FIITJEE

Samacheer Talent Recognition Drive

CLASS - 9

(9^{th} going to 10^{th})

Time: 3 Hours ***Maximum Marks: 300***

IQ, MATHS, PHYSICS & CHEMISTRY

1. ***Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.***
2. ***Answers have to be marked on the OMR sheet.***
3. ***The Q uestion Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.***
4. ***Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed***
5. ***Write your Name, Reg. No. and Test Centre in the space provided at the bottom of this sheet.***
6. ***You are advised to devote around 1 Hour on each Section as there will be minimum cutoff marks in each Section for qualifying.***
7. ***The question paper consists of 4 Sections:***
   Section - I……IQ (30 questions)
   Section-II……Mathematics (30 questions)
   Section -III……Physics (20 questions)
   Section -IV……Chemistry (20 questions).
8. ***Each question carries +3 marks for correct answer and -1 mark for wrong answer.***

Name of the Candidate	:		
Registration Number	:		
Date of Examination	:	*Centre :*	

IQ

Section – I

1. In a row of students of Ravi's class, Ravi is 17th from either end of the row. How many students are there in his class?
   (A) 34 (B) 35 (C) 33 (D) 19

2. How many numbers from 11 to 50 are there which are exactly divisible by 7 but not divisible by 3 ?
   (A) 2 (B) 4 (C) 5 (D) 6

Directions (Q.No. 3 – 5) Find the Missing Numbers

3. 2, 8, 3, 27, 4, 64, 5, ____
   (A) 100 (B) 120 (C) 125 (D) 625

4. 4, 27, 25, 343, 121, ___, 289
   (A) 169 (B) 1397 (C) 225 (D) 2197

5. 14, 17, 20, ___, 26, 29
   (A) 21 (B) 25 (C) 23 (D) 24

Directions (Q.No. 6 – 8) The following questions are based on direction sense

6. Neeta starting from point X and walked straight 5 km west, then turned left and walked 2 km and again turned left and walked straight 7 km. In which direction is she from X
   (A) North-East (B) South-West (C) South-East (D) North-West

Space for rough work

7. Starting from a point 'M', Hari walked 18 metres towards south. He turned to his left and walked 25 metres. He then turned to his left and walked 18 metres. He again turned to his left and walked 35 metres and reached a point 'P'. How far Hari is from the point 'M' and in which direction?
   (A) 10m east (B) 10m west (C) 35m west (D) 10m south

8. Anuradha walk 3 km northward and then she turns left and moves 2 km. She again turns left and goes 3 km and turns to her right and starts walking straight. In which direction is she walking now?
   (A) North (B) East (C) South (D) West

Directions for questions 9 to 12 : Find the odd man

9. (A) Dawn (B) Moon (C) Dusk (D) Noon

10. (A) Book: Pages (B) Flower : Petals
    (C) Sentence: Words (D) Class: Teachers

11. (A) Dear b) Dare (C) Fear (D) Hear

12. (A) Squash (B) Football (C) Hockey (D) Cricket

Directions for questions 13 to 16: Select the correct alternative from the given choices.

13. In a certain code language, if the word "INFERNO" is coded as FOREINN, then "PLACATE" is coded as
    (A) AEAPLTC (B) AEACPTL (C) AEACTPL (D) CEPTLAA

14. In a certain code language, if the word "PRINTER" is coded as TRINPRE, then "BAMBOOS" is coded as
    (A) BMBOOAS (B) BOMBOAS (C) OSMBBAO (D) AMBBSOO

15. In a certain code language, if the word "COVER" is coded as DPWFS, then what will be the code for the word "CRACK" coded in that language?
    (A) DBSTL (B) DBSBL (C) DSCDL (D) DSBDL

Space for rough work

16. In a certain code language, if the word "STRONG" is coded as UVTQPI, then "DOCILE" is coded as
(A) FQEKMG (B) FQEKNG (C) FQEJNG (D) FQDKNG

Directions for questions 17:

In each question a group of five words is given. From the answer choices choose the one which gives the best logical order of the words.

17. (1) Flowers (2) Sapling (3) Pollimate (4) Seed (5) Tree
(A) 5, 2, 1, 3, 4 (B) 5, 1, 2, 3, 4 (C) 1, 4, 3, 2, 5 (D) 1, 3, 4, 2, 5

Directions for questions 18 to 20: Select the correct alternative from the given choices

18. Shiva travels 10m towards. West. He turns left and travels 15m. Again he turns to his left and walks 10m further. Finally, he walks 13m towards North and then stops. At what vertical distance is he from his house?
(A) 13m (B) 15m (C) 28m (D) 2m

19. Shahana walks towards South for 15km and then turns towards East to travel 10km further. She then travels a distance of 6km towards her right side and again 12km towards the right side. Finally, she travels 17km towards North. Find the horizontal distance traveled by her in the journey. Also find the direction she is facing at the end of the journey.
(A) 12km, South (B) 2km, North (C) 22km, North (D) 12km, South

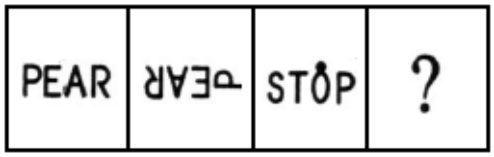
20. Sai travels 10km southwards, then travels 3km to his right. Again he travels 2km southwards. He travels another 5km to his right. Now he turns to his right to travel 2 km. What is his position (in vertical and horizontal directions) with reference to the starting point?
(A) 10km, 8km (B) 13km, 8km (C) 10km, 13km (D) 18km, 10km

Space for rough work

Directions(Q.No.21 – 24) : Each of the following questions consists of two sets of figures. Figures P, Q, R and S constitute the Problem set while figures (A), (B), (C) and (D) constitute the Answer set. There is a definite relationship between figures A and B. Establish a Answer set that would replace the question mark in Fig S

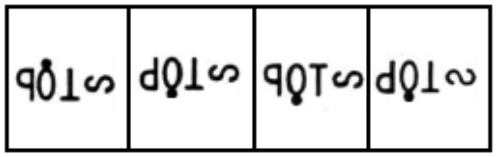
Problem set

21.



P Q R S

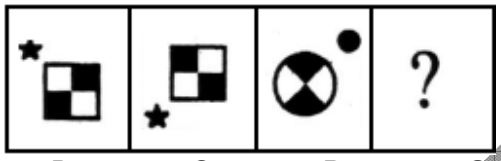
Answer set.



(A) (B) (C) (D)

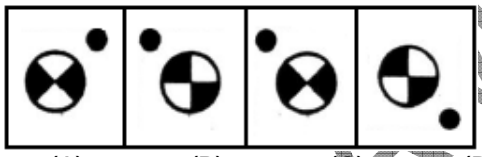
Problem set

22.



P Q R S

Answer set.

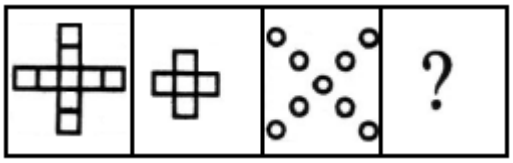


(A) (B) (C) (D)

Space for rough work

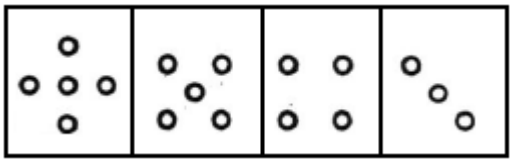
Problem set

23.



P Q R S

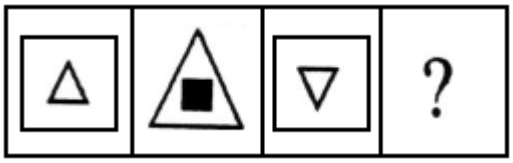
Answer set.



(A) (B) (C) (D)

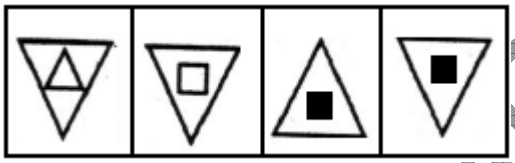
Problem set

24.



P Q R S

Answer set.



(A) (B) (C) (D)

Space for rough work

Directions (Q.No. 25 – 28) : In each of the following questions, select a figure from amongst four alternatives, which when placed in the blank space of fig (X) would complete the pattern.

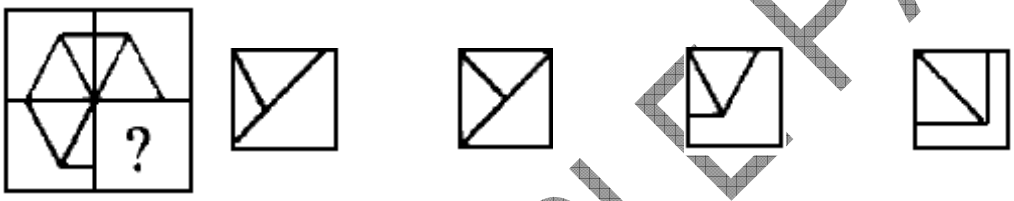
25.

(X) (A) (B) (C) (D)

26.

(X) (A) (B) (C) (D)

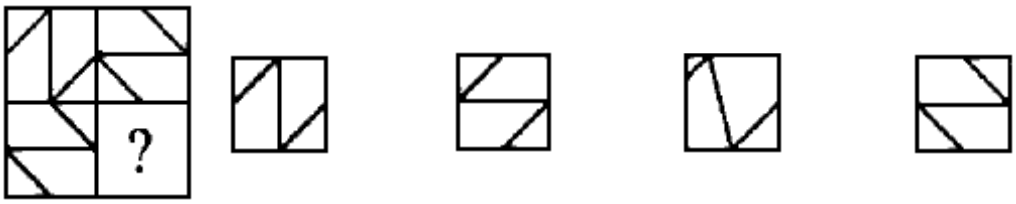
27.



(X) (A) (B) (C) (D)

Space for rough work

28.



(X) (A) (B) (C) (D)

29. How is Anil's Mother's husband's Mother's grand daughter related to Anil?
(A) Daughter (B) Aunt
(C) Sister (D) cannot be determined

30. My Mother's Sister's husband's only son's Sister is related to me as _____
(A) Sister (B) Cousin (C) Aunt (D) Niece

Mathematics Section – II

1. If A = {x : x is a factor of 15}, B = {x : x is a factor of 18}, then $A \cap B$ = _____
(A) {1, 3, 5, 15} (B) {1, 2, 3, 6, 9, 18} (C) {1, 3} (D) {5, 15}

2. If A and B have 3 and 6 elements then the minimum number of elements in $A \cup B$ is
(A) 3 (B) 6 (C) 9 (D) 18

Space for rough work

3. The value of $\sqrt{a\sqrt{a\sqrt{a.....\infty}}}$ = _____
   (A) a (B) a^2 (C)1 (D) ∞

4. Which of the following is a non-terminating and recurring decimal
   (A) $\frac{5}{16}$ (B) $\frac{13}{50}$ (C) $\frac{11}{75}$ (D) $\frac{19}{200}$

5. The square root of 0.549081 is _____
   (A) 0.739 (B) 0.74 (C) 0.741 (D) 0.742

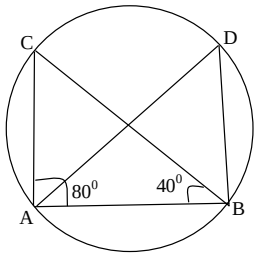
6. The number of divisors of 360 is
   (A) 18 (B) 20 (C) 22 (D) 24

7. If $x = 2 + 2^{\frac{2}{3}} + 2^{\frac{-2}{3}}$ then $x^3 - 6x^2 + 9x - 2 =$ _____
   (A) $\frac{17}{2}$ (B) $\frac{17}{3}$ (C) $\frac{17}{4}$ (D) $\frac{17}{5}$

8. What is the remainder when $1 + x + x^2 + x^3 + ... + x^{2006}$ when it is divided by x – 1 is _____
   (A) 2007 (B) 2006 (C) 2008 (D) 2005

Space for rough work

9. In the given figure $\angle CAB = 80^0, \angle ABC = 40^0$ The sum of $\angle DAB + \angle ABD$ is equal to

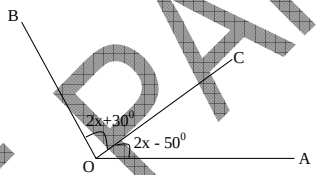


(A) 80^0 (B) 100^0
(C) 120^0 (D) 140^0

10. The degree of zero polynomial is
(A) 0 (B) 1 (C) 2 (D) none of these

11. If $\angle P$ and $\angle Q$ are complementary in a triangle PQR, then the measure of $\angle R$ is _____
(A) 45^0 (B) 60^0 (C) 75^0 (D) 90^0

12. What value of x will make AOB a straight line?



(A) 30^0 (B) 50^0
(C) 49^0 (D) 60^0

13. The sum of the acute angles of an obtuse triangle is 70^0 and then difference is 10^0. The largest angle of the triangle is _____
(A) 110^0 (B) 105^0 (C) 100^0 (D) 95^0

Space for rough work

14. The two diagonals of a rhombus are 24cm and 10cm long. The length of each side of rhombus is _____
(A) 15cm (B) 14cm (C) 13cm (D) 12cm

15. The angle between the internal and external bisector of an angle is _____
(A) 60^0 (B) 90^0 (C) 120^0 (D) 135^0

16. If $Q_1 and Q_2$ denotes 1st and 2nd quadrants respectively then $Q_1 \cap Q_2$ = _____
(A) positive y – axis (B) positive x – axis (C) negative y – axis (D) none of these

17. The three points $(2,-4),(4,-2)$ and (7,1)
(A) form an equilateral triangle (B) form an isosceles triangle
(C) collinear (D) none of these

18. The circum centre of the triangle formed by the vertices $(1,\sqrt{3}),(3,\sqrt{3}) and (1,-\sqrt{3})$ is _____
(A) (0,2) (B) (2,0) (C) (2,3) (D) (3,0)

19. If the distance between the points (k,2) and (3,4) is 8 then k = _____
(A) $\sqrt{60}$ (B) $-\sqrt{60}$ (C) 5 (D) $3 \pm \sqrt{60}$

20. The point on y – axis which is equidistant from $(6,-1)$ and (2,3) is
(A) $(0,-1)$ (B) (0,1) (C) $(0,-3)$ (D) (0,3)

21. If for two sets A and B, $A \cup B = A \cap B = A$, then we have
(A) $A - B \neq \varphi$ (B) $B - A \neq \varphi$ (C) A = B (D) none of these

22. 90 students take mathematics, 72 take science in a class of 120 students. If 10 take neither mathematics nor science then the number of students take both the subjects is _____
(A) 52 (B) 110 (C) 162 (D) 100

Space for rough work

23. Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than total number of subsets of second set. The value of m and n are respectively
(A) 8, 5 (B) 6, 3 (C) 4, 1 (D) 4, 2

24. If x – 3 is a factor of $3x^3 - x^2 + px + q$ then
(A) p – q = 72 (B) 3p + q = 72 (C) 3p + q + 72 = 0 (D) p + q = 72

25. The polynomials $kx^3 + 3x^2 - 3$ *and* $2x^3 - 5x + k$ who divided by x – 4 leave the same remainder in each case. The value of k is
(A) 1 (B) 2 (C) 3 (D) 4

26. The zero of the polynomial p(x) = 2x + 5 is _____
(A) $\frac{-2}{5}$ (B) $\frac{-5}{2}$ (C) $\frac{5}{2}$ (D) $\frac{2}{5}$

Space for rough work

27. The solution of $5x - 6 < 3x$ is _____
(A) x > 3 (B) $x \geq 3$ (C) x < 3 (D) $x \leq 3$

28. The solution set of $\frac{1}{x+a} - \frac{1}{x+b} = \frac{1}{a} - \frac{1}{b}$ is _____
(A) $\{0, -(a+b)\}$ (B) $\{1, -a\}$ (C) $\{1, -b\}$ (D) { 0, (a + b)}

29. Rationalizing factor of $\frac{1}{\sqrt{5}-\sqrt{3}}$ is _____
(A) $\sqrt{5}-\sqrt{3}$ (B) $\sqrt{5}+\sqrt{3}$ (C) $5-\sqrt{3}$ (D) none of these

30. $0.6\overline{7}$ is equal to _____
(A) $\frac{62}{90}$ (B) $\frac{61}{9}$ (C) $\frac{61}{90}$ (D) $\frac{62}{9}$

Physics Section – III

1. If time period of a wave is 0.02 seconds, its frequency is
(A)0.02Hz (B)5 Hz (C)7Hz (D)50Hz

2. A boy hears an echo of his own voice from a distance hill after one second. The speed of sound in air is 360 ms^{-1}, the distance of hill from the boy is
(A)720m (B)360m (C)180m (d)18m

3. A boy is standing 40 m away a 20Hz sound source. The time interval in which successive compression pulses from the source reach him is
(A)2 s (B)0.05s (C)800 s (D)20 s

4. A column of water 60 cm high supports a 50cm column of an unknown liquid. The density of the liquid is
(A)1000 kg/m^3 (B)1200 kg/m^3 (C)3000 kg/m^3 (D)800 kg/m^3

Space for rough work

5. An athlete takes 2.0 s to reach the maximum speed of 18.0 km/h. The magnitude of his average acceleration is
(A)2.5 m/s^2 (B)2.5 km/s^2 (C)9 m/s^2 (D)9 km/s^2.

6. An object having a velocity 4.0 m/s is accelerated at the rate of 1.2 m/s^2 for 5.0 s. The distance traveled during the period of acceleration is
(A)5 m (B)20 m (C)6 m (D)35m

7. A car covers 30 km in 30 minutes and the next 30 km is 45 minutes. The average speed for the entire journey is
(A)48 km /hr (B)4/5 km /hr (C)1.83 km/hr (D)0.8 m/s

8. An insect moves along a circular path of radius 10 cm with a constant speed. If it takes 1 minute to move from a point on the path to the diametrically opposite point, the displacement is
(A)2m (B)20 cm (C)$\pi \times 10$cm (D)$2\pi \times 10$cm

9. 900 pico metres is _____ m
(A) 9×10^{-12} (B) 9×10^{-10} (C) 9×10^{10} (d) 9×10^{-6}

10. The least count of a vernier calipers is 0. 0025 cm and it has an error of +0 .0125cm. While measuring the length of a cylinder, the reading on main scale is 7.55 cm, and 12^{th} vernier scale division coincides with main scale. Corrected length is
(A)7.5525 cm (B)7.5625 cm (C)7.5925 cm (D)7.5675cm

11. In a Vernier Callipers 19 main scale divisions coincide with 20 Vernier Scale divisions. If the main scale has 20 divisions in a centimeter. The pitch of the scale is
(A)0.05 cm (B)0.05mm (C)1mm (D)0.1mm

Space for rough work

12. **Match the following**

COLUMN – I		COLUMN – II	
A	Beam balance	P	Jewelry shop
B	Medical Scale	Q	Laboratories
C	Physical Balance	R	Hospitals
D	Digital Balance	S	Markets

(A)A $\rightarrow$ S, B $\rightarrow$ R, C $\rightarrow$Q, D $\rightarrow$P (B)A $\rightarrow$ R, B $\rightarrow$ S, C $\rightarrow$ Q, D $\rightarrow$ P
(C)A $\rightarrow$ S, B $\rightarrow$ Q, C $\rightarrow$ R, D $\rightarrow$ P (D)A$\rightarrow$ S , B $\rightarrow$P, C $\rightarrow$ Q, D$\rightarrow$ R

13. The waves produced when *a* spring is pulled in the downward direction and released are
(A)transverse (B)longitudinal
(C)longitudinal non - mechanical (D)Transverse mechanical

14. The distance travelled by a wave in one vibration of a particle is
(A)Amplitude (B)frequency (C)wave length (D)velocity

15. A man has to go 50m due north, 40m due east and 20m due south to reach the field. His displacement from house to the field is
(A)30m (B)110m (C)50m (D)40m

16. The distance covered by a car moving at a speed of 36 km/hr in 15 minutes is :
(A)0.9 km (B)9.0 km (C)90 km (D)900 km

17. If a particle covers equal distances in equal time intervals, it is said to '
(A)be at rest (B)move with uniform velocity
(C)move with uniform speed (D)move with uniform acceleration

Space for rough work

18. The numerical ratio of displacement to distance for a moving object is ,
(A)always less than 1 (B)always equal to 1
(C)always more than 1 (D)equal or less than 1

19. A bus decreases its speed from 54 kmh^{-1} to 18 kmh^{-1} in 5 seconds, the deceleration of the bus is
(A)7.2 m/s^2 (B)2m/s^2 (C)10m/s^2 (D)15m/s^2 .

20. A particle is moving in a circular path of radius r. The distance after half a circle would be ,
(A)zero (B)πr (C)2r (D)$2\pi r$

Chemistry Section – IV

1. Which of the following is a compound ?
(A)air (B)solution (C)marble (D)stainless steel

2. Gases are separated which of the following method.
(A)fractional evaporation (B)fractional distillation
(C)fractional crystallization (D)fractional sublimation

3. Which one of the following is a physical change
(A)burning of magnesium (B)exposure of iron to moisture
(C)dissolution of sugar in water (D)formation of a compound

4. Which is a homogeneous mixture?
(A)it has a fixed composition (B)it has uniform composition
(C)it has non-uniform composition (D)it cannot be broken down to simpler substances

Space for rough work

5. Bohr's model can explain:
   (A)spectrum of hydrogen atom only
   (B)spectrum of any atom or ion having one electron only
   (C)spectrum of hydrogen molecule
   (D)solar spectrum

6. The nucleus of the atom (Z > 1) consists of :
   (A)proton and neutron (B)proton and electron
   (C)neutron and electron (D)proton, neutron and elements

7. Proton is :
   (A)nucleus of deuterium (B)ionised hydrogen molecule
   (C)ionized hydrogen atom (D)an α-particle

8. Electrons in the atom are held by :
   (A)coulombic forces (B)nuclear forces
   (C)gravitational forces (D)van der Waal's forces

9. Li^{2+} and Be^{3+} are :
   (A)isotopes (B)isomers (C)isobars (D)isoelectronic

10. Nuclides :
    (A)have same number of protons
    (B)have specific atomic numbers
    (C)have specific atomic number and mass numbers
    (D)are isotopes

Space for rough work

11. Which of the following is chemical change?
(A)Lime water turning milky (B)rusting of Iron
(C)Digestion of food (D)All

12. A mixture of iodine and sodium iodide can be separated by
(A)Sublimation (B)chromatography
(C)Solvent extraction (D)decantation

13. Brass is an example of
(A)Solid in liquid (B)Gas in liquid
(C)Solid in solid (D)liquid in solid

14. Which of the following are physical changes
(i) melting of iron metal
(ii) Rusting of iron
(iii) Bending of iron rod
(iv) drawing a wire of iron metal
(A)(i), (ii) and (iii) (B)(i), (ii) and (iv) (C)(i), (iii) and (iv) (D)(ii), (iii) and (iv)

15. Which of the following statements are true for pure substances?
(i) Pure substances contain only one kind of particles
(ii) pure substances may be compounds or mixtures
(iii) Pure substances have the same composition throughout
(iv) Pure substances can be exemplified by all elements other than nickel
(A)(i) and (iv) (B)(i) and (iii) (C)(iii and iv) (D)(ii) and (iii)

Space for rough work

16. Which of the following isotopes is/are having 10 neutrons
(A) ${}_9F^{18}$ (B) ${}_6C^{14}$ (C) ${}_8O^{18}$ (D) ${}_3Li^{6}$

17. During summer, water kept in an earthen pot becomes cool because of the phenomenon of
(A)diffusion (B)transpiration (C)osmosis (D)evaporation

18. Identify the manganic ion-
(A) Mn^{+1} (B) Mn^{+2} (c) Mn^{+3} (D) Mn^{+4}

19. $a\,BaCl_2 + Al_2(SO_4)_3 \longrightarrow b\,BaSO_4 + c\,AlCl_3$. Then what is the value of a + c
(A)2 (B)0 (C)5 (D)3

20. Which of the following ion name ends with 'ic'
(A) Sn^{4+} (B) Sn^{6+} (C) Sn^{2+} (D) Sn^{3+}

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Space for rough work

Space for Rough Work

Samacheer Talent Recognition Drive
CLASS - 9 - (9th going to 10th)
ANSWER KEY

IQ

1.C	2.B	3.C	4.D	5.C
6.C	7.B	8.D	9.B	10.D
11.B	12.A	13.B	14.C	15.D
16.B	17.D	18.D	19.C	20.A
21.B	22.C	23.B	24.D	25.D
26.B	27.C	28.A	29.D	30.B

Mathematics

1.C	2.B	3.A	4.C	5.C
6.D	7.C	8.A	9.C	10.D
11.D	12.B	13.A	14.C	15.B
16.D	17.C	18.B	19.D	20.C
21.C	22.A	23.B	24.C	25.A
26.B	27.C	28.A	29.B	30.C

Physics

1. D	2. C	3. B	4. B	5. A
6. D	7. A	8. B	9. B	10. D
11. A	12.A	13. B	14. C	15. C
16. B	17. C	18. D	19. B	20. B

Chemistry

1.C	2.B	3.C	4.B	5.B
6.A	7.C	8.A	9.D	10.B
11.D	12.A	13.C	14.C	15.B
16.C	17.D	18.C	19.C	20.A