RANKERS
JEE | NEET | FOUNDATION

RGP – RANKERS GUARANTEED PROGRAM

Set 1

(PHYSICS, CHEMISTRY, MATH & MAT)

Time: 1 Hour **Studying in class 10th & Moving to 11th (MATH)** **Marks: 120**

1. General Instructions: **(Paper Code: 1101)**

* *This test paper consists of 60 questions in 4 sections (A, B, C, D)*

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: - .....

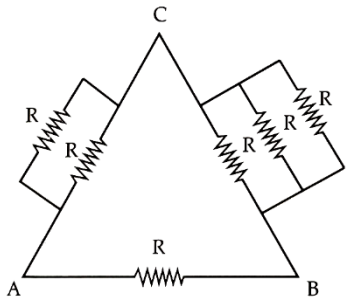
School Name: - .....

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

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

Physics (Section – A)

1. Six identical resistors connected between points A, B and C as shown in diagram. The equivalent resistance would be maximum between.



(a) A and B

(b) B and C

(c) A and C

(d) Option (a), (b) and (c) are correct.

2. 2-point A and B are at electric potentials 10 V and 100 V respectively. A charge q is taken from A to B and 18 joule of work is done. The value of q is

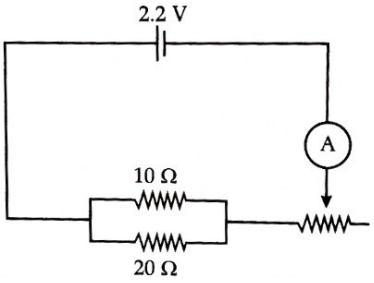
(a) 2 Coulomb (b) 0.2 Coulomb (c) 20 Coulomb (d) 0.02 Coulomb

3. Light travels through a glass slab of thickness t and having refractive index n. If c is the velocity of light in vacuum, then the time taken by light to travel this thickness of glass is

(a) $\frac{t}{nc}$ (b) $\frac{nt}{c}$ (c) $\frac{n^2t}{c}$ (d) $\frac{t}{n^2c}$

4. The resistance of rheostat shown in the figure is 0 – 30 Ω. Neglecting the resistance of ammeter and connecting wire, the minimum and maximum currents through the ammeter will be

(a) (0.08 A, 0.33 A)



(b) (0.06 A, 0.08 A)

(c) (0.06 A, 0.33 A)

(d) (0.33 A, 0.09 A)

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

5. An object of height 2.0 cm is placed on the principal axis of a concave mirror at a distance of 12 cm from the pole. If the image is inverted, real and 5 cm in height then location of the image and focal length of the mirror respectively are
(a) (-30 cm, +8.6 cm) (b) (-30 cm, -8.6 cm)
(c) (+30 cm, +8.6 cm) (d) (+30 cm, -8.6 cm)

6. A 10 V battery is connected to a series combination of two resistances of 4000 Ω and 6000 Ω. A non-ideal voltmeter of resistance 10,000 Ω connected across 4000 Ω reads 3.226 V. What would be the value if the same voltmeter is connected across 6000 Ω?
(a) 3.326 V (b) 4.326 V (c) 3.238 V (d) 4.838 V

7. A person cannot clearly see objects at a distance more than 40 cm. He is advised to use lens of power
(a) -2.5 D (b) 2.5 D (c) -1.5 D (d) 1.5 D

8. An observer moves towards a stationary plane mirror at a speed of 4 m/s. The speed with which his image moves towards him?
(a) 2 m/s (b) 4 m/s (c) 8 m/s (d) Image will stay at rest

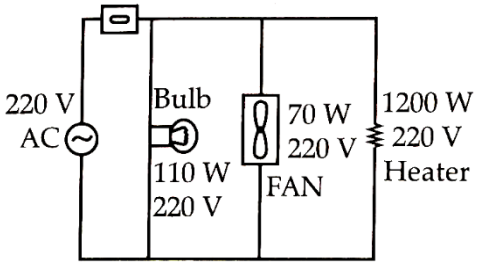
9. A concave mirror of focal length 15 cm forms an image. The position of the object when the image is virtual and linear magnification is 2 is
(a) 22.5 cm (b) 7.5 cm (c) 30 cm (d) 45 cm

10. An object is placed at point A in front of a convex lens of focal length f. Its real, inverted and magnified image is formed behind the lens. When the object is brought closer to the lens and placed at a point B, a virtual and erect image, but with exactly the same magnification (in magnitude) as before is formed in front of the convex lens. Let F be the focus of the lens in front of it. Which of the following relations is correct?
(a) AF = FB (b) AB = f (c) AF – BF = f (d) AB = 2f

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

11. Nethra, who is a back-bencher, discovers one day in the class that she is unable to discern the details on the blackboard very well. When she visits an optician, he prescribes glasses for her. Which of the following statement(s) is/are false?
I. She suffers from myopia where the far point is nearer than the blackboard.
II. A concave lens with a suitable power can help correct her vision.
III. Her eye is defective and is forming images in front of the retina.
IV. A concave lens or a convex lens may be used to correct her vision.
(a) Only I (b) I, II and III (c) I, II and IV (d) Only IV

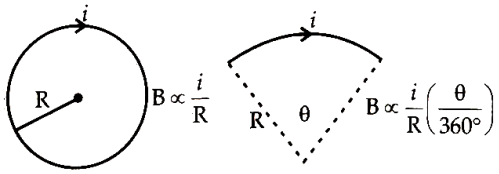
12. Figures shows three electrical appliances connected to 220 V ac mains. What is the amperage (current rating) of the fuse that should be used in the circuit?
(a) 1.0 A
(b) 2.0 A
(c) 5.0 A
(d) 10.0 A



13. A positively charged plate and negatively charged plate are kept parallel to each other at a distance of 10 cm. An electron is released near the negative plate. Looking from the negative plate towards the positive plate, the magnetic field produced by the moving electron will be
(a) clockwise (b) anti – clockwise
(c) positive to negative plate (d) negative to positive plate

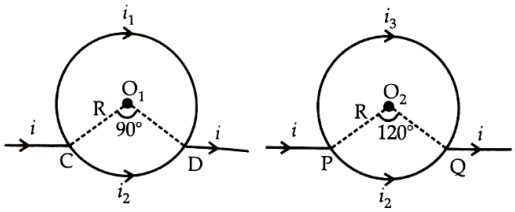
---------- *Rough* ----------

14. Magnetic field at the centre of a circular coil of radius R carrying current i is $B \propto \frac{i}{R}$ and its direction is given by right-hand thumb rule. Magnetic field at the centre of circular arc subtending an angle θ (in degree) is $B \propto \frac{i}{R}\left(\frac{\theta}{360°}\right)$ and its direction can be found using right hand rule.



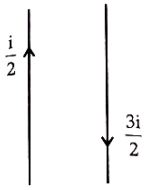
Considering two circular coils made of uniform conductors as shown in figure 3 and 4. In figure 3 points C and D are diametrically opposite to each other, and in figure 4 $\angle PO_2Q = 120°$.

Then magnetic fields _____

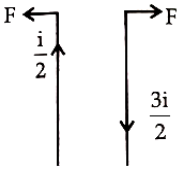


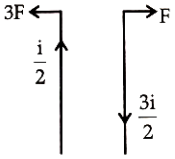
(a) at both O_1 and O_2 are zero.
(b) at both O_1 and O_2 are non – zero.
(c) is zero at O_1 but non – zero at O_2
(d) is non – zero at O_1 but zero at O_2

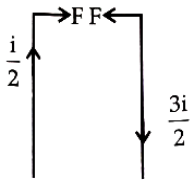
15. Two long current-carrying parallel wires are placed as shown.

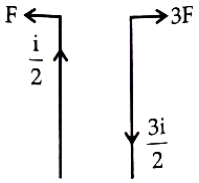


Which of the following figures will represent the magnitude and direction of the forces exerted on the wires?

(a) 

(b) 

(c) 

(d) 

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Chemistry (Section – B)

16. Denatured alcohol is a mixture of
(a) CH_3OH and HCHO (b) CH_3OH and CH_3COOH
(c) C_2H_5OH and CH_3OH (d) C_2H_5OH and CH_3COOH

17. For welding a mixture of oxygen and _____ is burnt
(a) Benzene (b) Butane (c) Methane (d) Ethyne

18. Which one of the following oxides is insoluble in water?
(a) Na_2O (b) CuO (c) K_2O (d) CaO

19. The values of stoichiometric coefficients m, x, y and z in the following reaction after balancing are, respectively:

$$m(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} xCr_2O_3 + yN_2 + zH_2O$$

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

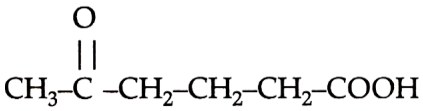
20. You are provided with aqueous solution of three salts A, B and C. 2 -3 drops of blue litmus solution, red litmus solution and phenolphthalein were added to each of these solutions in separate each of these solutions in separate experiments. The change in colour of different indicators were recorded in the following table:

Sample	With blue litmus solution	With red litmus solution	With phenolphinalein
A	No change	Turns blue	Turns pink
B	No change	No change	No change
C	Turns red	No change	No change

On the basis of above observations, identify A, B and C from the following options:
(a) A = NaCl, B = CH_3COONa, C = $FeCl_3$ (b) A = CH_3COONa, B = NaCl, C = $FeCl_3$
(c) A = $FeCl_3$, B = NaCl, C = CH_3COONa (d) A = $FeCl_3$, B = CH_3COONa, C = NaCl

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

21. IUPAC name of the following compound will be:



(a) 2 – Keto hexan – 6 oic acid
(b) 5 – Keto hexanoic acid
(c) Methyl Ketone butanoic acid
(d) 5 – Aldo hexanoic acid

22. The compound 'A' when treated with alkaline potassium permanganate gives 'B', and with conc. Sulphuric acid gives 'C' and 'D'. The compounds A, B, C and D are respectively
(a) C_2H_4, CH_3COONa, C_2H_5OH, H_2O
(b) CH_3COOH, C_2H_4, CH_3OH, H_2O
(c) C_2H_5OH, CH_3COOH, C_2H_4, H_2O
(d) CH_3OH, $HCOOH$, H_2O, CH_4

23. Which of the following does not contain seven molecules of water of crystallization?
(a) Epsom salt (b) Green vitriol (c) Blue vitriol (d) White vitriol

24. If excess of CO_2 is passed through the suspension of a compound 'X' in water, a compound 'Y' is formed. Substances 'X' and 'Y' dissolve in H_2SO_4 giving white compound 'Z' which is insoluble in water. Identify the compounds 'X', 'Y' and 'Z'.
(a) $CaSO_4$, $CaCO_3$, gypsum
(b) $CaSO_4$, $Ca(HCO_3)_2$, lime
(c) $CaCO_3$, $Ca(HCO_3)_2$, $CaSO_4$
(d) $CaHCO_3$, $CaCO_3$, $CaSO_4$

25. Tick the arrangement of metals Fe, Cu, Zn, Ag in the order of decreasing reactivity.
(a) Fe > Cu > Zn > Ag
(b) Cu > Fe > Zn > Ag
(c) Ag > Zn > Fe > Cu
(d) Zn > Fe > Cu > Ag

26. Read the following statements.
Statements I: Sodium metal reacts violently with water to produce heat and fire.
Statements II: Potassium metal reacts violently with water to from potassium hydroxide and hydrogen gas.
Select the correct answer from the option given below.
(a) Statement I is true, Statement II is false.
(b) Statement I is false, Statement II is true.
(c) Both statements are true, and statement II provides explanation to Statement I.
(d) Both Statements are true but Statement II does not provide explanation to Statement I.

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

27. Which of the following set of reactions will NOT occur?
I. $MgSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Mg(s)$
II. $CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$
III. $MgSO_4(aq) + Cu(s) \rightarrow CuSO_4(aq) + Mg(s)$
IV. $CuSO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + Cu(s)$
(a) I and III (b) II and IV (c) I, II and III (d) II, III and IV

28. The following observations are given for four metals:
I. Metal H does not react with dilute HCl
II. Metal K reacts with warm water.
III. Metal L does not react with water but displaces metal H from its aqueous salt solution.
IV. Metal M reacts with cold water.
Choose the correct decreasing order of reactivity of these metals amongst the following:
(a) M > L > H > K (b) K > M > H > L (c) M > K > L > H (d) L > H > K > M

29. Match chemical reactions given in the List-I with the type of chemical reactions given in List-II and select the correct answer using the options given below:

List – I (Chemical reactions)		List – II (Types of chemical reactions)	
(A)	Formation of NH_3 from N_2 and H_2	I.	Decomposition
(B)	Calcination of zinc carbonate	II.	Double displacement
(C)	Reaction of aqueous $BaCl_2$ solution with dilute H_2SO_4	III.	Combination
(D)	Rancidity of oils	IV.	Redox
		V.	Displacement

(a) A – I, B – V, C – III, D – IV (b) A – III, B – IV, C – V, D - I
(c) A – IV, B – III, C – V, D – I (d) A – III, B – I, C – II, D – IV

30. In the balanced chemical equation:
(a lead nitrate + b aluminium chloride → c aluminium nitrate + d lead chloride)
Which of the following alternative is correct?
(a) a = 1, b = 2, c = 2, d = 1 (b) a = 4, b = 3, c = 3, d = 4
(c) a = 2, b = 3, c = 2, d = 3 (d) a = 3, b = 2, c = 2, d = 3

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

MATH (Section – D)

31. Given that $\frac{1}{7} = 0.\overline{142857}$, which is a repeating decimal having six different digits. If x is the sum of such first three positive integers n such that $\frac{1}{n} = 0.\overline{abcdef}$, where a, b, c, d, e, and f are different digits, then the value of x is
(a) 20 (b) 21 (c) 41 (d) 42

32. Which of the following digits is ruled out in the units place of $12^n + 1$ for every positive integer n?
(a) 1 (b) 3 (c) 5 (d) 7

33. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$, then the value of a is
(a) -1 (b) -5 (c) 1 (d) 5

34. The value of k, so that the equations $2x^2 + kx - 5 = 0$ and $x^2 - 3x - 4 = 0$ have one root in common, are
(a) 3, $\frac{27}{2}$ (b) 9, $\frac{27}{4}$ (c) -3, $\frac{-27}{4}$ (d) -3, $\frac{4}{27}$

35. The value of $\cos x^o - \sin x^o (0 \leq x < 45)$ is
(a) 0 (b) positive
(c) negative (d) sometimes negative and sometimes positive

36. A box contains four cards numbered as 1,2,3 and 4 and another box contains four cards numbered as 1,4,9 and 16. On card is drawn at random from each box. What is the probability of getting the product of the two numbers so obtained, more than 16?
(a) $\frac{5}{8}$ (b) $\frac{1}{2}$ (c) $\frac{3}{8}$ (d) $\frac{1}{4}$

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

37. Let ℓ be the length of each equal side of an isosceles triangle. If the length of each equal side is double, keeping its height unchanged, then the difference of the squares of bases of the new triangle and the given triangle is
(a) 0 (b) $4\ell^2$ (c) $9\ell^2$ (d) $12\ell^2$

38. In ΔABC, AB = AC, P and Q are points on AC and AB respectively such that BC = BP = PQ = AQ. Then $\angle AQP$ is equal to (use $\pi = 180°$)
(a) $\frac{2\pi}{7}$ (b) $\frac{3\pi}{7}$ (c) $\frac{4\pi}{7}$ (d) $\frac{5\pi}{7}$

39. The value of n for which the expression $x^4 + 4x^3 + nx^2 + 4x + 1$ becomes a perfect square is:
(a) 3 (b) 4 (c) 5 (d) 6

40. If $sin^4x + sin^2x = 1$, then the value of $cos^4x + cos^2x$ is
(a) $5 - 2\sqrt{5}$ (b) sin^2x (c) tan^2x (d) 1

41. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is
(a) 10 : 17 (b) 20 : 27 (c) 10 : 27 (d) 20 : 37

42. A cone, a right circular cylinder and a hemisphere standing on equal base and have same height. The ratio of their volumes is
(a) 1 : 2 : 3 (b) 1 : 3 : 2 (c) 2 : 3 : 1 (d) 2 : 1 : 3

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

43. An equilateral triangle has its side of $3\sqrt{3}$ cm, then radius of its circum-circle is:
(a) 3 cm (b) 4 cm (c) $2\sqrt{3}$ (d) 2 cm

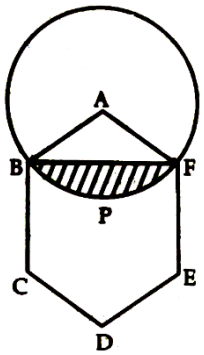
44. In the given figure, the centre of the circle is A and ABCDEF is a regular hexagon of side 6 cm. The approximate area of segment BPF is. (Take $\pi = 3.14$)

(a) 25 cm^2

(b) 22 cm^2

(c) 32 cm^2

(d) 30 cm^2



45. If $a : b = 2 : 3$ and $x : y = 3 : 4$, then $\frac{2ax-25by}{3ay+4bx}$ is
(a) $\frac{24}{5}$ (b) $\frac{5}{24}$ (c) $-\frac{24}{5}$ (d) $\frac{12}{13}$

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

MAT (Section – E)

46. Sunil is the son of Keshav, Simran, Keshav's sister, has a son Maruti and daughter Sita. Prem is the maternal uncle of Maruti. How is Sunil related to Maruti?
(a) Cousin (b) Maternal uncle (c) Brother (d) Nephew

47. Which two months in a year have the same calendar?
(a) June, October (b) April, November
(c) April, July (d) October, December

48. Ashish leaves his house at 20 minutes to seven in the morning, reaches Kunal's house in 25 minutes, they finish their breakfast in another 15 minutes and leave for their office which takes another 35 minutes. At what time do they leave Kunal's house to reach their office?
(a) 7.40 a.m. (b) 7.20 a.m. (c) 7.45 a.m. (d) 8.15 a.m.

49. If in a certain code 'INTELLIGENCE' is written as 'ETNIGILLECNE', then how can 'MATHEMATICAL' be written in the same code?
(a) AMHTMETACILA (b) TAMMEHITALAC
(c) HTAMTAMELACI (d) LACITAMEHTAM

50. A boy starts from home in early morning and walks straight for 8 km facing the Sun. Then, he takes a right turn and walks for 3 km. Then, he turns right again and walks for 2 km and then turns left and walks for 1 km. Then, he turns right, travels 1 km and then turns right and travels for 4 km straight. How far is he from the starting point?
(a) 5 km (b) 6 km (c) 2 km (d) 4 km

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

51. If $+ = \times, - = \div, \times = +, \div = -$, then which is the correct equation out of the following?
(a) $18 + 6 - 4 \times 2 \div 3 = 26$ (b) $18 \div 6 + 4 - 2 \div 3 = 22$
(c) $18 - 6 \times 7 \div 2 + 8 = 63$ (d) $18 \times 6 - 4 + 7 \times 8 = 47$

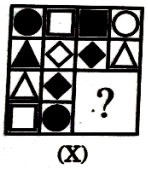
52. Find the missing number
(a) 92
(b) 128
(c) 200
(d) 30

2	3	8
4	5	10
6	7	12
32	50	?

53. 3, 5, 35, 10, 12, 35, _, _
(a) 19, 35 (b) 17, 19 (c) 19, 24 (d) 22, 35

54. 7, 8, 18,57, ?, 1165
(a) 174 (b) 232 (c) 224 (d) 228

55. What comes in place of question mark.



(X)


(a)

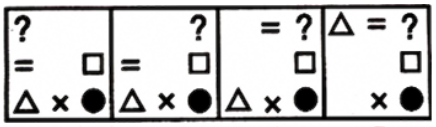

(b)


(c)

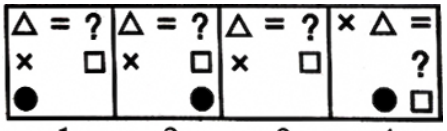

(d)

56. What come next in problem figure

PROBLEM FIGURES



ANSWER FIGURES



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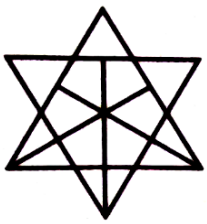
57. Count the number of triangles in the given figure.

(a) 21

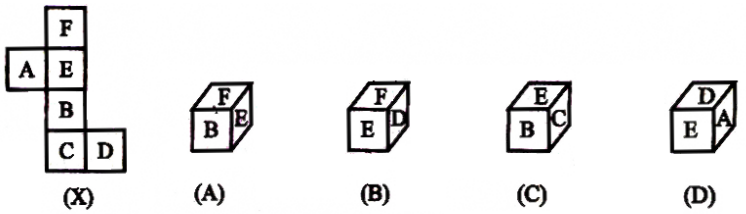
(b) 23

(c) 25

(d) 27



58.



Which of the following is correct?

(a) A only (b) B only (c) A and C only (d) A, B, C and D

59. A newspaper has 6 sheets consisting of 24 pages in total. If page number 17 of that newspaper is missing then find the set of missing pages in that newspaper, from the alternatives given below:

(a) 6, 7, 16, 17 (b) 7, 8, 17, 18 (c) 8, 9, 17, 18 (d) 9, 10, 16, 17

60. A comparison of marks scored by Gauri, Aaban, Seerat and Alvina in an examination is as follows.

I. Gauri has scored 15 marks less than Aaban.

II. Gauri has scored 20 marks more than Seerat.

III. Alvina has scored 10 marks less than Seerat.

To decide who has scored the highest marks, identify the statement from those given in the alternatives in respect of sufficiency of data.

(a) Data given in I and II are sufficient. (b) Data given in I and III are sufficient.

(c) Data given in II and III are sufficient. (d) Data given in I, II and III are sufficient.

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