RIMC Entrance Exam: June 2023

MATHEMATICS

Time: 90 minutes   **Maximum marks: 200**
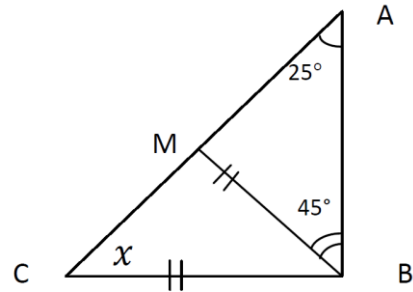
Instructions:
1. Attempt all 30 questions. Write answers separately on the answer sheet provided at the exam centre.
2. Part 'A' contains 20 questions and each question carries 'Five marks'.
3. Part 'B' contains 10 questions and each question carries 'Ten marks'.
4. Use of calculator is prohibited. Marks will be awarded for each step.
5. Take the value of π as **22/7**.
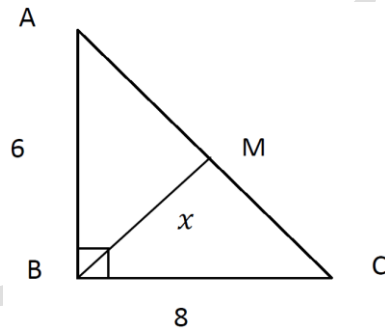6. The questions paper can be retained by the candidates post examination.

PART A   ($20 \times 5 = 100$ **Marks**)

1. Before a soccer game between North and South, there were five predictions
   a) There won't be a draw
   b) North will score against South
   c) North will win
   d) North won't lose
   e) Three goals were made, in total
   After the match, it turned out that exactly three of these predictions turned out to be true. What was the final score?

2. Find natural numbers x, y that satisfy the equation $x^2 - y^2 = 11$

3. List all the divisors of N where $N = 13^2 \times 29$

4. Find at least one solution of the following cryptogram where each distinct letter encodes a distinct digit
   I+HE+HE+HE+HE+HE+HE+HE+HE = US

5. Find at least two pairs of natural numbers which satisfy the equation $2x^3 = y^4$

6. The year 2009 has the following property: no matter how one rearranges the digits, one cannot obtain a smaller 4-digit number (we don't allow numbers to start with zeros). What is the next year that has this property?

7. An alien from a planet of TAO said "A!" when he arrived on earth on Monday. On Tuesday he exclaimed: "AY!". On Wednesday he said "AYYA!" and on Thursday he said "AYYAYAAY!" What will he say on Saturday?

8. Every seventh mathematician is also a philosopher, and every ninth philosopher is also a mathematician. Are there more philosophers or more mathematicians?

9. Three diggers can dig three pits in three hours. How many pits can six diggers dig in five hours?

10. Consider the equation
    $\frac{2}{73} = \frac{1}{60} + \frac{1}{219} + + \frac{1}{292} + \frac{1}{x}$

11. Mickey Mouse, Minnie Mouse, Goofy and Pluto are sitting on a bench. If Goofy, who is sitting in the rightmost spot, gets up and then sits down between Mickey Mouse and Minnie Mouse, then Minnie Mouse will be the left most one. In which order are they sitting?

12. The New Delhi currency exchange has the following currency rates: 11 tugriks cost 14 dinars, 22 rupees cost 21 dinars, 10 rupees cost 3 thalers and 5 krona cost 2 thalers. How many tugriks can you get for 13 kronas?

13. Valentine the Cockroach said he could run with a speed of 50 meters/min. No one believed him and they were right. Valentine got confused and thought there were 60 cm in a meter and 100 seconds in a minute. So what is Valentine's real running speed (in "normal" meter/minute).
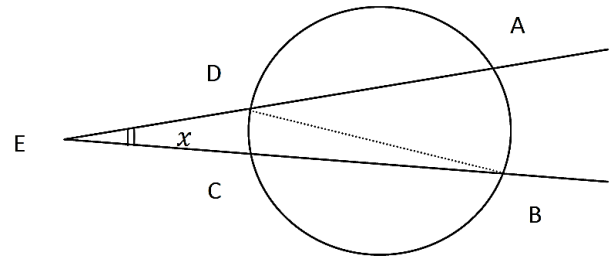
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14. At the start of the year screws, nuts and bolts were equally priced at one dollar per kg. On Feb 27th the store owner decided that screws should increase in price by 50% and bolts should decrease in price by 50%. On Feb 28th the owner changed the price again. This time, the price of screws went down by 50% and the price of bolts went up by 50%. What will be the least and the most expensive product to buy in March; screws, nuts or bolts?

15. In the sequence 2, 6, 12, 20, 30⋯⋯⋯where 2 is in first place, find the number in the 6th place. Give a clear explanation of your answer.

16. Alisha has a mobile phone. Its fully charged battery gives her 6 hours of talk time and 210 hours of standby time. When Alisha boarded the train the phone was fully charged but the moment she arrived at her destination, the battery ran out. How long did Alisha travel on the train, if it is known that she was talking on the phone for exactly half of her journey time?

17. The diagonals of a parallelogram are of lengths 24 and 10 and are perpendicular to each other. Find the sides of the parallelogram and the area of the parallelogram.

18. If BC=BM, then find the value of "x" in the given figure.
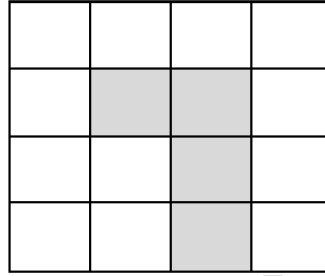

19. In the right angled triangle ABC, M is midpoint of hypotenuse AC. Find "x" (length of BM).
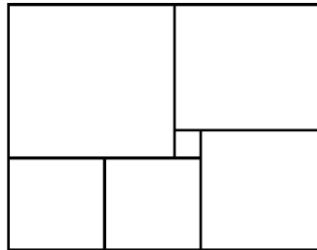

20. In the figure, Arc AB measure 120°. Arc CD measure 30°. What is "x"?($\angle E$ =?)

21. The book "magic for dummies" contains the following passage "If you replace each of the distinct letters in GLOBALHELLFRY with distinct digits, and you get a prime number, then the world will suffer a terrible heat wave." Prove that such a heat wave can never occur.

22. If an octopus has an even number of legs, it always tells the truth but if it has an odd number of legs, it always lies. One day a green Octopus said to a blue one, "I have eight legs, and you have only six". "I have eight legs, and you have just seven," indignantly replied the blue Octopus.

    "The blue Octopus does really have eight legs", agreed the purple Octopus, who boasted, "And I have nine". A striped octopus joined in, saying, "None of you have eight legs, I am the only one who does!". Which of these Octopuses actually has eight legs?

23. There are knights and liars living on an island. The knights always tell the truth, while the liars always lie. A traveler met three islanders and asked each one of them. "How many of the other two islanders are knights? The first one said "None", The second one said "ONE". What did the third one say?

24. Natasha and Inna have bought two identical boxes of tea. We know that each tea bag was used to make two or three cups of tea. Natasha made 41 cups of tea from her box, and Inna managed to make 58 cups. How many tea bags were there in the box?

25. Copy this diagram onto your answer book and mark out four congruent pieces such the each piece contains exactly one shaded square.

26. 100 students live in village A, and 50 in village B, the villages are 3 Km apart. If we are trying to minimize the total distance walked by the students to their common shared school, where on the line joining AB should we build the school.

27. A shop sells 5 different cups, 4 different saucers and 3 different types of spoons. In how many different ways can I purchase two items from this shop.

28. How many different rearrangements are possible of the letter ABCA. List all of them

29. How many perfect cubes lie between $2^8 + 1$ and $2^{18} + 1$.

30. A rectangle consist of 6 squares (see picture). Find the side length of the largest square if the smallest one has side length 1.

ENGLISH

Time: 120 minutes   **Maximum marks: 125**

Instructions:

1. Read all the questions thoroughly before answering.
2. The question paper comprises of three sections.
   a) Reading Section   -   25 Marks
   b) Writing Section   -   60 Marks
   c) Grammar   -   40 Marks
3. The question paper can be retained by the candidate post exam.

SECTION 'A' READING   **(25 Marks)**

1. Read the passage and answer the questions that follow: (15 Marks)

   It does not sound appropriate for anybody to use the profession they belong to as the most important thing on earth to define who they are or what they are. Of course, one must be proud of one's profession, but to consider a particular profession to be head and shoulders above others is definitely preposterous. Indeed every profession is equally important; however it is the nature of time and space that attaches more importance to a particular profession. For instance, when we think of giving our children, the best education possible, teachers are very important; when we fall ill, doctors are very important; when we think of the security of the nation, people in uniform - the army, the navy, the air force and the police - are very important and when we watched the football world cup, many of us wished we were footballers.

   It is not the profession that makes us great; it is we that make our profession great. If a patient dies in a hospital due to the carelessness of a doctor, the society won't feel great about his/her profession or if a scientist starts about developing a deadly virus to destroy mankind, people of his profession might be seen by the world as viruses.

   On the contrary, when we think of Anand Kumar's Super 30 programme that has sent many underprivileged students to IITs, the profession of teaching is seen as something second to none. When we think of how Captain Vikram Batra and Captain Manoj Kumar Pandey laid down their lives for the country, we have the highest respect for those who protect the nation; cricket has almost become a religion in India because of people like Kapil Dev, Sunil Gawaskar, Sachin Tendulkar, Mahendra Singh Dhoni, etc. During the pandemic, the world put the healthcare professionals on the pedestal because they risked their lives to save millions of covid patients around the globe.

   Young boys and girls who have started to go to school must know that they should have big dreams and they must pull out all the stops to achieve their dreams. However, if they do not become responsible and productive citizens of their country after they have achieved their dreams, they cannot be considered assets of the society.

   a) How do we make our profession great? Give an example. (03)
   b) Can any profession be considered the best? Why? (03)
   c) What advice is being given to the young students by the passage? (02)
   d) How do we make our profession look bad? Give an example. (02)
   e) Find the words from the passage which mean the following: (03)
      i. Ridiculous
      ii. Wealth
      iii. Deprived
   f) Find the phrases from the passage which mean the following: (02)
      i. To be a lot better than others
      ii. Make a lot of effort

2. Read the poem given below and answer the

questions that follow: (10 Marks)

I have taken a road
I have travelled some distance
The ride has been bumpy
Should I go ahead or not?
Should I blame myself for the road I have taken?
No, I used to love it
Though the reality is a little harsher.
Should my family be blamed for the road I have taken?
No, they thought this is
Where I would travel fastest
They say the other roads
Though appear smoother and greener
Have their own puddles.
It's done with a design.

Each road is a life
And is not a bed of roses
Believe that your road is the best
And always look forward to the best.

a) Give a suitable title to the poem.   (01)
b) Why does the poet feel hesitant to go ahead?   (01)
c) Why won't the poet blame his family? (01)
d) Why won't the poet blame himself?   (01)
e) What is the message given by the poem?   (02)
f) Name the literary devices used in the poem. Explain with examples.   (02)
g) Find the words from the poem which mean the opposite of the following: (02)
   i.   Bumpy
   ii.   Disbelief

SECTION 'B' WRITING   (60 Marks)

3. You are Manisha, a resident of South Delhi. Write a letter to the editor of 'The Times of India' telling him/her how every resident of Delhi could contribute to creating a healthy environment in the city in 175 words(10 Marks)

4. Write an article on "The Impact of ChatGPT on Education" in about 175 words.   (10 Marks)

5. Write a paragraph each on any two of the following topics in about 75 words.

                    (05 x 2 =10 Marks)

   a) Child is the father of man.
   b) One swallow does not make a summer.
   c) A rotten apple spoils the barrel.

6. Look at the picture given below and write a story in about 175 words.   (10 Marks)

7. Write a descriptive paragraph about your favourite video game and why you like it.

                    (20 Marks)

Instructions: In this question, you are required to write a descriptive paragraph about a video game you enjoy playing. Your paragraph should be at least 350-400 words long and should describe the video game in detail. Make sure to use vivid and descriptive language to bring the experience to life for the reader. You will be assessed on your ability to organize your thoughts, use appropriate vocabulary and grammar to create a clear and engaging piece of writing.

8. Identify the parts of speech of the words underlined in the following   (1 x 4 = 4 Marks)
   a) <u>Though</u> he was angry, he remained calm.
   b) I have never met a <u>miserly</u> person like him.
   c) <u>Each</u> of you will be rewarded.
   d) <u>Each</u> boy will be given a pen.

9. Re-write the following using correct tenses.

   (1.5 x 4 = 6 Marks)
   a) I have taken breakfast two seconds ago.
   b) The Prime Minister will leave for London tomorrow.
   c) He came to my house after I had my lunch.
   d) She came to my house while I read a novel.

10. Transform the following sentences by making use of the instructions given within brackets:

    (1 x 10 = 10 Marks)
    a) Lionel Messi is the best footballer in the world. (negative sentence)
    b) We do not know where the girl lives. (simple sentence)
    c) Despite his poverty, he continued to have big dreams. (compound sentence)
    d) Mahender Singh Dhoni is admired by everyone. (interrogative sentence)
    e) The fearless soldier was able to kill five terrorists single-handedly.(complex sentence)
    f) As soon as we reached the stadium, the coach shouted at us. (negative sentence)
    g) The chef cooked the meal. (passive voice)
    h) Raju said that he had completed the assignment the previous day. (direct speech)
    i) Why did your sister not like the car? (passive voice)
    j) Meena said to Tina, "Let's go to the theatre tomorrow." (Indirect speech)

11. Write the idioms or phrases which mean the following: (1 x 5 = 5 Marks)
    a) To be excited or nervous
    b) Quickly or very fast
    c) To avoid or shy away from danger
    d) To do something to get the attention of others
    e) Of a feeling being felt by everyone.

12. Write one word each for the following expressions: (1 x 5 = 5 Marks)
    a) Study of handwriting
    b) Fear of books
    c) A place for keeping bees
    d) A person who helps a golfer
    e) A figure of speech which consists in saying something which is just the opposite of what is intended.

13. Identify the underlined grammatical particles in the following sentences.   (1 x 5 = 5 Marks)
    a) This car is mine.
    b) This is my car.
    c) The door was left open.
    d) The cake was eaten by them.
    e) What is your name?

14. The following words have two or more meanings. Give two different meanings for each of the word and frame sentences using them.

    (1 x 5 = 5 Marks)
    a) Match
    b) Watch
    c) Ring
    d) Point
    e) Bear

6

GENERAL KNOWLEDGE

Time: 60 minutes   **Maximum marks: 75**

Instructions:
1. There are a total of 75 questions and each question carries one mark.
2. There is no negative marking for any wrong answer.
3. Do not over write, dual answers shall not fetch any marks.
4. All questions to be answered on the question paper only.

{TICK (✓) THE CORRECT ANSWER}

1. What is the smallest bone in the human body?
   a) The Stapes
   b) Sternum
   c) Malleus
   d) Patel

2. What is the chemical formula for table salt?
   a) H_2SO_4
   b) HNO_3
   c) NaCl
   d) K_2CO_3

3. Which of the following is NOT a greenhouse gas?
   a) Carbon dioxide
   b) Methane
   c) Oxygen
   d) Water vapor

4. What is the largest organ in the human body?
   a) Brain
   b) Skin
   c) Heart
   d) Liver

5. Which gas is produced when an acid reacts with a metal?
   a) Hydrogen
   b) Oxygen
   c) Nitrogen
   d) Carbon dioxide

6. What is the name of the process by which a liquid turns into a gas at a temperature below its boiling point?
   a) Evaporation
   b) Sublimation
   c) Melting
   d) Condensation

7. What is the process by which plants release water vapour into the air called?
   a) Photosynthesis
   b) Transpiration
   c) Respiration
   d) Evaporation

8. Which planet in our solar system is known for its rings?
   a) Jupiter
   b) Saturn
   c) Neptune
   d) Uranus

9. Which of the following elements is a metal?
   a) Nitrogen
   b) Carbon
   c) Oxygen
   d) Iron

10. Which of the following is NOT a state of matter?
    a) Solid
    b) Gas
    c) Plasma
    d) Liquidation

11. Who is known as the "Father of Modern Genetics"?
    a) Charles Darwin
    b) Gregor Mendel
    c) Louis Pasteur
    d) Robert Koch

12. What is the name of the process by which living organisms break down glucose to produce energy?
    a) Photosynthesis
    b) Respiration
    c) Digestion
    d) Excretion

13. What is the acceleration due to gravity near the surface of the Earth?
    a) 9.8 meters per second square
    b) 1.62 meters per second square
    c) 3.71 meters per second square
    d) 24.79 meters per second square

14. What is the name of the largest ocean on Earth?

a) Atlantic Ocean
b) Indian Ocean
c) Pacific Ocean
d) Arctic Ocean

15. What is the name of the process by which a solid turns directly into a gas without becoming a liquid first?
    a) Evaporation
    b) Sublimation
    c) Melting
    d) Freezing

16. Who was the first president of the United States of America?
    a) Thomas Jefferson
    b) George Washington
    c) John Adams
    d) James Madison

17. What is the capital city of Japan?
    a) Tokyo
    b) Kyoto
    c) Osaka
    d) Hiroshima

18. Which of the following is NOT a state in India?
    a) Uttarakhand
    b) Himachal Pradesh
    c) Tibet
    d) Kerala

19. Which country is known as the "Land of the Rising Sun"?
    a) Japan
    b) China
    c) South Korea
    d) North Korea

20. In which year did India gain independence from British colonial rule?
    a) 1945
    b) 1946
    c) 1948
    d) 1947

21. Which of the following is NOT one of the three branches of the United States government?
    a) Legislative
    b) Executive
    c) Judicial
    d) Military

22. Who wrote the Indian national anthem "Jana Gana Mana"?
    a) Rabindranath Tagore
    b) Bankim Chandra Chatterjee
    c) Sarojini Naidu
    d) Mahatma Gandhi

23. Which ancient civilization is known for inventing the wheel?
    a) Egyptian
    b) Mesopotamian
    c) Greek
    d) Roman

24. Which of the following is NOT one of the Seven Wonders of the Ancient World?
    a) The Great Pyramid of Giza
    b) The Hanging Gardens of Babylon
    c) The Colossus of Rhodes
    d) The Eiffel Tower

25. Who was the first prime minister of India?
    a) Jawaharlal Nehru
    b) Indira Gandhi
    c) Rajiv Gandhi
    d) Narendra Modi

26. What is the theme of International Girls in ICT Day 2023?
    a) Empower girls
    b) Digital Skills for Life
    c) STEM
    d) Science Skills for Life

27. If 3 oranges and 2 bananas cost Rs. 35, and 2 oranges and 3 bananas cost Rs. 30, what is the cost of one orange and one banana?
    a) Rs. 5
    b) Rs. 6
    c) Rs. 7
    d) Rs. 8

28. Which number comes next in the following sequence: 1, 4, 9, 16, 25,⋯ ?
    a) 36
    b) 49
    c) 64
    d) 81

29. What is the missing number in the following sequence: 2, 5, 11, 23?
    a) 47
    b) 48
    c) 49
    d) 50

30. If A is the father of B, B is the son of C, and C is the father of D, who is B to D?
    a) Brother
    b) Uncle
    c) Father
    d) Grandfather

31. Which letter comes next in the following sequence: A, E, I, M, Q,⋯?
    a) S
    b) T
    c) U
    d) V

32. What is the missing number in the following sequence: 1, 2, 6, 24, ?
    a) 96
    b) 120
    c) 144
    d) 168
33. Which of the following words is different from the others?
    a) Elephant
    b) Lion
    c) Giraffe
    d) Fish
34. Which of the following numbers is the odd one out?
    a) 9
    b) 27
    c) 64
    d) 125
35. Which of the following is a synonym for "conundrum"?
    a) Solution
    b) Riddle
    c) Confusion
    d) Question
36. What is the next shape in the following pattern?
    Square, Circle, Triangle, Square, Circle, Triangle, Square, Circle, ?
    a) Triangle
    b) Square
    c) Circle
    d) Star
37. Which tribe is playing a major role in 'Protect Hornbills Project'?
    a) Nyishi Tribe
    b) Baiga Tribe
    c) Bodo Tribe
    d) Bhil Tribe
38. If the first two statements are true, is the third statement true as well?
    All trees are plants./ All plants are green./ All trees are green.
    a) True
    b) False
39. Recently, India has opted out of which pillar of 'Indo-Pacific Economic Framework (IPEF)'?
    a) Trade
    b) Supply chain
    c) Clean Economy
    d) Fair Economy
40. Which of the following is the opposite of "brave"?
    a) Timid
    b) Bold
    c) Confident
    d) Courageous
41. If all balls are cubes, and some cubes are blue, then which of the following statements must be true?
    a) All cubes are balls.
    b) Some balls are blue.
    c) No cubes are balls
    d) Some cubes are not blue
42. If all flowers are trees and some trees are evergreen, then which of the following statements must be true?
    a) All evergreen things are trees.
    b) All trees are evergreen.
    c) Some evergreen things are not flowers.
    d) Some flowers are not evergreen.
43. Which city hosted the Shanghai Corporation Organisation (SCO) Film Festival 2023?
    a) Gandhinagar
    b) Mumbai
    c) Mysure
    d) Kochi
44. 'Copernicus Climate Change Service (C3S)' is associated with which association?
    a) ASEAN
    b) G-20
    c) EU
    d) ISA
45. Namda, is the centuries-old traditional craft, is associated with which state/UT?
    a) Arunachal Pradesh
    b) Assam
    c) Jammu and Kashmir
    d) Uttarakhand
46. If all apples are fruits and all fruits are healthy, then which of the following statements must be true?
    a) All healthy things are apples
    b) Some healthy things are not fruits.
    c) No fruits are healthy
    d) All fruits are apples
47. If all cats are black and all black things are tall, then which of the following statements must be true?
    a) Some tall things are not cats.
    b) All tall things are cats
    c) No cats are tall.
    d) All cats are tall.
48. If no books are pens and all pens are pencils, then which of the following statements must be true?
    a) No books are pencils.

b) All pencils are books.

c) Some books are not pencils.

d) Some pencils are not books.

49. When is the 'National Science Day' celebrated every year?

a) February 21

b) February 24

c) February 28

d) March 3

50. 'Satuani and Jur Sital' are the festivals celebrated in which state / UT.

a) West Bengal

b) Bihar

c) Assam

d) Karnataka

51. If all snakes are reptiles, and all reptiles are cold-blooded, then which of the following statements must be true?

a) All cold-blooded things are snakes.

b) No snakes are cold-blooded.

c) All snakes are cold-blooded.

d) All reptiles are snakes.

52. Which block has set up a task force to monitor OpenAI's ChatGPT?

a) SAARC

b) EU

c) ASEAN

d) G-20

53. If all birds can fly, and some birds are blue, then which of the following statements must be true?

a) Some blue things can fly.

b) No blue things can fly.

c) All birds are blue.

d) Some birds can't fly.

54. Which country recently received the 'GSMA Government Leadership Award 2023'?

a) USA

b) China

c) India

d) Japan

55. What is the theme of International Women's Day 2023?

a) DigitALL: Innovation and technology for gender equality

b) Gender and Financial Inclusion

c) Financial Independence of women

d) Representation: Equality of women

56. Galathea Bay National Park is situated in which state / UT?

a) Himachal Pradesh

b) Madhya Pradesh

c) Goa

d) Andaman and Nicobar Islands

57. Mohinattam dance form is most popular in which state?

a) Kerala

b) Karnataka

c) Tamil Nadu

d) Rajasthan

58. The capital city of Vietnam is

a) Hanoi

b) Ho Chi Minh City

c) Ulaanbaatar

d) Vientiane

59. Headquarters of World Meteorological organization is

a) New York

b) Paris

c) Geneva

d) Vienna

60. Every year, International Literacy Day is observed on

a) 08 march

b) 08 September

c) 09 April

d) 10 October

61. Who is the current Managing director and CEO of IMF?

a) Kristalina Georgieva

b) Horst Kohler

c) Christine Lagarde

d) Dominique Strauss Kahn

62. Who is the present Railway Minister of India?

a) Piyush Goyal

b) Ashwini Vaishnaw

c) DV Sadananda Gowda

d) Suresh Prabhu

63. Which is the largest lake in the world?

a) Lake Victoria

b) Caspian Sea

c) Lake Superior

d) Lake Baikal

64. In Lawn Tennis, who won the Argentina Open Title in 2023?

a) Rafael Nadal

b) Cameron Norrie

c) Siome Bolelli

d) Carlos Alcaraz

65. India's first Glass Igloo Restaurant is inaugurated in which state / UT?

a) Himachal Pradesh

b) Sikkim

c) Jammu and Kashmir

d) Arunachal Pradesh

66. In which state in the famous Somnath temple located
    a) Rajasthan
    b) Gujarat
    c) Madhya Pradesh
    d) Maharashtra
67. At which city is the Head office of reserve bank of India located?
    a) Delhi
    b) Mumbai
    c) Chandigarh
    d) Bangalore
68. Who among the following eminent personalities received Padma Vibhushan in the year 2023?
    a) Buddhasaheb Bhattacharjee
    b) Sandhya Mukherjee
    c) EMS Namboodiripad
    d) Zakir Hussain
69. Which article of the Indian Constitution was recently invoked by the Central Government of India to resolve the crises situation in Manipur?
    a) Article 355
    b) Article 356
    c) Article 360
    d) Article 362
70. Which space agency launched the Juice Mission to search for life on Jupiter's moons?
    a) NASA
    b) European Space Agency (ESA)
    c) Russian Space Agency (Roscosmos)
    d) China National Space Administration
71. Who won the gold medal for India in the 2023 Asian Wrestling Championships?
    a) Aman Sherawat
    b) Sushil Kumar
    c) Bajrang Punia
    d) Yogeshwar Dutt
72. The Bandipur National park is located in?
    a) Rajasthan
    b) Andhra Pradesh
    c) Karnataka
    d) Himachal Pradesh
73. 'Sedna' is the name of a_____?
    a) Planet
    b) Asteroid
    c) Satellite
    d) Missile
74. Kilowatt-hour is a unit of _____?
    a) Power
    b) Energy
    c) Time
    d) None of these
75. The paintings of Ajanta depict stories of the _____?
    a) Ramayana
    b) Mahabharta
    c) Jatakas
    d) Panchatantra