RANKERS
JEE | NEET | FOUNDATION

RGP – RANKERS GUARANTEED PROGRAM

Set 1

(SCIENCE, MATH & MAT)

Time: 1 Hour | **Studying in class 9th & 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:

- ✓ Students must score a minimum of 70% positive marks in their respective papers.
- ✓ Exciting Cash Rewards for RGP Toppers
  - 1st Topper – ₹ 21,000/-
  - 2nd Topper – ₹ 11,000/-
  - 3rd – 5th Topper – ₹ 5,100/-
  - 6th – 10th Topper – ₹ 2,100/-

  Students Scoring Rank from 11th – 20th will get Exciting Rewards.

4. Scholarship Criteria in Rankers Offline Classroom Program:

(100% FEE WAIVER – 1ST TOPPER) and must getting above 70% marks.

- ✓ 80% Fee Waiver – Student Scoring 80% and above.
- ✓ 60% Fee Waiver – Student Scoring 70% to 79.999%.
- ✓ 50% Fee Waiver – Student Scoring 60% to 69.999%.
- ✓ 40% Fee Waiver – Student Scoring 50% to 59.999%.
- ✓ 20% Fee Waiver – Student Scoring 30 % to 49.999%
- ✓ 10% Fee Waiver – All the Aspirants Appearing in RGP.

Student's Name: - .....

School Name: - .....

Class: - ..... Mob. No. .....

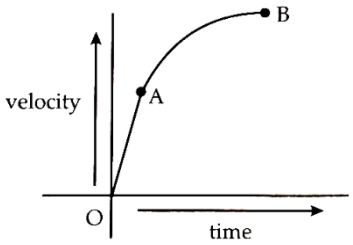
Student's Signature: - ..... Invigilator's Signature: - .....

SCIENCE (Section – A)

1. A water pumps lifts water from a level 10 m below the ground. The water is pumped at the rate of 30 kg/min with negligible velocity. Calculate the minimum power the pump should have to do this work.
(a) 49 J/s (b) 490 J/s (c) 500 J/s (d) 48 J/s

2. A particle of mass 0.3 kg is subjected to a force F = Kx with K = 15 N/m, what will be its acceleration if it is released from a point x = 20 cm?
(a) 1 m/s^2 (b) 10 m/s^2 (c) 100 m/s^2 (d) 0.1 m/s^2

3. An object is moving in a straight line. The velocity time graph is as shown below. Then



(a) In part OA acceleration is increasing.
(b) In part AB acceleration is increasing.
(c) In part OA acceleration is decreasing.
(d) In part AB acceleration is decreasing.

4. A car moving along straight line covers 1/5th of total distance with speed v_1 and remaining part of distance with speed v_2. The average speed of car over entire distance is
(a) $\frac{5v_1v_2}{v_2+4v_1}$ (b) $\frac{4v_1v_2}{5v_1+v_2}$ (c) $\frac{5v_1v_2}{4v_2+v_1}$ (d) $\frac{4v_1v_2}{4v_1+v_2}$

---------- *Rough* ----------

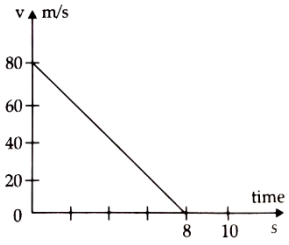
5. Figure shows the velocity versus time graph for a block of mass 50 g sliding on a rough floor. The average rate at which energy dissipates (in J/s) due to the force of friction is:

(a) 5.0 J/s

(b) 10.0 J/s

(c) 20.0 J/s

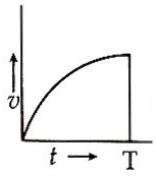
(d) 40.0 J/s

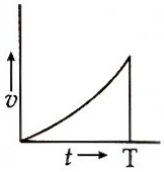


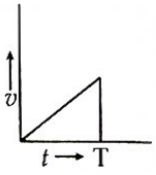
6. A bomb of Mass 30 kg at rest explodes into two pieces of masses 18 kg and 12 kg. The velocity of 18 kg mass is 6 m/s. The kinetic energy of the other mass is

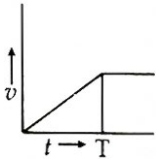
(a) 324 J (b) 486 J (c) 256 J (d) 524 J

7. A body initially at rest starts moving when a constant external force F is applied on it. The force F is applied for time t = 0 to time t = T. Which of the following graph represents the variation of the speed (v) of the body with time (t)?

(a) 

(b) 

(c) 

(d) 

8. Two planets of radii r_1 and r_2 are made from the same material having same density. The ratio of acceleration due to gravity g_1/g_2 at the surfaces of the planets is

(a) r_1/r_2 (b) r_2/r_1 (c) $(r_1/r_2)^2$ (d) $(r_2/r_1)^2$

---------- *Rough* ----------

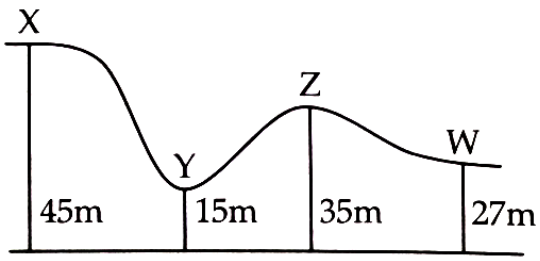
9. Two balls A and B are released towards point W from point X and point Z respectively, on a perfectly smooth track as shown in the figure. The balls move along the track without losing contact. What will be the ratio of their speeds (v_A/v_B) at point W?

(a) 1

(b) $\frac{1}{2}$

(c) $\frac{2}{3}$

(d) $\frac{3}{2}$



10. The mass of a planet is twice and its radius is three times that of the earth. The weight of a body, which has a mass of 5 kg, on that planet will be

(a) 11.95 N (b) 10.88 N (c) 9.88 N (d) 20.99 N

11. The size of colloidal particles are:

(a) $10^{-3} - 10^{-5}$ metre (b) $10^{-6} - 10^{-9}$ metre

(c) $10^{-10} - 10^{-15}$ metre (d) None of the above

12. Which one of the following will have the largest number of atoms?

(a) 100 g of He (b) 100 g of Na (c) 100 g of Li (d) 100 g of Al

13. Which of the following are NOT correct methods for separating the components of given mixtures?

I. The mixture of iodine and sodium chloride by sublimation.

II. Plant pigments by chromatography.

III. Mixture of acetic acid and water by separating funnel.

IV. Oxygen, argon and nitrogen from air by fractional distillation.

(a) I only (b) III only (c) II and III (d) II, III and IV

---------- *Rough* ----------

14. Which of the following statements are true?
I. On heating the kinetic energy of particles in solids does not change because they have a fixed position.
II. Sublimation is the change of gaseous state directly to solid state without going through liquid state and vice versa.
III. The movement of particles from an area of higher concentration to lower concentration is called diffusion.
IV. The rate of evaporation is not affected by increasing the temperature.
(a) I, II and III (b) II and IV (c) II, III and IV (d) II and III

15. Let T = Temperature; H = Humidity and *v* = Wind speed. Which of the following are the best suited condition for drying up of clothes?
(a) T = 40°C, H = 10%, v = 45 m/s
(b) T = 28°C, H = 20%, v = 35 m/s
(c) T = 20°C, H = 30%, v = 25 m/s
(d) T = 15°C, H = 40%, v = 15 m/s

16. Atomic number of an element Z is 16. Element Z has two isotopes Z_1 and Z_2 with 16 and 18 neutrons, respectively. The average atomic mass of a sample of the element Z is 32.1 μ.
Which one of the following percentages of Z_1 and Z_2 in the sample is correct?

	Z_1	Z_2		Z_1	Z_2
(a)	95%	5%	(b)	94%	6%
(c)	93%	7%	(d)	92%	8%

17. 1.80 g of glucose ($C_6H_{12}O_6$) was dissolved in 36 g of water. The number of oxygen atoms in solution are:
(a) 6.68×10^{23} (b) 12.40×10^{22} (c) $6.68\ 10^{22}$ (d) 12.40×10^{23}

---------- *Rough* ----------

18. Which is the correct answer, if n = 4 (where n is number of shell) then number of orbitals and electron present in atom?
(a) 16, 32 (b) 32, 16 (c) 32, 32 (d) 16, 16

19. Which of the following sub shells present in atom?
(a) s, p, d, f (b) a, b, c, d (c) s, d, n, g (d) None

20. Which of following have higher kinetic energy of particles
(a) Solid (b) Gas (c) Liquid (d) None of these

21. Match the column I and column II and select correct option.

	Column – I		Column – II
(A)	Ribosome	1.	ATP formation
(B)	Mitochondria	2.	Photosynthesis
(C)	Centriole	3.	Protein synthesis
(D)	Chloroplast	4.	Cell division

(a) A → 1; B → 2; C → 4; D → 2 (b) A → 3; B → 1; C → 4; D → 2
(c) A → 4; B → 3; C → 2; D → 1 (d) A → 2; B → 1; C → 3; D → 4

22. Eukaryotic cells contain several membranes bound subcellular structures called organelles. The vacuole is one such organelle found in both animal and plant cells.
Which of the following statement are true for vacuoles?
A. Contain cell sap.
B. Provide turgidity to the plant cell.
C. Plant cell vacuoles are smaller than animals cell vacuoles.
D. Vacuoles store amino acids, sugar, acids and contain protein.
(a) A, B, C & D (b) A, B & C only
(c) A, B & D (d) B, C & D only

---------- *Rough* ----------

23. Sclereids are present in
(a) Fruit walls of nuts (b) Grit of guava
(c) Seed coats of legumes (d) All of these

24. The presence of specific molecules (called markers) in an organelle can be used to identify the presence of that organelle. A researcher has three test tubes with organelles A, B and C, each of which shows the presence of one marker as shown below:

Organelle	Marker	Function of the marker
A.	Cytochrome oxidase	Involved in ATP synthesis
B.	Ribosomal RNA	Part of ribosome
C.	Acid hydrolyase	Degrades different molecules

Based on the information given in the table, identify the organelles A, B and C.
(a) A – Plastids; B – Rough Endoplasmic Reticulum (RER); C – Lysosomes
(b) A – Mitochondria; B – Rough Endoplasmic Reticulum (RER); C – Lysosomes
(c) A – Mitochondria; B – Smooth Endoplasmic Reticulum (SER); C – Golgi apparatus
(d) A – Plastids; B – Smooth Endoplasmic Reticulum (SER); C – Golgi apparatus

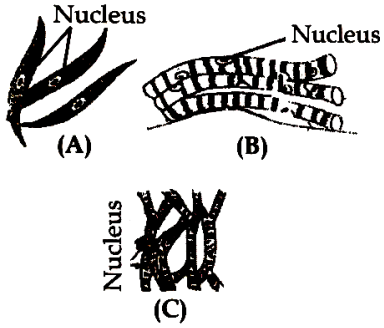
25. Given below are figures of three kinds of muscle fibres.
Which one/ones would you find in the grass hopper's legs?

(a) A only

(b) B only

(c) A and C

(d) B and C

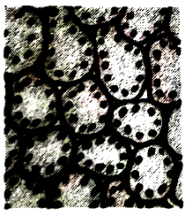


26. Cells are of different shapes & sizes. Some cells are irregular in shape such as _____
(a) Amoeba (b) Red blood cell (c) Leucocyte (d) Both (a) & (c)

---------- *Rough* ----------

27. Who first saw & described a living cell?
(a) Mathias Schleiden (b) Theodor Schwann
(c) Anton Van Leeuvenhoek (d) Rudolf Virchow

28. Tarun observed a sude of WBCs under microscope. His teacher asked him to draw the diagram. Select the diagram which should be drawn by Tarun

(a)  (b)  (c)  (d) 

29. Match column I with column II and select the correct option from the given codes.

Column I		Column I	
A.	Vessels	(i)	Cells are living, with thin cellulosic cell walls
B.	Tracheids	(ii)	Cells possess highly thickened walls with obliterated central lumen
C.	Xylem fibres	(iii)	Individual members are inter-connected through perforations in their common walls
D.	Xylem parenchyma	(iv)	Elongated tube-like cells with thick, lignified walls and tapering ends

(a) A – (iv), B – (iii), C – (ii), D – (i) (b) A – (iii), B – (iv), C – (ii), D – (i)
(c) A – (ii), B – (iv), C – (iii), D – (i) (d) A – (iv), B – (ii), C – (iii), D – (i)

30. Smooth muscles are
(a) involuntary, fusiform, non-striated (b) voluntary, multinucleated, cylindrical
(c) involuntary, cylindrical, striated (d) voluntary, spindle shape, uninucleate

---------- *Rough* ----------

MATH (Section – B)

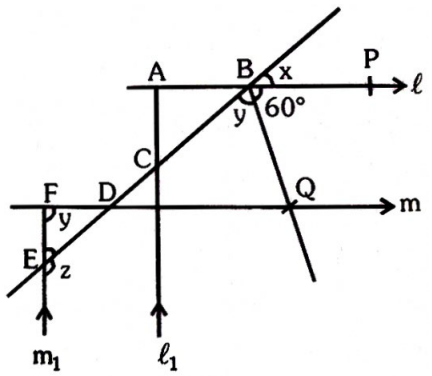
31. If $x = 2 + 2^{1/3} + 2^{2/3}$, then $x^3 - 6x^2 + 6x$ is
(a) 2 (b) 1 (c) 4 (d) 3

32. If $\frac{\left(p+\frac{1}{q}\right)^p\left(p-\frac{1}{q}\right)^q}{\left(q+\frac{1}{p}\right)^p\left(q-\frac{1}{p}\right)^q} = \left(\frac{p}{q}\right)^x$, then x is
(a) p – q (b) p + q (c) q – p (d) pq

33. A polynomial is exactly divisible by $x + 1$, and when it is divided by $3x$ -1, the remainder is 4. The polynomial gives a remainder $hx + k$ when divided by $3x^2 + 2x - 1$ then the values of h and k are
(a) h = 2, k = 3 (b) h = 3, k = 3 (c) h = 3, k = 2 (d) None of these

34. The remainder when x^{1999} is divided by $x^2 - 1$ is
(a) $1 - x$ (b) $3x$ (c) x (d) None of these

35.



In the above figure $\ell \parallel m$ and $\ell_1 \parallel m_1$. If $x = y$ and $\angle PBQ = 60°$ then find $\angle z$.
(a) 60° (b) 80° (c) 100° (d) 120°

---------- *Rough* ----------

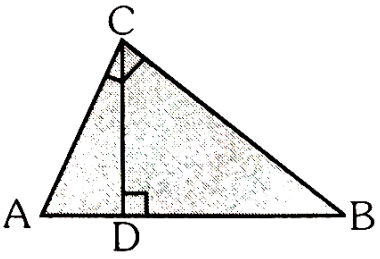
36. In a right angled ΔABC, $\angle C = 90°$ and CD is the perpendicular on hypotenuse AB. If BC = 15 cm and AC = 20 cm then CD is equal to

(a) 18 cm

(b) 12 cm

(c) 17.5 cm

(d) Can't be determined



37. Consider the following statements:

(i) If three sides of a triangle are equal to three sides of another triangle, then the triangles are congruent.

(ii) If three angles of a triangle are equal to three angles of another triangle respectively, then the two triangles are congruent.

Of these statements

(a) (i) is the correct and (ii) is false.
(b) both (i) and (ii) are false
(c) both (i) and (ii) are correct
(d) (i) is false and (ii) is correct

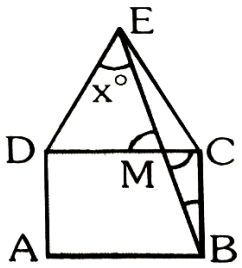
38. In the given diagram, equilateral triangle EDC surmounts square ABCD. Find the m $\angle BED$ represented by x.

(a) 45°

(b) 60°

(c) 30°

(d) None of these



---------- *Rough* ----------

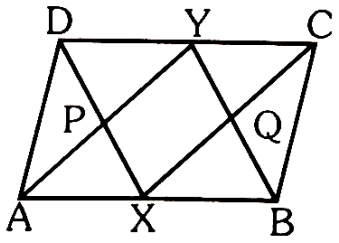
39. X, Y are the mid-points of opposite sides AB and DC of a parallelogram ABCD. AY and DX are joined intersecting in P; CX and BY are joined intersecting in Q. The PXQY is a

(a) rectangle

(b) rhombus

(c) parallelogram

(d) square



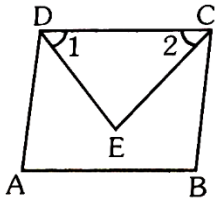
40. In a quadrilateral ABCD, the line segments bisecting $\angle C$ and $\angle D$ meet at E, Then $\angle A + \angle B$ is equal to

(a) $\angle CED$

(b) $\frac{1}{2}\angle CED$

(c) $2\angle CED$

(d) None



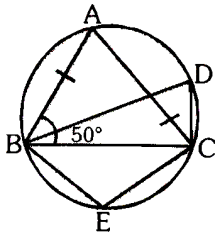
41. In the given figure, ABC is an isosceles triangle in which AB = AC and m $\angle ABC = 50°$, m $\angle BDC$ is

(a) 80°

(b) 60°

(c) 65°

(d) 100°



---------- *Rough* ----------

42. If AB is a chord of a circle, P and Q are two points on the circle different form A and B, then
(a) the angle subtended by AB at P and Q are either equal or supplementary.
(b) the sum of the angles subtended by AB at P and Q is always equal two right angles.
(c) the angles subtended at P and Q by AB are always equal.
(d) the sum of the angles subtended at P and Q is equal to four right angles.

43. If the radius of a circle is increased by 100%, then the area of the circle increases by
(a) 100% (b) 200%
(c) 300% (d) 400%

44. The length of each side of a square is $\frac{3x}{4} + 1$. What is the perimeter of the square?
(a) $x + 1$ (b) $3x + 1$
(c) $3x + 4$ (d) $\frac{9}{16}x^2 + \frac{3}{2}x + 1$

45. If h, s, V be the height, curved surface area and volume of a cone respectively, then $(3\pi Vh^3 + 9V^2 - s^2h^2)$ is equal to
(a) 0 (b) π
(c) $\frac{V}{sh}$ (d) $\frac{36}{V}$

---------- *Rough* ----------

MAT (Section – C)

46. A is the brother of B, B is the daughter of C and D is the father of A. then, how is C related to D?
(a) Husband (b) Wife (c) Granddaughter (d) Grandfather

47. If 18th February, 2005 falls on Friday than what will be the day on 18th February, 2007?
(a) Sunday (b) Monday (c) Tuesday (d) Wednesday

48. Ajay left home for the bus stop 15 minutes earlier than usual. It takes 10 minutes to reach the stop. He reached the stop at 8.40 a.m. What time does he usually leave home for the bus stop?
(a) 8.30 a.m. (b) 8.45 a.m. (c) 8.55 a.m. (d) Data inadequate

49. In a certain code MOUSE is written as PRUQC. How is SHIFT written in that code?
(a) VJIDR (b) VKIDR (c) RKIVD (d) VIKRD

50. Raj is standing in the middle of a square field. He starts walking diagonally to North-East. Then, he turns right and reaches the far end of the field. Then, he turns right and starts walking. In the midway, he again turns right and starts walking. In halfway, he turns to his left and reaches a new far end. In what direction is Raj now?
(a) North (b) South (c) North-West (d) South-West

51. Select the correct combination of mathematical signs to replace * signs and to balance the following equation. (8 * 7 * 6) * 5 * 10
(a) × − ÷ = (b) − × ÷ + (c) + − ÷ × (d) × + = ÷

---------- *Rough* ----------

52. Find the missing number

(a) 120
(b) 27
(c) 27
(d) 84

4	3	2	8	32
5	3	1	9	24
7	3	3	7	70
2	9	4	12	?

53. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

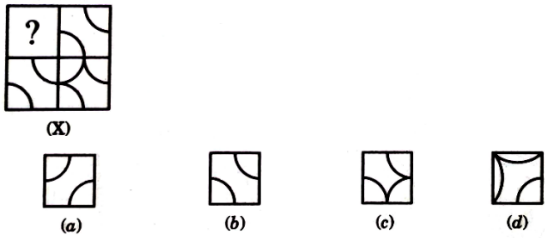
ipi _ upog _ pig _ pogi _ _ g

(a) iupgg (b) upgii (c) puigp (d) giupi

54. 5, 16, 51, 158, ?

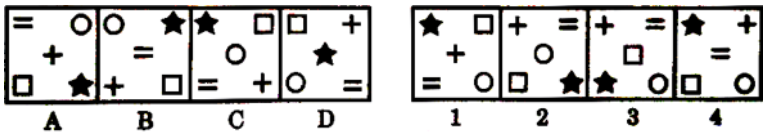
(a) 1452 (b) 483 (c) 481 (d) 1454

55. What comes in place of questions mark.



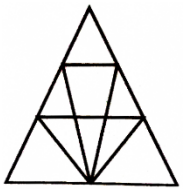
56. What comes next in problem figure

PROBLEM FIGURES ANSWER FIGURES



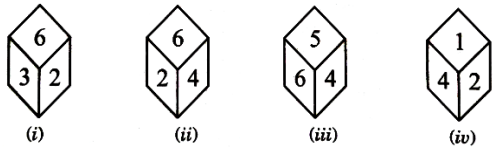
---------- *Rough* ----------

57. Count the number of triangles



(a) 12
(b) 18
(c) 22
(d) 26

58. The four different positions of a dice are given below:



Which number is on the face opposite 6?

(a) 1 (b) 2 (c) 3 (d) 4

59. If the alternate letters in the given alphabet starting from A are written in small and rest all in capital letters, which of the following will represent the third month after July?

(a) OCTOBER (b) OCtObEr
(c) oCtObEr (d) ocToBeR

60. Direction: Read the following statements carefully to answer the questions:

I. X is older than L.
II. M and N are of equal age.
III. Z is younger than N.
IV. Y is older than X.

Which two of the above statements indicate that Y is older the L?

(a) I and IV (b) IV and V
(c) I and V (d) None of these

---------- *Rough* ----------