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Academic Session: 2021-22

ResoNET 2021

SAMPLE PAPER

(Resonance National Entrance Test for Admission in PCCP Classroom Contact Programmes-PCCPs)

FOR STUDENTS MOVING IN CLASS- X (WINNER) IN 2021-2022
(PRESENTLY STUDYING IN CLASS - IX IN 2020-2021)

COURSE NAME : PINNACLE/WINNER **COURSE CODE : PX/JTT**

Duration: 1 Hours | Max. Marks: 210

Name : _____ **Application Form Number :** _____

Please read the next & last page of this booklet for the instructions.

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IMPORTANT INSTRUCTIONS

GENERAL INSTRUCTIONS

1. This booklet is your Question Paper.
2. Blank papers, clip boards, log tables, slide rule, calculators, mobile or any other electronic gadgets in any form are not allowed to be used.
3. Write your **Name** & **Application Form Number** in the space provided in the first page of this booklet.
4. No rough sheets will be provided by the invigilators. All the rough work is to be done in the blank space provided in the question paper.
5. No query related to question paper of any type is to be put to the invigilator.

INSTRUCTIONS FOR OPTICAL RESPONSE SHEET (ORS)

- Darken the appropriate bubbles on the original by applying sufficient pressure.
- The original is machine-gradable and will be collected by the invigilator at the end of the examination.
- Do not tamper with or mutilate the ORS.
- Write your name, Application form number and the name of the examination centre and sign with pen in the space provided for this purpose on the original. **Do not write any of these details anywhere else**. Darken the appropriate bubble under each digit of your roll number.
- Before answering the paper, fill up the required details in the blank space provided in the Objective Response Sheet (ORS).
- Do not forget to mention your paper code and **Application Form Number** neatly and clearly in the blank space provided in the Objective Response Sheet (ORS) / Answer Sheet.
- Use a **BLACK BALL POINT** to darken the bubbles in the upper sheet.
- Darken the bubble **COMPLETELY.**
- Darken the bubble **ONLY** if you are sure of the answer.
- The correct way of darkening a bubble is as shown here : ●
- There is **NO** way to erase or "un-darkened bubble.
- The marking scheme given at the beginning of each section gives details of how darkened and **not darkened** bubbles are evaluated.

Marks distribution of questions is as follows.

Reso NET 2021-22

S.No.	Subject	Nature of Questions	Marks to be awarded			
			No. of Questions	Correct	Wrong	Total
1 to 25	PART-I (Maths)	Single Choice Questions (SCQ)	25	3	0	75
26 to 35	PART-II (Physics)	Single Choice Questions (SCQ)	10	3	0	30
36 to 45	PART-III (Chemistry)	Single Choice Questions (SCQ)	10	3	0	30
46 to 55	PART-IV (Biology)	Single Choice Questions (SCQ)	10	3	0	30
56 to 70	PART-V (Mental Ability)	Single Choice Questions (SCQ)	15	3	0	45
		Total	**70**			**210**

Zero marks '0' If none of the options is chosen (i.e. the question is unanswered).

1. MATHEMATICS

Straight Objective Type

This section contains 25 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

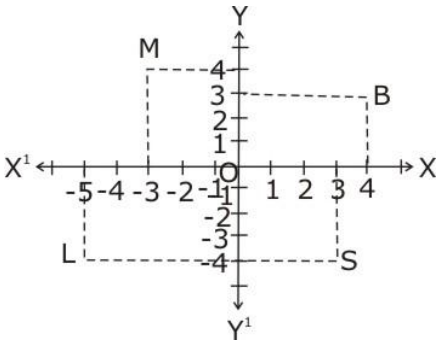
1. Number r is termed as Rational number if it can be expressed as $\frac{p}{q}$, where p and q are Integers and

(A) $p = 0$ (B) $p \neq 0$ (C) $q = 0$ (D) $q \neq 0$

2. $\frac{16a^2}{9b^2} + 2 + \frac{9b^2}{16a^2}$ is a square of :

(A) $\left(\frac{4}{3}a + \frac{3}{4}b\right)$ (B) $\left(\frac{4a}{3b} + \frac{3b}{4a}\right)$ (C) $\frac{4}{3}\left(\frac{a}{b} + \frac{b}{a}\right)$ (D) $\frac{3}{4}\left(\frac{a}{b} + \frac{b}{a}\right)$

3. Observe the graph carefully.



The coordinates of S are :

(A) (4, 3) (B) (–3, 4) (C) (–5, –4) (D) (3, –4)

4. An angle is 14^0 more than its complementary angle then angle is : –

(A) 38^0 (B) 52^0 (C) 50^0 (D) none of these

5. The altitudes of triangle are 12, 15 and 20 units. The largest angle in the triangle is :

(A) 75º (B) 90º (C) 120º (D) 135º

6. Point (0, 4) lies :

(A) in I quadrant (B) on x-axis (C) on y-axis (D) in IV quadrant

7. In a school $\frac{2}{7}$ of the students are boys. If there are 305 girls, find the number of boys in the school?

(A) 112 (B) 122 (C) 132 (D) 127

Space for Rough Work

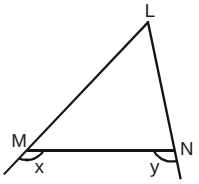
8. Which of the following is a rational number?
(A) $\sqrt{5}$ (B) π
(C) 0.101001000100001..... (D) 0.853853853.....

9. If $x - y = 4$ and $xy = 21$ then $x^3 - y^3 =$
(A) 316 (B) 225 (C) – 225 (D) – 316

10. There are four prime numbers written in ascending order. The product of the first three is 385 and that of the last three is 1001. The last number is :
(A) 11 (B) 13 (C) 17 (D) 19

11. Ray OS stands on a line POQ. Ray OR and ray OT are angle bisectors of $\angle$POS and $\angle$SOQ, respectively. Find $\angle$ROT.
(A) 60º (B) 80º (C) 90º (D) None of these

12. In the given figure, x > y. Hence



(A) LM = LN (B) LM < LN (C) LM > LN (D) None of these

13. The sum of distances from x-axis and y-axis measured from the point (3, 5) will be
(A) – 1 (B) 0 (C) 2 (D) 8

14. If 75% of a number is added to 75, then the result is number itself. The number is
(A) 50 (B) 60 (C) 300 (D) 400

15. The simplified value of $\frac{1}{\sqrt{2}+\sqrt{3}-\sqrt{5}} + \frac{1}{\sqrt{2}-\sqrt{3}-\sqrt{5}}$ is

(A) 1 (B) 0 (C) $\sqrt{2}$ (D) $\frac{1}{\sqrt{2}}$

16. Factorise: $9 - 6x + x^2$
(A) (3 – x) (3 – x) (B) (3 + x) (3 – x) (C) (3 + x) (3 + x) (D) None of these

17. The area of the figure formed by the intersection of lines x = 0, y = 0, x =3, y = 4 will be —
(A) 3 sq. unit (B) 4 sq. unit (C) 6 sq. unit (D) 12 sq. unit

18. The angle between the bisectors of two adjacent supplementary angles is:
(A) acute angle (B) right angle (C) obtuse angle (D) none of these

19. In a right angled triangle ABC, right angled at B. P is mid point of AC. Which one is true?
(A) PA = $\frac{AC}{2}$ (B) PB = $\frac{AC}{2}$ (C) PA = PB (D) All of these

Space for Rough Work

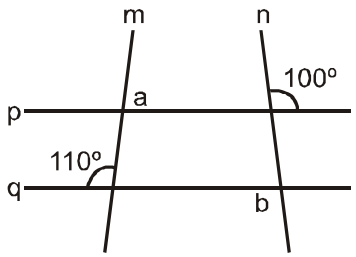
20. If $x = 3 + \sqrt{3}$, then what is the value is $x^2 + \frac{9}{x^2}$?

(A) $(15 + 3\sqrt{3})$ (B) $(18 + 3\sqrt{3})$ (C) $(27 + \sqrt{3})$ (D) None of these

21. Rama is 8 cm taller than Krishna. Hari is 12 cm shorter than Rama. If krishna is 125 cm tall, how tall (in cm) is Hari ?

(A) 129 (B) 121 (C) 105 (D) 113

22. In the adjoining figure, line p | | line q and line m and n are transversals. As per information in figure, find $\angle a + \angle b$.



(A) 225° (B) 90° (C) 180° (D) 170°

23. In triangles ABC and PQR, AB = AC, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are :

(A) isosceles but not congruent (B) isosceles and congruent
(C) congruent but not isosceles (D) neither congruent nor isosceles

24. If $7^{x+1} - 7^{x-1} = 336$ then find x = ?

(A) –1 (B) –2 (C) 3 (D) 2

25. If $x^2 - 4$ is a factor of $2x^3 + ax^2 + bx + 12$, where a and b are constant. Then the values of a and b are:

(A) – 3, 8 (B) 3, 8 (C) –3, – 8 (D) 3, – 8

2. PHYSICS

Straight Objective Type

This section contains 10 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

26. A car increase its speed from 20 kmh^{-1} to 50 kmh^{-1} in 10 s., its acceleration is :

(A) 30 ms^{-2} (B) 3 ms^{-1} (C) 18 ms^{-2} (D) 0.83 ms^{-2}

Space for Rough Work

27. Which of the following has largest inertia?
(A) A pin (B) An ink pot (C) Your physics book (D) Your body

28. The gravitational force between two bodies varies with distance r as :
(A) $\frac{1}{r}$ (B) $\frac{1}{r^2}$ (C) r (D) r^2

29. In five minutes, distance between a pole and a car changes progressively. What is true about the car?
(A) Car is at rest (B) Car is in motion
(C) Nothing can be said with this information (D) None of the above

30. An unbalanced force acts on a body. The body:
(A) Must remain in same state (B) Must move with uniform velocity
(C) Must accelerate (D) None of these

31. Law of gravitation is applicable for:
(A) heavy bodies only (B) medium sized bodies only
(C) small sized bodies only (D) bodies of any size

32. The motion along a straight line is called :
(A) Vibratory (B) Stationary (C) Circular (D) Linear

33. A body of mass 20 kg moves with an acceleration of $2ms^{-2}$. The rate of change of momentum in S.I. unit is :
(A) 40 (B) 10 (C) 4 (D) 1

34. Force between two masses of 1 kg each, are separated by a distance 1 metre will be:
(A) $6.6\ 7\times 10^{-11}$ N (B) 9.8 N (C) $6.6\ 7\times 10^{-8}$ N (D) $6.6\ 7\times 10^{-12}$ N

35. Newton's second law of motion :
(A) defines force (B) defines inertia
(C) gives measure of force (D) none of these

3. CHEMISTRY

Straight Objective Type

This section contains 10 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

36 Which of the following is/are application(s) of high compressibility of gases?
(A) L.P.G. is used as fuel in homes for cooking food
(B) Oxygen cylinders are supplied to hospitals.
(C) C.N.G. is used as fuel in vehicles.
(D) All of these

Space for Rough Work

37. When two liquids in a mixture differ by their boiling points, which of the following is the best method to separate these liquids?
(A) Evaporation (B) Distillation (C) chromatography (D) Filtration

38. What happens to the volume of the aqueous solution when small amount of sugar is dissolved in it?
(A) Volume increases (B) Volume decreases
(C) Volume first increases then decreases. (D) No change in volume

39. Carbon burns in oxygen to form carbon dioxide. The properties of carbon dioxide are -
(A) Similar to carbon
(B) Similar to oxygen
(C) totally different from both carbon and oxygen
(D) Much similar to both carbon and oxygen

40. 10ºC temperature is equal to -
(A) 163 K (B) 10 K (C) 183 K (D) 283 K

41. Which of the following substance is not a compound?
(A) Water (B) Air (C) Glucose (D) Salt

42. Rate of evaporation depends upon -
(A) Temperature (B) surface area (C) humidity (D) All of these

43. Which of the following statements is not correct?
(A) A compound is a pure substance.
(B) A compound is homogeneous in nature.
(C) A compound always contains two or more elements.
(D) A compound can be separated into its constituent elements by some physical process.

44. One atmosphere is equal to -
(A) 1.01×10^5 Pa (B) 3.46×10^4 Pa (C) 1 Pa (D) 10 Pa

45. A solution is a homogeneous mixture of two or more substances. Which of the following is a solution?
(A) Milk (B) Smoke (C) Brass (D) Face Cream

4. BIOLOGY

Straight Objective Type

This section contains 10 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

46. The organelle attached to the RER is
(A) Ribosomes (B) Lysosomes (C) Golgi bodies (D) Proteins

47. One of the following tissues provide a barrier between the organ it covers and the externa environment, namely
(A) Connective tissue. (B) Epithelial tissue. (C) Muscle tissue. (D) Nervous tissue.

Space for Rough Work

48. Inland fisheries is referred to
(A) Culturing fish in salt water. (B) Culturing fish in brackish water.
(C) Culturing fish in fresh water. (D) Culturing fish in deep sea salt water.

49 Golgi apparatus is involved in the formation of
(A) Lysosome (B) Vacuoles (C) Plastids (D) Mitochondria

50. The process of formation of permanent tissue in plants is called
(A) Scalarification (B) Differentiation. (C) Cell thickening. (D) Specialisation.

51. The most common activity followed by the farmers to generate additional income is
(A) Part-time jobs in industries. (B) Bee-keeping.
(C) Uprooting weeds. (D) Pumping of water

52. The energy currency of the cell is
(A) ADP (B) ATP (C) NADP (D) FADP

53. The cells of the cork of the older plants have deposits of
(A) Lignin. (B) Suberin. (C) Calcium. (D) Cutin.

54. Use of neem leaves or turmeric during grain storage serves the purpose of
(A) Bio-pesticides. (B) Providing nutrients.
(C) Imparting the desired colours to the grain. (D) Preparation of bio fertilizers.

55. The function of neuron is
(A) To help in digestion. (B) To help in locomotion.
(C) To help in sending stimulus. (D) To help in reproduction.

5. MENTAL ABILITY

Straight Objective Type

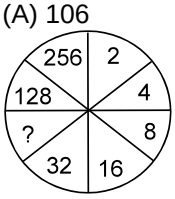
This section contains 15 questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **ONLY ONE** is correct.

Direction (56 to 61) Find the missing term.

56. 1, 3, 7, 13,?
(A) 19 (B) 23 (C) 21 (D) 25

57. 0, 6, 20, 42, 72, ?
(A) 106 (B) 112 (C) 110 (D) 108

58.



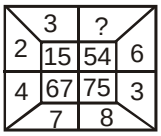
(A) 64 (B) 54 (C) 34 (D) 60

Space for Rough Work

59. PQMN, NOKL, LMIJ, ?, HIEF

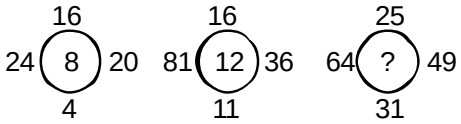
(A) KLHI (B) MNJK (C) GHIJ (D) JKGH

60.



(A) 4 (B) 5 (C) 6 (D) 7

61.



(A) 11 (B) 13 (C) 15 (D) 17

62. If **OLYMPICS** is coded as **PMZNOHBR** and **JUMP** is coded as **KVLO then COMPUTER** will be coded as:-

(A) DPNQVUFS (B) DPNQTSFQ (C) DPNQTSDQ (D) BNLOTSDQ

63. Amit walks 2 km South, turned right and walked 1 km, again turned North and walked 5 km, turned East and walked 5 km. How far is he from the starting point?

(A) 3 km (B) 7 km (C) 5 km (D) 6 km

64. Five children are sitting in a row. S is sitting next to P but not T. K is sitting next to R who is sitting on the extreme left and T s not sitting next to K. Whose are sitting adjacent to S?

(A) K and P (B) R and P (C) Only P (D) P and T

Directions (65) : In the following question, two statements are given followed by four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance from the commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

65. **Statements :** All terrorists are guilty. All terrorists are criminals.

Conclusions : I. Either all criminals are guilty or all guilty are criminals.
II. Some guilty persons are criminals.
III. Generally criminals are guilty.
IV. Crime and guilt go together.

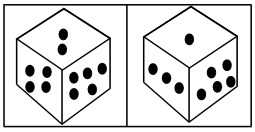
(A) Only I follows (B) Only I and III follows
(C) Only II follows (D) Only II and IV follow

66. How many Mondays are there in a particular month of a particular year. If the months ends on Wednesday?

(A) 4 (B) 5 (C) 6 (D) Can't Say

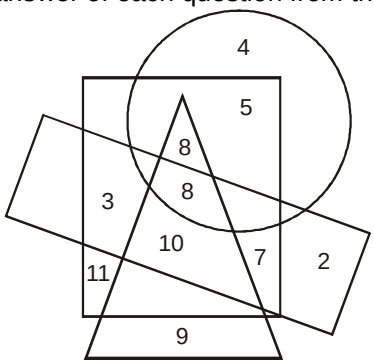
Space for Rough Work

67. Study the two different positions of a cube given below with dots from 1 to 6 marked on its faces. Find out how many dots are contained on the face opposite to that containing 4 dots.



(A) 1 (B) 6 (C) 5 (D) 3

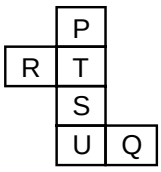
Directions : (68) Following question are based on the Venn diagram given below in which the triangle stands for lady, the rectangle stands for doctors, the circle stands for teachers and the, square stands for engineers. Find out the correct answer of each question from the alternatives given under it.



68. How many persons are engineers as well as do only teaching job?
(A) 5 (B) 8 (C) 13 (D) 7

69. There are 30 days in a month and 1st day of this month is Monday. If each second Monday and each Sunday is a holiday then how many working days are there in this month?
(A) 23 (B) 24 (C) 25 (D) 26

70. Which of the following dices is identical to the unfolded figure as shown here?



(A) 

(B) 

(C) 

(D) 

Space for Rough Work

RESO-NET-2021-22

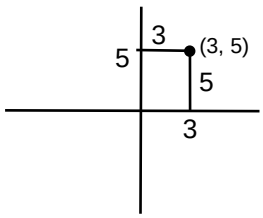
ANSWER KEY_CLASS – X(WINNER)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	B	D	B	B	C	B	D	A	B	C	C	D	C	D
Ques.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	A	D	B	D	D	B	D	A	D	C	D	D	B	B	C
Ques.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	D	D	A	A	C	D	B	D	C	D	B	D	D	A	C
Ques.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	A	B	C	A	B	B	B	B	A	C	C	C	A	D	A
Ques.	61	62	63	64	65	66	67	68	69	70					
Ans.	B	C	C	A	C	D	D	A	B	D					

HINTS AND SOLUTIONS

4. Let the angle be $(x + 14)°$.
$\therefore$ The complement is $(x°)$.
As both are complementary $\angle$s,
$x + x + 14 = 90°$
$2x = 76°$
$x = \frac{76°}{2}$
$x = 38°$
The angle $= x + 14°$
$= 38° + 14° = 52°$
$\therefore$ (B) 52°

13.



5 + 3 = 8

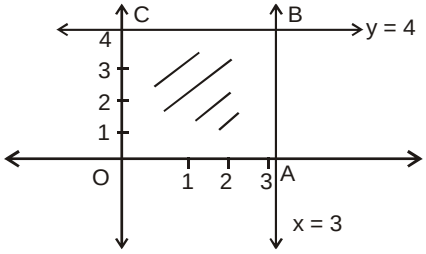
14. Let number be x
75% of x + 75 = x

$x \times \frac{3}{4} + 75 = x$

$75 = \frac{x}{4}$

x = 300

17. x = 0, y = 0, x = 3, y = 4



Area OABC = OA × AB
= 3 units × 4 4 units
= 12 units
∴ Area = 12 sq unit

24. $7^{x+1} - 7^{x-1} = 336$

$\left(7^{x-1}\right)\left(7^2 - 1\right) = 336$

$\left(7^{x-1}\right) \times 48 = 336$

$7^{x-1} = 7$

x–1 = 1
x = 2