VIKRAMADITYA ACADEMY

Sainik School • Military School • RIMC Coaching | Day Boarding & Boarding

Plot No. 11, Wazirpur Road, Palwali, Sector-88, Greater Faridabad

RASHTRIYA INDIAN MILITARY COLLEGE (RIMC), DEHRADUN

ENTRANCE EXAMINATION – PRACTICE SET (DECEMBER PATTERN)

PRACTICE SET 01

#	Subject	Time	Max. Marks	Questions
1	English	2 Hours	125	15
2	General Knowledge	1 Hour	75	75
3	Mathematics	1 Hr 30 Min	200	30

CANDIDATE DETAILS

Name of Candidate: _____ Roll No.: _____

Batch / Class: _____ Date of Test: _____

Marks Obtained: _____ Checked by: _____

GENERAL INSTRUCTIONS

1. This practice set is prepared by Vikramaditya Academy on the pattern and level of the RIMC December entrance papers.
2. Attempt each subject within the time shown above. Use a blue / black ball pen only.
3. English and Mathematics answers are to be written on a separate answer sheet; GK answers are marked on the paper.
4. Use of calculator is not allowed. Read the instructions given at the start of each subject carefully.

VIKRAMADITYA ACADEMY — RIMC ENTRANCE PRACTICE SET : SET 01

SUBJECT : ENGLISH

Time : 2 Hours **Maximum Marks : 125**

Instructions:

1. Read all the questions thoroughly before answering.
2. Write all answers on the separate answer sheet.
3. The question paper comprises three sections.
   (a) Reading Section – 25 Marks
   (b) Writing Section – 50 Marks
   (c) Grammar Section – 50 Marks

SECTION A – READING (25 MARKS)

Q.1 Read the passage and answer the questions that follow. **[15 Marks]**

High in the Himalayas, where the air is thin and the winter temperature falls far below freezing, soldiers of the Indian Army guard the nation's borders throughout the year. Life at such posts is a daily test of endurance. Water has to be made by melting snow, fresh vegetables are a luxury, and a short walk can leave a newcomer gasping for breath. Before being posted to these heights, every soldier spends several days at lower camps so that the body can slowly adjust to the lack of oxygen, a process known as acclimatisation.

The greatest enemy at these heights is often not the adversary across the border but the weather itself. Sudden snowstorms can cut off a post for weeks, and avalanches have claimed many brave lives. Frostbite, which damages fingers and toes, and high-altitude sickness are constant dangers. To survive, soldiers depend on special clothing, careful discipline and, above all, on one another. A soldier who notices that his comrade is becoming confused or drowsy knows that this may be an early sign of illness and immediately alerts the medical team.

Yet those who have served at these posts speak of them with pride rather than complaint. The silence of the mountains, the brilliance of the stars at night and the deep bond formed between men who share hardship leave a lasting mark. Many young officers say that the lessons they learnt there — patience, teamwork and calmness under pressure — have guided them for the rest of their lives. It is this spirit that allows ordinary men to perform extraordinary duties in one of the harshest places on earth.

(a) Mention any three hardships faced by soldiers at high-altitude posts. **[3]**

(b) What is acclimatisation and why is it necessary? **[2]**

(c) Why does the writer call the weather "the greatest enemy"? **[2]**

(d) How do soldiers help one another survive at such heights? **[2]**

(e) What lessons do young officers say they learn at these posts? **[2]**

(f) Give a suitable title to the passage. **[1]**

(g) Find words from the passage which mean: (i) the ability to bear hardship (ii) a person who shares one's work or duties (iii) very bad or severe **[3]**

Q.2 Read the poem and answer the questions that follow. **[10 Marks]**

The Lamp on the Hill

A little lamp upon the hill
Burns on when all the town is still;
It does not ask who sees its light,
It simply shines throughout the night.

The wind may howl, the rain may beat,
The traveller hurry down the street,
But steady in its window-place
It throws a glow on every face.

So let me be, in work and play,
A light for those who lose their way;
Not loud, not proud, but warm and true,
A little lamp the whole night through.

(a) What does the lamp do when the town is asleep? **[1]**
(b) Which line shows that the lamp does not want praise? **[1]**
(c) What difficulties does the lamp face in the second stanza? **[2]**
(d) What does the poet wish to become, and why? **[2]**
(e) Name the figure of speech in "The wind may howl". **[1]**
(f) Pick out two pairs of rhyming words from the poem. **[1]**
(g) What is the central idea of the poem? **[2]**

SECTION B – WRITING (50 MARKS)

Q.3 You are Arjun / Anjali of Class VII, living at 14, Rajpur Road, Dehradun. Write a letter to the Editor of a national daily about the problem of plastic waste on the hill roads of your city, suggesting steps that the administration and the public should take. (150–175 words) **[15 Marks]**

Q.4 Write an article for your school magazine on the topic **"Discipline: The Key to Success"** in about 175 words. **[15 Marks]**

Q.5 Write a paragraph on any **TWO** of the following in about 80 words each: **[2 × 5 = 10]**

(a) Where there is a will, there is a way.
(b) My favourite sport.
(c) A day without electricity.

Q.6 Write a story in about 150 words that begins with: *"The bus had just left the last village when the driver suddenly stopped …"* Give a suitable title to your story. **[10 Marks]**

SECTION C – GRAMMAR (50 MARKS)

Q.7 Rewrite the sentences as directed. **[1 × 10 = 10]**

(a) The boy was too weak to walk. (Remove 'too')
(b) As soon as the bell rang, the students ran out. (Begin with 'No sooner')
(c) The teacher praised the student. (Change into passive voice)

(d) He said to me, "Where do you live?" (Change into indirect speech)
(e) What a beautiful sight it is! (Change into an assertive sentence)
(f) Mumbai is the largest city in India. (Change into comparative degree)
(g) Though he is rich, he is not happy. (Begin with 'In spite of')
(h) Everyone loves a brave soldier. (Change into an interrogative sentence)
(i) She is honest. She is hard-working. (Combine using 'not only … but also')
(j) Unless you work hard, you will fail. (Use 'If')

Q.8 Correct the following sentences. **[1 × 5 = 5]**

(a) Each of the boys have done his homework.
(b) He is senior than me.
(c) I am living in Delhi since 2020.
(d) The news are very good.
(e) She did not knew the answer.

Q.9 Fill in the blanks with suitable prepositions. **[1 × 5 = 5]**

(a) He is fond _____ music.
(b) The cat jumped _____ the wall.
(c) She has been ill _____ Monday.
(d) He was accused _____ theft.
(e) Divide the sweets _____ the two brothers.

Q.10 Fill in the blanks with suitable modals. **[1 × 5 = 5]**

(a) You _____ respect your elders.
(b) _____ I come in, sir?
(c) He _____ swim when he was only five.
(d) Work hard lest you _____ fail.
(e) It _____ rain today; the sky is cloudy.

Q.11 Give the meanings of the following idioms and use any two in sentences. **[5]**

(a) A bolt from the blue
(b) To burn the midnight oil
(c) To turn over a new leaf
(d) Once in a blue moon
(e) To hit the nail on the head

Q.12 Give one word for each of the following. **[1 × 5 = 5]**

(a) One who loves his country
(b) A person who cannot read or write
(c) A place where orphans live
(d) That which cannot be seen
(e) One who walks on foot

Q.13 Choose the synonym of the word in capitals. **[1 × 5 = 5]**

(a) The soldier showed great VALOUR.
(i) fear **(ii)** courage **(iii)** pride **(iv)** anger

(b) The task seemed ARDUOUS.
(i) easy **(ii)** difficult **(iii)** pleasant **(iv)** short

(c) He gave a LUCID explanation.
(i) clear **(ii)** long **(iii)** confusing **(iv)** dull

(d) The weather was INCLEMENT.
(i) pleasant **(ii)** harsh **(iii)** warm **(iv)** calm

(e) She is a DILIGENT student.
(i) lazy **(ii)** clever **(iii)** hard-working **(iv)** proud

Q.14 Choose the antonym of the word in capitals. **[1 × 5 = 5]**

(a) ACQUIT
(i) release **(ii)** convict **(iii)** pardon **(iv)** excuse

(b) TRANSPARENT
(i) clear **(ii)** opaque **(iii)** visible **(iv)** bright

(c) MAGNANIMOUS
(i) generous **(ii)** petty **(iii)** noble **(iv)** large

(d) NOVICE
(i) beginner **(ii)** veteran **(iii)** learner **(iv)** amateur

(e) VIGOROUS
(i) energetic **(ii)** feeble **(iii)** active **(iv)** strong

Q.15 Fill in the blanks with the correct form of the verbs in brackets. **[1 × 5 = 5]**

(a) The sun _____ in the east. (rise)

(b) Look! The children _____ in the rain. (play)

(c) By next June, I _____ this course. (complete)

(d) When I reached the station, the train _____ already. (leave)

(e) If I _____ a bird, I would fly high. (be)

***** ALL THE BEST *****

VIKRAMADITYA ACADEMY — RIMC ENTRANCE PRACTICE SET : SET 01

SUBJECT : GENERAL KNOWLEDGE

Time : 1 Hour **Maximum Marks : 75**

Instructions:

1. There are a total of 75 questions and each question carries one mark. There is no negative marking for a wrong answer.
2. Overwriting or dual answers shall not fetch any marks.
3. All questions are to be answered on the question paper only. Tick (✓) the correct option.

TICK (✓) THE CORRECT ANSWER

Q.1 In which year was the Rashtriya Indian Military College (RIMC), Dehradun founded?

(a) 1947 **(b)** 1922 **(c)** 1932 **(d)** 1919

Q.2 Who inaugurated the Prince of Wales Royal Indian Military College (now RIMC) in 1922?

(a) Edward, Prince of Wales **(c)** King George V
(b) Lord Curzon **(d)** Lord Mountbatten

Q.3 Who is known as the 'Father of the Indian Constitution'?

(a) Rajendra Prasad **(b)** Jawaharlal Nehru **(c)** Sardar Patel **(d)** B R Ambedkar

Q.4 The Fundamental Rights in the Indian Constitution are given in which Part?

(a) Part V **(b)** Part III **(c)** Part II **(d)** Part IV

Q.5 Which is the largest state of India by area?

(a) Rajasthan **(b)** Madhya Pradesh **(c)** Uttar Pradesh **(d)** Maharashtra

Q.6 The Tropic of Cancer does NOT pass through which of these states?

(a) Tripura **(b)** Odisha **(c)** Gujarat **(d)** Jharkhand

Q.7 Which river is known as the 'Sorrow of Bihar'?

(a) Kosi **(b)** Gandak **(c)** Damodar **(d)** Son

Q.8 The highest peak in India is:

(a) Kamet **(c)** K2 (Godwin Austen)
(b) Nanda Devi **(d)** Kanchenjunga

Q.9 Which planet is known as the 'Morning Star'?

(a) Mercury **(b)** Jupiter **(c)** Venus **(d)** Mars

Q.10 Consider the following statements:

1. Nitrogen makes up about 78% of the Earth's atmosphere.
2. Argon is the third most abundant gas in the atmosphere.

Which of the statements given above is/are correct?

(a) 1 only **(b)** 2 only **(c)** Both 1 and 2 **(d)** Neither 1 nor 2

Q.11 The battle of Plassey was fought in the year:

(a) 1761 **(b)** 1764 **(c)** 1857 **(d)** 1757

Q.12 Who founded the Maurya dynasty?

(a) Bindusara
(b) Ashoka
(c) Chandragupta Maurya
(d) Bimbisara

Q.13 The Dandi March of Mahatma Gandhi was started in:

(a) 1942 **(b)** 1919 **(c)** 1930 **(d)** 1920

Q.14 Who gave the slogan 'Do or Die'?

(a) Subhas Chandra Bose
(b) Bhagat Singh
(c) Mahatma Gandhi
(d) Bal Gangadhar Tilak

Q.15 The 'Param Vir Chakra' is awarded for gallantry:

(a) In peace time
(b) In the face of the enemy
(c) For civil service
(d) For sports

Q.16 Who was the first recipient of the Param Vir Chakra?

(a) Capt Vikram Batra
(b) Maj Shaitan Singh
(c) Maj Somnath Sharma
(d) Lt Arun Khetarpal

Q.17 INS Vikrant is India's first indigenously built:

(a) Frigate **(b)** Submarine **(c)** Destroyer **(d)** Aircraft carrier

Q.18 The headquarters of the Indian Military Academy (IMA) is at:

(a) Dehradun **(b)** Chennai **(c)** Pune **(d)** Mhow

Q.19 The National Defence Academy (NDA) is located at:

(a) Khadakwasla **(b)** Ezhimala **(c)** Dehradun **(d)** Hyderabad

Q.20 Which vitamin is produced in our skin in the presence of sunlight?

(a) Vitamin C **(b)** Vitamin D **(c)** Vitamin A **(d)** Vitamin B12

Q.21 Deficiency of iodine in the diet causes:

(a) Night blindness **(b)** Scurvy **(c)** Goitre **(d)** Rickets

Q.22 The unit of electric resistance is:

(a) Ampere **(b)** Watt **(c)** Ohm **(d)** Volt

Q.23 Which part of the plant conducts water from roots to leaves?

(a) Stomata **(b)** Cambium **(c)** Phloem **(d)** Xylem

Q.24 Which is the longest part of the human alimentary canal?

(a) Stomach **(b)** Large intestine **(c)** Oesophagus **(d)** Small intestine

Q.25 Which metal is kept under kerosene because it reacts vigorously with air and water?

(a) Sodium **(b)** Aluminium **(c)** Copper **(d)** Iron

Q.26 The audible range of frequencies for human beings is about:

(a) 2 Hz to 200 Hz
(b) 200 Hz to 2 lakh Hz
(c) 20 Hz to 20,000 Hz
(d) 0 Hz to 20 Hz

Q.27 Who invented dynamite?
(a) Thomas Edison **(b)** Michael Faraday **(c)** Alfred Nobel **(d)** James Watt

Q.28 'Gitanjali' was written by:
(a) Sarojini Naidu
(b) Rabindranath Tagore
(c) Bankim Chandra Chatterjee
(d) Premchand

Q.29 'Wings of Fire' is the autobiography of:
(a) A P J Abdul Kalam
(b) Vikram Sarabhai
(c) C V Raman
(d) Homi Bhabha

Q.30 Who designed the Param Vir Chakra medal?
(a) Amrita Sher-Gil
(b) Savitri Khanolkar
(c) Pingali Venkayya
(d) Nandalal Bose

Q.31 Which is regarded as the oldest regiment of the Indian Army?
(a) Punjab Regiment **(b)** Grenadiers **(c)** Rajputana Rifles **(d)** Madras Regiment

Q.32 The Durand Cup is associated with:
(a) Football **(b)** Golf **(c)** Cricket **(d)** Hockey

Q.33 Which Indian won the World Chess Championship title in December 2024, becoming the youngest ever world champion?
(a) Viswanathan Anand
(b) Arjun Erigaisi
(c) D Gukesh
(d) R Praggnanandhaa

Q.34 How many medals did India win at the Paris Olympics 2024?
(a) 4 **(b)** 7 **(c)** 5 **(d)** 6

Q.35 Which country won the ICC Men's T20 World Cup 2024?
(a) South Africa **(b)** Australia **(c)** England **(d)** India

Q.36 International Yoga Day is observed on:
(a) 14 November **(b)** 5 June **(c)** 2 October **(d)** 21 June

Q.37 Army Day in India is celebrated on:
(a) 8 October **(b)** 26 January **(c)** 15 January **(d)** 4 December

Q.38 Match the following operations with their context:
A. Operation Pawan — 1. Indian Peace Keeping Force in Sri Lanka
B. Operation Rakshak — 2. Counter-insurgency in Punjab and J&K
C. Operation Parakram — 3. Mobilisation after the 2001 Parliament attack
(a) A-1, B-2, C-3 **(b)** A-2, B-1, C-3 **(c)** A-1, B-3, C-2 **(d)** A-3, B-2, C-1

Q.39 The 'Dirham' is the currency of:
(a) Iran
(b) Saudi Arabia
(c) United Arab Emirates
(d) Kuwait

Q.40 Consider the following statements:

1. The Pacific is the largest ocean.
2. The Arctic is the smallest ocean.

Which of the statements given above is/are correct?

(a) 1 only **(b)** 2 only **(c)** Both 1 and 2 **(d)** Neither 1 nor 2

Q.41 The 'Land of the Midnight Sun' is:

(a) Japan **(b)** Norway **(c)** Finland **(d)** Canada

Q.42 The Suez Canal connects:

(a) Atlantic and Pacific Oceans **(c)** Black Sea and Caspian Sea
(b) Arabian Sea and Red Sea **(d)** Red Sea and Mediterranean Sea

Q.43 Which Indian state is known as the 'Spice Garden of India'?

(a) Karnataka **(b)** Goa **(c)** Assam **(d)** Kerala

Q.44 The capital of Arunachal Pradesh is:

(a) Dispur **(b)** Kohima **(c)** Itanagar **(d)** Aizawl

Q.45 The Sundarbans are famous for:

(a) Lions **(c)** One-horned rhinoceros
(b) Royal Bengal tigers **(d)** Wild asses

Q.46 Who is the Supreme Commander of the Indian Armed Forces?

(a) Prime Minister **(c)** President of India
(b) Chief of Defence Staff **(d)** Defence Minister

Q.47 The minimum age to become the President of India is:

(a) 40 years **(b)** 25 years **(c)** 35 years **(d)** 30 years

Q.48 The Rajya Sabha is a _____ house.

(a) Permanent **(b)** Lower **(c)** Dissolvable **(d)** Temporary

Q.49 Which organ of the human body produces insulin?

(a) Liver **(b)** Pancreas **(c)** Stomach **(d)** Kidney

Q.50 The largest bone in the human body is:

(a) Humerus **(b)** Spine **(c)** Tibia **(d)** Femur

Q.51 Which blood group is called the universal donor?

(a) A **(b)** B **(c)** AB **(d)** O negative

Q.52 Which continent has no permanent human population?

(a) South America **(b)** Antarctica **(c)** Australia **(d)** Europe

Q.53 Tenzing Norgay first climbed Mount Everest in 1953 along with:

(a) Reinhold Messner **(b)** Edmund Hillary **(c)** George Mallory **(d)** John Hunt

Q.54 'Satyamev Jayate' is taken from:
(a) Bhagavad Gita **(c)** Ramayana
(b) Rigveda **(d)** Mundaka Upanishad

Q.55 Who composed the National Anthem of India?
(a) Rabindranath Tagore **(c)** Sarojini Naidu
(b) Muhammad Iqbal **(d)** Bankim Chandra Chatterjee

Q.56 The Iron Pillar near Qutub Minar is famous because it:
(a) Does not rust **(c)** Was built by Akbar
(b) Is the tallest pillar **(d)** Is made of gold

Q.57 Who built the Red Fort in Delhi?
(a) Akbar **(b)** Shah Jahan **(c)** Jahangir **(d)** Aurangzeb

Q.58 The first Battle of Panipat was fought between:
(a) Babur and Rana Sanga **(c)** Akbar and Hemu
(b) Marathas and Abdali **(d)** Babur and Ibrahim Lodi

Q.59 Which operation did the Indian Armed Forces launch in May 2025 against terror camps in Pakistan and PoK?
(a) Operation Vijay **(c)** Operation Sindoor
(b) Operation Kaveri **(d)** Operation Meghdoot

Q.60 Which Indian Air Force officer travelled to the International Space Station on the Axiom-4 mission in 2025?
(a) Angad Pratap **(c)** Prasanth Nair
(b) Rakesh Sharma **(d)** Shubhanshu Shukla

Q.61 In a certain code, 'LION' is written as 'MKRR'. How is 'BEAR' written in that code?
(a) CGDV **(b)** DGDV **(c)** CFDV **(d)** CGEV

Q.62 Find the next number: 2, 6, 12, 20, 30, ?
(a) 40 **(b)** 36 **(c)** 44 **(d)** 42

Q.63 Ravi walks 5 km north, turns right and walks 3 km, then turns right and walks 5 km. In which direction is he from the starting point?
(a) North **(b)** West **(c)** East **(d)** South

Q.64 Pointing to a boy, Meena says, "He is the son of my father's only son." How is the boy related to Meena?
(a) Cousin **(b)** Son **(c)** Nephew **(d)** Brother

Q.65 Find the odd one out (celestial bodies):
(a) Mars **(b)** Moon **(c)** Mercury **(d)** Venus

Q.66 Cricket : Pitch :: Boxing : ?
(a) Glove **(b)** Court **(c)** Ring **(d)** Arena

Q.67 How many diagonals does a hexagon have?
(a) 6 **(b)** 8 **(c)** 12 **(d)** 9

Q.68 Which of the following is NOT a Central Armed Police Force?
(a) Territorial Army **(b)** ITBP **(c)** CISF **(d)** SSB

Q.69 Which device converts electrical energy into mechanical energy?
(a) Generator **(b)** Battery **(c)** Transformer **(d)** Electric motor

Q.70 1 gigabyte (GB) is equal to:
(a) 1024 kilobytes **(b)** 1024 megabytes **(c)** 1000 kilobytes **(d)** 100 megabytes

Q.71 Kaziranga National Park is in:
(a) West Bengal **(b)** Madhya Pradesh **(c)** Uttarakhand **(d)** Assam

Q.72 Lake Wular is located in:
(a) Jammu & Kashmir **(c)** Sikkim
(b) Uttarakhand **(d)** Himachal Pradesh

Q.73 The Khajuraho temples are in which state?
(a) Odisha **(b)** Rajasthan **(c)** Madhya Pradesh **(d)** Karnataka

Q.74 The Nobel Prize was first awarded in:
(a) 1895 **(b)** 1901 **(c)** 1920 **(d)** 1910

Q.75 Who was the first Indian woman to win an Olympic medal?
(a) Karnam Malleswari **(c)** P T Usha
(b) Saina Nehwal **(d)** Mary Kom

***** ALL THE BEST *****

VIKRAMADITYA ACADEMY — RIMC ENTRANCE PRACTICE SET : SET 01

SUBJECT : MATHEMATICS

Time : 1 Hr 30 Mins **Maximum Marks : 200**

Instructions:

1. **Attempt all 30 questions.** Write your answers on the separate answer sheet.
2. **Part 'A'** contains 20 questions of **5 marks** each. **Part 'B'** contains 10 questions of **10 marks** each.
3. Use of **calculator is prohibited.** Marks will be awarded for steps.
4. Take the value of π as 22/7 wherever required.

PART A (20 × 5 = 100 MARKS)

Q.1 Factorise: $6x^2 + 17x - 14$

Q.2 A shopkeeper marks his goods 20% above the cost price and allows a discount of 12%. Find his gain or loss percent.

Q.3 If $x - \frac{1}{x} = 7$, find the value of $x^3 - \frac{1}{x^3}$.

Q.4 Express $0.\overline{35}$ in the form p/q and simplify. Hence find $0.\overline{35} + 0.\overline{3}$.

Q.5 A card is drawn at random from cards numbered 1 to 40. Find the probability that the number on the card is a multiple of 3.

Q.6 A can do a piece of work in 18 days and B can do it in 24 days. They work together for 2 days and then B leaves. In how many days will A finish the remaining work?

Q.7 A car travels from P to Q, a distance of 120 km, at 36 km/h and returns from Q to P at 54 km/h. Find its average speed for the whole journey.

Q.8 A dealer allows three successive discounts of 30%, 20% and 15% on an article marked at Rs 8,000. Find the selling price and the single discount equivalent to these three discounts.

Q.9 Find the compound interest on Rs 8,000 for 1 year at 10% per annum, interest being compounded half-yearly.

Q.10 A boy walking at 4 km/h reaches his school 15 minutes late. If he walks at 5 km/h, he reaches 5 minutes early. Find the distance of his school from his house.

Q.11 A train running at 45 km/h crosses a pole in 20 seconds. How long will it take to cross a platform 250 m long?

Q.12 Find the angle between the hour hand and the minute hand of a clock at 2:15.

Q.13 A wire is bent into the shape of a square of side 33 cm. If the same wire is re-bent into a circle, find the area of the circle. (π = 22/7)

Q.14 Find x if $5^{x+5} - 5^x = 15620$.

Q.15 The present ages of Anil and Bimal are in the ratio 2 : 3. After 6 years, the ratio of their ages will be 3 : 4. Find their present ages.

Q.16 In what ratio must rice at Rs 30 per kg be mixed with rice at Rs 40 per kg so that by selling the mixture at Rs 45 per kg, a profit of 25% is made?

Q.17 Solve for x: $\frac{2x + 2}{2} - \frac{x - 3}{2} = 7\ 1/2$

Q.18 Two trains of lengths 150 m and 200 m are running in the same direction on parallel tracks at 90 km/h and 72 km/h respectively. In how much time will they cross each other completely?

Q.19 At what price must an article costing Rs 1,200 be marked so that after allowing a discount of 10%, a profit of 12% is made?

Q.20 If $x - \frac{1}{x} = 7$, find the value of $x^2 + \frac{1}{x^2}$.

PART B (10 × 10 = 100 MARKS)

Q.21 A copper sphere of radius 9 cm is drawn into a wire of radius 2 mm. Find the length of the wire in metres.

Q.22 A solid metallic sphere of radius 6 cm is melted and recast into small cones, each of base radius 3 cm and height 4 cm. How many cones are formed?

Q.23 The difference between the compound interest and the simple interest on a sum for 3 years at 5% per annum is Rs 76.25. Find the sum and the compound interest.

Q.24 What must be subtracted from $(2x^4 + 17x^3 + 30x^2 - 21x - 1)$ so that the result is exactly divisible by $(x^2 + 4x - 1)$?

Q.25 The sum of the digits of a two-digit number is 15. The number obtained by interchanging the digits exceeds the given number by 27. Find the number.

Q.26 A machine is bought for Rs 50,000. Its value depreciates by 5% in the first year and 10% in the second year. Find its value after 2 years and the total depreciation.

Q.27 If 1 is added to the numerator and 2 to the denominator of a fraction, it becomes 2/5. If 1 is subtracted from both the numerator and the denominator, it becomes 1/3. Find the fraction.

Q.28 A starts a business with Rs 8,000. After 3 months B joins with Rs 12,000, and after 6 months from the start C joins with Rs 16,000. At the end of the year the profit is Rs 10,000. Find the share of each.

Q.29 A contractor undertook to build a road in 240 days and employed 80 men. After 80 days he found that only 1/4 of the work was done. How many more men must he employ to finish the work on time?

Q.30 The difference between the compound interest and simple interest on a certain sum for 2 years at 5% per annum is Rs 50. Find the sum. Also find the compound interest.

***** ALL THE BEST *****