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OFFLINE EXAMINATION (PHASE –II)

CLASS-X

M.M. 70 **TIME: 70 Minutes**

Name :_____ Regn. No_____ Mobile No._____

General Instructions:-

1. Duration of the examination is 70 Minutes. Question Paper contains 70 questions with maximum 70 marks.
2. **There will be negative marking in Phase -II i.e: ¼ mark will be deducted for each incorrect answer.**
3. Use of gadgets is not allowed.
4. Students must abide by the instructions issued during the examination by the invigilator or the centre incharge.
5. Before attempting the question paper ensure that it contains all pages & no question is missing.
6. Immediately fill the particulars on this page of the test booklet with blue/black ball point pen. Use of pencil is strictly prohibited.
7. Darken the bubbles completely. Do not put a tick ☑ or a cross ☒. Fill the bubbles completely.
8. Half –filled or over-filled bubbles will not be read by the software & liable to be rejected.

Correct Method

Wrong Method

Student's Signature

Invigilator's Signature

ALL INDIA RPS OLYMPIAD-2022

(Organized by RPS Education Society Mahendergarh-Haryana)

M.M. 70 **Class -X** **Time: 70 Minutes**

English (10)

1. I don't play hockey, _____ do I play football. **(Fill the gap by choosing correct option.)**
   (a) so (b) or (c) nor (d) for
2. Poverty comes _____ idleness. **(Fill the gap by choosing correct option.)**
   (a) from (b) to (c) off (d) of
3. I know about when he will go. **(Identify the underlined clause by choosing the correct option.)**
   (a) Adverb clause of time (b) Noun clause (c) Adjective clause (d) Principal clause
4. The train will have left by the time we _____ the station. **(Fill the gap by choosing correct option.)**
   (a) will reach (b) shall reach (c) reached (d) reach
5. All renew licences may be collected from the cashier's counter after paying the fees. **(Find incorrect part of the sentence by choosing correct option.)**
   (a) All renew licences may (b) be collected from the cashier's counter
   (c) after paying the fees. (d) No error
6. Diving into the swimming pool, he splattered water on me all over. **(Identify the underlined verbs by choosing the correct option.)**
   (a) Diving - Gerund
   Swimming – participle
   (b) Diving - Gerund
   Swimming - Gerund
   (C) Diving – Participle
   Swimming – Participle
   (d) Diving- participle
   Swimming – Gerund
7. "If he does not perform his duties properly, I will send him packing", said the manager. **(Choose the correct option which best expresses the meaning of the underlined Idiom/ Phrase in the given sentence)**
   (a) serve him a notice (b) terminate his services
   (c) send him to packing department (d) give him a warning
8. _____ you see Caroline, tell her I've got the tickets. **(Fill the gap by choosing correct option.)**
   (a) will (b) shall (c) would (d) should
9. It is a must to read this book. **(Change into passive voice)**
   (a) This book must be read. (b) It is a must to be read this book.
   (c) It is a must for this book to be read. (d) It is a must be read this book.
10. He said, "I had to do the work." **(Change into indirect speech)**
    (a) He said that he had had to do the work. (b) He said that he had to do the work.
    (c) He told that he had done the work. (d) He asked if he had had to do the work.

Mathematics (20)

11. The sum of all non-integer roots of the equation $x^5 - 6x^4 + 11x^3 - 5x^2 - 3x + 2 = 0$ is

(a) 6 (b) –11 (c) –5 (d) 3

12. Let S={1, 2, 3, … … . , 100}. Sppose b and c are chosen at random from the set S. The probability that $4x^2 + bx + c$ has equal roots is

(a) 0.001 (b) 0.004 (c) 0.007 (d) 0.01

13. The number of non-negative integer solution of the equations $6x + 4y + z = 200$ and $x + y + z = 100$ is

(a) 3 (b) 5 (c) 7 (d) infinite

14. Let $N_1 = 2^{55} + 1$ and $N_2 = 165$. Then

(a) N_1 and N_2 are coprime (b) the HCF (Highest Common Factor) of N_1 and N_2 is 55

(c) the HCF of N_1 and N_2 is 11 (d) the HCF of N_1 and N_2 is 33

15. A prime number p is called special if there exist prime p_1, p_2, p_3, p_4 such that $p = p_1 + p_2 = p_3 - p_4$. The number of special primes is

(a) 0 (b) 1 (c) more than 1 but less than 3 (d) infinite

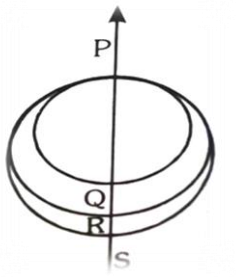
16. Consider the equation $x^2 + 2x - n = 0$, where $n \in N$ and $n \in [5,100]$. Total number of different values of 'n' so that the given equation has integral roots is

(a) 8 (b) 3 (c) 6 (d) 4

17. Let $f(x) = x^6 - 2x^5 + x^3 + x^2 - x - 1$ and $g(x) = x^4 - x^3 - x^2 - 1$ be two polynomials. Let a, b, c and d be the roots of $g(x) = 0$. Then the value of $f(a) + f(b) + f(c) + f(d)$ is

(a) –5 (b) 0 (c) 4 (d) 5

18. PQRS is a common diameter of three circles. The area of the middle circle is the average of the other two. If PQ = 2 and RS = 1, then the length of QR is



a) $\sqrt{6} + 1$ (b) $\sqrt{6} - 1$ (c) 5 (d) 4

19. If $72^x . 48^y = 6^{xy}$, where x and y are non zero rational numbers, then x + y equals

(a) 3 (b) 10/3 (c) –3 (d) –10/3

20. Let ABCD be a square and E be a point outside ABCD such that E, A, C are collinear in that order. Suppose EB = ED = $\sqrt{130}$ and the areas of triangle EAB and square ABCD are equal. Then the area of square ABCD is

(a) 8 (b) 10 (c) $\sqrt{120}$ (d) $\sqrt{125}$

21. Let P be an interior point of a convex quadrilateral ABCD and K, L, M, N be the midpoints of AB, BC, CD, DA respectively. If Area (PKAN) = 25, Area (PLBK) = 36, and Area (PMDN) = 41, then Area (PLCM) is

(a) 20 (b) 29 (c) 52 (d) 54

22. Let, $n \geq 1$ be an AP with first term 2 and common difference 4. Let m_n be the average of the first n term. Then the sum $\sum_{n=1}^{10} m_n$ =?

(a) 110 (b) 335 (c) 770 (d) 1100

23. If $x - \frac{1}{x} = 3$ then find $x^7 - \frac{1}{x^7}$.

(a) 4284 (b) 4287 (c) 4290 (d) 4293

24. A motorbike leaves point A at 1 pm and moves towards point B at a uniform speed. A car leaves point B at 2 pm and moves towards point A at a uniform speed which is double that of the motorbike. They meet at 3:40 pm at a point which is 168 km away from A. What is the distance, in km, between A and B?

(a) 210 (b) 310 (c) 378 (d) 478

25. Let b be a non-zero real number. Suppose the quadratic equation $2x^2 + bx + (1/b) = 0$ has two distinct real roots. Then

(a) $b + (1/b) > (5/2)$ (b) $b + (1/b) < (5/2)$

(c) $b^2 - 3b > -2$ (d) $b^2 + (1/b^2) < 4$

26. If for an A.P. $a_1, a_2, a_3, \ldots\ldots, a_n, \ldots\ldots$ $a_1 + a_3 + a_5 = -12$ and $a_1 a_2 a_3 = 8$ then the value of $a_2 + a_4 + a_6$ equals

(a) – 12 (b) – 16 (c) – 18 (d) – 21

27. Consider a semicircle of radius 1 unit constructed on the diameter AB, and let O be its centre. Let C be a point on AO such that AC: CO = 2:1. Draw CD perpendicular to AO with D on the semicircle. Draw OE perpendicular to AD with E on AD. Let OE and CD intersects at H. Then DH equals

(a) $1/\sqrt{5}$ (b) $1/\sqrt{3}$ (c) $1/\sqrt{2}$ (d) $(\sqrt{5} - 1)/2$

28. Among all the parallelograms whose diagonals are 10 and 4, the one having maximum area has its perimeter lying in the interval

(a) (19, 20) (b) (20, 21) (c) (21, 22) (d) (22, 23)

29. Consider the equation $(1 + a + b)^2 = 3\ (1 + a^2 + b^2)$, where a, b are real numbers. Then

(a) There is no solution pair (a, b).

(b) There are infinitely many solution pairs (a, b).

(c) There are exactly two solution pairs (a, b).

(d) There is exactly one solution pair (a, b).

30. If a leap year is selected randomly then what is the probability of having 53 Monday or 53 Sunday in this year.

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{4}{7}$

Social Science (10)

31. Which of the events are chronologically arranged?

(a) Salt Satyagraha, Non – Cooperation Movement, Quit India Movement, Swadeshi Movement

(b) Swadeshi Movement, Non – Cooperation Movement, Salt Satyagraha, Quit India Movement

(c) Quit India Movement, Swadeshi Movement, Non – Cooperation Movement, Salt Satyagraha

(d) Salt Satyagraha, Swadeshi Movement, Quit India Movement, Non – Cooperation Movement

32. Between whom was the Poona Pact signed?

(a) M.K. Gandhi and Mountbatten (b) M.K. Gandhi and Dr. B.R. Ambedkar

(c) M.K. Gandhi and Moti Lal Nehru (d) M.K. Gandhi and Viceroy Lord Irwin

33. What was the subject of Sarkaria Commission?

(a) Tax system (b) Land Reforms (c) Centre – State relations (d) Election reforms

34. Which one is a state political party of Punjab?

(a) T.M.C (b) D.M.K (c) Shiromani Akali Dal (d) Biju Janta Dal

35. In which of the following iron ore belt Kudremukh mines are located?

(a) Odisha – Jharkhand belt

(b) Ballary – Chitradurg – Chikkamagaluru – Tumakuru belt

(b) Durg – Bastar – Chandrapur belt

(d) Maharashtra – Goa belt

36. Match the following:-

Column A (Grasslands)		Column B (Regions)	
A	Downs	1	South Africa
B	Velds	2	New Zealand
C	Pampas	3	Australia
D	Canterbury	4	Argentina

(a) A-3, B-1, C-4, D-2 (b) A-4, B-3, C-2, D-1

(c) A-1, B-2, C-3, D-4 (d) A-3, B-2, C-1, D-4

37. The modern currency is without any use of its own, then why is it accepted as a medium of exchange?

(a) It can be used in foreign exchange (b) It has digital and manual system

(c) It is authorized by the govt. of the country (d) Because it is convenient

38. When did demonetization take place in India?

(a) 6 November, 2016 (b) 8 November, 2016

(c) 9 November, 2016 (d) 10 November, 2016

39. Which pair of states have bicameral houses?

(a) Haryana, Uttar Pradesh, Bihar, Jharkhand

(b) Punjab, Maharashtra, Tamilnadu, Karnataka

(c) Bihar, Uttar Pradesh, Maharashtra, Andhra Pradesh

(d) Kerala, Bihar, Odisha, West Bengal

40. When was the Vernacular Press Act passed?

(a) 1855 (b) 1870 (c) 1875 (d) 1878

Aptitude (Reasoning) (10)

Direction (41-42) :

A, B, C, D, E, F and G are brothers. Two brothers had an argument and A said to B "you are as old as C was when I was twice as old as D, and will be as old as E Was when he was as old as C is now. B said to A, "you may be older than F but G is as old as I was when you where as old as G is and D will be as old as F was when F will be as old as G is .

41. Which two are probably twins?

(a) D and G (b) E and C (c) A and B (d) can't be determined

42. Which of the following is false?

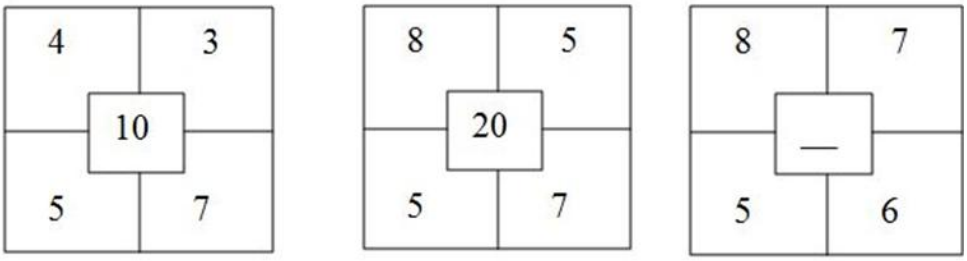
(a) G has 4 older brothers.

(b) A is older than G but younger than E.

(c) B has three older brothers.

(d) There is probably a pair of twins among the brothers.

43.



(a) 28 (b) 20 (c) 10 (d) 25

44. 

(a) 21.5 (b) 22.59 (c) 27 (d) 24.55

45. Find the next number in the given series?

3 20 87 392 _____

(a) 1963 (b) 2015 (c) 1612 (d) None of these

46. If the following words are arranged in logical order, then what will come in the third place in ascending order?

(1) Major (2) Lieutenant (3) Captain (4) Brigadier (5) Lieutenant General

(a) Lieutenant (b) Major (c) Captain (d) Lieutenant General

47. In a certain code, DECEMBER is written as EMDBECCE. Which word will be written as ERMBVENO in that code?

(a) RVEEBMMB (b) EEMMBKTV (c) MPJKTJVF (d) None of these

48. The maximum number of points of intersection of 4 circles and 4 straight lines is

(a) 25 (b) 50 (c) 56 (d) 72

49. If the concept of Leap Year is as

(i) Every year divisible by 5 is Leap Year except 100th Year.

(ii) Every 100th year divisible by 500 is Leap Year and there are 29 days in February in a Leap Year and 28 Days in February in Non-Leap Year.

What was the day on 28th March, 2001. If there was Monday on 29th Dec., 1999.

(a) Monday (b) Tuesday (c) Wednesday (d) Thursday

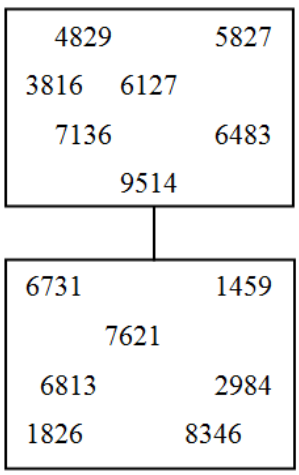
50. Which two numbers, one in the top rectangle and one in the bottom rectangle, are the odd ones out?

(a) 5827 and 1826

(b) 6483 and 8346

(c) 3816 and 6813

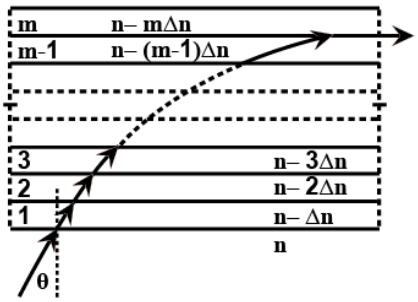
(d) 6127 and 7621



Science (20)

Physics (7)

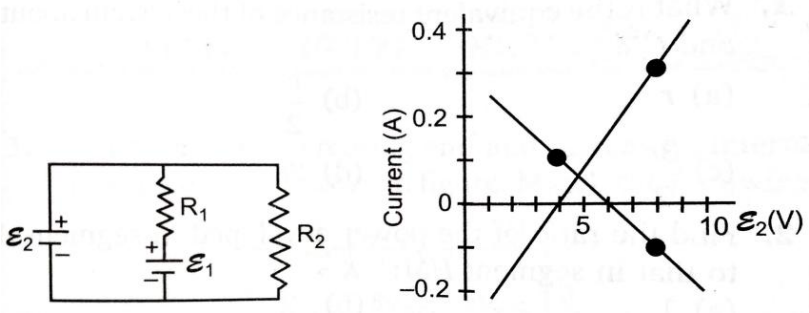
51. A monochromatic light is travelling in a medium of refractive index $n = 1.6$. It enters a stack of glass layers from the bottom side at an angle $\theta = 30^o$. The interfaces of the glass layers are parallel to each other.



The refractive indices of different glass layers are monotonically decreasing as $n_m = n - m\Delta n$, where n_m is the refractive index of the m^{th} slab and $\Delta n = 0.1$ (see the figure). The ray is refracted out parallel to the interface between the $(m-1)^{th}$ and m^{th} slabs from the right side of the stack. What is the value of m?

(a) 2 (b) 4 (c) 6 (d) 8

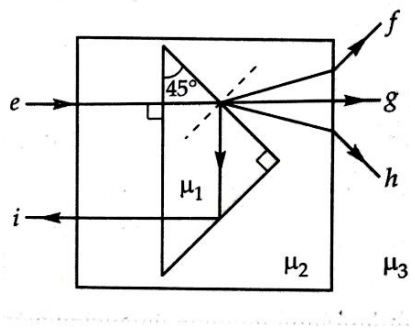
52. In the circuit shown, both batteries are ideal. EMF ε_1 of battery 1 has a fixed value, but emf ε_2 of battery 2 can be varied between 1.0 V and 10.0 V. The graph gives the currents through the two batteries as a function of ε_2, but are not marked as which plot corresponds to which battery. But for both plots, current is assumed to be negative when the direction to the current through the battery is opposite the direction of that battery's emf. (Direction of emf is from negative to positive)



The values of ε_1 and R_1 are :

(a) 8 V, 20 Ω (b) 6 V, 20 Ω (c) 4 V, 10 Ω (d) 2 V, 10 Ω

53. A right angled prism of refractive index μ_1 is placed in a rectangular block of refractive index μ_2, which is surrounded by a medium of refractive index μ_3, as shown in the figure. A ray of light 'e' enters the rectangular block at normal incidence. Depending upon the relationship between μ_1, μ_2 and μ_3, it takes one of the four possible paths $'ef', 'eg', 'eh'$ and $'ei'$.



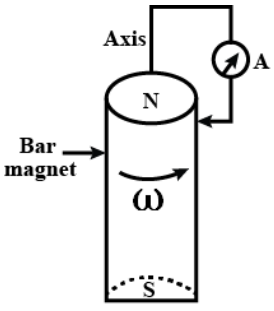
Match the paths in List I with conditions of refractive indices in List II and select the correct answer.

List I		List II	
P.	$e \to f$	1.	$\mu_1 > \sqrt{2}\mu_2$
Q.	$e \to g$	2.	$\mu_2 > \mu_1$ and $\mu_2 > \mu_3$
R.	$e \to h$	3.	$\mu_1 = \mu_2$
S.	$e \to i$	4.	$\mu_2 < \mu_1 < \sqrt{2}\mu_2$ and $\mu_2 > \mu_3$

(a) P→1; Q→2; R→3, S→4 (b) P→1; Q→2; R→4, S→3

(c) P→2; Q→3; R→4, S→1 (d) P→4; Q→3; R→2, S→1

54. A cylindrical bar magnet is rotated about its axis (Figure). A wire is connected from the axis and is made to touch the cylindrical surface through a contact. Then



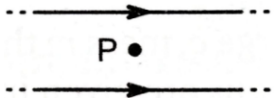
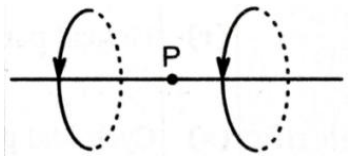
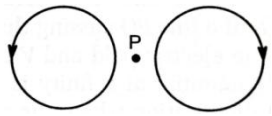
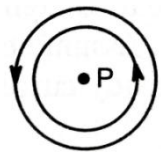
(a) A direct current flow in the ammeter A.

(b) No current flow through the ammeter A.

(c) An alternating sinusoidal current flow through the ammeter A with a time $= 2\pi\omega$

(d) A time varying non-sinusoidal current flows through the ammeter.

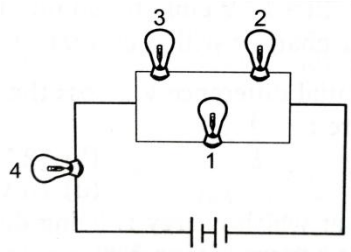
55. Two wires each carrying a steady current *I* are shown in four configurations in Column-I. Some of the resulting effects are described in Column-II. Match the statements in Column-I with the statements in Column-II.

Column-I		Column-II	
(1)	Point P is situated midway between the wires. 	(p)	The magnetic field (B) at P due to the currents in the wires are in the same direction.
(2)	Point P is situated at the mid-point of the line joining the centers of the circular wires, which have same radii. 	(q)	The magnetic fields (B) at P due to the currents in the wires are in opposite directions.
(3)	Point P is situated at the mid-point of the line joining the centers of the circular wires, which have same radii. 	(r)	There is no magnetic field at P.
(4)	Point P is situated at the common centre of the wires. 	(s)	The wires repel each other.

(a) 1→p, r; 2→q; 3→q, r; 4→q (b) 1→q, r; 2→p; 3→q, r; 4→p

(c) 1→s, r; 2→p; 3→q, r; 4→p (d) 1→r; 2→p; 3→q, r; 4→s

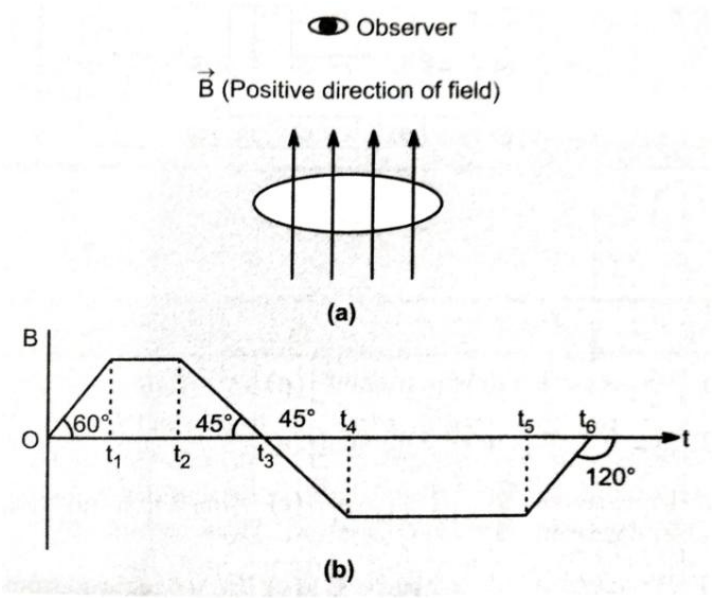
56. All bulbs consume same power. The resistance of bulb 1 is 36Ω.



What is the voltage output of the battery if the power consumed by each bulb is 4 W?

(a) 12 V (b) 24 V (c) 16 V (d) none of these

57. A conducting loop is held in a magnetic field such that the field is oriented perpendicular to the area of the loop as shown in figure (a). At any instant magnetic field over the entire area has the same value but it varies with time as shown in figure (b).



Column-I		Column-II	
(1)	Induced current in the coil is in the clockwise sense	(p)	For $t_2 < t < t_3$
(2)	Induced current in the coil is in the anticlockwise sense	(q)	For $t_3 < t < t_4$
(3)	Induced current is zero	(r)	For $t_5 < t < t_6$
(4)	Induced current is maximum	(s)	For $t_4 < t < t_5$

(a) 1→s; 2→p, q; 3→p, s; 4→r (b) 1→q, r; 2→p, q; 3→s; 4→p

(c) 1→s, r; 2→p, q; 3→s; 4→q (d) 1→r; 2→p, q; 3→s; 4→r

Chemistry (7)

58. Which of the following species contains equal number of σ and π-bonds?

(a) $(CN)_2$ (b) $CH_2(CN)_2$ (c) HCO_3^- (d) XeO_4

59. A weak monobasic acid is 0.1% ionized at 0.1 M. Hence, its pH is

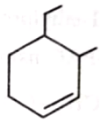
(a) 2 (b) 3 (c) 4 (d) 5

60. Which of the following changes requires a reducing agent?

(a) $CrO_4^{2-} \rightarrow Cr_2O_7^{2-}$ (b) $BrO_3^- \rightarrow BrO^-$

(c) $H_3AsO_3 \rightarrow HAsO_4^{2-}$ d) $Al(OH)_3 \rightarrow Al(OH)_4^-$

61. The IUPAC name of the given compound

 is :

(a) 1-Ethyl-2-methylcyclohexene (b) 2-Methyl-1-ethylcyclohexene

(c) 3-Ethyl-2-methylcyclohexene (d) 4-Ethyl-3-methylcyclohexene

62. Select the correct statement.

(a) $CaCO_3$ is more soluble in a solution of CO_2 than in H_2O

(b) Na_2CO_3 is converted to Na_2O and CO_2 on heating

(c) Li_2CO_3 is thermally stable

(d) Presence of $CaCl_2$ or $CaSO_4$ in water causes temporary hardness

63. In which of the following, the oxidation number of oxygen has been arranged in increasing order?

(a) $BaO_2 < KO_2 < O_3 < OF_2$ (b) $OF_2 < KO_2 < BaO_2 < O_3$

(c) $BaO_2 < O_3 < OF_2 < KO_2$ (d) $KO_2 < OF_2 < O_3 < BaO_2$

64. During the process of electrolyte refining of copper, some metals present as impurity settle as 'anode mud'. These are:

(a) Sn and Ag (b) Pb and Zn (c) Ag and Au (d) Fe and Ni

Biology (6)

65. A male rabbit of genotype AA BB DD EE is crossed with female rabbit of genotype aa bb dd ee to produceF_1 hybrid offspring. How many genetically different gametes can be produced by this F_1 hybrid

(a) 4 (b) 8 (c) 16 (d) 32

66. The accumulation of urea in the blood due to malfunctioning of kidneys is referred to as

(a) uremia (b) renal calculi (c) edema (d) glomerulonephritis

67. Hormones secreted by the placenta to maintain pregnancy are

(a) hCG, hPL, progestogens, prolactin (b) hCG, hPL, estrogens, relaxin, oxytocin

(c) hCG, hPL, progestogens, estrogens (d) hCG, progestogens, estrogens, glucocorticoids

68. The appetite and satiety centres in the brain are located in the region of the

(a) hypothalamus (b) cerebral hemispheres

(c) medulla oblongata (d) cerebellum

69. Which one of the following is the most important cause for animals and plants being driven to extinction?

(a) Habitat loss and fragmentation (b) Drought and floods

(c) Economic exploitation (d) Allien species invasion

70. Minamata disease is a pollution-related disease which results from

(a) release of human organic waste into drinking water;

(b) accumulation of arsenic into atmosphere;

(c) release of industrial waste mercury into fishing water;

(d) oil spills into sea

SPACE FOR ROUGH WORK

RPS - THE COMPLETE SCHOOL

BEST IN HARYANA

IN CULTURAL | **IN SPORTS** | **IN ACADEMICS**

NDA 27 GIRLS QUALIFIERS

Highest Number of **Girls Qualifiers** in **NDA** Among Schools of India

Proudly Ranked Among the **TOP 10 Schools** in the Region by the Coveted **THE TIMES OF INDIA School Survey 2021**

RPS International School Sec-50 Gurugram, **Rank-4** in Gurugram Challengers Category

RPS International School Sec-89 Gurugram, **Rank-5** in Gurugram Chalengers Category

RPS International School Behror, Rajasthan, **Rank-7** among Top 10 Boarding Schools of North India

in World Dancer Online International Dance Contest 2021 to Amishi Gautam by Akhil Natrajam Aantar sanskrutik Sangh, Nagpur

SANYAM BANSAL IN **COMMERCE WIZARD-2021** by **Institute of Chartered Accountants of India** & won Prize of ₹ **1 Lakh**

Sensational performance by **LAXIT** in the **ASIAN PARALYMPIC GAMES (Bahrain)** **Bronze Medal** (Javelin Throw)

RPS PUBLIC SCHOOL (HANSAKA) **OVERALL CHAMPION** in Distt. Rewari in Bal Mahotsava 2021 **9th Time in a Row**

RPS SR. SEC. SCHOOL (MAHENDERGARH) Claimed Distt. Narnaul **CHAMPION'S TROPHY** in Bal Mahotsava 2021, **12th Time in a Row**

RPS PUBLIC SCHOOL (DHARUHERA) stood proud as **First Runner Up** in Bal Mahotsava Rewari 2021

RPS INTERNATIONAL SCHOOL (Sec-50, Gurugram) **CHAMPION'S TROPHY** in Bal Mahotsava, Gurugram-2021

SUPER Achievements of **RPS GROUP OF SCHOOLS**

40 STUDENTS AIIMS 2021	66 STUDENTS NTSE-II 2022	507 STUDENTS NEET	441 STUDENTS IIT-JEE Main	80 STUDENTS IIT-JEE Advanced	15 STUDENTS KVPY	110 STUDENTS NDA	62 STUDENTS Securing 600 marks & Above in NEET	17 STUDENTS CLAT