

<u>1. QUANTITATIVE APTITUDE</u>

- In a bag there are certain number of coins of the denominations Rs.1, Rs.2 and Rs.5 in the ratio of 5 : 7 : 9respectively. If the total value of the coins in the bag is Rs.192, find the number of Rs. 1 coins in the bag.
 (1) 5 (2) 10 (3) 15 (4) 20
- In a factory, the number of engineers, skilled workers and unskilled workers are in the ratio of 5 : 6 : 7. Their average salaries are in the ratio of 5 : 3 : 2. If the total wages paid to all the employees is Rs.22,80,000, then what is the total wage paid to the skilled workers?
 (1) Rs.5.4 lakh (2) Rs.6 lakh (3) Rs.6.6 lakh (4) Rs.7.2 lakh
- 3. In a class, there are 30 students. If the height of each among 10% of them increases by 10% and the height of each of the remaining increases by 20%, find the percentage increase in the total height of all the students of the class?
 (1) 19% (2) 18% (3) 16% (4)Cannot be determined
- 4. X bought a certain quantity of oranges for an amount of Rs. 1,800. He sold two-fifths of those at a loss of 20%. He earned an overall profit of 15%. At what approximate profit percentage did X sell the rest of the oranges?
 (1) 30.33% (2) 34.67% (3) 38.33% (4) 42.67%
- 5. The sum of 4 consecutive odd numbers is 24. What is the sum of the cubes of the numbers?
 (1) 1224 (2) 1392 (3) 1424 (4) 1592
- 6. Vikram purchased two dozen mangoes at Rs. 121 per dozen, three dozen mangoes at Rs. 150 per dozen and four dozen mangoes at Rs. 160 per dozen. What is the average cost of mangoes per dozen purchased by Vikram?
 (1) Rs. 148 (2) Rs. 150 (3) Rs. 162 (4) Rs. 172
- 7. A and B together can complete a work in 24 days, B and C can do the same work in 40 days while A and C can do it in 30 days. Find the number of days in which each of them would complete the work.
 (1) 36, 48, 120 days (2) 40, 72, 120 days (3) 40, 60, 120 days (4) 40, 60, 128 days
- 8. A 300 m long train travelling at 108 km/hr crosses the driver of a slower train which is 200 m long travelling in the opposite direction in 6 seconds. Find the time taken by the faster train to overtake the slower train.

(1) 25 sec (2) 30 sec (3) 150 sec (4) 50 sec



- 9. At 8:00.a.m. Uday started from city A and travelled towards city B at 50 kmph and at 9:30 a.m. Vikram started from city A and travelled to city B at 60 kmph. At what time would Vikram overtake Uday?
 (1) 2.20 (2) 4.00 (2) 4.00 (4) 5.00
 - (1) 3:30 p.m. (2) 4:00 p.m. (3) 4:30 p.m.(4) 5:00 p.m.
- 10. A boat can travel 5.6 km downstream in 28 minutes. If the ratio of the speed of the boat in still water to the speed of the stream is 3 : 1, how much time will the boat take to cover 4.2 km upstream?

(1) 33 min (2) 36 min (3) 39 min (4) 42 min

11. Rohit was moving towards the hill to have a sight scene from its top. At a certain point in his way he found that the angle of depression to top of the hill was 45°. After travelling 30 m towards the hill he found that the angle of depression to the top of the hill how become 60°. Find the height of the hill.

(1) 69.80 mts (2) 70.98 mts (3) 68.47 mts (4) None of these

- 12. In a quadrilateral, the length of one of its diagonals is 33.6. cm and the perpendiculars drawn on this diagonal from other two vertices measure 12.4 cm and 11.6 cm respectively. Find the area of the quadrilateral.
 - (1) 403.2 sq.cm (2) 446 sq.cm (3) 413.2 sq.cm (4) 464 sq.cm
- 13. The height of a cylinder is five times its radius. If the volume of the cylinder is 5,390 cu.cm, then what is the area of the base of the cylinder?
 (1) 154 sq.cm (2) 189sq.cm (3) 224 sq.cm (4) 259 sq.cm
- 14. Five cubes, each bf side 5 cm are joined side by side in a row to form a cuboid. What is the cost of painting the entire outer surface of the cuboid, if the cost per sq. cm is `2.40? (1) `990 (2) `1980 (3) `660 (4) `1320
- 15. The sum of the infinite series 1 + 2/3 + 4/9 + isa) 1/3 b) 3 c) 2/3 d) none of these
- 16. A person pays Rs.975 by monthly instalment each less than the former by Rs.5. The first instalment is Rs.100. The time by which the entire amount will be paid isa) 10 months b) 15 months c) 14 months d) none of these



- 17. Find the first four terms of a geometric progression whose nth term is $4(-5)^n$
- (A) -20, 100, -500, 2500 (B) 20,-100,-500, 2500 (C) -20,-100, -500,-2500 (D) 20, 100, 500, 2500
- 18. If 3 positive numbers are in geometric progression, their logarithms will be in
 - (A) Arithmetic progression
 - (B) Geometric progression
 - (C) not necessarily in arithmetic progression or geometric progression.
 - (D) Harmonic Progression
- 19. The sides of an equilateral triangle are shortened by 12 units 13 units and 14 units respectively and a right angle triangle is formed. The side of the equilateral triangle is a) 17 units b) 16 units c) 15 units d) 18 units

Answer questions 20-22 based on the data given below.

An urn consists of five green, six blue, three red and four yellow coloured balls.

- 20. If two balls, are drawn randomly, then what is the probability that both the balls are of the same colour?
 (1) 2/9 (2) 1/3 (3) 4/9 (4) 5/9 (5) None of these
- 21. If three balls are drawn randomly, then what is the probability that at least one is yellow coloured ball?
 (1) 31/68 (2) 113/204 (3) 41/68 (4) 131/204 (5) None of these
- 22. If four balls are drawn randomly, what is the probability that all the balls are of different colours?
 (1) 1/17 (2) 2/17 (2) 2/17 (4) 4/17

(1) 1/17 (2) 2/17 (3) 3/17 (4) 4/17

Answer questions 23 & 24 based on the data given below.

A bag contains 5 yellow balls and 6 pink balls.

If two balls are selected at random, one after the other, what is the probability that the first ball is yellow and the second ball is pink, if

23. the first ball is replaced?
(1) 30/121 (2) 25/121 (3) 3/11 (4) 4/11



- 24. the first ball is not replaced?(1) 30/121 (2) 25/121 (3) 3/11 (4) 4/11

2. VERBAL

10 questions 20 marks

When Lee Nelson first began researching autoimmune disorders in the 1980s, the prevailing assumption was that conditions such as arthritis and lupus tend to show up more commonly in women because they are linked to female sex hormones. But to Nelson, this explanation did not make sense. If hormones were the culprit, one would expect these afflictions to peak during a woman's prime reproductive years, when instead they typically appear later in life.

One day in 1994, a colleague specializing in prenatal diagnosis called her up to say that a blood sample from a female technician in his lab was found to contain male DNA a full year after the birth of her son. 'It set off a light bulb,' Nelson told me. 'I wondered what the consequences might be of harbouring these lingering cells.' Since the developing foetus is genetically half-foreign to the mother, Nelson set out to investigate whether it could be that pregnancy poses a long-term challenge to women's health.

Evidence that cells travel from the developing foetus into the mother dates back to 1893, when the German pathologist Georg Schmorl found signs of these genetic remnants in women who had died of pregnancy-induced hypertensive disorder. Autopsies revealed 'giant' and 'very particular' cells in the lungs, which he theorised had been transported as foreign bodies, originating in the placenta.

Within weeks of conception, cells from both mother and foetus traffic back and forth across the placenta, resulting in one becoming a part of the other. And the foetus need not come to full term to leave its lasting imprint on the mother: a woman who had a miscarriage or terminated a pregnancy will still harbour foetal cells. With each successive conception, the mother's reservoir of foreign material grows deeper and more complex, with further opportunities to transfer cells from older siblings to younger children, or even across multiple generations.

Far from drifting at random, human and animal studies have found foetal origin cells in the mother's bloodstream, skin and all major organs, even showing up as part of the beating heart. This passage means that women carry at least three unique cell populations in their bodies – their own, their mother's, and their child's – creating what biologists term a microchimera, named for the Greek fire-breathing monster with the head of a lion, the body of a goat, and the tail of a serpent.

Researchers realised in the 1990s that it also occurs during organ transplantation, where the genetic match between donor and recipient determines whether the body accepts or rejects the grafted tissue, or if it triggers disease. The body's default tendency to reject foreign material begs the question of how, and why, microchimeric cells picked up during pregnancy linger on indefinitely. No one fully understands why these 'interlopers', as Nelson calls them, are tolerated for decades. One explanation is that they are stem or stem-like cells that are absorbed into the different features of the body's internal landscape, able to bypass immune defences because they are half-identical to the mother's own cell population. Another is that pregnancy itself changes the immune identity of the mother, altering the composition of what some researchers have dubbed the 'microchiome', making her more tolerant of foreign cells.



Most of the research focuses on the Y chromosome as a marker for foetal microchimerism. This does not mean that sons, rather than daughters, uniquely affect their mother's bodies, but rather reflects an ease of measurement: the Y chromosome stands out among a woman's XX genes. And there is nothing to suggest that the presence of male cells in women's brains wields a particular influence. Nonetheless, the findings gesture toward an array of questions about what it means for one individual to play host to the cellular material of another.

Answer questions 1-5 based on the passage given above.

- 1. Which of the following can be inferred from the passage?
- A) Presence of male cells in women's bodies influences behaviour of the mother and the offspring.
- B) At some point in time, every human being has foreign cells in his body.
- C) Humans are an autonomous entity, distinct from one another.
- D) Cells travel from the developing foetus into the mother
- 2. A suitable title for the passage would be
- A) Male cells: Culprits of women health's problems
- B) Male hormones: Residue effect in women
- C) Pregnancy: Hazards of inter-cell exchange
- D) Pregnancy: Changing the mother's DNA
- 3. All of the following are true according to the passage, except
- A) Cells flow from foetus to mother and all these cells remain floating in the mother's bodytill she conceives again
- B) The male cells present in the women's brain do not suggest any particular influence on women
- C) There could be a transfer of cells from older siblings to younger siblings
- D) Foetus cells can linger in the mother's body even in case of miscarriages or abortions
- 4. The author mentions organ transplantation to put forth the point that
- A) Microchimerism is unique to pregnancy
- B) Foreign cells linger for a short period in organ transplants unlike indefinitely in pregnancy
- C) Organ transplants are safe because body rejects foreign material and hence foreign cells do not enter the receiver's body
- D) To give another example of and possible reasons why foreign cells are tolerated in body forlong time
- 5. Nelson questions which of the following prevailing assumptions
- A) One individual can play host to another individual's cells
- B) Y chromosomes only affect the mother's brain; X chromosomes have no effect
- C) Michrochimerism affects only women and that too, only pregnant women
- D) Joint diseases affect women because the diseases are linked to female sex hormones



6. No one is _____about Stephens: he inspires either uncritical adulation or profound _____in those who work for him.

Fill in the blanks with the appropriate set off words.

- A) Neutral...Antipathy
- B) Infuriated...Aversion
- C) Enthusiastic...Veneration
- D) Apprehensive..Consternation

A sentence or a part of the sentence is underlined. Four alternatives are given as substitutions for the highlighted part, one of which will improve the sentence. Choose the correct alternative.

7. Doctors at India's leading medical research institute have established <u>that cancer is not caused</u> <u>only by harmful exposure to rays but also by continuously working in an atmosphere with less</u> <u>oxygen.</u>

A) that cancer is not caused only by harmful exposure to rays but also by continuously working in an atmosphere with less oxygen.

B) that cancer is not only caused by harmful exposure to rays but also by continuously working in an atmosphere with less oxygen.

C) that cancer is caused not only by harmful exposure to rays but also by continuously working in an atmosphere with less oxygen.

D) that cancer is caused by not only harmful exposure to rays but also by continuously working in an atmosphere with less oxygen.

- 8. According to a recent study, <u>the elderly in the United States are four times more likely to</u> give regular financial aid to their children as to receive it from them.
- A) the elderly in the United States are four times more likely to give regular financial aid to their children as
- B) the elderly in the United States are four times as likely to give regular financial aid to their children as it is for them
- C) the elderly in the United States are four times more likely to give regular financial aidto their children than
- D) it is four times more likely for the elderly in the United States to give regular financial aid to their children than they are
- 9. Select the figure of speech in the following sentence from the options given below:

The dentist has cavities!

- A) Allusion B) Irony C) Simile D) Anaphora
- 10. Choose the word from the options which is most similar in meaning to the given word.

Impetuous

A) Impious B) Impressive C) Hasty D) Disturbing



3. LOGICAL REASONING

- A man starts from a point, walks 4 miles towards north and turns left and walks 6 miles, turns right and walks for 3 miles and again turns right and walks 4 miles and takes rest for 30 minutes. He gets up and walks straight 2 miles in the same direction and turns right and walks one mile. What is the direction he is facing?
 (a) North (b) South (c) South-East (d) West
- Babu is Rahim's neighbour and his house is 200 meters away in the north-west direction. Joseph is Rahim's neighbour and his house is located 200 meter away in the south-west direction. Gopal is Joseph's neighbour and he stays 200 meters away in the south-east direction. Roy is Gopal's neighbour and his house is located 200 meters away in the northeast direction. Then where is the position of Roys' house in relation to Babu's?
 (a) South-East (b) South-West (c) North (d) North-East
- 3. A compass is damaged and its pointer, which was showing south, is now showing west. If a person faces a rising sun, towards which direction is the person facing as per the damaged compass?
 - (a) West (b) North (c) East (d) South

Directions for questions 4 and 5: These questions are based on the following information.

Six players -A, B, C, D, E and F are standing in a cricket stadium. C is 14 m to the north of E and is 8 m to the east of F. B is 15 m to the west of A, who is 12 m to the south of E. D is 10 m to the west of E.

- 4. How far is D from B?
 (a) 14 m (b) 10 m (c) 15 m (d) 13 m
- 5. In which direction is F with respect to B?(a) North-west (b) South-west (c) North-east (d) South-east
- Based on the statements given below, find out who is the uncle of P? (i) K is the bother of J (ii) M is the sister of K
 - (iii) P is the brother of N
 - (iv) N is the daughter of J
 - (a) K (b) J (c) N (d) M



7. Introducing a man, a woman said, "His wife is the only daughter of my mother." How is the woman related with the man?(a) Sister-in-law (b) Wife (c) Aunt (d) Mother-in-law

Directions for questions for 8 and 9: These questions are based on the following information.

In a family - A, B, C, D, E, and F are the six members. A is the brother of B, who is the mother of C. C is the daughter of D, who is the son of E. E is the wife of F.

- 8. How is E related to B?
- (1) Mother-in-law (2) Mother (3) Son (4) Daughter
- 9. How is A related to C?
- (1) Aunt (2) Uncle (3) Son (4) Cousin

Directions (Q. No. 10-14) Study the following information carefully to answer the given questions.

Ten students are A to J are sitting in a row facing west.

- I. B and F are not sitting on either of the edges.
- II. G is sitting left of D and H is sitting to the right of J.
- III. There are four persons between E and A.
- IV. I is the north of B and F is the south of D.
- V. J is between A and D and G is in between E and F.
- VI. There are two persons between H and C.
- 10. Who is sitting at the seventh place counting from left?(a) H (b)C (c)J (d) Either H or C
- 11. Who among the following is definitely sitting at one of the ends?
- (a) C (b)H (c)E (d) Cannot be determined
- 12. Who are immediate neighbours of I?
- (a) BC (b) BH (c) AH (d) Cannot be determined
- 13. Who is sitting second left of D?
- (a) G (b) F (c) E (d) J
- 14. If G and A interchange their positions, then who become the immediate neighbours of E?
- (a) G and F (b) Only F (c) Only A (d) J and H



15. The first day of the years 2012 and 2023 are Mondays, which day of the week will the last days of years be respectively?

(A) Tuesday, Tuesday (B) Tuesday, Monday (C) Monday, Tuesday (D) Sunday, Monday