

## SECOND SEMESTER (CUFYUGP) DEGREE EXAMINATION, APRIL 2026

## MATHEMATICS

## MAT2FM106(2) Mathematics for Competitive Examinations - Part II

[ 2025 Admission onwards ]

Time: 1.5 Hours

Maximum Marks: 50

## Section A

[Answer All. Each question carries 1 marks]

1. If 3 men or 4 women can complete a piece of work in 43 days, how long will 7 men and 5 women take to complete the same work?

a) 10 days                      b) 12 days                      c) 15 days                      d) 18 days

2. Pipes A and B can fill a tank in 20 and 30 hours respectively, while Pipe C can empty the tank in 15 hours. If all three are opened simultaneously, how long will it take to fill the tank?

a) 60 hours                      b) 45 hours                      c) 30 hours                      d) 12 hours

3. A construction project requires 25 workers to build a bridge in 36 days. The contractor is asked to complete the bridge in 25 days. How many extra workers must he employ to meet the deadline?

a) 9                                  b) 11                                  c) 14                                  d) 36

4. A bus travels at a speed of 72 km/hr. What is the distance covered by the bus in 5 seconds?

a) 100 m                          b) 50 m                                  c) 60 m                                  d) 74.5 m

5. A man finishes 30 km of a journey at 6 km/hr and the remaining 40 km of the journey in 5 hr. What is his average speed for the whole journey?

a) 6 km/hr                          b) 7 km/hr                                  c) 7.5 km/hr                                  d) 8 km/hr

6. A car completed a journey of 400 km in 12 hrs. The first  $\frac{1}{4}$ th of the journey was done at 30 km/hr. Calculate the speed for the rest of the journey.
- a) 45 km/hr      b) 25 km/hr      c) 40 km/hr      d) 30 km/hr
7. Two trains 121 metres long and 99 metres long are running in opposite directions with speeds of 40 km/hour and 32 km/hour respectively. In what time will they completely clear each other from the moment they meet?
- a) 9 seconds      b) 10 seconds      c) 11 seconds      d) 12 seconds
8. A train travelling at 78 kmph completely crosses another train having twice its length and travelling in opposite direction at 66 kmph in 12 seconds. The length of the longest train is:
- a) 160 m      b) 480 m      c) 320 m      d) 240 m
9. If the speed of a boat in still water is 8 km/h and the rate of stream is 4 km/h, then find upstream speed of the boat.
- a) 4 km/h      b) 5 km/h      c) 6 km/h      d) 7 km/h
10. Keshav can row 60 km downstream and 36 km upstream, taking 10 h each time. What is the velocity of the current?
- a) 3 km/h      b) 2.2 km/h      c) 4 km/h      d) 1.2 km/h
- e) None of the above
11. How many times do the hands of a clock overlap in a day?
- a) 22      b) 24      c) 21      d) 23
- e) None of these
12. How many days are there in the year 2024?
- a) 365      b) 366      c) 364      d) 367

a) ZXVF

b) TVXZ

c) LNPR

d) MOOS

14. Cobbler : Leather :: Carpenter ? :

a) Furniture

b) Wood

c) Hammer

d) Chair

15. 542 : 20 :: 976 : ?

a) 189

b) 288

c) 169

d) 289

16. 11, 29, 55, ?, 131

a) 110

b) 81

c) 89

d) 78

17. 975, 864, 753, 642, ?

a) 431

b) 314

c) 531

d) 532

18. NZ, OY, PX, QW, RV, ?

a) FS

b) SU

c) UF

d) TU

19. Choose the word which is different from others:

a) TPLI

b) YUQM

c) RNJF

d) SOKJ

20. Choose the number which is different from others:

a) 216

b) 729

c) 1330

d) 1728

21. Choose the odd term from the following numbers:

a) 3598

b) 1878

c) 6909

d) 8439

22. In a certain code, 'RATIONAL' is written as 'ARITNOLA'. How would 'TRIBAL' be written in that code?

- a) TRIALB                      b) RBTLAI                      c) RTBILA                      d) TIRABLE

23. If 'air' is called 'green', 'green' is called 'blue', 'blue' is called 'sky', 'sky' is called 'yellow', 'yellow' is called 'water' and 'water' is called 'pink', then what is the colour of clear sky?

- a) Blue                      b) Sky                      c) Yellow                      d) Water

24. There are 25 boys in a horizontal row. Rahul was shifted by three places towards his right side and he occupies the middle position in the row. What was his original position from the left end of the row?

- a) 15th                      b) 16th                      c) 12th                      d) 10th

25. Five birds Crow, Pigeon, Little pigeon, Big crow and Eagle fly one after other from a tree branch. Big crow flew after Crow but is ahead of Eagle. Pigeon is between Crow and Big crow. Little pigeon is before Crow. Which bird is in the last?

- a) Pigeon                      b) Big crow                      c) Eagle                      d) None of these

26. Pointing out to a photograph, a man tells his friend: "She is the daughter of the only son of my father's wife". How is the girl in the photograph related to the man?

- a) Daughter                      b) Cousin                      c) Mother                      d) Sister

27.  $M \times N$  means M is the daughter of N;

$M + N$  means M is the father of N;

$M \% N$  means M is the mother of N;

$M - N$  means M is the brother of N.

Given that  $P \% Q + R - T \times K$ , what is the relation of P to K?

- a) Daughter-in-law                      b) Sister-in-law                      c) Aunt                      d) None of these

28. A is the mother of B. C is the daughter of A. D is the brother of B. E is the father of D. How is E related to C?

- a) Brother                      b) Husband                      c) Father                      d) Son

29. A man said to a woman, "Your mother's husband's sister is my mother." How is the man related to the woman?

- a) Cousin                      b) Brother                      c) Uncle                      d) Father

30. Amit walks 10 km towards South. From there, he walks 6 km towards North, then he walks 3 km towards his left. How far and in which direction is he with reference to his starting point?

- a) 5 km South-west    b) 5 km North-east    c) 7 km East                      d) 7 km West

31. Starting from a point P, Sumit walked 20 m South, turned left and walked 30 m. Then he turned left and walked 20 m. Again he turned left and walked 40 m to reach Q. How far and in which direction is Q from P?

- a) 20 m West                      b) 10 m East                      c) 10 m West                      d) 10 m North

32. Going 50 m South of her house, Ruchi turns left and goes 20 m. Then turning to North she goes 30 m and then starts walking to her house. In which direction is she walking now?

- a) North-west                      b) North                      c) South-east                      d) East

33. Arun walks 10 metres in front and 10 metres to his right. Then every time turning to his left, he walks 5 m, 15 m and 15 m respectively. How far is he from his starting point?

- a) 5 m                      b) 10 m                      c) 15 m                      d) 20 m

34. All cats are animals. Some animals are pets. Which conclusion follows?

- a) Some cats are pets    b) All pets are cats    c) Some pets are animals    d) No cat is a pet

35. Statements: All engineers are graduates. Some graduates are researchers.

Conclusions:

- (a) Some engineers are researchers.  
(b) Some researchers are graduates.

- a) Only I                      b) Both                      c) Only II                      d) None

36. Statements: All fruits are healthy. Some healthy foods are vegetables.

Conclusions:

- (a) Some fruits are vegetables.

(b) Some vegetables are healthy foods.

- a) Only I                      b) Only II                      c) Both                      d) None

37. Statements:

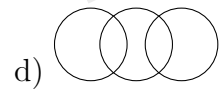
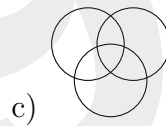
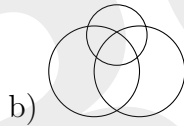
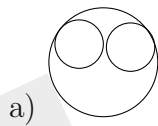
- All engineers are graduates.
- Some graduates are researchers.
- No researcher is unemployed.

Conclusions:

- (a) Some engineers are not unemployed.  
 (b) Some researchers are graduates.

- a) Only I                      b) Only II                      c) Both                      d) None

38. Which figure best represents the relationship among Birds, Parrots, and Eagles?



39. There is a cube in which one pair of adjacent faces is painted black; the second pair of adjacent faces is painted blue and the third pair of adjacent faces is painted green. This cube is now cut into 216 smaller and identical cubes.

How many small cubes will be there with one face painted black?

- a) 8                      b) 81                      c) 60                      d) 100

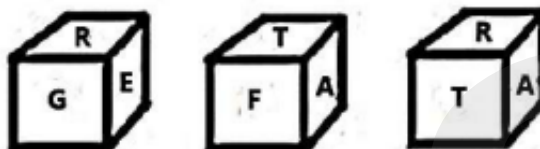
40. Three different faces of a cube are coloured in three different colours—black, green and blue. This cube is now cut into 216 smaller but identical cubes.

How many smaller cubes have exactly two faces coloured?

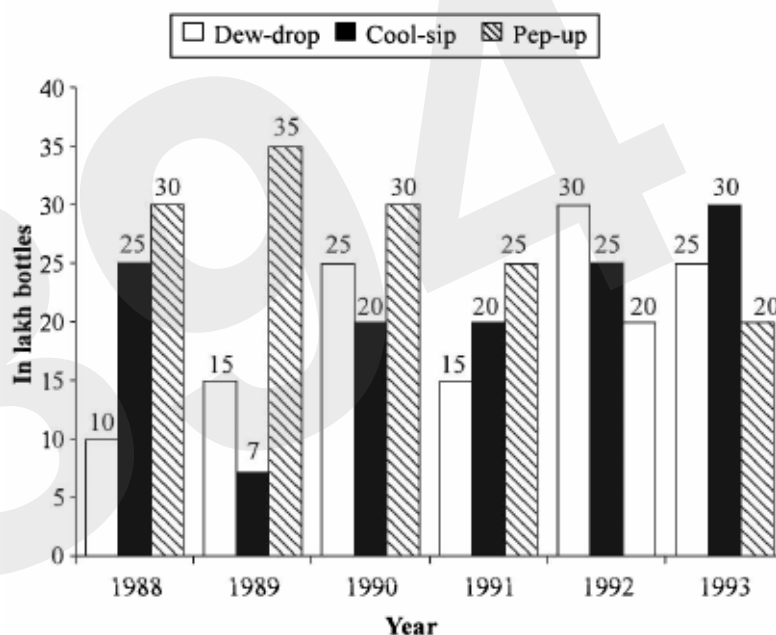
- a) 12                      b) 15                      c) 16                      d) cannot be determined

41. Three different positions of the same non-standard dice are shown. Which letter will be

760763 the face opposite to the face with the letter 'T'?



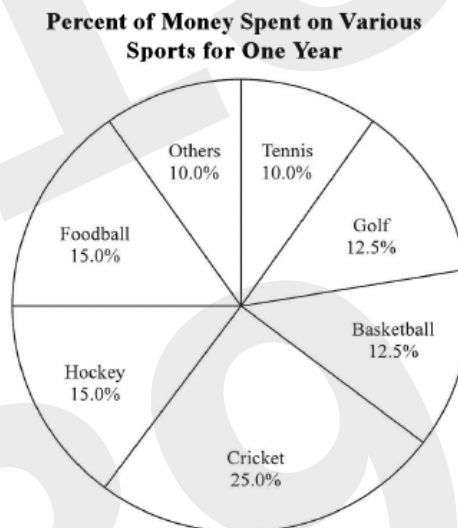
- a) R                      b) E                      c) F                      d) G
42. If  $A = 1, B = 2, C = 3, \dots, Z = 26$ , what is the value of the word CAT?
- a) 24                      b) 31                      c) 44                      d) 48
43. Find the next letter in the series: A, D, G, J, ?
- a) L                      b) M                      c) N                      d) O
44. In a certain code language, 'cat and dog' is written as 'tre pol sam', 'dog is black' is written as 'pol jug kit', and 'black and white' is written as 'jug tre kat'. What is the code for 'and'?
- a) tre                      b) pol                      c) jug                      d) sam
45. The sum of the interior angles of a pentagon is
- a)  $360^\circ$                       b)  $540^\circ$                       c)  $720^\circ$                       d)  $900^\circ$
46. The area of a semicircle of radius 14 cm is
- a)  $98\pi$                       b)  $196\pi$                       c)  $154\pi$                       d)  $49\pi$
47. A rectangle has length 15 cm and diagonal 17 cm. Its breadth is
- a) 6                      b) 7                      c) 8                      d) 9
48. Study the following graph carefully and answer the question given below.



In the case of which soft drink was the average annual sale maximum in the given period?

- a) Pep-up only      b) Cool-sip only      c) Dew-drop only      d) Cool-sip and Dew-drop
- e) Pep-up and Dew-drop

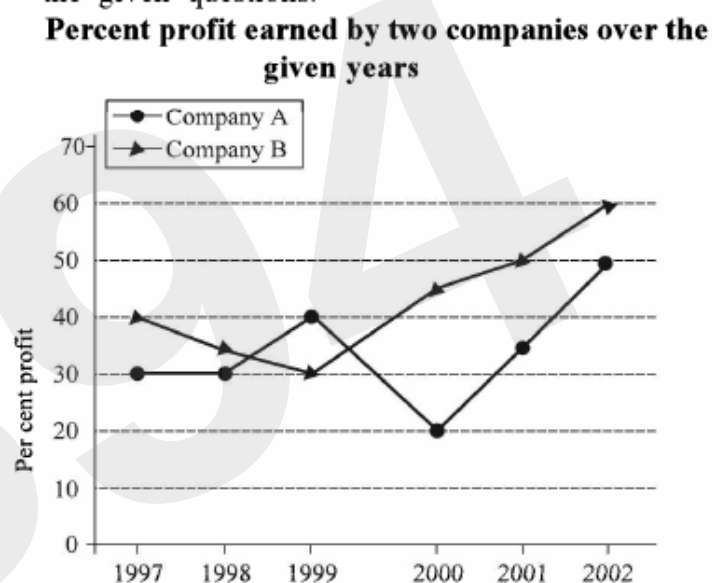
49. The circle graph given here shows the spendings of a country on various sports during a year. Study the graph carefully to answer these questions.



The ratio of the total amount spent on football to that spent on Hockey was

- a) 1 : 15      b) 1 : 1      c) 15 : 1      d) 3 : 2

50. Study the following graph to answer the given questions.



If the expenditure of Company B in 2000 was Rs. 200 crore, what was its income?

- a) Rs. 240 crore      b) Rs. 220 crore      c) Rs. 160 crore      d) Cannot be determined
- e) None of these