



RGP – RANKERS GENIUS PROGRAM

(Phase - 02)

(SCIENCE, MATH, MAT)

Set

A

Time: 1 Hour

Moving to 10th

Marks: 120

1. General Instructions:

(Paper Code: 1001)

- * This test paper consists of 60 questions in 3 sections (A, B, C)

Marking Scheme:

- Full marks: + 2 if answered correctly.
- Zero marks: 0 if not attempted or incorrect.

2. RGP College Grant Criteria:

- ✓ Students must score a minimum of 70% positive marks in RGP.
- ✓ Student must get under AIR 5,000 in JEE/NEET Examination.

3. Cash Reward Criteria:

- ✓ Exciting Cash Rewards for RGP Toppers

SENIOR WING (Student's Moving to Class XI th , XII th , Dropper JEE /NEET)	JUNIOR WING (Student's Moving to Class IX th & X th)
Overall 1 st Topper	Overall 1 st Topper
₹ 21,000/-	₹ 5,100/-
Overall 2 nd Topper	Overall 2 nd Topper
₹ 11,000/-	₹ 3,100/-
Overall 3 rd Topper	Overall 3 rd Topper
₹ 5,100/-	₹ 2,100/-
Overall 4 th – 8 th Topper	Overall 4 th – 8 th Topper
₹ 2,100/-	₹ 1,100/-
Overall 9 th – 15 th Topper	Overall 9 th – 15 th Topper
₹ 1,100/-	₹ 500/-

- ✓ Candidate who got 1st Rank in junior or senior wing in RGP (Phase – 01) will not be eligible for any cash Reward in RGP (Phase – 02).

** Rankings from 1 to 20 are determined based on the specific criteria outlined in the FAQ section of our website, www.myrankers.com.

4. Scholarship Criteria in Rankers Offline Classroom Program:

- ✓ 100% Fee Waiver – Student Scoring 90% and Above
- ✓ 80% Fee Waiver – Student Scoring 85% to 89.999%
- ✓ 60% Fee Waiver – Student Scoring 75% to 84.999%
- ✓ 50% Fee Waiver – Student Scoring 70% to 74.999%
- ✓ 40% Fee Waiver – Student Scoring 60% to 69.999%
- ✓ 20% Fee Waiver – Student Scoring 40 % to 59.999%
- ✓ 10% Fee Waiver – Student Scoring 30% to 39.999%
- ✓ 5% Fee Waiver – All the Aspirants Appearing in RGP

RGP RESULT & REWARD CEREMONY

Result Date: 26th March 2025

Check Your Result at: www.myrankers.com

Reward Ceremony Date: 27th March 2025

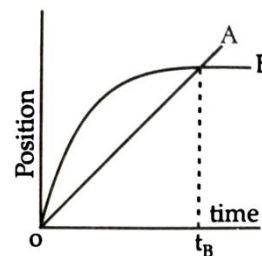
Student's Name: -

SCIENCE (SECTION – A)

- Two extremes ends of a moving train (engine and guard coach) pass a pole with speeds U and V respectively with a constant acceleration. The speed with which the middle point of the train will pass the same pole is
 (A) $\frac{U+V}{2}$ (B) $\frac{V^2+U^2}{2}$ (C) $\frac{UV}{2}$ (D) $\sqrt{\frac{U^2+V^2}{2}}$
- An athlete completes one round of circular track of radius r in 30 s with uniform speed. The ratio of distance to the displacement travelled by the athlete at the end of 45 s is
 (A) $2r$ (B) $\frac{2}{3}r$ (C) $\frac{3}{2}\pi$ (D) 2π
- A source produces sound waves under water. Waves travel through water and then into air. Which of the following statements about the frequency (f) and wavelength (λ) is correct as sound passed from water to air?
 (A) f remains unchanged but λ decreases
 (B) f remains unchanged but λ increases
 (C) λ remains unchanged but f decreases
 (D) λ remains unchanged but f increases
- A ball is shot vertically upward with a given initial velocity. It reaches a maximum height of 100 m. If one second shot, the initial velocity is doubled then the ball will reach a maximum height of
 (A) 70.7 m (B) 141.4 m (C) 200 m (D) 400 m
- Two bodies of mass m and $3m$, moving with velocities $3v$ and v respectively along same direction, collide with each other. After collision they stick together and move with a velocity V in the same direction.
 (A) $V = v$ (B) $V = \frac{3}{2}v$ (C) $V = 2v$ (D) $V = \frac{4}{3}v$

----- Rough Work -----

6. A box of mass 20 kg is pushed along a rough floor with a velocity 2 m/s and then let go. The box moves 5 m on the floor before coming to rest. What must be the frictional force acting on the box? (take $g = 10 \text{ ms}^{-2}$)
 (A) 4 N (B) 2 N (C) 20 N (D) 8 N
7. A force of 10 N is applied on an object of mass 1 kg for 2 s, which was initially at rest. What is the work done on the object by the force?
 (A) 200 J (B) 20 J (C) 16 J (D) 180 J
8. If both the mass and the radius of the earth decrease by 1%, the value of the acceleration due to gravity will
 (A) decrease by 1% (B) increase by 1% (C) increase by 2% (D) remain unchanged
9. The speeds of sound in air and sea-water are given to be 340 m/s and 1440 m/s. respectively. A ship sends a strong signal straight down and detects its echo after 1.5 secs. The depth of the sea at that point is
 (A) 2.16 kms (B) 1.08 kms (C) 0.51 kms (D) 0.255 kms
10. A graph shows position as a function of time for two trains A and B running on parallel tracks. For times greater than $t = 0$, which of the following statement is true?
 (A) At time t_B , both trains have the same velocity.
 (B) Both trains speed up all the time.
 (C) Both trains may have the same velocity at some time earlier than t_B .
 (D) Graph indicates that both trains have the same acceleration at a given time.



----- Rough Work -----

11. A drop each of two non-corrosive and non-irritating liquids A and B at a temperature of 22°C are placed on the skin. Liquid A gives a more cooling sensation than liquid B. Which of the following can be said about the liquids A and B?
- (A) Liquid A has higher boiling point than that of liquid B.
(B) Liquid A has higher latent heat of vaporisation than that of liquid B.
(C) Liquid A has lower latent heat of vaporisation than that of liquid B.
(D) The boiling points of liquid A and B are equal.
12. Gram molecular mass of calcium phosphate is:
- (A) 330 g (B) 280 g (C) 310 g (D) 300 g
13. The body temperature of a Camel is 113°F . Its temperature in Kelvin Scale is
- (A) 31 K (B) 318 K (C) 321 K (D) 324 K
14. The properties of elements with 4, 5, 6 or 7 valence electrons is:
- (A) metallic (B) non-metallic (C) acidic (D) alkaline
15. Structures of nuclei of three atoms A, B and C are given below:
A has 90 protons and 146 neutrons
B has 92 protons and 146 neutrons
C has 90 protons and 148 neutrons
Based on the above data, which of these atoms are isotopes and which are isobars?
- (A) A and C are isotopes; B and C are isobars
(B) A and B are isotopes; A and C are isobars
(C) B and C are isobars; A and B are isotopes
(D) A and C are isotopes; A and B are isobars

----- *Rough Work* -----

16. Which of the following will have equal number of electrons?
 (A) Cl^- and Br^- (B) Na^+ and Mg^{2+}
 (C) Ar and Ne (D) Mg^{2+} and Ca^{2+}
17. The electronic configuration of an ion M^{2+} is 2, 8, 14. If its mass is 56, the number of neutrons in its nucleus is:
 (A) 30 (B) 32 (C) 34 (D) 42
18. How many sub-atomic particles are present in an α -particle used in Rutherford's scattering experiment?
- | | No. of protons | No. of Neutrons | No. of Electrons |
|-----|----------------|-----------------|------------------|
| (A) | 4 | 0 | 0 |
| (B) | 2 | 0 | 2 |
| (C) | 2 | 2 | 0 |
| (D) | 2 | 2 | 1 |
19. What are the electronic configuration of Na^+ and Cl^- ions?
 (A) $\text{Na}^+ = 2, 8, 1$ and $\text{Cl}^- = 2, 8, 7$ (B) $\text{Na}^+ = 2, 8$, and $\text{Cl}^- = 2, 8, 8$
 (C) $\text{Na}^+ = 2, 8, 2$ and $\text{Cl}^- = 2, 8, 6$ (D) $\text{Na}^+ = 2, 8$, and $\text{Cl}^- = 2, 8, 7$
20. What is the symbol of the element tungsten?
 (A) Ta (B) Tc (C) W (D) V
21. Natural insecticide extracted from chrysanthemum is
 (A) Rotenone (B) Pyrethrum (C) Thurioside (D) Nicotine
22. The most abundant protein of the plant world is
 (A) Chlorophyll (B) Rubisco (C) ATP (D) NADPH
23. The term silver revolution is connected to
 (A) Jute (B) Milk (C) Eggs (D) Petroleum

----- Rough Work -----

24. When a cell is fully turgid which of the following will be zero?
(A) Turgor pressure (B) Water potential
(C) Wall pressure (D) Osmotic pressure
25. Which one is a feature of Gram-positive bacteria
(A) Retain blue colour with Gram stain
(B) Do not retain blue colour with Gram stain
(C) Mesosomes are less prominent
(D) Mesosomes are absent
26. Detoxification of drugs and toxic substances occur in
(A) Lysosome (B) Ribosome
(C) Golgi body (D) Endoplasmic reticulum
27. The name "protoplasm" was coined by
(A) Robert Brown (B) Robert Hooke
(C) Antonie Van Leeuwenhoek (D) Purkinje
28. Jaya and Ratna are varieties of
(A) Maize (B) Rice (C) Wheat (D) Bajra
29. A substance produced in liver which prevents the freezing of blood is called
(A) Ptylin (B) Heparin (C) Trypsin (D) Bile juice
30. Which of the following carry hereditary characters to the offspring in the organism?
(A) Gene (B) Chromosome (C) DNA (D) RNA

----- *Rough Work* -----

MATH (SECTION – B)

31. If $x = \frac{\sqrt{3}+1}{2}$, then $x^3 + \frac{1}{x^3} =$

(A) $\frac{28\sqrt{3}+15}{8}$

(B) $\frac{27\sqrt{3}-35}{4}$

(C) $\frac{28\sqrt{3}-15}{8}$

(D) $\frac{27\sqrt{3}+35}{4}$

32. Match the following:

List-I

(P) If $x = \frac{\sqrt{7}}{5}$ and $\frac{5}{x} = p\sqrt{7}$, then $p =$

(Q) If $x = \sqrt{5} - 2$, then $\left(x^2 + \frac{1}{x^2}\right) =$

(R) If $5^{x-3} \cdot 3^{2x-8} = 455625$, then $x =$

(S) If $2^x = 3^y = 6^{-z}$, then $1/x + 1/y + 1/z =$

(A) P-1, Q-2, R-3, S-4

(C) P-3, Q-2, R-4, S-1

List-II

(1) 7

(2) 0

(3) 18

(4) 25/7

(B) P-4, Q-3, R-1, S-2

(D) P-4, Q-3, R-2, S-1

33. Following are the steps involved in finding the value of $a^4 + \frac{1}{a^4}$, when $a + \frac{1}{a} = 1$.

Arrange them in sequential order from the first to the last.

(A) $a^2 + \frac{1}{a^2} + 2 = 1 \Rightarrow a^2 + \frac{1}{a^2} = -1$

(B) $(a^2)^2 + \left(\frac{1}{a^2}\right)^2 + 2 = 1$

(C) $\left(a + \frac{1}{a}\right)^2 = 1^2$

(D) $\left(a^2 + \frac{1}{a^2}\right)^2 = (-1)^2$

(E) $a^4 + \frac{1}{a^4} = -1$

(A) CADBE

(B) CDBAE

(C) CBADE

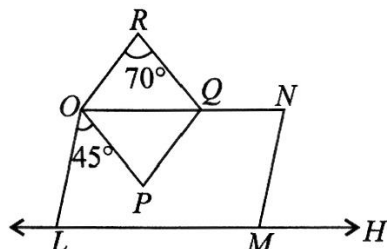
(D) CEDAB

----- Rough Work -----

34. The point $(2, 3)$ lies on the graph of the linear equation $3x - (a - 1)y = 2a - 1$. If the same point also lies on the graph of the linear equation $5x + (1 - 2a)y = 3b$, then find the value of b .

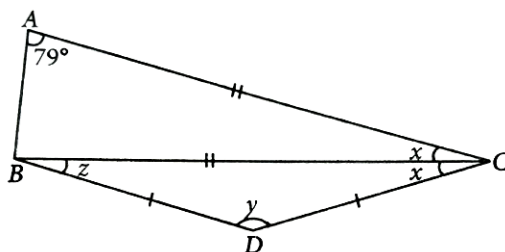
(A) $\frac{1}{3}$ (B) $\frac{1}{5}$ (C) $\frac{1}{7}$ (D) $\frac{2}{3}$

35. In the given figure (not drawn to scale), LMNO is a parallelogram and OPQR is a rhombus. Find $\angle NMH$ given that LMH is a straight line.



(A) 80° (B) 60° (C) 70° (D) 50°

36. In the given figure, $\angle BAC = 79^\circ$, $CA = CB$ and $BD = CD$. Find the measures of $\angle x$, $\angle y$ and $\angle z$.

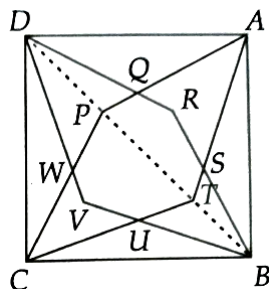


(A) $80^\circ, 132^\circ, 26^\circ$ (B) $48^\circ, 96^\circ, 48^\circ$
 (C) $132^\circ, 48^\circ, 26^\circ$ (D) None of these

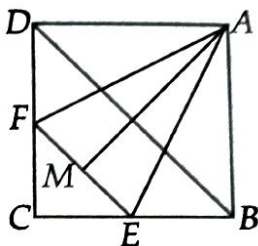
----- Rough Work -----

37. O is a point in the interior of a square ABCD such that $\triangle OAB$ is an equilateral triangle. Then, $\triangle COD$ is a/an
 (A) scalene triangle (B) isosceles triangle
 (C) equilateral triangle (D) right triangle

38. The figure below is made up of a square ABCD and two rhombuses, ATCP and DRBV. Given that $\angle BVD = 135^\circ$ and $AT = BR$, then find $\angle PCT$ and $\angle ABD$ respectively.

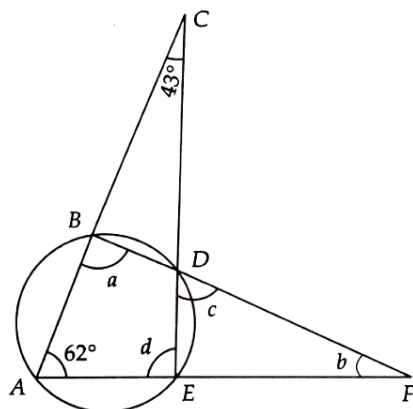


- (A) 135° , 135° (B) 135° , 45° (C) 45° , 135° (D) 45° , 45°
39. In the given figure, if ABCD is a square and EF is parallel to diagonal BD and $EM = FM$, then which of the following is correct?
 (i) $DF = BE$
 (ii) AM bisects $\angle BAD$
 (A) Only (i)
 (B) Only (ii)
 (C) Both (i) and (ii)
 (D) Neither (i) nor (ii)



----- Rough Work -----

40. In the given figure, find $\angle BCD = 43^\circ$ and $\angle BAE = 62^\circ$, then the values of a, b, c and d respectively are



- (A) $105^\circ, 13^\circ, 62^\circ, 75^\circ$ (B) $100^\circ, 10^\circ, 60^\circ, 75^\circ$
 (C) $105^\circ, 13^\circ, 60^\circ, 80^\circ$ (D) $105^\circ, 15^\circ, 62^\circ, 75^\circ$
41. If PQL and PRM are the tangents at the points Q and R respectively to a circle with centre O and S is a point on the circle such that $\angle SQL = 50^\circ$ and $\angle SRM = 60^\circ$. Then, $\angle QSR =$
 (A) 40° (B) 50° (C) 60° (D) 70°
42. The length, breadth and height of a cuboid are 20 m, 24 m and 12 m, respectively. The dimensions of length, breadth and height are increased by 15%, 25% and 50%, respectively. What is the ratio between the volume of the original cuboid and the new cuboid?
 (A) 32 : 69 (B) 40 : 69 (C) 35 : 69 (D) 32 : 70

----- Rough Work -----

43. If the area of the three adjacent faces of a cuboid are x , y and z respectively, then the volume of the cuboid is

- (A) \sqrt{xyz} (B) $x + y + z$ (C) x^2yz (D) $xy + z$

44. If \bar{x} is the mean of x_1, x_2, \dots, x_n , then for $a \neq 0$, the mean of $ax_1, ax_2, \dots, ax_n, \frac{x_1}{a}, \frac{x_2}{a}, \dots, \frac{x_n}{a}$ is

- (A) $\left(a + \frac{1}{a}\right)\bar{x}$ (B) $\left(a + \frac{1}{a}\right)\frac{\bar{x}}{2}$ (C) $\left(a + \frac{1}{a}\right)\frac{\bar{x}}{n}$ (D) $\frac{\left(a + \frac{1}{a}\right)\bar{x}}{2n}$

45. Fill in the blanks.

(P) Any point lying on x -axis is of the form ____.

(Q) The abscissa of a point on y -axis is ____.

(R) The point at which the two coordinate axes meet is called the ____.

(S) The perpendicular distance of the point (4, 5) from x -axis is ____.

(T) The perpendicular distance of the point (3, 7) from y -axis is ____.

	(P)	(Q)	(R)	(S)	(T)
(A)	(0, y)	1	origin	5	3
(B)	(x , 0)	0	origin	5	3
(C)	(x , 0)	0	origin	4	7
(D)	(0, y)	1	origin	4	7

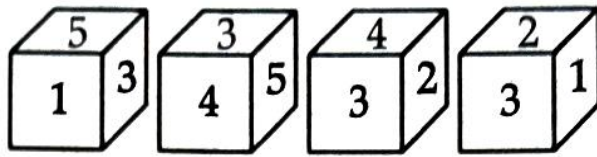
----- Rough Work -----

MAT (SECTION – C)

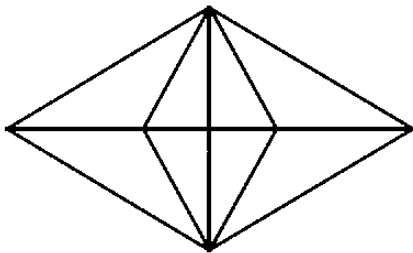
46. In a code language 'TIGER' is written as 'RIGET'. How 'CROWN' will be written in the same code?
(A) NRWCO (B) NROWC (C) ROWRC (D) NOWCR
47. Find the next term in the following series
APZLT, CQYNR, ERXPP, GSWRN, ITVTL.
(A) KUUVJ (B) KVUUJ (C) JUVUR (D) KVUVJ
48. In the following series of numbers, find out how many times 1, 3 and 7 have appeared together, 7 being in the middle and 1 and 3 either side of 7
2973173771331738571377173906
(A) 3 times (B) 4 times (C) 2 times (D) 5 times
49. If 25th December of 2008 was Thursday, what will be the day on 1st January of 2010?
(A) Friday (B) Monday (C) Wednesday (D) Sunday
50. Six faces of a cube are coloured black, brown, green, red, white and blue, such that Red is at the bottom, Brown is adjacent to Black, Black is adjacent to white, Red is opposite to Blue, Green is between Red & Blue. Which colour is opposite to Brown?
(A) Blue (B) Black (C) White (D) Green

----- *Rough Work* -----

Directions (Questions 51-52): Observe the die given below and answer:



51. Which number is opposite to 4
 (A) 1 (B) 2 (C) 3 (D) 5
52. What is the sum of numbers on two faces when one number is 5 & the other is on its opposite face?
 (A) 5 (B) 9 (C) 7 (D) 6
53. Five persons namely P, Q, R, S & T are enjoying picnic sitting in the park. P is mother of R who is wife of T. S is brother of P and Q is the husband of P. How is R related to Q?
 (A) Daughter (B) Daughter in Law
 (C) Son (D) Sister
54. What is the number of triangles in the figure given below:



- (A) 22 (B) 24 (C) 16 (D) 18

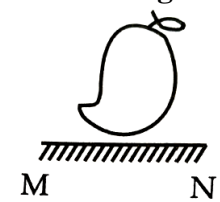
----- *Rough Work* -----

55. Read the following information carefully and answer the questions given below it:
Six students A, B, C, D, E & F are sitting in a closed circle facing the teacher standing at the centre. E is to the left of the D, C is between A & B. F is between E and A. Who is to the right of C?
(A) A (B) B (C) C (D) D
56. During a military training Ashu is seventh from the left and Puru is twelfth from the right in a row. If they interchange their positions, Ashu becomes twenty second from the left. How many candidates are there in the row?
(A) 31 (B) 32 (C) 33 (D) 49
57. A man walked 30 m towards south. Then, turned to his right and walked 30 m. He again turned to his left and walked 20 m. At last he turned to his left and walked 30 m. How far is he from his starting point?
(A) 20 m (B) 80 m (C) 50 m (D) 60 m
58. Dinesh entered the conference room ten minutes before 12 : 30 hours for meeting. He came 20 minutes before Naresh who was 30 minutes late. At what time, the meeting was scheduled?
(A) 12 : 10 (B) 12 : 20 (C) 12 : 40 (D) 12 : 50

----- *Rough Work* -----

59. Choose the correct mirror images of the given figures from the alternatives when the mirror is at MN

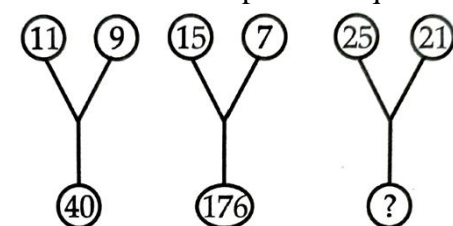
Problem figure



Answer figures

- (1) (2) (3) (4)
- (A) 1 (B) 2 (C) 3 (D) 4

60. Which one will replace the question mark?



- (A) 105 (B) 184 (C) 255 (D) 196

----- *Rough Work* -----