

Lot-A

CODE: XXXXXX.X

SET-A

Time Allotted: 3 Hours

Maximum Marks: 255

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

**INSTRUCTIONS**

**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.**

**A. General Instructions**

1. Attempt ALL the questions. Answers have to be marked on the OMR sheets.
2. This question paper contains Three Parts.
3. **SECTION-I** is Physics, **SECTION -II** is Chemistry and **SECTION -III** is Mathematics.
4. Each **Section** is further divided into **Two Parts: Part-A & B** in the OMR.
5. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
6. Blank Papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

**B. Filling of OMR Sheet**

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
2. On the OMR sheet, darken the appropriate bubble with **Blue/Black Ball Point Pen** for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

**C. Marking Scheme For All Two Parts.**

- (i) **PART-A (01-07)** contains 7 Multiple Choice Questions which have **One or More Correct** answer. For each question in the group **Q. 01 – 07 of PART – A** you will be awarded  
**Full Marks: +4** If only the bubble(s) corresponding to all the correct options(s) is (are) darkened.  
**Partial Marks: +1** For darkening a bubble corresponding to **each correct option**, provided NO incorrect option is darkened.  
**Zero Marks: 0** If none of the bubbles is darkened.  
**Negative Marks: -1 In all other cases.**  
For example, if **(A), (C) and (D)** are all the correct options for a question, darkening all these three will result in **+4 marks**; darkening only **(A) and (D)** will result in **+2 marks**; and darkening **(A) and (B)** will result in **-1 mark**, as a wrong option is also darkened.
- (ii) **Part-A (08-14)** – Contains seven (07) multiple choice questions which have **ONLY ONE CORRECT** answer Each question carries **+3 marks** for correct answer and **-1 marks** for wrong answer
- (iii) **Part-A (15-18)** - This section contains Two paragraphs. Based on each table, there are Two multiple choice questions. Each question has **only one correct** answer and carries **+3 marks** for the correct answer. **There is no negative marking.**
- (iv) **Part-A (19-20)** – This section contains Two (02) List-Match Sets, each List-Match set has One (01) Multiple Choice Questions. Each List-Match set has two lists: List-I and List-II. FOUR options are given in each Multiple Choice Question based On List-I and List-II and **ONLY ONE** of these four options satisfies the condition asked in the Multiple Choice Question. Each question carries **+3 Marks** for correct combination chosen and **-1 mark** for wrong options chosen.
- (v) **Part-B (01-06)** contains six (06) Numerical based questions, the answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries **+3 marks** for correct answer. **There is no negative marking.**

Name of the Candidate : \_\_\_\_\_

Batch : \_\_\_\_\_ Date of Examination : \_\_\_\_\_

Enrolment Number : \_\_\_\_\_

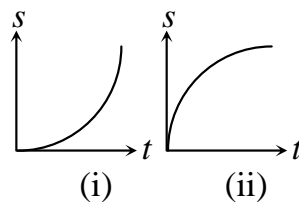
**SECTION – I (PHYSICS)****PART – A****Multiple Correct Choice Type**

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

1. A ball is dropped from top of a tower height of tower is 125 m. Which of the following statement(s) is/are true. For motion of ball before striking ground?  
 (A) ball reaches the ground after 5 sec  
 (B) Average speed of ball is constant  
 (C) Average speed of ball increases with time  
 (D) Magnitude of displacement and distance travelled is same.

1. **ACD**

2. Displacement (s) versus time (t) graphs of two particles moving in a straight line along x-axis is shown below. It can be stated that



- (A) Particle (i) has accelerated motion  
 (B) Particle (i) has uniform motion  
 (C) Particle (ii) has uniform motion  
 (D) Particle (ii) has a retarded motion

2. **AD**

3. A rocket is fired vertically up from the ground with a resultant acceleration of  $10 \text{ m/s}^2$  upward. The fuel is finished in 1 minute and it continues to move up ( $g = 10 \text{ m/s}^2$ )  
 (A) The maximum height reached by rocket from ground is 18 km.  
 (B) The maximum height reached by rocket from ground is 36 km.  
 (C) The time from initial in which rocket again at ground is 240 s.  
 (D) The time from initial in which rocket again at ground is  $(120+60\sqrt{2})$  s.

3. **BD**

4. Starting from rest, a particle is imparted constant acceleration of  $5 \text{ m/s}^2$  mark out correct statement(s)

for given situation

- (A) Velocity – time graph is straight line but does not pass through origin.  
 (B) Velocity time graph is straight line and passing through origin.  
 (C) Position time graph is straight line  
 (D) Position time graph is not straight line

4. **BD**

5. At  $t = 0$ , an arrow is fired vertically upwards with a speed of  $100 \text{ m/s}$ . A second arrow is fired vertically upwards with the same speed at  $t = 5 \text{ s}$ . Then

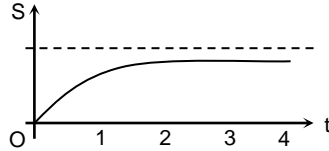
- (A) The two arrows will be at the same height above the ground at  $t = 5 \text{ s}$ .  
 (B) The two arrows will reach back their starting points at  $t = 20 \text{ s}$  and at  $t = 25 \text{ s}$ .  
 (C) The ratio of the speeds of the first and second arrows at  $t = 20 \text{ s}$  will be  $2 : 1$   
 (D) The maximum height attained by either arrow will be  $1000 \text{ m}$ .

5. **BC**

6. A car covers 30 km in 25 mins and next 30 km in 35 mins. The average speed for entire journey is  
 (A) 1 km/h (B) 60 km/h  
 (C) 60 km/min (D) 1 km/min

6. **BD**

7. The displacement of a particle as a function of time is shown in the figure. It indicates



- (A) The particle starts with a certain velocity, but the motion is retarded and finally the particle stops  
 (B) The velocity of the particle decreases.  
 (C) The acceleration of the particle is in opposite direction to the velocity  
 (D) The particle starts with a constant velocity, the motion is accelerated and finally the particle moves with another constant velocity

7. **ABC**

### Single Correct Choice Type

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

8. The initial velocity of a body moving along a straight line is 7 m/s. It has a uniform acceleration of  $4\text{m/s}^2$ . The distance covered by the body in the 5<sup>th</sup> second of its motion is  
 (A) 25 m (B) 35 m (C) 50 m (D) 85 m

8. **A**

9. For a particle moving along a curved path, velocity is directed  
 (A) Along tangent (B) Along normal to the tangent outward  
 (C) Along normal to the tangent inward (D) None of these

9. **A**

10. Two bullets fired simultaneously horizontally and with two different speeds from the same place which bullet will hit the ground first?  
 (A) The faster one (B) The slower one  
 (C) Both will reach simultaneously (D) Depend on the masses

10. **C**

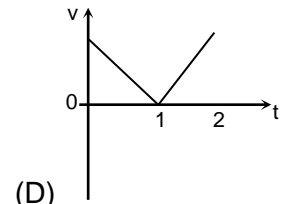
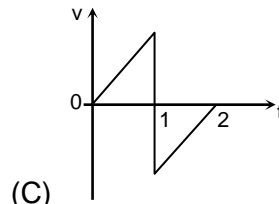
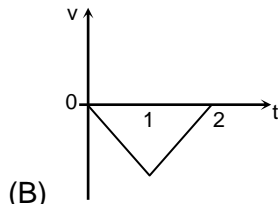
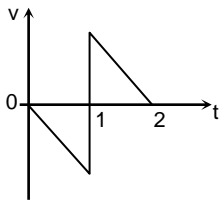
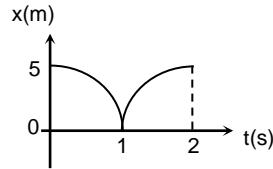
11. An object is projected upwards. Its acceleration at the highest point is  
 (A) Zero (B) Directed upward  
 (C) Directed downward (D) Cannot be predicted

11. **C**

12. A particle has an initial velocity 11 m/s due east and a constant acceleration of  $2\text{ m/s}^2$  due west. The displacement covered by the particle in sixth second is  
 (A) Zero (B) 0.5 m  
 (C) 1 m (D) 2 m

12. **A**

13. A train 100 m long traveling at  $40 \text{ ms}^{-1}$  overtakes another train 200 m long traveling at  $30 \text{ ms}^{-1}$ . The time taken by the first train to pass the second train is :  
 (A) 30 s (B) 40 s  
 (C) 50 s (D) 60 s
13. **A**
14. The displacement-time graph of moving particle with constant acceleration is shown in figure. The velocity-time graph is given by



14. **A**

**Comprehension Type**

This section contains 2 Paragraphs which has two multiple choice questions each. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

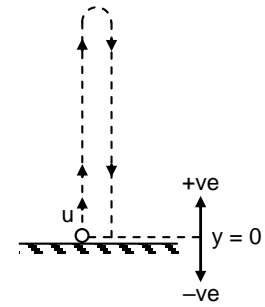
**Paragraph - I (15-16)**

A person walks up a stationary escalator in  $t_1$  s. If he is standing on elevator, then elevator carries him up in  $t_2$  s. The length of elevator is  $l$ .

15. If man starts to walk on moving escalator in the direction of motion of escalator, then time taken by the man to move up is  
 (A)  $\frac{t_1 t_2}{t_1 + t_2}$  (B)  $\frac{t_1 t_2}{t_1 - t_2}$  (C)  $t_1 + t_2$  (D)  $t_1 - t_2$
15. **A**
16. If man starts to move opposite to moving escalator, then time taken by the man to move up is  
 (A)  $\frac{t_1 t_2}{t_1 + t_2}$  (B)  $\frac{t_1 t_2}{t_1 - t_2}$  (C)  $t_1 + t_2$  (D)  $t_1 - t_2$
16. **B**

Paragraph –II (17-18)

A ball is thrown up with initial velocity  $u = 50 \text{ ms}^{-1}$  as shown in the figure. The origin and positive and negative directions are also indicated in the figure. Neglect air resistance and take  $g = 10 \text{ ms}^{-2}$



Based on above information, answer the following questions:

17. What is the maximum height attained by ball?  
 (A) 250m (B) 125m (C) 300m (D) 200m
17. **B**
18. How much time the ball takes to reach to a height which is half of the maximum height?  
 (A) 1.46 s (B) 2.5 s  
 (C) 3 s (D) 1.82 s
18. **A**

Match Type

This section contains Two (02) List-Match Sets, each List-Match set has One (01) Multiple Choice Questions. Each List-Match set has two lists: List-I and List-II. FOUR options are given in each Multiple Choice Question based On List-I and List-II and ONLY ONE of these four options satisfies the condition asked in the Multiple Choice Question.

19. Match the situation in column-I to the position-time and velocity-time graphs of second column-II.

LIST-I		LIST -II	
(A)	Car moving uniformly on a straight road	(P)	
(B)	A ball thrown upwards	(Q)	
(C)	A train accelerating, then retarding uniformly	(R)	
(D)	A block sliding down a smooth inclined plane	(S)	
		(t)	

- (A) A – T; B – R; C – S; D – P (B) A – P; B – R; C – S; D – T  
 (C) A – P; B – S; C – R; D – T (D) A – R; B – P; C – S; D – T

19. **B**

20. Match the parameters of a body projected vertically upwards with a velocity  $v_0$  and it returns to ground given in Column-I to their corresponding values given in Column-II.

Column I		Column II	
(A)	Average velocity	(P)	$v_0/2$
(B)	Time of ascent	(Q)	$2v_0/g$
(C)	Time of ascent + time of decent	(R)	$v_0/g$
(D)	Average speed	(S)	Zero for round the trip

- (A) A – P; B – R; C – Q; D – S  
 (C) A – S; B – R; C – Q; D – P

- (B) A – R; B – P; C – Q; D – S  
 (D) A – Q; B – R; C – P; D – S

20. **C**

**PART – B**  
**Numerical Based**

This section contains 6 questions. The answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries +3 marks for correct answer.

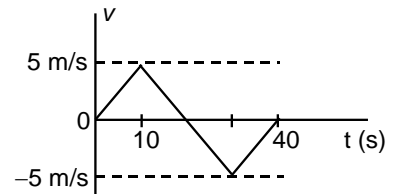
1. A car moving along a long straight road with a speed of 10 m/s is brought to rest within 10 seconds after applying the brakes. What is the magnitude of the retardation of the car?

1. **1**

2. A ball takes  $t$  second to fall from a height  $h_1$  and  $2t$  second to fall from a height  $h_2$  then what is the ratio of  $h_2/h_1$ .

2. **4**

3. From the velocity-time plot shown in figure, find the average velocity during 40s.



3. **0**

4. What is the speed with which a stone is projected vertically upwards from the ground if it attains a maximum height of 3.2 m? ( $g = 10 \text{ m/s}^2$ )

4. **8**

5. A ball is thrown vertically upward with velocity 20 m/s. Total distance covered by ball before striking the ground is  $10n$  meter. The value of  $n$  is \_\_\_\_\_

5. **4**

6. A balloon starts from the ground with an acceleration of  $1.25 \text{ m/s}^2$ . After 8 sec, a stone released from the balloon. The stone will reach the ground in  $n$  sec. Find the value of  $n$ .

6. **4**

Space for rough work

**SECTION – II (CHEMISTRY)****PART – A****Multiple Correct Choice Type**

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

1. Which of the following compounds undergoes sublimation?  
(A) Iodine (B) Ammonium chloride  
(C) Naphthalene (D) Camphor  
1. **ABCD**
2. Which one of the following statements is / are correct  
(A) Freezing point of water is 0°C (B) Freezing point of water is 373 K  
(C) Freezing point of water is 32°F (D) Boiling point of water is 100°C  
2. **ACD**
3. In which of the following conditions, the distance between the molecules of hydrogen gas would increase?  
(A) Increasing pressure on hydrogen contained in a closed container  
(B) Some hydrogen gas leaking out of the container  
(C) Increasing the volume of the container of hydrogen gas  
(D) Adding more hydrogen gas to the container without increasing the volume of the container  
3. **BC**
4. Pressure of air at sea level is :  
(A) one atmosphere (B) 76 cm of Hg  
(C) 760 mm of Hg (D) none of these  
4. **ABC**
5. Which of the following statements about the liquid state is correct?  
(A) Liquids cannot be compressed  
(B) Liquids have maximum fluidity  
(C) Liquids have a definite volume  
(D) Liquids have moderate interparticle forces  
5. **ACD**
6. What are various factors which affect the rate of evaporation?  
(A) An increase in surface area (B) An increase in humidity  
(C) An increase in temperature (D) A decrease in humidity  
6. **ACD**
7. A wooden table is called a solid because  
(A) It is hard and rigid (B) It is hard but not fluid  
(C) It can be compressed (D) It has definite volume and definite shape  
7. **ABD**

**Single Correct Choice Type**

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

8. When water particles condenses on air on dust, it forms :-  
(A) mist (B) fog (C) frost (D) Vapour  
8. **A**
9. Which is more effective in cooling?  
(A) Water at 0°C (B) Water at 100°C (C) Ice at 0°C (D) All of these  
9. **C**
10. The temperature at which Celsius and Fahrenheit scales show the same reading is :-  
(A) 40° K (B) 100° F (C) – 40° C (D) – 100°C  
10. **C**
11. Latent heat of fusion for ice is :-  
(A) 80 gm cal<sup>-1</sup> (B) 80 cal / gm (C) 19 J cal<sup>-1</sup> (D) None of these  
11. **B**
12. Calculate the amount heat energy required to convert 100g water at 0°C to 30°C Given that specific heat of water is 4200 J/kg/°C (Hint: Q = mSΔT)  
(A) 1400 J (B) 12600 J (C) 4200 J (D) 14000 J  
12. **B**
13. When the vapour pressure of a liquid is equal to its atmospheric pressure, then it :-  
(A) Freezes (B) Evaporates  
(C) Boils (D) Does not undergo any change  
13. **C**
14. When ice is converted into water:-  
(A) Heat is absorbed (B) Heat is released  
(C) Temperature increases (D) Temperature decreases  
14. **A**

**Comprehension Type**

This section contains 2 Paragraphs which has two multiple choice questions each. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

**Paragraph - I (15-16)**

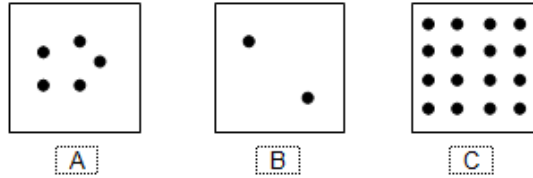
The change of liquid into gaseous state below the boiling point is known as evaporation. In evaporation a molecule of a liquid to escape to vapour state, it must overcome the intermolecular forces attracting it.

15. Identify the factors not affecting evaporation.  
(A) Surface area (B) Humidity (C) Temperature (D) Diffusion  
15. **D**



16. Why evaporation occurs?  
 (A) A liquid molecule must have minimum Kinetic energy to overcome intermolecular forces  
 (B) Due to high potential energy  
 (C) both A and B  
 (D) None of these
16. **A**

**Paragraph –II (17-18)**



17. The substance A may be  
 (A) Honey (B) Wax (C) Hydrogen (D) Nitrogen
17. **A**
18. The substance B may be  
 (A) Hydrogen (B) Liquid (C) Plastics (D) Wax
18. **A**

**Match Type**

This section contains Two (02) List-Match Sets, each List-Match set has One (01) Multiple Choice Questions. Each List-Match set has two lists: List-I and List-II. FOUR options are given in each Multiple Choice Question based On List-I and List-II and ONLY ONE of these four options satisfies the condition asked in the Multiple Choice Question.

19. Match the following and choose the correct answer.

LIST – I		LIST – II	
(a)	Solid	(i)	Super energetic particles
(b)	Liquid	(ii)	No shape nor fixed volume at a given pressure
(c)	Gas	(iii)	Has definite shape
(d)	Plasma	(iv)	Define shape with less molecular forces than that in solids

- (A) a – (ii), b – (i), c – (iv), d – (ii) (B) a – (iii) , b – (iv), c – (ii), d – (i)  
 (C) a – (iv) , b – (iii), c – (i), d – (ii) (D) a – (i) , b – (ii), c – (iii), d – (iv)
19. **B**

20. Match the following and choose the correct answer.

LIST – I		LIST – II	
(a)	Evaporation	(i)	Liquid to gas at a fixed temperature
(b)	Vaporisation	(ii)	Solid to gas
(c)	Sublimation	(iii)	Liquid to solid
(d)	Freezing	(iv)	Liquid into gas at any temperature

- (A) a – (iv), b – (i), c – (ii), d – (iii) (B) a – (i), b – (iii), c – (iv), d – (ii)  
 (C) a – (ii), b – (iv), c – (iii), d – (i) (D) a – (iii), b – (ii), c – (i), d – (iv)
20. **A**

**PART – B**  
**Numerical Based**

This section contains 6 questions. The answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries +3 marks for correct answer.

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1. The melting point of ice is –  
1. **0**
  
2. Convert the temperature of 270 K to the celsius scale –  
2. **3**
  
3. Plasma is the..... state of matter –  
3. **4**
  
4. Identify how many are sublimable among ammonium chloride, sodium chloride, magnesium, chloride, iodine, camphor, charcoal, naphthalene, anthracene.  
4. **5**
  
5. How many are diatomic in nature in the given list of gases:  
Fluorine, Neon, Helium, Oxygen, Bromine, Chlorine, Xenon, Ozone, Nitrogen, Hydrogen, Radon.  
5. **6**
  
6. In the following list of substances, identify how many experience negligible compressibility.  
Tungsten, Bromine, Mercury, Iron, Sponge.  
6. **2**

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Space for rough work

## SECTION – III (MATHEMATICS)

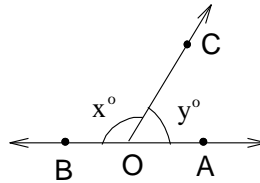
### PART – A

#### Multiple Correct Choice Type

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

1. If  $(0.25)^{-x^2} = 256$  then x is equal to  
 (A) - 4 (B) 4 (C) - 2 (D) +2  
**1. CD**

2. In figure  $\angle AOC$  and  $\angle BOC$  form a linear pair and  $x - y = 80^\circ$ , then



- (A)  $\angle AOC = 50^\circ$  (B)  $\angle AOC = 130^\circ$  (C)  $\angle BOC = 50^\circ$  (D)  $\angle BOC = 130^\circ$   
**2. AD**

3. Let  $g(x) = x^6 + ax^5 + bx^4 + cx^3 + dx^2 + ex + f$  be a polynomial such that  $g(1) = 1, g(2) = 2, g(3) = 3, g(4) = 4, g(5) = 5$  and  $g(6) = 6$ . And if  $g(7) = n$

- (A) sum of the digits of n is 16 (B) sum of the digits of n is 14  
 (C) last digit of n is 7 (D) last digit of n is 9

**3. AC**

4. If  $(x^2 - 1)$  is a factor of  $x^4 + ax^3 + 3x - b$  then

- (A)  $a = 3, b = -1$  (B)  $a = -3, b = 1$  (C)  $a = 3, b = 1$  (D) None of these

**4. B**

5. If  $p = x^{1/3} + x^{-1/3}$ , then  $p^3 - 3p$  is equal to:

- (A)  $\sqrt{x + x^{-1}}$  (B)  $\sqrt{x^2 + x^{-2} + 2}$  (C)  $x + x^{-1}$  (D)  $2\sqrt{x^2 + x^{-2} + 2}$

**5. BC**

6. If  $2^a = 3^b = 6^c$  then 'c' cannot be equal to

- (A)  $\frac{a+b}{ab}$  (B)  $\frac{ab}{a+b}$  (C)  $\frac{a-b}{ab}$  (D)  $\frac{ab}{a-b}$

**6. ACD**

7. If angles  $\angle BAC$  and  $\angle DCA$  is a pair of consecutive angles then which of them are correct

- (A) BC is their common arm (B) AC is common arm  
 (C) Non common vertices are B and D (D) None of these

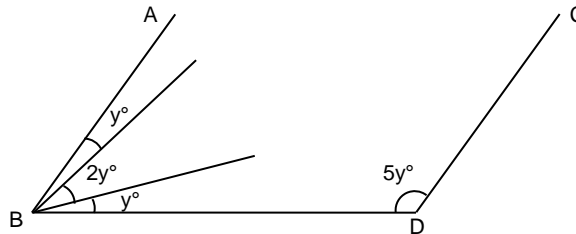
**7. BC**

#### Single Correct Choice Type

This section contains 7 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

8. The H.C.F. of two polynomials is  $x+1$  and their L.C.M. is  $x^6 - 1$ , if one of the polynomials is  $x^3 + 1$  other one is  
 (A)  $x^3 - 1$  (B)  $(x^3 + 1)(x + 1)$  (C)  $x^4 + x^3 - x - 1$  (D) None of these

8. **C**
9. A clock is started at 12 pm, through what angle would the hour –hand turned by 15 minutes past 6?  
 (A)  $30^\circ$  (B)  $187.5^\circ$  (C)  $167.5^\circ$  (D)  $97.5^\circ$
9. **B**
10.  $\sqrt{2^{22}}$  is equal to  
 (A)  $2^{21}$  (B)  $2^{21}$  (C)  $2^{21}$  (D) None
10. **C**
11. Evaluate  $\frac{15}{\sqrt{10} + \sqrt{20} + \sqrt{40} - \sqrt{5} - \sqrt{80}}$ , is being given that  $\sqrt{5} = 2.236$  and  $\sqrt{10} = 3.162$   
 (A) 2.399 (B) 3.399 (C) 4.339 (D) 5.399
11. **D**
12. Find the value of  $x^3 - 8y^3 - 36xy - 216$ , when  $x = 2y + 6$   
 (A) 0 (B) 1 (C) 2 (D) 3
12. **A**
13. The polynomials  $ax^3 + 3x^2 - 13$  and  $2x^3 - 5x + a$  are divided by  $x + 2$ . If the remainder in each case is the same, find the value of  $a$ .  
 (A)  $\frac{4}{9}$  (B)  $\frac{5}{9}$  (C)  $\frac{6}{7}$  (D)  $\frac{3}{5}$
13. **B**
14. In the given figure, if line segment AB is parallel to the line segment CD, what is the value of  $y$ ?



- (A) 12 (B) 15 (C) 18 (D) 20
14. **D**

### Comprehension Type

This section contains 2 Paragraphs which has two multiple choice questions each. Each question has four choices (A), (B), (C) and (D) out of which ONLY ONE option is correct.

#### Paragraph - I (15-16)

$$\text{If } (x + 1)^7 = a_7x^7 + a_6x^6 + a_5x^5 + \dots + a_1x + a_0$$

15. The value of  $a_0 + a_1 + a_2 + \dots + a_7$   
 (A) 0 (B) 1 (C) 128 (D) 64
15. **C**
16. The value of  $a_0$   
 (A) 0 (B) 2 (C) -1 (D) 1
16. **D**

Paragraph –II (17-18)

If  $x^4 + \frac{1}{x^4} = 47$ , then answer below questions

17. Find  $x^2 + \frac{1}{x^2}$   
 (A) 5 (B) 6 (C) 7 (D) 8  
**17. C**
18. Find  $x + \frac{1}{x}$   
 (A) 1 (B) 2 (C) 3 (D) 4  
**18. C**

Match Type

This section contains Two (02) List-Match Sets, each List-Match set has One (01) Multiple Choice Questions. Each List-Match set has two lists: List-I and List-II. FOUR options are given in each Multiple Choice Question based On List-I and List-II and ONLY ONE of these four options satisfies the condition asked in the Multiple Choice Question.

19. Match the following and choose the correct answer.

LIST-I		LIST -II	
(A)	If $3x - 1$ is a factor of the polynomial $81x^3 - 45x^2 + 3a - 6$ then a is	(P)	4
(B)	If $(x+1)(x+2)(x+3)(x+K)+1$ is a perfect square, then the value of K is	(Q)	1
(C)	If $p(x) = 6x^4 + 5x^3 - 14x^2 + 2x + 2$ and $q(x) = 3x^2 - 2x - 1$ , then the remainder when $p(x) \div q(x)$ is $ax + c$ . Find 'a'.	(R)	-1
(D)	The value of K, if HFC of $x^2 + x + (5K - 1)$ and $x^2 - 6x + (3K + 11)$ is $(x - 2)$ .	(S)	$\frac{8}{3}$

- (A) A - R; B - P; C - Q; D - S (B) A - S; B - P; C - Q; D - R  
 (C) A - P; B - R; C - Q; D - S (D) A - S; B - P; C - R; D - Q

- 19. B**

20. Match the following and choose the correct answer.

LIST-I		LIST -II	
(A)	If $10^x = 64$ , what is the value of $10^{\frac{x}{2}+1}$	(P)	128
(B)	If $(3x - 1)^7 = a_7x^7 + a_6x^6 + a_5x^5 + \dots + a_1x + a_0$ , then $a_7 + a_6 + a_5 + \dots + a_1 + a_0 =$	(Q)	80
(C)	If $x + \frac{1}{x} = 3$ , then $x^6 + \frac{1}{x^6} =$	(R)	2/5
(D)	If $x^2 + x + 1$ is a factor of the polynomial $3x^3 + 8x^2 + 8x + 3 + 5k$ , then the value of k is	(S)	322

- (A) A-R; B-P; C-S; D-Q (B) A-Q; B-P; C-R; D-S  
 (C) A-R; B-S; C-P; D-Q (D) A-Q; B-P; C-S; D-R

- 20. D**

**PART – B**  
**Numerical Based**

This section contains 6 questions. The answer of which maybe positive or negative numbers or decimals (e.g. 6.25, 7.00, -0.33, -.30, 30.27, -127.30) and each question carries +3 marks for correct answer.

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1. Find the remainder if  $f(x) = 2x^2 + (2\sqrt{2} - \sqrt{3})x - \sqrt{6}$  is divided by  $(2x - \sqrt{3})$   
1. 0
  2. If a679b is five digit number that is divisible by 72. Find a + b  
2. 5
  3. Find x, if  $\left(\frac{1}{2\sqrt{2}}\right)^{-x} = 512$   
3. 6
  4. The total number of real roots of the equation  $(x - 1)^2 + (x - 2)^2 + (x - 3)^2 + \dots + (x - 2013)^2 = 0$  is \_\_\_\_.  
4. 0
  5. If  $x + y + z = 1$ ,  $xy + yz + zx = -1$  and  $xyz = -1$ , find the value of  $x^3 + y^3 + z^3$ .  
5. 1
  6. If  $x^{140} + 2x^{151} + k$  is divisible by  $x + 1$ , then the value of k is  
6. 1

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Space for rough work

