.

- (1) Rs. 64, Rs. 76.5 and Rs. 67.5
- (2) Rs. 46, Rs. 76.5 and Rs. 67
- (3) Rs. 40, Rs. 50 and Rs. 65
- (4) Rs. 62, Rs. 72 and Rs. 82

29. Two partners invested Rs. 1250 and Rs. 850 respectively in a business. Both the partners shared 60% of the profit and distributed the rest 40% as the interest on their capitals. If one partner received Rs. 30 more than the other, the total profit is

- (1) Rs. 262.50
- (2) Rs. 622.50
- (3) Rs. 220.50
- (4) Rs. 226.50

30. A, B and C invested capitals in the ratio 7 : 3 : 2. At the end of the business term, they received the profits in the ratio 2 : 3 : 7. Find the ratio of time for which they contributed their capitals.

- (1) 4 : 14 : 49
- (2) 49 : 14 : 41

- (3) 14 : 41 : 49
- (4) 49 : 41 : 4

31. Two casks of 48 and 42 litres are filled with mixtures of wine and water, the proportions in the two casks being 13 : 7 and 18 : 17, respectively. If the contents of the two casks be mixed and 20 litres of water is added to the whole, what will be the proportion of wine to water in the resultant solution?

- (1) 21 : 31
- (2) 12: 13
- (3) 13 : 12
- (4) one of these

32. Three containers of capacity 20 litres, 5 litres and 9 litres contain mixture of milk and water with milk concentrations 90%, 80% and 70%, respectively. The contents of three containers are emptied into a large vessel. What is the approximate ratio of milk to water in the resultant mixture?

- (1) 3 : 1
- (2) 4 : 1
- (3) 5 : 1
- (4) 2 : 1

33. The price of petrol is increased by 25%. How much percent must a car owner reduce his consumption of petrol so as not to increase his expenditure on petrol?

- (1) 50%
- (2) 30%
- (3) 25%
- (4) 20%

34. Muan received Rs. 12000 as Puja Bonus. He invested a part of it at 5% per annum and the remaining at 6% per annum, simple interest being allowed in each case. The total interest earned by him in 4 years is Rs. 2580. The sum invested at 5% per annum is

- (1) Rs. 7500
- (2) Rs. 4500
- (3) Rs. 4000

(4) Rs. 8000

35. A pump can be operated both for filling a tank and for emptying it. The capacity of tank is 2400 m^3 . The emptying capacity of the pump is 10 m^3 per minute higher than its filling capacity. Consequently, the pump needs 8 minutes less to empty the tank than to fill it. Find the filling capacity of the pump.

(1) $45 \text{ m}^3/\text{min}$

(2) $30 \text{ m}^3/\text{min}$

(3) $50 \text{ m}^3/\text{min}$

(4) $55 \text{ m}^3/\text{min}$

36. Two pipes A and B can fill a cistern in 12 minutes and 15 minutes, respectively, while a third pipe C can empty it in 6 minutes. Both A and B pipes are opened together for 5 minutes and then the third pipe C is opened. In what time will the cistern be emptied?

(1) 39 min

(2) 47 min

(3) 45 min

(4) 25 min

37. Even after reducing the marked price of a transistor by Rs. 32, a shopkeeper makes a profit of 15%. If the cost price be Rs. 320, what percentage of profit would he have made if he had sold the transistor at the marked price?

(1) 25%

(2) 20%

(3) 10%

(4) one of these

38. Three partners invested capital in the ratio $2 : 7 : 9$. The time period for which, each of them invested, was in the ratio of the reciprocals of the amount invested. Find the share of the partner who brought in the highest capital, if profit is Rs. 1080.

(1) Rs. 120

(2) Rs. 360

(3) Rs. 540

(4) Rs. 420

39. In a certain city, all telephone numbers have six digits, the first two digits always being 41 or 42 or 46 or 62 or 64. The number of telephone numbers having all six digits distinct is

- (1) 9200
- (2) 7200
- (3) 8400
- (4) 1200

40. There are six teachers. Out of them two are primary teachers and two are secondary teachers. They are to stand in a row, so as the primary teachers, middle teachers and secondary teachers are always in a set. The number of ways in which they can do so, is

- (1) 52
- (2) 48
- (3) 34
- (4) None of these

Answers:

1	(1)
2	(1)
3	(3)
4	(2)
5	(3)
6	(2)
7	(3)
8	
9	(4)
10	(2)
11	(4)
12	(2)
13	(1)
14	(1)
15	(3)
16	(2)
17	(1)
18	(3)
19	(2)
20	(1)

21	(4)
22	(4)
23	(4)
24	(2)
25	(4)
26	(2)
27	(4)
28	(1)
29	
30	(1)
31	(2)
32	(3)
33	(4)
34	(1)
35	(3)
36	(3)
37	(1)
38	(2)
39	(3)
40	(2)