ALL INDIA RPS OLYMPIAD-2021

(Organized by RPS Education Society Mahendergarh Haryana)

M.M. 70 **Class 9th** **Time: 70 minutes**

English (10)

1. _____ all her qualifications, she could not do well.

   a) Beside b) In spite c) For d) By

2. The chief said, "A big school and not a good student !" (Change into indirect speech)

   a) The chief said that a big school had no good student.

   b) The chief exclaimed that a very big school had not any good student.

   c) The chief exclaimed with wonder a big school had not any good student.

   d) The chief exclaimed with surprise that even the big school had no good student.

3. Fill in the blank with the correct verb.

   I don't mind _____ if you are busy.

   a) wait b) waiting c) to wait d) having wait

4. Change the voice

   We wish you to forget this incident.

   a) This incident should be forgotten.

   b) We wish this incident should be forgotten by you.

   c) We wish this incident to be forgotten by you.

   d) You are wished to be forgotten this incident.

5. 'Blue stocking' means

   a) an intellectual and well read woman b) garments

   c) a savage woman d) blue dye

6. <u>If I were a poet,</u> I would write an epic.

   The underlined part is –

   a) Noun clause b) Adjective clause

   c) Adverb clause of condition d) Adverb clause of manner

7. Choose a correct sentence:-

   a) Would you mind to close the window?

   b) I am looking forward to see him again.

   c) Stop to move here and there.

   d) He is wise enough to take the decision.

8. Find the error part:-

   Being a boring job, / I decided / to resign. / No error.

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

9. Walk carefully lest you ……. fall.
(a) will (b) can (c) should (d) could

10. He worked hard but he failed. This is an example of a/an …… sentence.
(a) simple (b) compound (c) complex (d) Imperative

Mathematics (20)

11. The unit digit of $(1+9+9^2+9^3+$ _____$+9^{2009})$ is :
a) 0 b) 1 c) 9 d) 3

12. If $2^{(x-1)} + 2^{(x+1)} = 320$ then the value of x is
a) 6 b) 8 c) 5 d) 7

13. If x^2+2x+5 is the factor of x^4+Px^2+Q then the value of $6P - Q$ is
a) 18 b) 25 c) 11 d) 28

14. x and y are two non-negative integral numbers such that $2x+y=10$. The sum of maximum and mini mum values of $(x+y)$ is
a) 6 b) 9 c) 10 d) 15

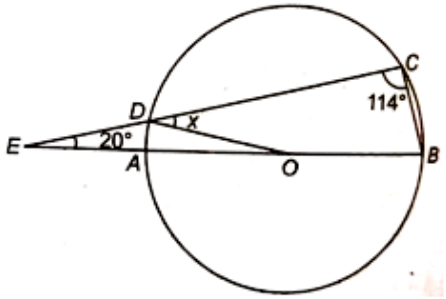
15. Fill in the blanks choosing the appropriate option:-
____(P)____ geometry is also called ____(Q)____ geometry
a) (P) – spherical (Q) – Euclidean
b) (P) – linear (Q) – non – Euclidean
c) (P) – Spherical (Q) – non – Euclidean
d) (P) – all (Q) – Euclidean

16. If angles of a triangle are in the ratio 2 : 4 : 9, then the difference of two smaller exterior angles of the triangle is
a) 24^o b) 30^o c) 44^o d) 60^o

17. P, Q and R are respectively the mid-points of side BC, CA and AB of a triangle ABC. PR and BQ meet at X. CR and PQ meet at Y. Then
a) $XY = \frac{1}{3}BC$ b) $XY = \frac{2}{3}BC$ c) $XY = \frac{1}{4}BC$ d) $XY = \frac{2}{5}BC$

18. The quadrilateral formed by joining the mid points of the sides of a quadrilateral PQRS, taken in order, is a rhombus, if
a) PQRS is a rhombus b) PQRS is a parallelogram
c) diagonals of PQRS are perpendicular d) diagonals of PQRS are equal

19. In the given figure, O is centre of the circle. EAOB and EDC are straight lines. Find x



a) 40^o b) 46^o c) 68^o d) 66^o

20. For the data 1, 2, 2, 3, 3, 3, 4, 4, 4, 4 ……. 9, 9 the product of mean and mode equals

a) 9 b) 45 c) 57 d) 285

21. If the median of $x, \frac{x}{2}, \frac{x}{8}, \frac{x}{5}, \frac{x}{6}$ and $\frac{x}{3}$ is 16 then x = ?

a) 64 b) 30 c) 60 d) 15

22. A number x is chosen at random from the numbers -3,-2,-1,0,1,2,3 the probability that | x|<2 is

a) 5/7 b) 2/7 c) 3/7 d) None of these

23. The volume of a sphere having radius $\sqrt[3]{2}$ cm is equal to the volume of a right circular cone whose lateral surface area is three times of the area of the base. The altitude of the cone is :

a) 4cm b) 6cm c) 8cm d) 10cm

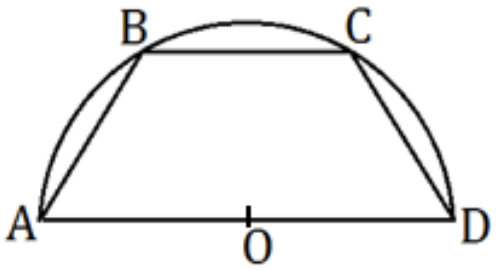
24. The base of a prism is square and its height is 10cm. If the whole surface area is 192 sq. cm, the volume of the prism is

a) 160 c.c b) 165 c.c c) 170 c.c d) 155 c.c

25. In a triangle the sum of any two sides exceeds the third side by 6cm, then the area in sq. cm is

a) $12\sqrt{3}$ b) $9\sqrt{3}$ c) $15\sqrt{3}$ d) $18\sqrt{3}$

26. In the given figure, the semicircle centered at O has diameter 6cm. The chord BC is paralled to AD and BC=1/3 AD. The area of the trapezium ABCD in cm^2, is :



a) 4 b) $4\sqrt{2}$ c) 8 d) $8\sqrt{2}$

27. The mid point of the base of a triangle is equidistant from all the vertices. The triangle is
a) equilateral b) right angled c) isosceles d) none of these

28. The value of $(1-\frac{1}{3})^2(1-\frac{1}{4})^2(1-\frac{1}{5})^2$ …….. $(1-\frac{1}{n})^2$ is equal to :
a) $\left(\frac{1}{n}\right)^2$ b) $\left(\frac{2}{n}\right)^2$ c) $\left(\frac{3}{n}\right)^2$ d) $\left(\frac{4}{n}\right)^2$

29. What is the remainder when the polynomial $p(x)=x^{200}-2x^{199}+x^{50}-2x^{49}+x^2+x+1$ is divided by $(x-1)(x-2)$?
a) 1 b) 7 c) $2x+1$ d) $6x-5$

30. In *a* right triangle with sides *a* and *b*, and hypotenuse *c*, the altitude drawn on the hypotenuse is *x*. Then which of the following is correct?
a) $ab=x^2$ b) $\frac{1}{a}+\frac{1}{b}=\frac{1}{x}$ c) $a^2+b^2=2x^2$ d) $\frac{1}{x^2}=\frac{1}{a^2}+\frac{1}{b^2}$

Social Science (10)

31. Which of the following hills is not a part of Purvanchal Himalayas?
a) Patkai Hills b) Naga Hills c) Garo Hills d) Mizo Hills

32. Which river, is right bank tributary of Ganga river?
a) Ghaghara river b) Kosi river c) Gandak river d) Yamuna river

33. In which layer of atmosphere Jet stream flows?
a) Troposphere b) Inosphere c) Troposphere d) Exosphere

34. Why was the subsistence crisis caused in France?
a) Increase in population led to a rapid increase in the demand for foodgrains
b) Wide spread unemployment
c) The State imposed various taxes
d) The wages of the people was low

35. Which of the following was not a part of Lenin's 'April Theses'?
a) Banks to be nationalised b) First World War to be closed
c) Land to the tillers d) Banks to be privatised

36. Who were called November criminals?
a) Socialists, Protestants and Democrats b) Socialists, Dictators and Democrats
c) Socialist, Catholics and Democrats d) Socialists, Orthodox and Democrats

37. Recently in which neighbouring country of India, military had overthrown democratically elected govt.?

a) Sri Lanka b) Nepal c) Bhutan d) Myanmmar

38. Which state has State Legislative Council?

a) Bihar b) Rajasthan c) Haryana d) Kerala

39. Which of the following is a non-economic activity?

a) Washerman washes cloth of people

b) Chef Cooking food in hotel

c) A woman doing household work

d) A doctor treats patients

40. When was Rural Employment Generation Programme launched?

a) 1993 b) 1995 c) 1999 d) 2000

Science (20)

41. Transverse waves can propagate –

both in a gas and in a metal

in a gas not in a metal

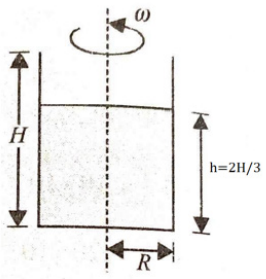
in a metal but not in a gas

neither in gas nor in metal

42. A student is very fond of Physics Experiments. He has a chain of length 'L' and mass 'M' and this chain is held on a frictionless table with $\left(\frac{1}{n}\right)^{th}$ of its length hanging over the edge. When the chain is released, find the velocity of chain while leaving the table.

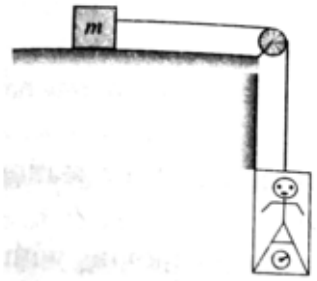
a) $\sqrt{gL(1-\frac{1}{n^2})}$ b) $\sqrt{\frac{gL}{n^2}-1}$ c) $\sqrt{gL(n^2-1}$ d) $\sqrt{\frac{gL}{n^2}(1-2n)}$

43. Ram is having a cylindrical container filled of water. He placed it on a machine. This machine makes the container to rotate as shown in figure. If he is using a cylindrical container of radius R = 1 m and height H = 3m and two – third of it is filled with water. What will be speed of rotation when the water just starts spilling over the rim?



a) $\sqrt{20}$ rad/s b) $\sqrt{30}$ rad/s c) $\sqrt{40}$ rad/s d) $\sqrt{50}$ rad/s

44. In Figure a man of true mass M is standing on a weighing machine placed in a cabin. The cabin is joined by a string with a body of mass m. Assuming no friction, and negligible mass of cabin and weighing machine, the measured mass of man is (normal force between the man and the machine is proportional to the mass)



(i) The measured mass of man is $\frac{Mm}{(M+m)}$

(ii) The acceleration of man is $\frac{mg}{(M+m)}$

(iii) The acceleration of man is $\frac{Mg}{(M+m)}$

(iv) The measured mass of man is M.

Which of the following is correct?

a) i, ii b) i, iii c) ii, iv d) i, iv

45. Preinika is a student of Class 9th and she is a good learner of Physics. She also helps other students in understanding Physics. She is doing an activity to make other students to understand different laws. She dropped a ball which hits the floor and rebounds after an inelastic collision with floor. In this case

(i) the momentum of the ball just after collision is the same as that just before the collision.

(ii) the mechanical energy of ball remains the same in the collision.

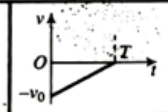
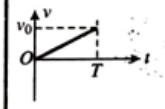
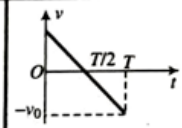
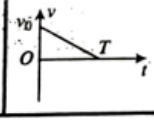
(iii) the total momentum of the ball and the earth is conserved.

(iv) the acceleration of the ball will remain the same from the point where ball is dropped to the point where ball reached after rebounding from the floor.

Which is/are incorrect?

a) i, ii, iv b) ii, iii, iv c) ii, iii d) iii, iv

46. It is better to make formula chart to revise the concepts. A student prepared the same. He made some graphs on LHS and their conclusions on RHS. The given graphs are velocity – time and motion of object is from O to T time.

Column I		Column II	
i.		a.	Net displacement is positive, but not zero
ii.		b.	Net displacement is negative, but not zero
iii.		c.	Particle returns to its initial position again
iv.		d.	Acceleration is positive

Which of the following is correct.

a) (i) → b, d, (ii) → a, d, (iii) → c, (iv) → a

b) (i) → d, (ii) → a, d, (iii) → b, (iv) → a, b

c) (i) → c, d, (ii) → a, (iii) → d, (iv) → c

d) (i) → b, c, (ii) → a, (iii) → c, (iv) → a

47. The mass of the moon $\frac{1}{81}$ is of the earth but the gravitational pull is $\frac{1}{6}$ of the earth. It is due to the fact that

(a) The radius of the moon is $\frac{81}{6}$ of the earth

(b) The radius of the earth is $\frac{9}{\sqrt{6}}$ of the moon

(c) Moon is the satellite of the earth

(d) None of the above

48. Impure sample of potash alum is purified by

(a) Crystallization (b) Chromatography (c) Evaporation (d) Filteration

49. The use of common salt (NaCl) or $CaCl_2$ anhydrous is made to clean snow on the roads. This causes.

a) a lowering in freezing point of water.

b) a lowering in melting point of ice.

c) ice melts at the temperature of atmosphere present at that time.

d) all of the above.

50. To form a super saturated solution of salt one must :
a) Cool slowly b) Cool rapidly
c) add some salt to cold solution d) use a clean vessel

51. Number of atoms of Iron present in 100g Fe_2O_3 having 20% purity is :
a) $0.20N_A$ b) $0.25N_A$ c) $0.50N_A$ d) $0.30N_A$

52. Which set of quantum numbers given below represents the highest energy of an electron in an orbital?

a) n = 3, l = 0, m = 0, s = + $\frac{1}{2}$ b) n = 3, l = 1, m = + 1, s = + $\frac{1}{2}$

c) n = 3, l = 2, m = + 1, s = + $\frac{1}{2}$ d) n = 4, l = 0, m = 0, s = + $\frac{1}{2}$

53. The ionisation enthalpy of hydrogen atom is $1.312\times10^6\ J/mol$. The energy required to excite the electron in the atom from $n=1\ to\ n=2$ is –
(a) $9.84\times10^5\ J/mol$ (b) $8.51\times10^5\ J/mol$
(c) $7.56\times10^5\ J/mol$ (d) $6.56\times10^5\ J/mol$

54. Gelatin is often used as an ingredient in the manufacture of ice – cream. The reason for this is :
a) to prevent the formation of a colloid.
b) to stabilize the colloid and prevent crystal growth.
c) to cause the mixture to solidify.
d) to improve the flavour.

55. Match the following columns and select the correct option

Column 1	Column 2
A) Smooth Endoplasmic reticulum	1) Protein synthesis
B) Rough Endoplasmic reticulum	2) Lipid synthesis
C) Golgi complex	3) Glycosylation
D) Centriole	4) Spindle formation

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

56. Find out the wrong match
a) Eosinophils– allergic response b) Basophils- secretes Histamine and Serotonin
c) Monocytes- secretes heparin d) Lymphocytes – Immune response

57. Consider following features

A) Organ system level of organisation

B) Bilateral symmetry

C) True coelomates with segmentation of body

Select the correct option of animal groups which possess all the above characteristics

a) Annelida, Arthropoda and platyhelminthes

b) Annelida, Arthropoda and Chordata

c) Arthropoda, Ascehelminthes and Chordata

d) Annelida, Chordata and platyhelminthes

58. Colostrum, the yellowish fluid, secreted by mother is very essential to impart immunity to new born infants because it contains

a) Natural killer cells b) Monocytes c) Macrophages d) Immunoglobulin A

59. What is the reason for mortality of fish in water body

a) Biodegradation of organic matter by microbes b) Due to algal bloom

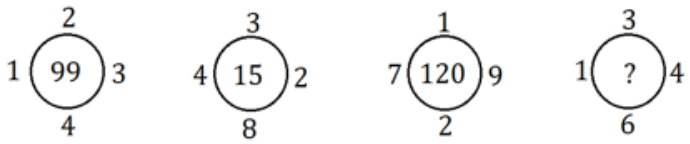
c) Due to decrease in BOD d) Both A and B

60. Which of following is an exotic breed of poultry

a) Peela b) Leghorn c) Kajal d) Nurie

Aptitude/ Reasoning (10)

61. Find the missing number (?) in the figure given below.



a) 442 b) 441 c) 440 d) 399

62. Find the next number in the given series?

3 6 17.5 64.75 _____

a) 295.875 b) 295.975 c) 295.425 d) None of these

63. If 'FINE' is coded as 'IFFI', 'TASTE' is coded as 'AETTE' then the code for 'TEACHER'.

a) EHAREER b) EHERERR c) EHEREER d) EHERRER

64. The question given below is based on the letter series, in some letters are missing. Select the correct alternative. If more than five letters are missing, select the last five letters of the series.

XYZU __ YZ __ V __ __ UV __ __ __ __ __ __ __

a) UVXYZ b) VUZYX c) UVZYX d) VUXYZ

65. If in any code language TARGET is coded as UYUCJN then which ward is coded as VICTORY in that language?
a) UKZXJXR b) UKYXJDR c) UKYXJWD d) None of these

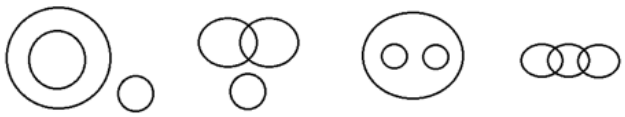
66. Select the series in which the letters skipped in between adjacent letters decrease in order?
a) AGMRV b) HNSWA c) NSXCH d) SYDHK

67. In a swimming race, Five participants A, B, C, D and E take part. Lane 1 is extreme left and Lane 5 is extreme right. The following conditions exist :
(I) B and E are not swimming adjacent to each other.
(II) D is not in one of the extreme (outermost) Lanes.
(III) A is to the left of C.
If B is in Lane 3, A is Lane 1, then C could be in
a) Lane 4 b) Lane 2
c) Lane 2 or 4 d) Situation violates the conditions

68. If it was Saturday on 17th November, 1962 what will be the day on 22nd November 1964?
a) Monday b) Tuesday c) Wednesday d) Sunday

69. Out of the following four choices what does not show the coinciding of the hour hand and minute hand?
a) 3 : 16 : 2 b) 6 : 32 : 43 c) 9 : 59 : 05 d) 5 : 27 : 16

70. In each of the following questions, select the diagram out of the four that best represents the relationship among the items given in the question.
Female, Medicine, Physician


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

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WOR