



7th All India RPS



OL MPIAD

Online & Offline Mega Event

QUESTION PAPER

M.M:60

Time: 60 minutes

OFFLINE EXAMINATION (PHASE-II)

CLASS - IX

Name: _____ Reg. No. _____ Mobile No. _____

General Instructions:

1. Duration of the examination is 60 minutes. Question Paper contains 60 questions with maximum 60 marks.
2. There will be negative marking in Phase - II, i.e. $\frac{1}{4}$ 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 and OMR with BLACK ballpoint pen only. Use of pencil is strictly prohibited.
7. Fill and darken the bubbles completely. Do not put a tick or a cross.
8. Half-filled or over-filled bubbles will not be read by the software & liable to be rejected.

Correct Method



Student's Signature

Wrong Method



Invigilator's Signature

SPACE FOR ROUGH WORK

Q10. Pick out a suitable option for the underlined idiom:

You are going to do great in the audition, break a leg.

- (A) Move slowly (B) Not to be nervous
(C) Not to be arrogant (D) Good luck

Mathematics (20 Marks)

Q11. If $\sqrt{23 + x\sqrt{10}} = \sqrt{18} + \sqrt{5}$ then $x = ?$

- (A) 6 (B) -6 (C) 3 (D) -2

Q12. If $a^{x-1} = bc$, $b^{y-1} = ac$, $c^{z-1} = ab$, then the value of $xy + yz + zx - xyz$ is:

- (A) 1 (B) 2 (C) 0 (D) None

Q13. If $64^x = \frac{1}{256^y}$, then the value of $3x + 4y$ is:

- (A) 0 (B) 8 (C) 1 (D) None of these

Q14. If $a(p + q)^2 + 2bpq + c = 0$ and also $a(q + r)^2 + 2bqr + c = 0$, then pr is equal to:

- (A) $p^2 + \frac{a}{c}$ (B) $q^2 + \frac{c}{a}$ (C) $p^2 + \frac{a}{b}$ (D) $q^2 + \frac{a}{c}$

Q15. If $h(x) = 2x^3 + (6a^2 - 10)x^2 + (6a + 2)x - 14a - 2$ is exactly divisible by $x - 1$ but not by $x + 1$, then the value of a is:

- (A) 0 (B) -1 (C) 10 (D) 2

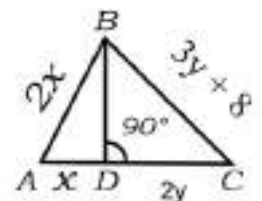
Q16. The value of $\left(\frac{x-3}{x^2-x-6} + \frac{2x-1}{2x^2+5x-3} - \frac{2x+5}{x^2+5x+6}\right)$ is:

- (A) 1 (B) 0 (C) -1 (D) $\left(\frac{x-3}{x-2}\right)$

Q17. In the $\triangle ABC$, BD bisects $\angle B$ and is perpendicular to AC .

If lengths of the sides of the triangle are expressed in terms of x and y as shown in the given figure, find the value of x and y .

- (A) 6, 12 (B) 16, 8
(C) 10, 12 (D) 18, 15

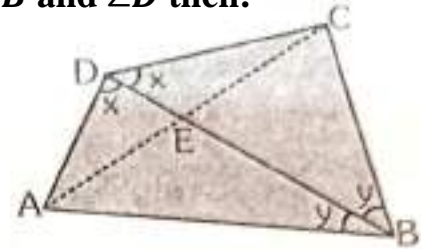


Q18. If AD , BE , CF are the altitudes of $\triangle ABC$ whose orthocentre is H , then C is orthocentre of:

- (A) $\triangle ABH$ (B) $\triangle BDH$ (C) $\triangle ABD$ (D) $\triangle BEA$

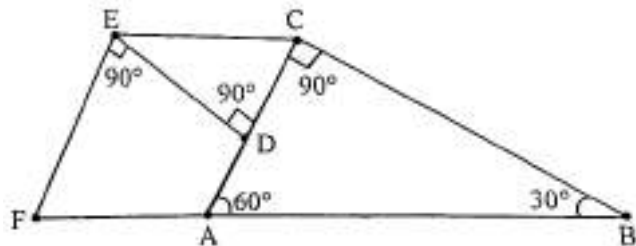
Q25. The diagonal BD of a quadrilateral $ABCD$ bisects $\angle B$ and $\angle D$ then:

- (A) $\frac{AB}{CD} = \frac{AD}{BC}$ (B) $\frac{AB}{BC} = \frac{AD}{CD}$
 (C) $AB = AD \times BC$ (D) None of these



Q26. In the adjoining figure, BAC is a $30^\circ - 60^\circ - 90^\circ$ triangle with $AB = 20$. D is the midpoint of AC . The perpendicular at D to AC meets the line parallel to AB through C at E . The line through E perpendicular to DE meets BA produced at F . If $DF = 5\sqrt{x}$ then $x =$ _____.

- (A) 6 (B) 14
 (C) 7 (D) 10

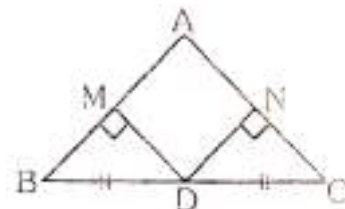


Q27. In a ΔABC , $\angle B$ is an acute angle and $AD \perp BC$ then:

- (A) $AB^2 = AC^2 + BC^2 - 2BC \times BD$ (B) $AB^2 = AC^2 + BC^2 - 2BC \times BD$
 (C) $AC^2 = AB^2 - BC^2 - 2BC \times BD$ (D) $AC^2 = AB^2 + BC^2 - 2BC \times BD$

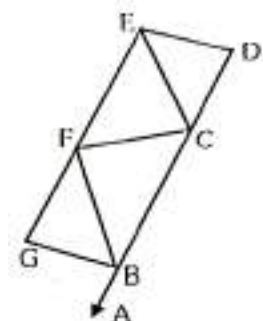
Q28. In the adjoining figure D is the midpoint of BC of ΔABC , DM and DN are the perpendiculars on AB and AC respectively and $DM = DN$, then the ΔABC is:

- (A) right angled (B) isosceles
 (C) equilateral (D) scalene



Q29. In the figure below, $AD \parallel GE$, $GB \parallel FC \parallel ED$ and $BF \parallel CE$ (not to scale). If $\angle ABG = x$, $\angle GBF = y$, $\angle CED = p$ and $\angle CDE = q$, then $x - y$ is:

- (A) $p - q$ (B) $q - p$
 (C) can't be determined (D) None of these



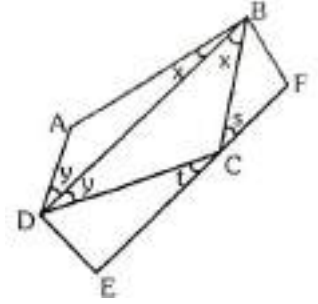
Q30. In the figure below (not to scale), $\overline{AB} \parallel \overline{CD}$ and $\overline{BD} \parallel \overline{EF}$. If $\angle ABD = \angle DBC = x$, $\angle BDC = \angle ADB = y$, $\angle BCF = s$ and $\angle DCE = t$, then which of the following is correct?

(A) $x = t$ and $y = s$

(B) $x = s$ and $y = t$

(C) $x = y = t = s$

(D) None of these



Social Science (10 Marks)

Q31. The French Revolution directly inspired which of the following in the 19th century?

(A) Russian Revolution

(B) Latin American Independence movement

(C) American Revolution

(D) Industrial Revolution in Britain

Q32. Which Enlightenment thinker's idea of "general will" most influenced the revolution?

(A) Montesquieu

(B) Voltaire

(C) Jean Jaques Rousseau

(D) John Locke

Q33. Which Slogan is famously associated with Lenin and the Bolsheviks in 1917?

(A) "Workers of the world, unite"

(B) "peace, bread and land"

(C) "All power of Tsar"

(D) "Equality, liberty and fraternity"

Q34. Which of the following is a lagoon?

(A) Wular Lake

(B) Pulicat Lake

(C) Sambhar Lake

(D) Loktak Lake

Q35. Which part of the Indian Constitution reflects the ideals of the freedom struggle?

(A) Fundamental Duties

(B) Preamble

(C) Directive principles

(D) Schedules

Q36. From which country did India borrow the idea of Directive principles of state policy?

(A) USA

(B) USSR

(C) Ireland

(D) France

Q37. Which state in India receives rainfall from both the Arabian Sea and Bay of Bengal?

(A) Punjab

(B) Gujarat

(C) Meghalaya

(D) Uttar Pradesh

Q38. Which is the highest peak in India under Indian administration?

(A) Mount Everest

(B) Nanda Devi

(C) Kanchenjunga

(D) K2

Q39. Which physiographic unit of India is most prone to earthquakes?

- (A) Northern plains (B) Peninsular Plateau
(C) Himalayas (D) Coastal plains

Q40. Which country is the best example of growth based on human capital rather than natural resources?

- (A) USA (B) Saudi Arabia (C) Japan (D) Brazil

Science (20 Marks) Phy.+Chem. +Bio.

Physics (7 Marks)

Q41. A stone is thrown upwards with a speed u from the top of a tower. It reaches the ground with a speed of $3u$. The height of the tower is:

- (A) $\frac{4}{g} u^2$ (B) $\frac{6}{g} u^2$ (C) $\frac{3}{g} u^2$ (D) $\frac{9}{g} u^2$

Q42. A ball is thrown vertically upwards with a velocity of 20 m/s from the top of a 25m high building. How long will it be before the ball hits the ground? (Take $g = 10 \text{ m/s}^2$).

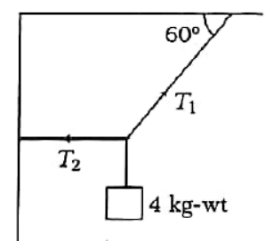
- (A) 5 s (B) 2 s (C) 3 s (D) 4 s

Q43. What is the unit vector perpendicular to the following vectors $\vec{A} = 2\hat{i} + 2\hat{j} - \hat{k}$ and $\vec{B} = 6\hat{i} - 3\hat{j} + 2\hat{k}$?

- (A) $\frac{1}{5\sqrt{17}} (\hat{i} + 10\hat{j} - 18\hat{k})$ (B) $\frac{1}{5\sqrt{17}} (\hat{i} - 10\hat{j} + 18\hat{k})$
(C) $\frac{1}{5\sqrt{17}} (-\hat{i} - 10\hat{j} - 18\hat{k})$ (D) $\frac{1}{5\sqrt{17}} (\hat{i} + 10\hat{j} + 18\hat{k})$

Q44. Determine the tensions T_1 and T_2 in the strings as shown in figure:

- (A) 40.2 N, 25.3 N (B) 30.2 N, 30.5 N
(C) 42.8 N, 28.3 N (D) 45.26 N, 22.63 N



Q45. A ball of mass 0.5 kg moving with a velocity of 2 m/s strikes a wall normally and bounces back with the same speed. If the time of contact between the ball and the wall is one millisecond, the average force exerted by the wall on the ball is:

- (A) 2000 N (B) 1000 N (C) 5000 N (D) 1250 N

Q46. A stone falls freely from rest from height h and it travel a distance $h/2$ in the last second. The time of journey is:

- (A) $\sqrt{2}s$ (B) $(2 - \sqrt{2})s$ (C) $(2 + \sqrt{2})s$ (D) $2s$

Q47. Two bodies A and B having masses in the ratio of 3 : 1 possess the same kinetic energy. Obtain the ratio of linear momentum of B to A.

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

Chemistry (7 Marks)

Q48. Calculate the wavelength in nanometer associated with a proton moving at 1.0×10^3 m/s .

- (A) 0.032nm (B) 0.40nm (C) 2.5nm (D)14.0nm

Q49. Maximum number of electrons in a subshell of an atom is determined by the following:

- (A) $4l+2$ (B) $2l+1$ (C) $4l-2$ (D) $2n^2$

Q50. Radioactive isotope is used to find the age of the fossils:

- (A) Co ⁶⁰ (B) Na ²⁴ (C) C¹⁴ (D) U²³⁵

Q51. An element has atomic mass 19 and atomic number is 9, its ion is represented by:

- (A) M⁺ (B) M²⁺ (C) M⁻ (D) M²⁻

Q52. The volume occupied by 4.4g of CO₂ at STP is :

- (A) 22.4 L (B) 2.24L (C) 0.224L (D) 0.1L

Q53. What is the percentage composition of hydrogen in water molecule?

- (A) 89.9% (B)11.11% (C) 33.33% (D) 66.66%

Q54. Ninhydrin having the molecular C₉H₆O₄ is commonly used by forensic scientists to detect and analyse the fingerprints. The number of molecules in 7.4g of ninhydrin is:

- (A) 1.5×10^{22} (B) 2.5×10^{23} (C) 2.5×10^{22} (D) 4.2×10^{23}

Biology (6 Marks)

Q55. Sclerenchyma in plants is an example of simple permanent tissue comprising of two types of cells, sclereids and fibres. Why these cells are functionally important to the plants even after they die? Choose the correct alternative from the options given below:

- (A) Both are usually thin walled cells lacking intercellular spaces.
- (B) Walls in both the cell types are thick and usually cutinized.
- (C) Walls in both the cell types are thick and usually lignified.
- (D) Both the cells are used for conducting solutes and providing strength to the plant.

Q56. Which of the following plant part tip has Quiescent Centre?

- (A) Stem
- (B) Root
- (C) Leaf
- (D) Sepal

Q57. Epithelial tissue performs the following functions

- (A) Protection, secretion, absorption, respiration
- (B) Protection, secretion, absorption, sensation
- (C) Protection, secretion, absorption, digestion
- (D) None of these

Q58. Eukaryotic organisms have different levels of organization. Select the combination where the levels are arranged in the descending order.

- (A) DNA , chromosome, cell, nucleus, tissue
- (B) Tissue, cell, nucleus, chromosome, DNA
- (C) Nucleus, cells, DNA, chromosome, nucleus, tissue
- (D) Tissue, cell, chromosome, nucleus, DNA

Q59. Mitochondria and chloroplast are:

I. Semi-autonomous organelles

II. Formed by division of preexisting organelles and they contain DNA but lack protein synthesizing machinery.

Which one of the following options is correct?

- (A) Both I and II are correct
- (B) II is True I is false
- (C) I is True but II is false
- (D) Both I and II are false

Q60. Pick out the items which have sequential arrangement.

- (A) Zygotene → Leptotene → Pachytene → Diplotene → Diakinesis
- (B) Diakinesis → Zygotene → Leptotene → Pachytene
- (C) Leptotene → Zygotene → Pachytene → Diakinesis
- (D) Leptotene → Pachytene → Diplotene → Diakinesis → Zygotene

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