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Reg. No. :

Code No. : 10732 E Sub. Code : ESMA 21

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2024

Second Semester

Mathematics

Skill Enhancement Course — MATHEMATICS FOR
COMPETITIVE EXAMINATION – II

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The formula for simple interest is

- (a) $\frac{PR}{100}$ (b) $\frac{PT}{100}$
(c) $\frac{PRT}{100}$ (d) None

2. When interest is compounded Half-Yearly, the amount is

- (a) $P\left[1 + \frac{(R/2)}{100}\right]^{2n}$ (b) $P\left[1 + \frac{(R/2)}{100}\right]^n$
(c) $P\left[1 + \frac{(R/2)}{100}\right]^{n/2}$ (d) None

3. Rohit can do a piece of work in 10 days, then Rohit 1 day's work =

- (a) $(10)^1$ (b) $\frac{1}{10}$
(c) $(1)^{10}$ (d) $(1)^{1/10}$

4. The value of $\frac{1}{4} + \frac{2}{5} + \frac{1}{10}$ is

- (a) $\frac{15}{20}$ (b) $\frac{4}{20}$
(c) $\frac{13}{20}$ (d) $\frac{11}{20}$

5. Distance =

- (a) $\frac{\text{Speed}}{\text{Time}}$ (b) $\frac{\text{Time}}{\text{Speed}}$
(c) Speed × Time (d) None



6. $\frac{x}{6} + \frac{x}{15} = \frac{7}{5}$ then $x = ?$

- (a) 4 (b) 5
(c) 3 (d) 6

7. $25 : 15 :: 35 : x$ then $x =$ _____.

- (a) 20 (b) 19
(c) 21 (d) 22

8. A canteen requires 105 kgs of wheat for a week. How many kgs of wheat will it require for 58 days?

- (a) 670 (b) 570
(c) 770 (d) 870

9. A pipe can fill a tank in 5 hours, then part filled in 1 hour = _____.

- (a) $\frac{1}{5}$ (b) $\frac{5}{60}$
(c) $\frac{60}{5}$ (d) 5

10. If $\frac{y}{3} + \frac{(y-1)}{4} - \frac{y-2}{1} = 0$ then $y =$ _____.

- (a) $5\frac{1}{4}$ (b) $4\frac{1}{5}$
(c) $6\frac{1}{7}$ (d) $7\frac{1}{6}$

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions by choosing (a) or (b).

11. (a) At what rate of simple interest a certain sum will be doubled in 15 years?

Or

- (b) In how many years ₹ 1,00,000 will become ₹ 1,33,100 at compound interest rate of 10% per annum?

12. (a) A can complete a work in 6 days while B can complete the same work in 12 days. If they work together and complete it, find the portion of work done by A.

Or

- (b) A alone can complete a piece of work of ₹ 300 in 6 days. But by engaging an assistant, the work is completed in 4 days. Find the share to be received by the assistant.

13. (a) A train travels 82.6 km/hr. How many meters will it travel in 15 minutes?

Or

- (b) How many minutes does Geetha take to cover a distance of 400 m, if she runs at a speed of 20 km/hr?



14. (a) If 5 students utilize 18 pencils in 9 days, how long, at the same rate, will 66 pencils last for 15 students?

Or

- (b) A canteen requires 651 bananas for a week. Totally how many bananas will it require for the months of April, May and June?
15. (a) Pipe A can fill a tank in 30 hours and Pipe B in 45 hours. If both the pipes are opened in an empty tank, how much time will they take to fill it?

Or

- (b) A pipe can fill a tank in x hours and another pipe can empty it in $y(y > x)$ hours. If both the pipes are open, in how many hours will the tank be filled?

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions by choosing (a) or (b).

16. (a) Elango invested $\frac{1}{3}$ of his capital at 7% ; $\frac{1}{4}$ at 8% and the remainder at 10%. If his annual income is ₹ 1021, find the capital.

Or

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- (b) Siddarth invested money in two schemes A and B offering compound interest at 8 p.c.p.a and 9 p.c.p.a respectively. If the total amount of interest accrued through two schemes together in two years was ₹ 4,818.30 and the total amount invested was ₹ 27,000, what was the amount invested in scheme A?

17. (a) 2 men, 3 boys can do a piece of work in 10 days while 3 men, 2 boys can do the same work in 8 days. In how many days can 3 men and 3 boys do the work.

Or

- (b) 3 men and 4 women can earn ₹ 3,780 in 7 days. 11 men and 3 women can earn ₹ 15,040 in 8 days. In what time will 6 men and 10 women earn 12,000?

18. (a) Shankar takes 6 hour 30 min in going by a cycle and coming back by scooter. He would lost 2 hour 10 min by going on cycle both ways. How long would it take him to go by scooter both ways?

Or

- (b) A train M leaves station X at 5 a.m and reaches station Y at 9 a.m. Another train N leaves station Y at 7 a.m and reaches station X at 10.30 a.m. At what time do the trains cross each other?

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19. (a) 2 men, 7 boys can do a piece of work in 14 days. 3 men, 8 boys can do the same work in 11 days. Then 8 men, 6 boys can do two times the amount of this work in how many days?

Or

- (b) The cost of 5 kgs of wheat, 12 kgs of dhal, 4 kgs of rice are ₹ 450, ₹ 4,320, ₹ 240 respectively. What is the total cost of 8 kg wheat, 8 kg dhal and 8 kg rice?
20. (a) A tank has two outlets A and B, which together to take 5 hours to empty a full tank when they are opened simultaneously. The tank was initially half-full and both the outlets were opened. After an hour, an inlet pipe 'X' was also opened. If the inlet alone can fill an empty tank in 2 hours, how much time will it now take to fill the tank completely? (In hours).

Or

- (b) Eight pipes are fitted to a water tank. Some of these are water pipes to fill the tank and the remaining are waste pipes used to empty the tank. Each water pipe can fill the tank in 12 hours and each waste pipe can empty it in 36 hours. On opening all the pipes an empty tank is filled in 3 hours. Find the number of waste pipes.

