SET - 01

1. In a chemical plant, a distillation column is used to separate a binary mixture of two components A and B. The feed is a saturated liquid, and the column operates at constant pressure. The relative volatility of component A with respect to component B is 2.5. The McCabe-Thiele method is employed to determine the number of ideal stages required for separation. The reflux ratio is set at 1.5 times the minimum reflux ratio.
   What does the relative volatility of 2.5 imply?

   (a) Component A is 2.5 times less volatile than component B.

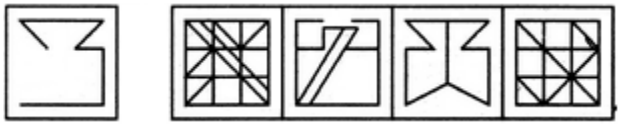
   (b) Component A is 2.5 times more volatile than component B.

   (c) Component A and B have the same volatility.

   (d) None of the above.

   Answer: (b) Component A is 2.5 times more volatile than component B.

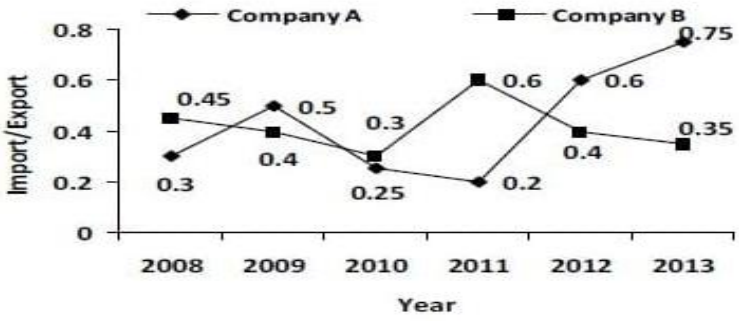
2. Find out the alternative figure which contains figure (X) as its part.



   a) 1
   b) 2
   c) 3
   d) 4

Answer: Option (a)

3. Following graph shows the ratio of import to export of two companies A and B during the period 2008 to 2013.



   In the year 2011, if the import of Company B is increased by 50% and the export is decreased by 50% then what will be its new import-to-export ratio?
   (1) 5:9 (2) 4:9 (3) 9:5 (4) 1:2

   Answer: (3) 9:5

4. Study the following table and answer the questions based on it.
Expenditures of a Company (in Lakh Rupees) per Annum Over the given Years.

Year	Item of Expenditure				
	Salary	Fuel and Transport	Bonus	Interest on Loans	Taxes
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

What is the average amount of interest per year which the company had to pay during this period?

a) Rs. 32.43 lakhs
b) Rs. 33.72 lakhs
c) Rs. 34.18 lakhs
d) Rs. 36.66 lakhs

Answer: d)

5. The first and sixth sentence are given in the beginning S_1 and last as S_6. The middle four sentences in each have been removed and jumbled up. These are labelled as P, Q, R and S. Find out the proper order for the four sentences.

S_1: In the middle of one side of the square sits the Chairman of the committee, the most important person in the room.
P: For a committee is not just a mere collection of individuals.
Q: On him rests much of the responsibility for the success or failure of the committee.
R: While this is happening, we have an opportunity to get the 'feel' of this committe.
S: As the meeting opens, he runs briskly through a number of formalities.
S_6: From the moment its members meet, it begins to have a sort nebulous life of its own.

The Proper sequence should be:
a) RSQP
b) PQRS
c) SQPR
d) QSRP

Answer: d) QSRP

SET - 02

6. In the following question, four probable answers have been given. Select the most appropriate alternative as the answer. While travelling in your car, certain persons stop you on the way asking you to take an injured child to the hospital. You would:

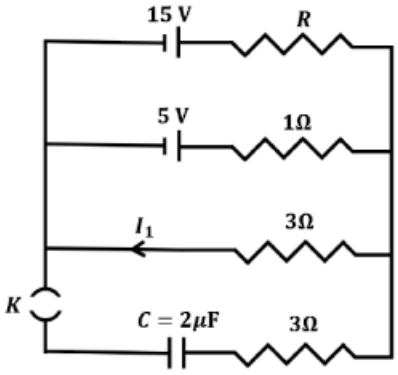
   a) ask them to first call the police
   b) get out of the car and ask some other persons to help to take the child to hospital.
   c) ask them to leave your way and then drive away.
   d) immediately take the child to hospital.

   Answer: d)

7. Consider an experiment of tossing a coin repeatedly until the outcomes of two consecutive tosses are same. If the probability of a random toss resulting in head is 1/3, then the probability that the experiment stops with head is
   (A) 1/ 3
   (B) 5 /21
   (C) 4 /21
   (D) 2 /7

   Answer: (B)

8. In a circuit shown in the figure, the capacitor C is initially uncharged and the key K is open. In this condition, a current of 1 A flows through the 1 Ω resistor. The key is closed at time t = to. Which of the following statement(s) is(are) correct? [Given: e –1 = 0.36]



   (A) The value of the resistance R is 3 Ω
   (B) For t < t 0, the value of current I 1 is 2 A
   (C) At t = t 0 + 7.2 μs, the current in the capacitor is 0.6 A
   (D) All of them

   Answer: (D)

9. Match the reactions (in the given stoichiometry of the reactants) in List-I with one of their products given in List-II and choose the correct option.

	List-I		List-II
(P)	$P_2O_3 + 3H_2O \rightarrow$	(1)	$P(O)(OCH_3)Cl_2$
(Q)	$P_4 + 3NaOH + 3H_2O \rightarrow$	(2)	H_3PO_3
(R)	$PCl_5 + CH_3COOH \rightarrow$	(3)	PH_3
(S)	$H_3PO_2 + 2H_2O + 4AgNO_3 \rightarrow$	(4)	$POCl_3$
		(5)	H_3PO_4

(A) P → 2; Q → 3; R → 1; S → 5
(B) P → 3; Q → 5; R → 4; S → 2
(C) P → 5; Q → 2; R → 1; S → 3
(D) P → 2; Q → 3; R → 4; S → 5

Answer: (D)

10. Let S =∪∪ (0, 1) (1, 2) (3, 4) and T = {0, 1, 2, 3}. Then which of the following statements is(are) true?

(A) There are infinitely many functions from S to T
(B) Every continuous function from S to T is not differentiable
(C) The number of continuous functions from S to T is at most 12
(D) All of them

Answer: (A)

SET - 03

11. Rearrange the following five sentences in proper sequence so as to for a meaningful paragraph, then answer the questions given below them.
Which sentence should come **third** in the paragraph?
    a) After Examining him, the doctor smiled at him mischievously and took out a syringe.
    b) Thinking that he was really sick, his father summoned the family doctor.
    c) That day, Mintu wanted to take a day off from school
    d) Immediately, Mintu jumped up from his bed and swore the he was fine
    e) Therefore; he pretended to be sick and remained in bed.

Answer: a)

12. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?
    a) 564
    b) 645
    c) 756
    d) None of these

Answer: d)

13. Read each definition and all four choices carefully, and find the answer that provides the best example of the given definition.
Applying for Seasonal Employment occurs when a person requests to be considered for a job that is dependent on a particular season or time of year. Which situation below is the best example of Applying for Seasonal Employment?

a) The ski instructors at Top of the Peak Ski School work from December through March.
b) Matthew prefers jobs that allow him to work outdoors.
c) Lucinda makes an appointment with the beach resort restaurant manager to interview for the summer waitressing position that was advertised in the newspaper.
d) Doug's ice cream shop stays open until 11 p.m. during the summer months.

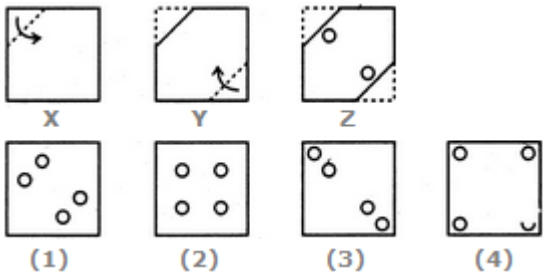
Answer: c)

14. Your neighbour is playing songs at a very high sound in the night and he is not turning it off even after you request many times, then you will:

1. Start abusing and fighting with him
2. Request him last time and if he won't agree, then you will inform the police
3. Inform the police without requesting him again
4. None of the above

Answer: 2.

15. Choose a figure which would most closely resemble the unfolded form of Figure (Z).



a) 1
b) 2
c) 3
d) 4

Answer: c)

Set – 04

16. Match the following:

1.	Chandrayaan – 1	a.	Cosmonaut
2.	Chandrayaan – 2	b.	Mars Orbiter
3.	Mangalyaan	c.	Dr. Mylsamy Annadurai
4.	Rakesh Sharma	d.	Dr. Kailasa vadivoo Sivan

a) 1-c, 2-a, 3-d, 4-b
b) 1-b, 2-d, 3-c, 4-a
c) 1-c, 2-d, 3-b, 4-a
d) 1-a, 2-d, 3-b, 4-c

Answer: c)

17. An ideal gas is in thermodynamic equilibrium. The number of degrees of freedom of a molecule of the gas is n. The internal energy of one mole of the gas is U_n and the speed of sound in the gas is v_n. At a fixed temperature and pressure, which of the following is the correct option?

(A) $v_3 < v_6$ and $U_3 > U_6$
(B) $v_5 > v_3$ and $U_3 > U_5$
(C) $v_5 > v_7$ and $U_5 < U_7$
(D) $v_6 < v_7$ and $U_6 < U_7$

Answer: (C)

18. Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:

a) 173 m
b) 200 m
c) 273 m
d) 300 m

Answer: c)

19. The number of integers, greater than 7000 that can be formed, using the digits 3, 5, 6, 7, 8 without repetition, is

(1) 120
(2) 168
(3) 220
(4) 48

Answer: (2)

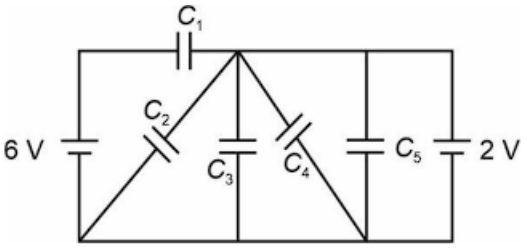
20. One New York publisher has estimated that 50,000 to 60,000 people in the United States want an anthology that includes the complete works of William Shakespeare. And what accounts for this renewed interest in Shakespeare? As scholars point out, his psychological insights into both male and female characters are amazing even today.
This paragraph best supports the statement that:

a) Shakespeare's characters are more interesting than fictional characters today.
b) people even today are interested in Shakespeare's work because of the characters.
c) academic scholars are putting together an anthology of Shakespeare's work.
d) New Yorkers have a renewed interested in the work of Shakespeare.

Answer: b)

SET – 05

21. In the following circuit C1 = 12 μF, C2 = C3 = 4 μF and C4 = C5 = 2 μF. The charge stored in C3 is ____ μC.



a) 4
b) 2
c) 8
d) 5

Answer: c)

22. The statement $B \Rightarrow ((\sim A) \vee B)$ is equivalent to:

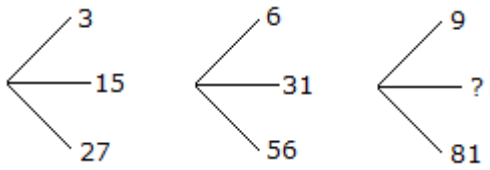
(1) $B \Rightarrow ((\sim A) \Rightarrow (\sim B))$
(2) $A \Rightarrow (A \Leftrightarrow B)$
(3) Both (1) and (2)
(4) $B \Rightarrow (A \Rightarrow (\sim B))$

Answer: (2)

23. A man standing at a point P is watching the top of a tower, which makes an angle of elevation of 30° with the man's eye. The man walks some distance towards the tower to watch its top and the angle of the elevation becomes 60°. What is the distance between the base of the tower and the point P?
    a) 43 units
    b) 8 units
    c) 12 units
    d) Data inadequate

Answer: d)

24. Which one will replace the question mark?



    a) 45
    b) 41
    c) 32
    d) 40

Answer: a)

25. The following table gives the sales of batteries manufactured by a company over the years.
Number of Different Types of Batteries Sold by a Company Over the Years (Numbers in Thousands)

Year	Types of Batteries					
	4AH	7AH	32AH	35AH	55AH	Total
1992	75	144	114	102	108	543
1993	90	126	102	84	126	528
1994	96	114	75	105	135	525
1995	105	90	150	90	75	510
1996	90	75	135	75	90	465
1997	105	60	165	45	120	495
1998	115	85	160	100	145	605

What was the approximate percentage increase in the sales of 55AH batteries in 1998 compared to that in 1992?

a) 28%
b) 31%
c) 33%
d) 34%

Answer: d)