8th All India RPS OLYMPIAD

Online & Offline Mega Event

QUESTION PAPER (PHASE – I)

CLASS - IX

ENGLISH (10 Marks)

Q1. Choose the correct indirect speech:

I said to my friend, "I must go now."

(A) I told my friend that I must go now.

(B) I told my friend that I had to go then.

(C) I told my friend that I would have to go now.

(D) I told my friend that I had gone then.

Q2. I believe that he is innocent.

"I believe" is a :

(A) Principal Clause

(B) Subordinate Clause

(C) Coordinate Clause

(D) No Clause

Q3. She has been reading a book since morning.

The tense used in the sentence is:

(A) Present Perfect Tense

(B) Present Continuous Tense

(C) Present Perfect Continuous Tense

(D) Past Perfect Continuous Tense

Q4. He _____ this book by next week.

(A) will not have read

(B) would not have read

(C) will not be reading

(D) has not read

Q5. All _____ die sooner or later.

(A) can (B) may (C) must (D) should

Q6. He enquired of her, "What is the matter?"

Choose the correct indirect speech:

(A) He enquired of her what the matter was.

(B) He enquired of her what was the matter.

(C) He enquired her what the matter was.

(D) He enquired of her what is the matter.

Q7. No news _____ good news.

(A) are (B) were (C) is (D) have

Q8. Each of these flowers _____ lovely.

(A) are (B) were (C) is (D) have

Q9. _____ of my friends attended the function.

(A) Much (B) Some (C) Little (D) Every

Q10. "You must wear a helmet while riding."

The modal 'must' expresses:

(A) Permission (B) Ability (C) Compulsion (D) Possibility

MATHEMATICS (20 Marks)

Q11. Find the positive integer n for which $n^2 + 20n + 21$ is a perfect square.

(A) 15 (B) 25 (C) 30 (D) 42

Q12. What is the remainder when $2^{2026} + 3^{2026}$ is divided by 13?

(A) 0 (B) 1 (C) 5 (D) 9

Q13. For how many natural values of n, $\frac{20}{n+1}$ is a natural number .

(A) 8 (B) 5 (C) 10 (D) 15

Q14. If $x + \frac{1}{x} = \sqrt{2}$, then value of $x^4 + \frac{1}{x^4}$ is

(A) 2 (B) -2 (C) 0 (D) -1

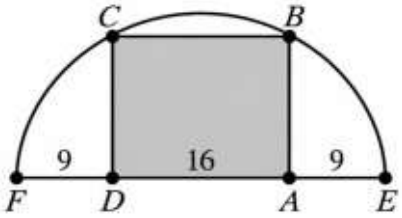
Q15. If a, b, c are non-zero real numbers such that $a = 2026, b = 2027, c = 2028$ then value of $a^2 + b^2 + c^2 - ab - bc - ca$

(A) 1 (B) 2 (C) 3 (D) 4

Q16. If $4^x + 4^x + 4^x + 4^x = 1024$

(A) 4 (B) 8 (C) 12 (D) 10

Q17. Rectangle ABCD is inscribed in a semicircle with diameter $\overline{FE}$ as shown in the figure. Let DA = 16, and FD = AE = 9. What is the area of ABCD



(A) 240 (B) 248 (C) 256 (D) 264

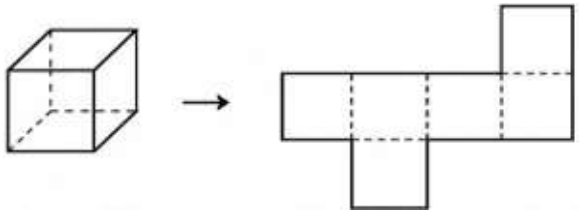
Q18. Find the area (in square units) bounded by lines 2x+3y=6, x=0, y=0 is

(A) 1.5 (B) 1 (C) 2 (D) 3

Q19. In △ ABC, D is mid point of BC and E is the mid point of AD. If area of △ ABC is 100 cm^2, then area of △ BED is ……..

(A) 50 (B) 25 (C) 30 (D) 20

Q20. Ram cuts open a cardboard cube along some of its edges to form the flat shape shown figure, which has an area of 18 square centimeters. What is the volume of the cube in cubic centimeters?



(A) $3\sqrt{3}$ (B) 6 (C) $6\sqrt{3}$ (D) 9

Q21. A cyclic quadrilateral ABCD is a rhombus with perimeter 52 meters. The length of diagonal AC is 24 meters. What is the area in square meters of rhombus ABCD?

(A) 60 (B) 90 (C) 105 (D) 120

Q22. Two parallel chords of a circle have lengths 10 cm and 24 cm. If the distance between them is 7 cm, find the radius of the circle.

(A) 12 cm (B) 13 cm (C) 15 cm (D) 17 cm

Q23. In a convex quadrilateral ABCD, the diagonals AC and BD intersect at O. If the areas of △ AOB,△ BOC, and △ COD are 4, 6, and 9 respectively, find the area of △ DOA.

(A) 4 (B) 5 (C) 6 (D) 8

Q24. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the _____.

(A) different ratios (B) same ratio

(C) opposite ratio (D) double ratio

Q25. In △ ABC, the medians AD and BE intersect at O. If area of △ BOD = 6cm^2, then area of △ ABC, is _____.

(A) 12 (B) 18 (C) 36 (D) 24

Q26. Two circles with radii 9 cm and 4 cm touch each other externally. Find the length of their common external tangent.

(A) 6 cm (B) 10 cm (C) 12 cm (D) 13 cm

Q27. Three distinct real numbers a, b, c form a Geometric Progression. If $a, 2b, 3c$ form an Arithmetic Progression, find the common ratio r of the GP.

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) 2

Q28. A sphere and a cube have equal surface areas. Find the ratio of the volume of the sphere to the volume of the cube.

(A) $\sqrt{\pi} : \sqrt{6}$ (B) $\sqrt{6} : \sqrt{\pi}$ (C) $\pi : 6$ (D) $6 : \pi$

Q29. A right circular cone has a base radius of 6 cm and a height of 8 cm. A sphere is inscribed inside the cone. Find the radius of this sphere.

(A) 2 cm (B) 3 cm (C) 4 cm (D) 2.5 cm

Q30. A number is chosen at random from the set $\{1, 2, 3, \ldots, 30\}$. Find the probability that it is a prime number.

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{1}{6}$ (D) $\frac{2}{3}$

SOCIAL SCIENCE (10 MARKS)

Q31. Which ruler added a long Sanskrit inscription describing his military achievements and the repair of the Sudarshana Lake?

(A) Skandagupta (B) Samudragupta

(C) Rudradaman I (D) Ashoka

Q32. The additional utility derived from consuming one more unit of a commodity decreases as more units are consumed. This is known as:

(A) Marginal utility (B) Production possibility

(C) Diminishing marginal utility (D) Decreasing want

Q33. Which of the following causes a rightward shift of the supply curve?

(A) Increase in input prices

(B) Improvement in the production technology

(C) Increase in taxes

(D) Increase in the price of the commodity

Q34. Identify the app on the basis of following features. It facilitates efficient form processing and maintenance of E-rolls. It helps in easy handling of databases

(A) ETPBS (B) Saksham App (C) Suvidha (D) Eronet

Q35. Who was popularly known as "Loknayak" and played a leading role in mobilizing students and citizens during the movements in Bihar and Gujarat in the 1970s?

(A) Atal Bihari Vajpayee (B) Jayaprakash Narayan

(C) Chaudhary Charan Singh (D) Babu Jagjivan Ram

Q36. Which of the following is the oldest neolithic site on the Bolan River?

(A) Kalibangan (B) Mehrgarh (C) Dholavira (D) Lothal

Q37. Which of the following statements is/are correct about the Chief Election Commissioner of India?

(i) The Chief Election Commissioner of India is appointed by the President of India.

(ii) The Chief Election Commissioner holds office for a term of six years or until attaining the age of 65 years, whichever is earlier.

(iii) The Chief Election Commissioner can be removed from office only through a process of impeachment by Parliament.

Options:

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (i) and (iii)
(D) All of the above

Q38. Identify the phenomenon based on the following statements:

(i) This phenomenon derives its name from a Roman goddess.

(ii) It is a colourful display of light seen in the sky near the poles.

(A) Rainbow (B) Solar lights (C) Lunar lights (D) Aurora

Q39. Which of the following is correct about stratosphere?

(i) It extends upto about 50km

(ii) It contains a layer of ozone gas which shields us by filtering the Sun's harmful radiation including ultraviolet radiation

(iii) It is ideal for flying aeroplanes.

(iv) The temperature decreases with increasing altitude

(A) (i), (ii) and (iii)
(B) (i), and (iv)
(C) (ii) and (iii)
(D) All of these

Q40. The Mid Atlantic Ridge is an example of landform formed at-

(A) Convergent boundary
(B) Transform boundary
(C) Divergent boundary
(D) Convergent and divergent boundary

SCIENCE (20 MARKS)

PHYSICS (7 MARKS)

Q41. When a spring is stretched by 10 cm, the potential energy stored is E. When the spring is stretched by 10 cm more, the potential energy stored in the spring becomes

(A) 2E (B) 4E

(C) 6E (D) 10E

Q42. A body of mass 2 kg has initial velocity $(3\hat{i} - 4\hat{j})$ ms^{-1} and final velocity is $(-6\hat{j} - 2\hat{k})$ ms^{-1}. Then the change in kinetic energy of the body is :

(A) 30J (B) 7.5J (C) 15J (D) None

Q43. Two forces have magnitudes in the ratio 3:5 and the angle between their directions is 60°. If their resultant is 35N, find their magnitudes.

(A) 15N, 25N (B) 25N, 18N (C) 5N, 15N (D) 35N, 15N

Q44. A stone is dropped from a height h, It hits the ground with a certain momentum P. If the same stone is dropped from a height 100% more then the previous height, the momentum when it hits the ground will change by

(A) 68% (B) 41% (C) 200% (D) 100%

Q45. A door 1.6 m wide requires a force of 1N to be applied at the free end to open or close it. The force that is required at a point 0.4 m distant from the hinges for opening or closing the door is :

(A) 1.2N (B) 3.6N (C) 2.4N (D) 4N

Q46. A particle is dropped under gravity from rest from a height h and it travels a distance 9h / 25 in the last second, the height h is ($g = 9.8$ m/sec^2) :

(A) 100 m (B) 122.5 m (C) 145 m (D) 167.5 m

Q47. Distance between successive compression and rarefaction is 1 m and velocity of sound is 360 ms^{-1}. Find the frequency of the sound wave.

(A) 180 Hz (B) 45 Hz (C) 120 Hz (D) 90 Hz

CHEMISTRY (7 MARKS)

Q48. What is the mole fraction of glucose in 10% w/w glucose solution?

(A) 0.01 (B) 0.02 (C) 0.03 (D) 0.04

Q49. During the column chromatography separation of a mixture containing a polar compound and a non-polar compound over a polar adsorbent like silica gel, which of the following statements holds true?

(A) The polar compound elutes first because it dissolves better in the polar adsorbent.

(B) The non-polar compound elutes first because it has a weaker affinity for the stationary phase.

(C) Both compounds travel at the same speed and elute together.

(D) The solvent choice does not affect the elution order.

Q50. Rutherford's alpha particle scattering experiment eventually led to the conclusion that:

(A) mass and energy are related

(B) electrons occupy space around the nucleus

(C) neutrons are buried deep in the nucleus

(D) the point of impact with matter can be precisely determined

Q51. Which of the following is the formula of barium peroxide?

(A) Ba_2O (B) Ba_2O_2 (C) BaO_2 (D) BaO_3

Q52. Which among the following pairs are having different number of total electrons?

(A) Na^+ and Al^{3+} (B) P^{3-} and Ar

(C) Mg^{2+} and Ar (D) O^{2-} and F^-

Q53. 5.85 g of NaCl is dissolved in 1 L of pure water. The number of ions in 1 mL of this solution is:

(A) 6.02×10^{19} (B) 1.2×10^{22}

(C) 1.2×10^{20} (D) 6.02×10^{20}

Q54. If two compounds have the same empirical formula but different molecular formula, They must have:

(A) same viscosity

(B) different molecular weight

(C) different percentage composition

(D) same vapour density

BIOLOGY (6 MARKS)

Q55. A drug damages the lysosomes of a cell. Which consequence is most likely?

(A) ATP production falls sharply

(B) Digestion of worn-out organelles and engulfed bacteria is impaired, and debris accumulates

(C) Protein synthesis on ribosomes stops completely

(D) Packaging of secretions into vesicles stops

Q56. Three cell types are examined under an electron microscope.

P: Too many mitochondria, little rough ER, striated and branched

Q: Extensive rough ER and Golgi, secretes digestive enzymes into a duct

R: Extensive smooth ER, detoxifies drugs and makes lipids

Identify P, Q and R.

(A) Cardiac muscle cell, pancreatic cell, liver cell

(B) Liver cell, cardiac muscle cell, pancreatic cell

(C) Pancreatic cell, liver cell, cardiac muscle cell

(D) Cardiac muscle cell, liver cell, pancreatic cell

Q57. A leafy twig is kept in water with red ink for two hours. A thin section of the stem shows the dye in certain conducting cells. Which statement about these cells is correct?

(A) They are living cells joined end to end with perforated walls, carrying food

(B) They are dead, hollow, lignified tubes, and water moves in them mainly because of evaporation from the leaves

(C) They are living parenchyma cells that store water, and the ink spreads by diffusion

(D) They are sclerenchyma fibres, and the ink moves by cytoplasmic streaming

Q58. Three observations: (i) a tree trunk gets wider every year, (ii) mown lawn grass regrows from the base of its leaves, (iii) a root lengthens at its tip. Which meristems are responsible, in this order?

(A) Apical, lateral, intercalary

(B) Lateral, intercalary, apical

(C) Intercalary, apical, lateral

(D) Lateral, apical, intercalary

Q59. A man undergoes a vasectomy, in which both vasa deferentia are cut and tied. Which combination of outcomes is expected?

(A) Testosterone level falls, secondary sexual characters regress, and semen volume drops to zero

(B) Sperm are still produced in the testes but are absent from the ejaculate; testosterone secretion and semen volume remain almost unchanged

(C) Sperm production stops immediately and the semen contains no fluid

(D) Sperm production continues, but testosterone falls because sperm can no longer leave the testes

Q60. After fertilisation in a flowering plant, which row is correct?

(A) Ovule → fruit; ovary → seed; zygote → embryo

(B) Ovary → fruit; ovule → seed; zygote → embryo

(C) Ovary → seed; ovule → fruit; zygote → embryo

(D) Ovary → fruit; ovule → seed; zygote → seed coat