RPS Olympiad-2021

Class-9th

M.M. : 70   Time : 70 Mins.

English (10 Marks)

1. She was vexed _____ her mother's illness.

    a) with

    b) of

    c) at

    d) from

2. The clown made me laugh. **(Change into passive Voice)**

    a) The clown was made me laugh.

    b) I am made laugh by the clown.

    c) The clown was being made laugh by me.

    d) I was made to laugh by the clown.

3. **'By fits and starts'** means

    a) To raise alarm

    b) Irregularly

    c) Be fit

    d) To get into trouble

4. She said, "Ugh ! I have hated him like anything." (**Indirect speech will be**)

    a) She exclaimed with sorrow that she has hated him like anything.

    b) She exclaimed with disgust that she had hated him like anything.

    c) She exclaimed with disgust that she had hated him and liked anything.

    d) She exclaimed in anger that she had hate him like anything.

5. I _____ have attended the meeting yesterday but I forgot all about it.

    a) ought

    b) may

    c) should

    d) would

    Find the error part. (6 to 9)

6. (a) Raman was one of those great sons of India (b) who has earned everlasting fame (c) for scientific researches. (d) No error.

7. (a) He gave me (b) rupees two and a half (c) when I met him yesterday. (d) No error.

8.   (a) Veena does not approve of (b) her husband working (c) as a teacher. (d) No error.

9.   (a) Having working hard (b) he (c) felt tired. (d) Nor error.

10.   This is the house <u>that Jack built.</u> The underlined part is –

a) main clause

b) adjective clause

c) noun clause

d) adverb clause

Mathematics (20 Marks)

11.   If $a^{1/3} + b^{1/3} + c^{1/3} = 0$, then $(a + b + c)^3 =$

a) $27abc$

b) $-27abc$

c) $9abc$

d) $-9abc$

12.   Evaluate $\left(52 - 6\sqrt{43}\right)^{3/2}$

a) $70\sqrt{43} - 441$

b) $70\sqrt{52} - 441$

c) $70\sqrt{43} - 414$

d) $70\sqrt{52} - 414$

13. $2^{90} + 3^{90}$ is a multiple of

a) 5

b) 6

c) 13

d) 2

14.   Which one of the following is one of the factors of $x^2(y - z) + y^2(z - x) - z(xy - yz - zx)$?

a) $(x - y)$

b) $(x + y - z)$

c) $(x - y - z)$

d) $(x + y + z)$

15.   If $(b + c - a)x = (c + a - b)y = (a + b - c)z = 2$, then $\left(\frac{1}{y} + \frac{1}{z}\right)\left(\frac{1}{z} + \frac{1}{x}\right)\left(\frac{1}{x} + \frac{1}{y}\right)$ is equals :

a) $a^2b^2c^2$

b) abc

c) $a^2 b^2$

d) $(abc)^2$

16. In the given fig. (not to scale); O is the centre of the circle and $\overline{CD} || \overline{AB}$. If $\angle DAO = 20^o$, then

$\angle AOB =$

a) 110°

b) 130°

c) 100°

d) 120°
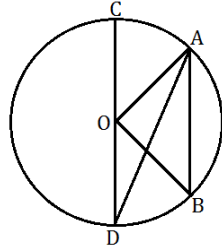
17. In ΔPQR, PD $\perp$ QR and PO is the bisector of $\angle QPR$, If $\angle PQR = 75^o$ and $\angle PRQ = 23\frac{1}{2}^o$, then

$\angle DPO$ in degrees = _____
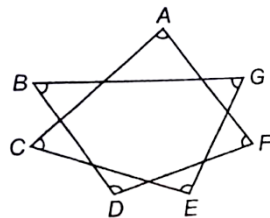
a) $20\frac{3}{4}$

b) $20\frac{1}{2}$

c) $25\frac{1}{5}$

d) $25\frac{3}{4}$

18. Two dice are thrown. Then the probability of getting an odd number on the first die and a multiple of 2 on the other.

a) $\frac{1}{4}$

b) $\frac{2}{3}$

c) $\frac{1}{6}$

d) data is insufficient

19. In the given fig. $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F + \angle G$

a) 360°

b) 540°

c) 270°

d) 180°

20. A cyclic parallelogram having unequal adjacent sides is necessarily a :

a) Square

b) Rectangle

c) Rhombus

d) Trapezium

21. MNOP is a trapezium in which side MN is parallel to side PO and X is the mid point of MP. If Y is a point on side NO such that segment XY is parallel to PO then (MN + PO) is

    a) 3 XY

    b) 2 XY

    c) $\frac{1}{2}$ XY

    d) $\frac{1}{3}$ XY

22. The volume of two spheres are in the ratio 64 : 27. Then the difference of their surface areas; if the sum of their radii is 7 cm

    a) 84 cm^2

    b) 88 cm^2

    c) 83 cm^2

    d) 85 cm^2

23. A sphere and a right circular cone of same radius have equal volumes. By what percentage does the height of the cone exceed its diameter?

    a) 50%

    b) $66\frac{1}{3}$ %

    c) 100 %

    d) 43.75 %

24. The lengths of three medians of a triangle are 19cm, 22cm and 25cm. Then area (in sq. cm) of this triangle is

    a) $\frac{156}{3}\sqrt{21}$

    b) $\frac{176}{3}\sqrt{21}$

    c) $\frac{176}{3}\sqrt{11}$

    d) $\frac{156}{3}\sqrt{11}$

25. If the sides of a triangle are 35cm, 12cm and 37cm, then the radius of the circum circle is

    a) 18.5 cm^2

    b) 20.5 cm^2

    c) 19.5 cm^2

    d) 17.5 cm^2

26. In the given fig. D is a point in the interior of square EFGH. AEOB is also a square. If BH = 3cm and AE = 2cm, then FB =
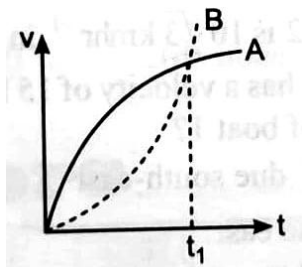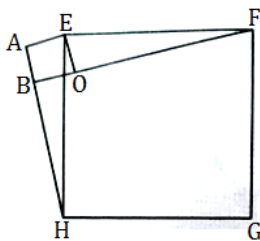
    a) 5cm

    b) 6cm

    c) 7cm

    d) 8cm

27. $F(x)$ is a polynomial in x. When $F(x)$ is divided by $(x - 2)$ the remainder obtained is 3. When the same polynomial is divided by $(x - 3)$ the remainder obtained is 5. Then the remainder when $F(x)$ is divided by $(x - 3)(x - 2)$ is

    a) $-x + 5$

    b) $2x + 1$

    c) $2x - 1$

    d) $x - 5$

28. If (2k – 1, k) is a solution of the equation $3x + 4y - 17 = 0$, then $k =$

    a) 3

    b) – 3

    c) 2

    d) – 2

29. If the arithmetic mean of the observations $x_1, x_2, x_3 \ldots\ldots x_n$ is 1, then the arithmetic mean of $\frac{x_1}{k}, \frac{x_2}{k}, \frac{x_3}{k} \ldots\ldots\ldots\ldots \frac{x_n}{k}$ $(k > 1)$ is :

    a) greater than 1

    b) less than 1

    c) equal to 1

    d) none of these

30. A distribution consists of three components with frequencies 45, 40 and 15 having their means 2, 2.5 and 2 respectively. The mean of the combined distribution is

    a) 2.1

    b) 2.2

    c) 2.3

    d) 2.4

Social Science (10 Marks)

31. Supreme Court has made Right to Free Education as the part of which among the following rights?

    a) Right against Exploitation

    b) Right to Life

    c) Right to Freedom of Speech

    d) Cultural and Education Rights

32. What happens when the Prime Minister in India quits?

    a) The entire council of ministers quits

    b) President will choose any leader as the Prime Minister

    c) Any leader from the ministry can be chosen as Prime Minister

    d) None of the above

33. The President of India is elected by

    a) Direct election by citizens who are 18 or above years of age

    b) The Prime Minister and Council of Ministers

    c) Indirect election by the Electoral College

    d) All of the above

34. Which one of the following is an example of secondary sector?

    a) Farming

    b) Teaching

    c) Forestry

    d) Manufacturing

35. When was the Revamped Public Distribution System (RPDS) adopted in India?

    a) 2000

    b) 1997

    c) 1995

    d) 1992

36. When did Louis XVI become king of France?

    a) 1782

    b) 1785

    c) 1774

    d) 1764

37. Who were Kulaks in Russia?

    a) Workers of Bolshevik Party

    b) Group of army leader

    c) Workers of Menshevik Party

    d) Well – to – do peasants

38. Mushrooms, a physical feature, are found in

    a) desert regions

    b) plains

    c) plateaus

    d) hilly regions

39. In which place of India there is very little difference between day and night temperatures?

    a) Delhi

    b) Patna

    c) Indore

    d) Mumbai

40. In which state is lying Vedanthangal Bird Sanctuary?

    a) Tamilnadu

    b) Odisha

    c) Karnataka

    d) Kerala

Science (20 Marks)

41. Once during the childhood, Bahubali and Bhallal Dev were playing game. At $t = 0$, both were at a same point. At $t = t_1$ (Motion of Bahubali and Bhallal Dev is represented by bold and dotted lines respectively):

    a) Bahubali overtakes Bhallal Dev

    b) Bahubali and Bhallal Dev are having same acceleration

    c) Speed of Bahubali increases and speed of Bhallal Dev decreases

    d) Bahubali is ahead of Bhallal Dev

42. There are two identical cars P and Q. These are running in the same direction on parallel roads such that P is faster than Q. When some packets of equal masses are exchanged between the two, then :

   a) P will be retarded but Q will be accelerated

b) P will be accelerated but Q will be retarded

c) Both P and Q will be accelerated

d) Both P and Q will be retarded

43. A plank is rotated at angular frequency $\omega = \sqrt{\frac{g}{2R}}$. A block is placed on the plank as shown in figure and it is rotating without sliding along with the plank. If the coefficient of friction between the coin and plate is 0.75 then the friction force acting on coin is

a) $\frac{3}{4}$ mg $\rightarrow$

b) $\frac{3}{4}$ mg $\leftarrow$

c) $\frac{mg}{2}$ $\leftarrow$

d) $\frac{mg}{2}$ $\rightarrow$
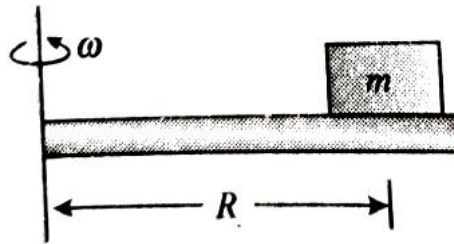
44. There is a body on which some forces are acting. The displacement – time graph of body is shown in figure.
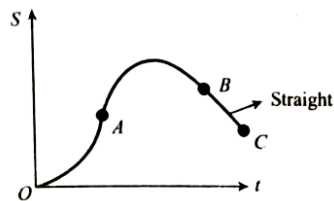
a) For OA the workdone by few of the acting forces can be negative

b) For BC the workdone by all forces together is negative

c) For AB the workdone by few of the acting forces is always positive

d) For OA the total workdone by all forces together is always negative

45. A solid sphere have uniform density and its radius is R. There is a particle present at point A at a distance of 2R from the centre of the sphere. This solid sphere exerts gravitational force of attraction equal to F_1 on the particle placed at A. Now spherical cavity of radius $\frac{R}{2}$ is now made in the sphere as shown in figure. Now this sphere with cavity now applies a gravitational force F_2 on the same particle at A. Find the ratio of $\frac{F_1}{F_2}$.

a) $\frac{7}{5}$

b) $\frac{7}{9}$

c) $\frac{5}{7}$

d) $\frac{9}{7}$
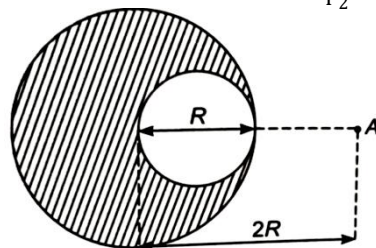
46. A solid spherical iron ball has density d and its radius is R. It has a concentric spherical cavity of radius = r. If this body is floating in water in such a way that its upper surface is touching the water surface. If density of water is taken unity then relation between R and r is :

    a) $r^3 = R^3 \left(1 - \frac{1}{d}\right)$

    b) $r^3 = R^3(d - 1)$

    c) $r^3 = R^3 \left(1 + \frac{1}{d}\right)$

    d) $r^3 = \frac{R^3}{\left(1 + \frac{1}{d}\right)}$

47. Ram is having a spherical ball made of a material of density ρ enters a tank of water of density $\rho_1 (\rho_1 > \rho)$. If the ball is dropped from height h on the surface of water then the maximum depth upto which it sink in water is :

    a) $\frac{h\rho_1}{(\rho_1 - \rho)}$

    b) $\frac{h\rho}{(\rho_1 - \rho)}$

    c) $\frac{h\rho}{\rho_1}$

    d) $\frac{h\rho_1}{\rho}$

48. Which of the following acid has the same molecular weight and equivalent weight.

    a) H_3PO_2

    b) H_3PO_3

    c) H_3PO_4

    d) H_2SO_4

49. Two electron in K-shell will differ in –

    a) Principal quantum number.

    b) Spin quantum number.

    c) Azimuthal quantum number.

    d) Magnetic quantum number.

50. The ration of charge and mass would be greater for

    a) Proton

    b) Electron

    c) Neutron

    d) Alpha

51. Which has maximum number of atom –

    a) 24 g C (12)

    b) 56 g Fe (56)

    c) 27 g Al (27)

    d) 108 g Ag (108)

52. The number of moles of H_2 in 0.224 litre of hydrogen gas at NTP is –

    a) 1

    b) 0.1

    c) 0.01

    d) 0.001

53. Absolute zero has been defined as the temperature –

    a) At which all molecular motion ceases.

    b) At which liquid helium boils.

    c) At which ether boils.

    d) All of the above.

54. The mass of a molecule of compound $C_{60}H_{122}$ is –

    a) 1.4×10^{-21} g

    b) 1.09×10^{-21} g

    c) 5.025×10^{23} g

    d) 16.023×10^{23} g

55. Which one of the following is not a characteristic of Phylum Annelida?

    a) Pseudocoelom

    b) Ventral nerve cord

    c) Closed circulatory system

    d) Segmentation

56. Polyribosomes are aggregates of

    a) ribosomes and rRNA

    b) peroxisomes

    c) only rRNA

    d) several ribosomes held together by string of mRNA

57. The ciliated columnar epithelial cells in humans are known to occur in

    a) Eustachian tube and stomach lining

    b) bronchioles and Fallopian tube

c) bile duct and oesophagus

d) Fallopian tube and urethra

58. Infection of Ascaris usually occurs by

a) Tse-tse fly

b) mosquito bite

c) drinking water containing eggs of Ascaris

d) eating imperfectly cooked pork

59. Emasculation is concerned with

a) hybridization

b) clonal selection

c) mass selection

d) pure line selection

60. Global agreement in specific control strategies to reduce the release of ozone depleting

substances, was adopted by

a) Montreal Protocol

b) Kyoto Protocol

c) Vienna Convention

d) Rio de Janeiro Conference

Aptitude (10 Marks)

61. If 27th march 1995 was Monday, then what day of the week was 1 November 1993?

a) Sunday

b) Monday

c)Tuesday

d) Wednesday

62. At what time between 9 and 10' O clock will the hands of a watch be together?

a) 45 min past 9

b) 50 min past 9

c) $49 \frac{1}{11} \; min \; past$ 9

d) $42 \frac{2}{11} \; min \; past$ 9

Directions (Q. 63): There are 10 family members A, B, C, D, E, F, G, H, I and J. A has 3 sons and 3 grand children. Out of three sons, C and D are married. Both had a dispute and they started living separately in H. No.-11 and H. No.-12. On the occasion of Rakhi, I, the uncle of F, told her to tie a Rakhi to her cousins. So she went to D's sister in law's house and E opened the gate. There are 3 male members in H. No.-11 and 2 female members in H. No.-12. Both the grandsons of B were happy to have a Rakhi. H told G and other brother to give some present to their sister.

63.   Who lives in H. No.-11?

a) H

b) D

c) J

d) I

64.   *Radiology : Pathology : : Cardiology : ?*

a) Biology

b) Zoology

c) Geology

d) Hematology

65.   Raman is brother of Shekhar and Manish is father of Raman. Jayant is brother of Priyal who is the daughter of Shekhar. Who is uncle of Jayant?

a) Manish

b) Shekhar

c) Raman

d) Cannot be determined

Directions (Q. 66) : Study the following information and answer the question that follow.

Six friends-Dheeraj, Vicky, Amit, Nasir, Rajeev and Sushma are studying six different subjects which are

Mathematics, Chemistry, Social studies, Mental ability, English and Hindi not necessarily in the same order.

Each one likes a different sports- hockey, cricket, swimming, football, badminton and tennis, again not in the same order. Nasir is not studying Hindi. Rajeev is studying Social studies and likes hockey. Amit likes swimming and is not studying Hindi. The one who likes football is studying English. Sushma is studying Mental ability and does not like tennis. The one who likes badminton is studying Chemistry. Dheeraj and Vicky do not like badminton. Dheeraj does not like tennis.

66.   Which subject is Nasir studying?

a) Mathematics

b) Chemistry

c) English

d) Hindi

67. In a certain coding language if DIRECTION is coded as WRIVXGRLM, then what will be the code for AVAILABLE?

a) ZEZROZYOV

b) ZEZTOZYMV

c) ZEZROZYMU

d) ZEZROZYOU

68. Find the next term in the series.

23, 31, 47, 79, 143, ?

a) 265

b) 286

c) 281

d) 271

69. 'Taj Mahal' is related to 'India' in the same way as 'Machu Picchu' is related to

a) Mexico

b) China

c) Peru

d) Rio de Janerio

70. Successive discount of 15% and 10% equivalent to

a) 25%

b) 23.5%

c) 22.5%

d) 24%