CAT MOCK TEST QUESTION

Quantitative Techniques

1. Find the unit digit of the given product: $(6 + 1)(6^2 + 1)(6^3 + 1) \ldots (6^{102} + 1)$
   (a) 9
   (b) 1
   (c) 3
   (d) 7

2. Let B = $30 \times 31 \times 32 \times 33 \ldots \times 40$, If B is divisible by 10^x then find the maximum value of x?
   (a) 3
   (b) 4
   (c) 5
   (d) 6

3. Sunil has forgotten his 6 digit bank account number but he can only remember that it was of the form A515A0 and was divisible by 36? What is the value of A?
   (a) 9
   (b) 7
   (c) 8
   (d) 6

4. Find the sum of $\sqrt{1 + \dfrac{1}{1^2} + \dfrac{1}{2^2}} + \sqrt{1 + \dfrac{1}{2^2} + \dfrac{1}{3^2}} + \ldots + \sqrt{1 + \dfrac{1}{2087^2} + \dfrac{1}{2088^2}}$?
   (a) $2088 - \dfrac{1}{2088}$
   (b) $2087 - \dfrac{1}{2088}$
   (c) $2088 - \dfrac{1}{2027}$
   (d) $2087 - \dfrac{1}{2027}$

5. A Patwari was asked to measure the field. By mistake, he measured the length 20% less and breadth 10% more. If its original area is 200 square metre, find the area after this measurement?
   (a) 176 square metre
   (b) 206 square metre
   (c) 226 square metre
   (d) 316 square metre

6. Fresh apple contain 90% water by weight while dried apple contain 10% water by weight. What is weight of dry apples available from 20 kg of fresh Apples??
   (a) $5\dfrac{1}{9}$ kg

(b) $6\frac{1}{9}$ kg

(c) $2\frac{2}{9}$ kg

(d) $1\frac{5}{9}$ kg

7. The difference between the simple and compound interest earned on sum a sum of money at the end of four years at the rate of 10% per annum is Rs. 256.40. Find the sum?
   (a) Rs. 4500
   (b) Rs. 5000
   (c) Rs. 4000
   (d) Rs. 6000

8. The ratio of amount for 2 years under CI and under SI for 1 year is 6 : 5 per annum. If rate of interest is same then the value of r?
   (a) 16.66%
   (b) 18%
   (c) 20%
   (d) 12.5%

9. A whole seller has some I Phones in his stock. He marks his I Phones 20% above cost price. He sold half the stock at marked price, 1/4 at a discount of 20% on Marked price and rest on discount of 40% on Marked price. Find his gain percent?
   (a) 2%
   (b) 3%
   (c) 5%
   (d) 8%

10. Total expenses of Army is partly fixed and variables. When the number of candidate is 20, then expenses is Rs. 15000 and when number of candidate is 30, total expense is Rs. 20000. What will be the expense when number of candidate are 40?
    (a) Rs. 25000
    (b) Rs. 22000
    (c) Rs. 21500
    (d) Rs. 28000

11. 20% of employee in factory are workers remaining are officers. The income of each worker is Rs. 390 per annum and for officers is Rs. 420. What is average annual income of factory?
    (a) 410
    (b) 416
    (c) 418
    (d) 414

12. In a set of three number, the average of first two number is 4, the average of the last two number is 5 and the Average of first and last is 9. What is the Average for all?
   (a) 6

(b) 7

(c) 6.5

(d) 7.5

13. From a 3 : 5 solution of wine and water, 20% is taken out and replaced by wine. How many times should this process be done to make the ratio of wine to water as 17 : 8?

   (a) 4

   (b) 2

   (c) 3

   (d) 1

14. In a mess of student there was stock of food for 190 days for 4000 students, After 30 days 800 students left the mess for how many days left over food?

   (a) 300

   (b) 150

   (c) 200

   (d) 250

15. Water is filled in tank in such manner that its volume doubles after every five minutes if it takes 30 minute to complete the tank to full, in how much time will it be one fourth full?

   (a) 20

   (b) 25

   (c) 15

   (d) 22

16. A tap having radius 'r' can empty a tank in 40 minute. How long another tap having radius '2r' take to empty the same tank?

   (a) 5

   (b) 10

   (c) 20

   (d) 40

17. A Boat running upstream covers a distance of 10 km in 30 minute while running downstream it covers the same distance in 25 minute. What is the speed of river current in km/hr?

   (a) 2.2

   (b) 2.6

   (c) 2

   (d) 1.8

18. A car driving in a fog passed a man who was walking at the rate of 30 km/hr in same direction. He could see the car for 4 minute and it was visible to him upto a distance of 100m. what is the speed of car?

   (a) 4.5

   (b) 6

   (c) 10

   (d) None

19. Find the value of $\left\lceil \dfrac{1}{8} \right\rceil + \left\lceil \dfrac{1}{8} + \dfrac{1}{400} \right\rceil + \left\lceil \dfrac{1}{8} + \dfrac{1}{200} \right\rceil + ... + \left\lceil \dfrac{1}{8} + \dfrac{399}{400} \right\rceil$ if [x] denotes the integral part of x

for real x

   (a) 75

   (b) 25

   (c) 50

   (d) CBD

20. In diagram below, PQRS is a rectangle. The area of isosceles triangle QRT is 14 and ST = 3TR. What is the area of PQRS?
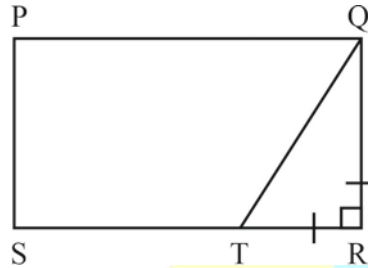
   (a) 112

   (b) 56

   (c) 84

   (d) $3\sqrt{28}$

21. Four equal circles are described about the four corners of a square so that each touches two of the other. If each side of the square is 14 cm, then the area enclosed between the circumference?

   (a) 24

   (b) 42

   (c) 154

   (d) None of these

22. The letters of word SOCIETY are placed in a random in a row. The probability that the three vowels come together is?

   (a) 1/6

   (b) 1/7

   (c) 2/7

   (d) 5/6

Data Interpretation and Logical Reasoning

Directions for questions 1 to 5: Answer the following questions based on the information given below. South Asian Football Federation (SAFF) has organized South Asian Football Championship. The pool B of the competition comprised of four teams viz. India, Nepal, Pakistan and Bangladesh. All the pool B matches were slated to be played at venues across India and the venues were Goa, New Delhi, Ranchi and Mumbai. The table below gives the number of matches won by each team at the end of the pool matches. The teams have been disguised as $T1$, $T2$, $T3$ and $T4$ (not in any order) and the venues have been disguised as $V1$, $V2$, $V3$ and $V4$ not in any order.

	V1	V2	V3	V4

T1	2	6	4	6
T2	6	4	8	10
T3	4	6	6	8
T4	2	8	4	8

Some additional information available with SAFF is as follows:
In New Delhi, maximum number of matches was won by Bangladesh.
Pakistan won its minimum number of matches at Goa.
Nepal has won 4 matches less than Pakistan.

1. Which two countries have won equal number of matches in New Delhi?
    (a) India and Pakistan
    (b) Nepal and India
    (c) Pakistan and Bangladesh
    (d) Bangladesh and Nepal

2. Which of the following can never be correct?
    (a) Nepal has won 2 matches in Goa.
    (b) Bangladesh has won 4 matches in New Delhi.
    (c) India has won 6 matches in Mumbai.
    (d) Pakistan has won 8 matches in Ranchi.

3. Which of the following is correct?
    (a) Pakistan has won 6 matches more than Bangladesh.
    (b) India has won 6 matches less than Nepal.
    (c) Nepal has won 10 matches less than Bangladesh.
    (d) India has won 2 matches less than Pakistan.

4. If at Mumbai, no country has won lesser matches than Nepal, which of the following may not be correct?
    (a) Pakistan has won 8 matches in Ranchi.
    (b) The difference between the matches won by Bangladesh and India at Mumbai is 2.
    (c) India has won 6 matches in New Delhi.
    (d) None of the above

5. Which Team is Pakistan?
    (a) T1
    (b) T3
    (c) T2
    (d) T4

Directions for questions 6 to 10: Answer the following questions based on the information given below.
Cost and price data for Portland cement manufactured by Ambuja Cement and Ultratech Cement, for four consecutive quarters, are given in table.

	Ambuja Cement		Ultratech Cement	
	Cost	Price	Cost	Price
Oct − Dec 2020	92.11	352	94.21	438
Jan − Mar 2021	87.56	304	91.34	440
Apr − Jun 2021	91.03	340	89.96	430
Jul − Sep 2021	90.42	322	90.38	434

Cost is given as percetnage of sales revenue and Price is given in Rs. per bag.

Sales Revenue = Price × Sales Quantity

Profit = Sales Revenue – Cost

Profit Rate = Profit / Sales Quantity

6 Profit rate of Ambuja Cement is more than the profit rate of Ultratech cement in :
    (a) Oct-Dec 2020 and Jan-Mar 2021
    (b) Jan-Mar 2021 and Apr-Jun 2021
    (c) Oct-Dec 2020 only
    (d) Jan-Mar 2021 only

7. If between Jan-Mar 2021 and Apr-Jun 2021 sales of Ambuja Cement increased from 543278 to 698236 and that of Ultratech Cement decreased from 526532 to 499874, then which of the following is true?
    (a) Between Jan-Mar 2021 and Apr-Jun 2021, profit and profit rate of Ambuja Cement increased, whereas profit and profit rate of Ultratech cement decreased.
    (b) Between Jan-Mar 2021 and Apr-Jun 2021, profit rate of Ambuja Cement increased but its profit decreased, whereas both profit and profit rate of Ultratech Cement is increased.
    (c) Between Jan-Mar 2021 and Apr-Jun 2021, both profit and profit rate of Ambuja cement decreased, whereas profit rate of Ultratech Cement decreased but its profit increased.
    (d) Between Jan-Mar 2021 and Apr-Jun 2021, profit rate of Ambuja cement decreased but its profit increased, whereas both profit and profit rate of Ultratech Cement increased.

8. If between Apr-Jun 2021 and Jul-Sept 2021 sales of Ambuja Cement increased by 2.25%, it profit increased by
    (a) 2.08%
    (b) 2.25%
    (c) 2.96%

(d) 3.42%

9. Profit rate of Ambuja cement in Oct – Dec 2020, is how much percent less than the profit rate of Ultratech Cement in Apr – Jun 2021?
    (a) 32.82%
    (b) 37.85%
    (c) 35.64%
    (d) 41.23%

10. Profit rate of Ultratech cement in Apr-Jun 2021 is how much percent less/more than the profit rate of Ambuja cement in Jul-Sep 2021?
    (a) 39.94%
    (b) 38.72%
    (c) 41.32%
    (d) 36.52%

Directions for questions 11 to 15: Answer the questions on the basis of the information given below

The finals of 50 meters Air Pistol event at the 2018 Asian games was contested by four players Sanjeev, Takayuki, Hui Zicheng and Anwar. The final was held in 3 rounds, and in each round a shooter could have scored a maximum of 150 points. The table below shows the points of the 4 shooters in the 3 rounds. While displaying the result, the judge arranged the scored round wise in the ascending order by mistake and hence it was difficult to tell which shooter scored how many points in various rounds.

Round 1	Round 2	Round 3
20	60	80
50	80	100
60	100	120
70	120	140

The judge had a task to correct his mistake and announce the winner. So, he took help of some observers to find the winner. The observers gave the following accounts:

Observer 1: The total score of Takayuki and Anwar is 290 and 260 respectively,

Observer 2: Hui Zicheng score same points in atleast two rounds.

Observer 3: Hui Zicheng's total score is more than the total score of Sanjeev.

Observer 4: Sanjeev did not scored same number of points in any of the rounds.

Observer 5: Takayuki did not scored 50 or 100 in any of the rounds.

11. If Hui Zicheng scored 50 in round 1, then what could be the ratio of Hui Zicheng's score in round 2 to the score of Sanjeev in round 3?
    (a) 1.25
    (b) 1.5
    (c) 1.2
    (d) either 1.25 or 1.5

12. If the total score of each of the shooters are unequal, then find the difference of Anwar's score in round 2 and Sanjeev's score in round 3?

    (a) 0

    (b) 10

    (c) 20

    (d) 40

13. The world shooting federation decides to give the medals on basis of a unique system in which the player with the highest points in a round is given 10 points, the next is given 9 points, the third highest score is given 8 points and the least scorer is given 7 points. What can be total number of points of Anwar?

    (a) 24

    (b) 26

    (c) 28

    (d) either 26 or 28

14. Which of the following may be true?

    I. The ratio of scores of Takayuki and Anwar in round 3 is 1.4.

    II. The ratio of scores of Takayuki and Hui Zicheng in round 3 is 1.25.

    III. The ratio of scores of Hui Zicheng and Anwar in round 2 is 2.

    IV. The ratio of scores of Hui Zicheng and Sanjeev in round 1 is 1.2.

    (a) Only I and III

    (b) Only II and III

    (c) Only II and IV

    (d) Only I and IV

15. If Anwar did not score same number in any rounds then what is the score of Sanjeev in round 1?

    (a) 20

    (b) 50

    (c) 60

    (d) 70

Directions for questions 16 to 20: The table given below shows the runs scored by 4 players of Indian Cricket Team in a series of 5 matches against West Indies. The table also shows the highest and lowest runs scored by these players in that particular series. Two terms are also introduced in the table i.e. Playerwise Points Average(PPA) and Matchwise Points Average(MPA). PPA means the average of points received by a player in all the given matches. MPA means the average of points received by these players in a particular match.

	Rohit	Dhawan	Mayank	Rahul	Highest Score	Lowest Score	MPA
Match 1	Duck	10	--	--	30	--	1.5
Match 2	--	--	--	30	--	--	1.75
Match 3	--	--	30	--	--	20	2.75
Match 4	20	30	20	--	30	--	1.75
Match 5	--	--	40	--	--	Duck	2.25

PPA	2	1.4	--	1.8	--	--	

- **"Duck" means that the player scored 0 runs**

In this series players are given points as per the runs scored by them in the matches of this series.

40 runs = 4 Points

30 runs = 3 Points

20 runs = 2 Points

10 runs = 1 Point

00 runs = 0 point

16. Which of the following can be the runs scored by Dhawan in Match 3?

(a) 40

(b) 30

(c) 20

(d) Either 30 or 20

17. If the Rohit and Dhawan both scores 10 runs each in Match 2, then which of the following can show the runs scored by Rohit and Rahul in Match 3?

  (I) Rohit = 40 ; Rahul = 20

  (II) Rahul = 20 ; Rohit = 30

  (III) Rahul = 30 ; Rohit = 30

(a) Only II

(b) Only III

(c) Either I or II

(d) Either I or III

18 Which of the following statement(s) is/are correct?

(a) Dhawan cannot score 40 runs in Match 5.

(b) Rahul can score 30 runs in Match 5

(c) Dhawan can score maximum 20 runs in Match 3.

(d) None of these

19. What is the Playerwise Points Average(PPA) of Mayank? **[TITA]**

20. If Rohit scores 20 runs in match 2 and match 5, then what is the score of Rohit in match 3? **[TITA]**

Language Comprehension

Direction (1-14): The passage below is accompanied by a set of questions. Choose the best answer to each question.

Passage 1

The recipients of this year's Nobel Prize in Physiology or Medicine are William G. Kaelin of Harvard Medical School, Sir Peter J. Ratcliffe of Oxford University and Gregg L. Semenza of Johns Hopkins University. They won for their pioneering research into how the cells sense and adapt to low oxygen conditions.

Understanding how cells talk to each other in a low oxygen environment – like a tumour – is critical for learning how cancers grow and progress. The pioneering work from these three eminent scientists laid the foundation for my research and that of many others studying disease.

Adapting to varying oxygen levels is one of the key evolutionary adaptations for most life forms on Earth. Every cell in the human body requires oxygen for its normal function.

Both the environment and the physiological status of the body determines how much oxygen is available to cells. For example, in higher altitudes, oxygen availability decreases. This is especially important for mountain climbers, who must adapt to altitude in order to help their body increase the oxygen-carrying capacity in the blood. This is essential to avoid mountain sickness and other altitude-associated health issues such as pulmonary and cerebral diseases.

Oxygen levels in the human body are constantly fluctuating, depending on whether the individual is eating or fasting, exercising or resting and even whether they are stressed or calm. For example, during exercise, the oxygen supply to the muscles is increased to supply energy. This leaves less oxygen for other organs such as the liver.

In many diseases, damage to the blood vessels can drop blood supply, and thus oxygen supply, to the affected organ, which may make the patient even sicker. Thus, the oxygen levels within the cell are important to both healthy and sick people.

In the early 1990s, Semenza and Ratcliffe independently discovered that cells adapt to changes in oxygen levels by making more of a protein called hypoxia-inducible factor-1 or HIF-1. When oxygen levels decrease, the HIF protein inhibits oxygen-consuming processes of the cells by altering the activity of numerous genes, thereby enabling the cells to adapt quickly and survive the low oxygen environment.
A few years later, Kaelin and Ratcliffe characterized how oxygen levels in the cells regulate the amount of HIF-1 produced.

After their seminal discovery, numerous studies from researchers around the world including ours uncovered this protein's many roles in keeping the body healthy, and how the disease can occur when the oxygen-sensing system is broken. HIFs are now known to control a diverse array of functions in many different types of cells, including immune, brain and cancer cells.

In the last decade, researchers have shown that HIFs have a pivotal role in promoting the growth of tumours. Cancer cells divide and grow rapidly and have a larger appetite for both nutrients and oxygen. But the blood vessels feeding the tumour cannot keep up with the cancer growth.

The clever cancer cells survive by producing higher quantities of HIF protein. The HIF proteins trigger changes in cancer cell metabolism and switch them to low oxygen and low energy mode. This helps the cancer cells to survive in oxygen- and nutrient-poor conditions, and keep growing and spreading.

Some research has even shown that the increase in HIF in cancer cells induces drug resistance to chemotherapy. Thus, pharmaceutical companies are now targeting HIF in the treatment of numerous cancers.

As oxygen is involved in all cellular processes, the discovery of the mechanisms by which cells are able to detect and rapidly respond to changes in oxygen levels has revolutionized biomedical research and helped to identify novel targets for various diseases treatments.

1. Which of the following scientist was responsible for the given research finding "production of HIF relies on oxygen levels"?
A. Gregg L. Semenza
B. Gregg L. Semenza and Peter J. Ratcliffe
C. Peter J. Ratcliffe and William G. Kaelin
D. The author

2. Which of the following statements is not true regarding the oxygen flux within the cell?
A. Adaptation to high altitude is indispensable to increase oxygen carrying capacity in the blood.
B. Daily routine of a human being determines the oxygen level in his body.
C. The physiological status of the body is a key factor in determining oxygen availability to cells.
D. Exercise to build a particular part of a body will draw out more oxygen.

3. Based on the passage, which of the following best captures the meaning of HIF, or hypoxia-inducible factor?
A. It is a protein that increases inside the cell when the oxygen levels fall, helping the cell survive.
B. It inhibits oxygen carrying process in the body as the oxygen level increases inside the cell.
C. It enables cells to adapt quickly to the changing environment and helps in its survival.
D. It regulates the amount of oxygen available to the cell and the body during exercise.

4. All of the following, if true, would negate the findings of the study reported in the passage EXCEPT:
A. Cells adjust to changes in oxygen levels by making to a greater degree of protein called hypoxia-inducible factor-1 or HIF-1.
B. It has been shown that HIFs play a very important role in retreating the development of tumour.
C. Sensing oxygen in the body is vital in healthy person as well as in the person suffering from diseases.
D. HIF proteins trigger changes in malignant growth in cell digestion and change them to low oxygen and low vitality mode.

5. All of the following statements can be inferred from the given passage EXCEPT:
A. Semenza and Ratcliffe jointly discovered that cells adjust oxygen levels in the cells according to HIF.
B. Pharmaceutical companies are focusing on HIF for various malignant growths in the body.
C. Oxygen is an important element for survival and human body can cope with its constant fluctuation through treatments.
D. The spearheading work of the Noble Prize winner in Physiology has established the framework for the author's research.

Passage 2

The super cyclonic storm Amphan has just closed its eyes in the Bay of Bengal, and yet another one is intensifying over the Arabian Sea—within just two weeks. While the increasing frequency of tropical storms is a common trend across the globe, the rapidly growing number of cyclones over basins like the Arabian Sea in the past few years is of particular concern among climate scientists.

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The current storm over the Arabian Sea will be called 'Nisarga', once it intensifies into a cyclone. As per the latest forecasts, the cyclone is very likely to make landfall around Mumbai in coming days — first to do so in recorded history. Last week, the Indian Meteorological Department had tracked two disturbances over the Arabian Sea, one of which failed to concentrate into a cyclone and dissipated over Oman.

Over the past few years, scientists have shown that the primary reason for the formation of more and more cyclones over the Arabian Sea is the increase in sea surface temperature leading to rapid intensification of disturbances.

According to records, the surface temperature which led to the formation of the cyclonic storm Nisarga over the Arabian Sea was around 32 degrees Celsius, while the normal temperature range over this past of the world is around 24 and 26 degrees Celsius. According to the IMD's report State on Climate of India during 2019, the sea-surface temperature over the Arabian Sea has increased dramatically by over 0.36-degree celsius, as against the baseline temperatures of 1981-2010.

As the cyclones draw their energy mainly from ocean heat, the warmer the sea is, higher are the chances of cyclones. In addition to the warmer temperatures, relative humidity, and moist air are also some of the key factors associated with cyclone formation.

Many scientific studies have highlighted that cyclones across the globe are becoming stronger than before. In the upcoming years, as the sea surface temperatures continue to rise, the chances of potentially deadly cyclones would increase further. The root causes cited for this drastic change is global warming.

One of the recent studies, conducted by the National Oceanic and Atmospheric Administration (NOAA) has warned that cyclones may become disastrous in the near future due to climate change.

There are mainly two cyclone seasons—pre-monsoon (March-June) and post-monsoon (October-December)—over the Arabian Sea. According to reports, in the time frame of the last 20 years i.e., 2000-2019, there have been only three years i.e., 2005, 2011, and 2012, when no such storms were witnessed during the pre-monsoon period.

According to senior scientist from the Indian Institute of Tropical Meteorology (IITM), Dr Roxy Mathew Koll, in the case of both the recent cyclones—Amphan and now Nisarga—the anomalously warm ocean temperatures are proving to give them a major boost. He further added, we already see a detectable increase in post-monsoon tropical cyclones over the Arabian Sea. Are we moving towards such a trend during the pre-monsoon also?

According to experts, during the recent years there has been a noted surge in Arabian Sea cyclones occurring close to the monsoon onset but are yet to understand if there is a climate change element to it.

Another study done by the Cochin University of Science and Technology (CUSAT) analysed the data from 1955-2014 to examine the cyclone trends. The study noted that the number of cyclonic storms in the Bay of Bengal has reduced while the frequency of those in the Arabian Sea has drastically increased.

The team divided the information into three periods—early years (1955-1975), middle (1975-95), and the recent (1995-2014). The data of the past 60 years showcased that the number of cyclonic activities in the Bay of Bengal has declined in every 20-year period.

However, over the Arabian Sea, there was a decrease in cyclonic activity in the earlier years i.e., 1955-1975. The intensity of such events was minimum during the middle years (1975-1995), while it showcased an increase in recent years. The study linked the main reason behind to be the warming of the atmosphere and ocean.

6. Based on the given passage, which of the following questions is majorly answered by the author?
A. Why frequency of cyclonic storms is rising sharply over Arabian Sea?
B. What is the root cause for advancement of Amphan cyclone?
C. How cyclones draw their energy from the oceans?
D. What is the reason behind decrease in cyclonic activity in the earlier years?

7. All of the following, if true, would negate the findings of the study reported in the passage EXCEPT:
A. Climate change is one of the responsible factors for a much disastrous cyclone in the future.
B. Frequency of cyclone in Bay of Bengal was high before but now it's high in Arabian sea.
C. Increase in sea surface temperature is directly proportional to increase in number of cyclones.
D. Cyclonic storm Nisarga was formed due to decrease in the surface temperature of Bay of Bengal.

8. Which of the following institutions has provided the analysis related to increasing sea surface temperature over Arabian sea during 2019?
A. Cochin University of Science and Technology
B. Indian Institute of Tropical Meteorology
C. National Oceanic and Atmospheric Administration
D. Indian Meteorological Department

9. Which of the following statements is true according to the given passage?
A. As per the latest records, cyclonic storm like 'Nisarga' has never formed in history.
B. Super cyclonic storm Amphan emerged from the Bay of Bengal.
C. Sea surface temperature over the Arabian sea has increased by over 0.36-degree celsius.
D. Nisagra cyclone once failed to concentrate into a cyclone and dissipated over Oman.

10. "Are we moving towards such a trend during the pre-monsoon also?", why scientists have raised this question in the 9th paragraph?
A. Due to increase in pre-monsoon cyclonic activity in the Arabian sea.
B. Growing trend of cyclonic activity in the Bay of Bengal.
C. Post-monsoon tropical cyclones are more prevalent in Bay of Bengal.
D. No sign of super cyclone in 20 years in pre-monsoon period in the Arabian sea.

Passage 3

Atoms are so small that you can't even see them (except with some very special equipment) – yet they make up all the matter in the universe.

If something is hot, it means that its atoms have lots of energy and are bouncing around. If something is cold, its atoms have much less energy and they stay quite still.

It's true that space is a vacuum, which means that there isn't much matter floating around out there. Space isn't a perfect vacuum though. Even if we ignore the big stuff like stars, planets and comets, space is not completely empty. In fact, the sun is constantly blowing matter, known as the solar wind, out into our solar system. This is part of what causes the beautiful light display we call the aurora. But the solar wind isn't very dense - it has much, much fewer atoms in it than air, for example. This means it can't carry much heat in it and so it can't explain how the warmth from the sun reaches Earth.

Conduction is what scientists call the transfer of heat through touching. If you touch something warm, heat goes from it to you. If you touch something cold, heat goes from you to it. Some materials, such as metals, are good conductors. Other materials, such as glass, are poor conductors and are called insulators.

Heat can also be conducted in more than one step. For example, if you hold a metal spoon in a mug of hot tea, heat will be transferred from the tea to the spoon, and then from the spoon to your hand. But we're not touching the sun (and that's a good thing too - its surface temperature is over 5,000°C!) and space is a vacuum so there isn't anything to act as a spoon and conduct the heat. So, we can rule out conduction.

Convection is the transfer of heat through the flow of fluids. Both liquids and gases can convect heat. Atoms will flow away from hot regions toward cooler regions, carrying their heat and energy with them. But because space is a vacuum, there are no liquids or gases to convect heat away from the sun, all the way to Earth.

As the matter's atoms move and vibrate, they give off, or "radiate", electromagnetic energy – this is called "thermal radiation".

Electromagnetic energy comes in a range, or spectrum, of types - some of these we can see: they make up the rainbow of "visible light". Other types that we cannot see exist too, such as the infrared energy our hot bodies radiate and microwave energy, we use to cook food. Unlike conduction and convection, radiation does not need matter to transfer heat. Energy is radiated from the sun, through the vacuum of space at the speed of light. When this energy arrives at Earth, some of it is transferred to the gases in our atmosphere. Some of it passes through and heats up the atoms on the earth's surface. Some will even be absorbed by your skin.

The ground soaks up the energy from the sun's radiation, and this causes it to give off heat, too. Some of this heat is conducted – like when the hot sand on the beach burns your feet in the summer. Some are convected through wind and ocean currents, and some of it is radiated back into the atmosphere or even outer space.

11. What is the major concern of the author behind the given passage?
A. If space is vacuum then how does heat travel through space.
B. If space is a perfect vacuum, then how air is dense.
C. In what ways heat can be shared in the environment.
D. To analyse how the warmth from the sun affects the earth.

12. For which type of process author has stated the following fact "No matter is required to transfer the heat"?

A. Conduction

B. Insulation

C. Radiation

D. Convection

13. All of the following, IF TRUE, would weaken the author's claims EXCEPT:

A. Hot bodies of matter give off heat.

B. Insulators can conduct heat through metals.

C. Air is more dense than solar wind.

D. Convection can't transfer heat in the space.

14. Based on the passage, all of the following can be inferred about radiation method EXCEPT that:

A. There are some radiations that we can't see but they exist

B. Human beings' warm bodies radiate infrared energy.

C. Heat travels through the method of radiation from the space.

D. Aurora phenomenon is one of the examples of it.

Direction (15-17): The four sentences (labelled 1, 2, 3, 4) given below, when properly sequenced would yield a coherent paragraph. Decide on the proper sequence and choose the correct option.

15. 1. This implies families who decided to move away would have to sell their homes for far less than their present worth.

2. The highway bypass would have disastrous effects on the area's homeowners as the new road would cut directly through the middle of the subdivision.

3. This would increase vehicles in the area and property holders would need to manage the expanded clamor and contamination.

4. Finally, the new road would cause residential properties to depreciate.

A. 2341

B. 1234

C. 3421

D. 2143

16. 1. Indeed, I know, the current $55 a barrel for Brent is an immense enhancement on the low of less than $28 that it reached in January 2016, yet it is still generally half what was a year and a half prior.

2. It is the ideal opportunity for the oil producer group to change its concentration from managing creation to managing exports and let the market take the strain in observing consistency.

3. OPEC oil producers have clarified that "taking the necessary steps" does exclude making further yield cuts.

4. Commendable consistency with output cuts has done little to enhance oil costs.

A. 1234

B. 2413

C. 3241

D. 4321

17. 1. Since the time July, there has been a decrease in the number of shares exchanged in S&P 500 organizations whose stock costs have been falling.

2. On Wednesday, declining volume, on a 100-day, moving normal - it's unstable, so in general, a great many people take it on a rolling basis - hit 254 million shares exchanged, the most minimal in more than two years.

3. Purchasing on the plunges is commonly viewed as great as it shows hopefulness and that financial specialists are still ready to face challenges.

4.A market's capacity to snap again from a misfortune, instead of winding down, is something financial specialists watch to ensure a bull market is still solid.

A. 2341

B. 1234

C. 4123

D. 4231

Direction (18-20): The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

18. The pterosaurs looked like the two-winged creatures and bats in their general structure and extents. This isn't amazing on the grounds that the plan of any flying vertebrate is dependent upon streamlined imperatives. Both the pterosaurs and the winged creatures have empty bones, an element that speaks of savings in weight. In the birds, nonetheless, these bones are fortified all the more hugely by inward struts.

A. Bones of birds are almost similar to the structure of bones present in the pterosaurs as both are flying creatures.
B. The skeleton of a pterosaur can be distinguished from that of a bird by the anatomic origin of the wing of strut.
C. Both the pterosaurs and the birds have hollow bones, a feature that represents a savings in weight.
D. The pterosaurs resembled both birds and bats in their overall structure and the ability to fly up to

any extent.

19. Because of the media and communication blast and the impact of globalisation, markets everywhere throughout the world are experiencing a period of transformation. The visual media is routinely uncovering a more up to date way of life, items and administrations to the quick-growing netizen driven society. Today, customers have gotten very worried about medical problems and are taking an extraordinary enthusiasm for food matters. Ecological issues, more prominent division and expanded versatility are additional factors. In addition, the Green Movement bolstered by media inclusion has been making an inclination for natural food.

A. Markets are experiencing period of transformation due to the blast of visual media and globalisation which has become the cause of concern for many consumers regarding health facilities and food.

B. The quick-growing netizen society has brought the transformation around the world, influencing people to eat green food and warning about the medical problems associated with many food items.

C. The emergence of media and communication and globalisation collectively has impacted the lives of consumers as now they are more concerned about medical problems and the intake of natural food.

D. Media blast like the green movement and globalisation has transformed the markets all over the world as it plays with the mind of netizens and questions there way of living and eating habits.

20. We conservatively estimated that between five and 14 cats lived in our study area. Although cats were common here, we detected them less often in areas of dense vegetation. By contrast, this was where we found potoroos more often. Long-nosed potoroos are nocturnal foragers that mainly, but not exclusively, feed in more open habitat before sheltering in dense vegetation during the day. But we found potoroos rarely ventured out of their thick vegetation shelter. This may be because they're trading off potentially higher quality foraging habitat in more open areas against higher predation risk. In other words, it appears they've effectively learnt to hide from the cats.

A. Potoroos are mainly found in areas of dense vegetation and they are mainly active in night, collecting and searching food for their survival and at the same time hiding themselves from the predators around them.

B. Potoroos rarely come out of their thick vegetation shelter in order to hide from the cats as they are mostly busy in collecting and searching food at night, which also helps them to keep them safe which is not possible in open spaces.

C. Cats have no despise for open spaces but their contemporary like long-nosed potoroos mainly hunt at night in their thick vegetation shelter and then feed on it in the day light.

D. Long-nosed potoroos search for food in the night and rarely come from their dense vegetation during that period of time but when it comes to feeding, they prefer daytime.

Direction (21-22): Five sentences related to a topic are given below. Four of them can be put

together to form a meaningful and coherent short paragraph. Identify the odd one out.

20. 1. Jevons selected intensity and duration as the most fundamental dimensions of feeling.
2. This formed the starting point of William Stanley Jevons's Theory of Political Economy: a quantitative analysis of the feelings of pleasure and pain.
3. Of the seven Benthamite circumstances that are associated with pleasure and pain.
4. The result is that they haven't absorbed many of the lessons on risk management learnt by the financial sector.

A. Option 1

B. Option 2

C. Option 3

D. Option 4

22. 1. The tenor of the bonds is 8 years with provision of premature cancellation after 5 years.
2. The scheme will be open till November 2, 2016 at all its 2,853 branches across the country, the bank said.
3. The bonds will be restricted for sale to resident Indian entities including individuals, HUFs, Trusts, Universities and charitable institutions.
4.RBI has notified a rate of interest of 2.5 per cent per annum on the initial investment based on nominal value.

A. Option 1

B. Option 2

C. Option 3

D. Option 4

23. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: This explains why some people learn more from their experiences (and develop faster) than others.

Someone with leadership potential has the capacity to be an effective leader in the future, but may need support to develop the right skills and experience to succeed. (1)_____. So, how can you work out your own leadership potential?
Many studies identify the ability to learn as key to predicting future leadership effectiveness.
(2)_____.This incorporates keenness to learn, the ability to extract as many lessons as possible from different experiences, and to adapt by applying these to enhance your future performance.

(3)_____. There is also a motivational component that includes drive and perseverance to achieve results, and the ambition to lead. (4)_____.

    A. Option 1

    B. Option 2

    C. Option 3

    D. Option 4

24. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: In coffee plantations, for example, the roots of selected interplanted trees can absorb mineral nutrients from soil depths beyond the reach of coffee roots.

(1)_____. It is common practice to apply fertilizers to fruit trees to stimulate floral induction, increase fruit set and growth, develop high-quality fruits, and prolong the storage life of harvested fruits. (2)_____. Most benefits of fertilizers are obtained only if factors other than mineral deficiency are not seriously limiting growth. (3)_____.
It is difficult to sustain yield of fruit trees in the tropics without a fallow period or fertilizer application. Acceptable yields sometimes can be obtained without fertilizers by growing crop trees together with other trees, often N-fixing legumes. (4)_____.

A. Option 1

B. Option 2

C. Option 3

D. Option 4