

I. Choose the correct answer: 6x1=6

1. Protoxylem lies towards the center and metaxylem lies towards the periphery. This condition is called as _____.
a) Exarch b) Endarch c) Concentric d) Radial
2. Glycolysis takes place in _____.
a) cytoplasm b) mitochondria
c) chloroplast d) cell membrane
3. To increase the sugar production _____ is sprayed in sugarcanes.
a) Auxin b) Cytokinin c) Gibberellins d) Ethylene
4. Decreased secretion of thyroid hormones in the children leads to _____.
a) simple goitre b) cretinism
c) myxoedema d) Exophthalmia
5. The gas released from vehicles exhaust are (i) Carbon monoxide ii) sulphur dioxide iii) oxide of nitrogen
a) (i) and (ii) b) (i) and (iii)
c) (ii) and (iii) d) (i), (ii) and (iii)
6. Deforestation leads to _____ in rainfall.
a) decrease b) increase
c) abundant level d) moderate level

II. Answer any five of the following questions: 5x2=10

7. a) Cortex lies between _____.
b) Casparian strips are band like thickening made of _____.
8. Write the External factors affecting photosynthesis.

9. What are chemical messengers?

10. Name the hormones produced by Adrenal Medulla.

11. Draw and label the parts of chloroplast.

12. Why fossil fuels are to be conserved?

13. Write few measures taken to conserve Electrical energy.

III. Answer any five of the following questions: 5x4=20

14. Write the differences between Dicot stem and monocot stem.

15. Draw and describe the internal structure of Dicot Leaf.

16. Write the physiological effects of Ethylene.

17. Sanjay is sitting in the exam hall. Before the start of the exam, he sweats a lot, with increased rate of heart beat. Why does this condition occur?

18. What are the consequences of deforestation?

19. Write the environmental concerns of Shale gas.

20. What is biogas? What are the uses of biogas?

IV. Answer any two of the following in detail: 2x7=14

21. Describe the structure of Mitochondria and mention its functions.

22. Describe an experiment which demonstrates that growth stimulating hormone is produced at the tip of coleoptiles.

23. Enumerate the importance of forest.

I. Choose the correct answer: 7x1=7

1. Which president of the USA Pursued 'Good Neighbour' policy towards Latin America.
a) English b) Spaniards c) Russians d) French
2. _____ established a full-fledged printing press in 1709, at Tranquebar.
a) Caldwell b) F.W. Ellis
c) Ziegenbalg d) Meenakshi Sundaram
3. Dollar imperialism is used to describe the policy of _____.
a) USA b) USSR c) England d) France
4. Who among the following decides whether a Bill is a Money Bill or not?
a) The President b) The Attorney General
c) Parliamentary Affairs Minister d) Speaker of Lok Sabha
5. The President of India resides at the building _____.
a) Rajbhavan b) Rashtrapati Bhavan
c) White Palace d) Parliament
6. _____ tax is charged on the benefits derived from property ownership.
a) Income Tax b) Wealth Tax
c) Corporate Tax d) Excise Duty
7. _____ introduced Income Tax in India.
a) Sir James Wilson b) Lord Dalhousie
c) Lord Canning d) Sir John Cradock

II. Fill in the blanks: 5x1=5

8. The secret state police in Nazi Germany was known as _____.
9. The name Suriyanarayana Sastri changed in Tamil as _____.
10. South Indian Liberal Federation is changed as _____.
11. The Chief Justice and other judges of the supreme court hold the office up to the age of _____.
12. The origin of the word 'tax' is from the word _____.

III. Match the following: 5x1=5

13. a) Tongking - Office of the Attorney General
b) Article 76 - 238 Elected by the State Assemblies
c) Rajyasabha - 1 July 2017
d) Dravidian Home- Guerrilla Activities
e) GST - Natesanar

IV. Answer the following under each captions: 2x4=8

14. Political developments in South America
a) By which year did the whole of South America become free from European Domination?
b) How many republics came into being from the central America?
c) In which year was Cuba occupied by the USA?
d) What made oligarchic regimes unpopular in South America?
15. Periyar E.V.R
a) When did periyar form Dravidar Kazhagam?
b) What were the Newspapers and Journals run by Periyar?
c) Why was Periyar known as Vaikom hero?
d) Which was the most important work of Periyar?

V. Answer any six of the following in brief: 6x2=12

16. What do you know of the White Terror in Indochina?
17. Who were Boers?
18. Highlight the contribution of Caldwell for the cause of South Indian language.
19. How did Periyar try to improve the condition of women?
20. Do you know the women who rendered their service for social transformation in Tamilnadu?
21. List out any two special powers of the Attorney General in India.
22. Who can act as a president when there is a situation of President and Vice President lie vacant? Has it happened in India? Explain.
23. What is meant by black money?
24. Write the canons of tax system.

VI. Answer any two in detail: 2x4=8

25. Write a note on how the process of decolonization happened in India.
26. Describe the Legislative powers of the president.
27. Describe the background for the formation of the Justice party and point out its contribution.
28. Write the structure of GST.

VII. Mark the following places on the world outline map: 5x1=5

- a) Germany b) Japan c) Greece
d) Morocco e) Austria-Hungary

I. Choose the correct answer: 10x1=10

- The sum of all deviations of the data from its mean is _____.
 a) always positive b) always negative
 c) zero d) non-zero integer
- The standard deviation of a data is 3, if each value is multiplied by 5 then the new variance is _____.
 a) 3 b) 15 c) 5 d) 225
- Which of the following is incorrect?
 a) $P(A) > 1$ b) $0 \leq P(A) \leq 1$ c) $P(\emptyset) = 0$ d) $P(A) + P(\bar{A}) = 1$
- The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is _____.
 a) 2 b) 1 c) 3 d) 1.5
- If the mean and coefficient of variation of a data are 4 and 87.5% then the standard deviation is _____.
 a) 3.5 b) 3 c) 4.5 d) 2.5
- In ΔLMN , $\angle L = 60^\circ$, $\angle M = 50^\circ$. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is _____.
 a) 40° b) 70° c) 30° d) 110°
- The perimeters of two similar triangles ΔABC and ΔPQR are 36cm and 24cm respectively. If $PQ = 10$ cm, then the length of AB is _____.
 a) $6\frac{2}{3}$ cm b) $\frac{10\sqrt{6}}{3}$ cm c) $66\frac{2}{3}$ cm d) 15cm
- Two triangles are similar if their corresponding angles are angles are _____.
 a) congruent b) equal c) same ratio d) proportional
- A pair of equiangular triangles are _____.
 a) similar b) congruent c) proportional d) same

10. Which of the following is similar:

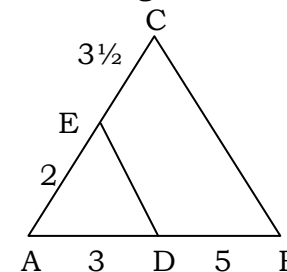


II. Answer any six of the following: 6x2=12

- If the standard deviation of a data is 3.6 and each value of the data is divided by 3, then find the new variance and new standard deviation.
- Find the range of the following distribution:

Age (in years)	16-18	18-20	20-22	22-24	24-26	26-28
Frequency	0	4	6	8	2	2

- If $P(A) = \frac{2}{3}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{1}{3}$ then find $P(A \cap B)$
- A and B are two candidates seeking admission to IIT. The probability that 'A' getting selected is 0.5 and the probability that both A and B getting selected is 0.3. Prove that the probability of B being selected is atmost 0.8.
- If the range and Coefficient of range of the data are 20 and 0.2 respectively, then find the largest and smallest values of the data.
- Check whether the triangle is similar and find the value of x.



17. A vertical stick of length 6m casts a shadow 400cm long on the ground and at the same time a tower casts a shadow 28m long. Using similarity, find the height of the tower.

18. A coin is tossed thrice. What is the probability of getting two consecutive tails?

III. Answer any four of the following: 4x5=20

19. Find the standard deviation of first 21 natural numbers.

20. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3 respectively. They are rolled and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9 separately.

21. If A, B, C are any three events such that probability of B is twice as that of probability of A and probability of C is thrice as that of probability of A and if $P(A \cap B) = \frac{1}{6}$, $P(B \cap C) = \frac{1}{4}$, $P(A \cap C) = \frac{1}{8}$, $P(A \cup B \cup C) = \frac{9}{10}$, $P(A \cap B \cap C) = \frac{1}{15}$, then find P(A), P(B) and P(C).

22. The King, Queen and Jack of the suit spade are removed from a deck of 52 cards. One card is selected from the remaining cards. Find the probability of getting
i) a diamond ii) a queen iii) a spade
iv) a heart card bearing the number 5

23. Two poles of height 'a' metres and 'b' metres are 'p' metres apart. Prove that the height of the point of intersection of the lines joining the top of each pole to the foot of the opposite pole is given by $\frac{ab}{a+b}$ metres.

24. State and prove Basic Proportionality Theorem.

IV. Answer the following: 1x8=8

25. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (Scale factor $\frac{7}{4} > 1$)

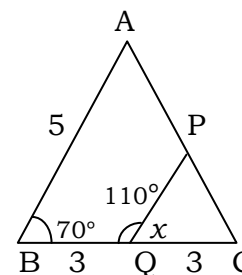
I. Chose the correct answer: 10x1=10

- The range of the data 8,8,8,8,8..... 8 is ____.
 a) 0 b) 1 c) 8 d) 3
- If the standard deviation of x, y, z is P then the standard deviation of $3x+5, 3y+5, 3z+5$ is _____.
 a) $3P+5$ b) $3P$ c) $P+5$ d) $9P+15$
- The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is _____.
 a) $\frac{q}{p+q+r}$ b) $\frac{p}{p+q+r}$ c) $\frac{p+q}{p+q+r}$ d) $\frac{p+r}{p+q+r}$
- The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all deviation is _____.
 a) 40000 b) 160900 c) 160000 d) 30000
- Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is _____.
 a) 5 b) 10 c) 15 d) 20
- A purse contains 10 notes of ₹ 2000, 15 notes of ₹ 500, and 25 notes of ₹ 200, one note is drawn at random. What is the probability that the note is either a ₹ 500 note or ₹ 200 note?
 a) $\frac{1}{5}$ b) $\frac{3}{10}$ c) $\frac{2}{3}$ d) $\frac{4}{5}$
- If ΔABC an isosceles triangle with $\angle C=90^\circ$ and $AC=5\text{cm}$, then AB is _____.
 a) 2.5cm b) 5cm c) 10cm d) $5\sqrt{2}$ cm
- The perimeters of two similar triangles ΔABC and ΔPQR are 36cm and 24cm respectively. If $PQ=10\text{cm}$, then the length of AB is _____.
 a) $6\frac{2}{3}$ cm b) $\frac{10\sqrt{6}}{3}$ cm c) $66\frac{2}{3}$ cm d) 15cm
- Two triangles are said to be similar if their corresponding _____ are proportional.
 a) angles b) sides c) vertices d) altitudes

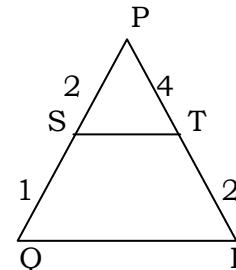
10. If the variance is 0.49 then the standard deviation is _____.
 a) 0.07 b) 7 c) 0.7 d) 0.007

II. Answer any six of the following: 6x2=12

- The range of a set of data is 13.67 and the largest value is 70.08. Find the smallest value.
- If the mean and Coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.
- Two coins are tossed together. What is the probability of getting different faces on the coins?
- What is the probability that a leap year selected at random will contain 53 Saturdays?
- If A and B are two events such that $P(A)=\frac{1}{4}$, $P(B)=\frac{1}{2}$ and $P(A \text{ and } B) = \frac{1}{8}$ find $P(\text{not } A \text{ and not } B)$
- A boy of height 90cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamp post is 3.6m above the ground, find the length of his shadow cast after 4 seconds.
- Check whether the triangle is similar and find the value of x .



18. Show that $\Delta PST \sim \Delta PQR$



III. Answer any four of the following (Q.No.24 compulsory) $4 \times 5 = 20$

19. For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later on it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct mean and standard deviation.
20. A bag contains 6 green balls, some black and red balls, number of black balls is as twice as the number of red balls. Probability of getting a green ball is thrice the probability of a red ball. Find (i) number of black balls (ii) total number of balls.
21. A coin is tossed thrice. Find the probability of getting exactly two heads or atleast one tail or two consecutive heads.
22. Find the Coefficient of variation of 24,26,33,37,29,31.
23. Two triangles QPR and QSR, right angled at P and S respectively are drawn on the same base QR and on the same side of QR. If PR and SQ intersect at T, Prove that $PT \times TR = ST \times TQ$
24. State and prove Basic proportionality Theorem.

IV. Answer the following : $1 \times 8 = 8$

25. Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (Scale factor $\frac{7}{3}$)

I. பலவுள் தெரிசு: 7x1=7

1. வானத்திற்கும் வையத்திற்கும் இடைப்பட்ட யாவற்றையும் கவிதையாகக் கொண்டவள் _____.
 அ) கலை மகள் ஆ) அலை மகள்
 இ) தமிழ் அன்னை ஈ) மலை மகள்
2. 'காய்ந்த இலையும் காய்ந்த தோகையும்' - நிலத்துக்கு நல்ல உரங்கள் - இத்தொடரில் அடக்கோட்ட பகுதி குறிப்பிடுவது _____.
 அ) சருகும் சண்டும் ஆ) இலையும் சருகும்
 இ) தோகையும் சண்டும் ஈ) தாளும் ஓலையும்
3. பொருந்தாத ஒன்றைக் கண்டறிக.
 அ) செய்யுளிசை ஆ) சொல்லிசை
 இ) இன்னிசை ஈ) குரலிசை
4. பேராயக் கட்சிக்காரர்கள் என்று அழைக்கப்பட்டோர் _____.
 அ) கம்யூனிஸ்ட் கட்சிக்காரர்கள் ஆ) காங்கிரஸ் கட்சிக் காரர்கள்
 இ) இந்திய தேசியபடையினர் ஈ) தொழிலாளர் கட்சிக் காரர்கள்
5. இளம் வயதிலேயே சமூக விடுதலைக்காகப் போராடியவர் _____.
 அ) சங்கரலிங்கம் ஆ) ஏ.எஸ்.பணிக்கர் இ) ஏ.நேசமணி ஈ) பி.எஸ்.மணி
6. இராசராசன் காலத் தமிழ்க் கல்வெட்டுக் காணப்படும் இடம் _____.
 அ) பிள்ளையார்பட்டி - இராமநாதபுரம்
 ஆ) கைலாசநாதர் கோவில் - காஞ்சிபுரம்
 இ) கடற்கரைக் கோவில் - மாமல்லபுரம்
 ஈ) பெரியகோவில் - தஞ்சாவூர்
7. இட்லிப்பு என்று அழைக்கப்படுவது _____.
 அ) காஞ்சி ஆ) வெட்சி இ) கரந்தை ஈ) வஞ்சி

II. சுருக்கமான விடையளிக்க: 5x1=5

8. கலைச் சொல் எழுதுக.
 அ) Patent ஆ) Conversation
 9. எடுப்பதூஉம் - என்பது எவ்வகை அளபெடை?
 10. வேங்கை - என்பது எவ்வகை மொழி?
 11. வினைமுற்றை வினையாலணையும் பெயராக மாற்றுக.
 * நேற்று என்னைச் சந்தித்தார். அவர் என் நண்பர்.
 12. நாலும் இரண்டும் சொல்லுக்கு உறுதி - எண்ணுப் பெயர் எழுதுக.
- III. கீழ்க்காணும் வினாக்களுள் எவையேனும் நான்கனுக்கு விடையளி: 4x2=8
13. பெருஞ்சித்திரனார் இயற்றிய நூல்கள் யாவை?
 14. தாவரங்களின் இலை வகைகளை எவ்வாறு அழைப்பர்?
 15. கடல் எவற்றைத் தருகிறது?
 16. வேங்கை - என்பதைத் தொடர் மொழியாகவும், பொது மொழியாகவும் வேறுபடுத்திக் காட்டுக.

17. தமிழர் பண்பாட்டின் மகுடம் எது?
 18. மெய்க்கீர்த்தி பாடப்படுவதன் நோக்கம் யாது?
- IV. கீழ்க்காணும் வினாக்களுள் எவையேனும் மூன்றனுக்கு விடையளி: 3x3=9
19. 'புளியங்கன்று ஆழமாக நடப்பட்டள்ளது' இதுபோல் இளம் பயிர் வகை ஐந்தின் பெயர்களைத் தொடர்களில் அமைக்க.
 20. இலக்கணக் குறிப்பு தருக.
 அ) நின்று ஆ) வருபுனல் இ) மாமலர்
 21. பாசவர், வாசவர், பல் நிண விலைஞர், உமணர் - சிலப்பதிகாரம் காட்டும் இவ் வணிகர்கள் யாவர்?
 22. அவந்தி நாட்டு மன்னன், மருத நாட்டு மன்னனுடன் போர் புரிந்து அந்நாட்டைக் கைப்பற்ற நினைக்கிறான். அப்போர் நிகழ்வைப் புறப் பொருள் வெண்பாமாலை கூறும் இலக்கணத்தின் வழி விளக்குக.
- V. கீழ்க்காணும் வினாக்களுள் எவையேனும் மூன்றனுக்கு விடையளி: (26-வது வினாவிற்குக் கட்டாயமாக விடையளிக்கவும்) 3x5=15
23. சொல்லுவதற்குரிய தமிழன்னைபின் பெருமையைத் தமிழ் நாக்கு எவ்வாறு எடுத்துரைக்கும்?
 24. தாவரத்தின் பிஞ்சு வகைகளுக்கு வழங்கும் சொற்கள் யாவை?
 25. மருவூர்ப்பாக்கத்தில் அமைந்த வீதிகள் குறித்து எழுதுக.
 26. 'தூசும் துகிரும்' - எனத் தொடங்கும் சிலப்பதிகாரப் பாடலை அடிபிறழாமல் எழுதுக.
 27. கீழ்க்காணும் பாடலைப் படித்து வினாக்களுக்கு விடையளி:
 இந்திரன்முதற் திசபால் எண் மரும் ஒரு வடிவாகி
 வந்தபடி யென நின்று மனுவாணை தனி நடாத்திய
 படியானையே பிணிப்புண்பன
 வடி மணிச் சிலம்பே யரற்றுவன
 அ) இவ்வடிகள் இடம் பெற்ற நூல் எது?
 ஆ) இப்பாடலின் ஆசிரியர் யார்?
 இ) பிணி - என்பதன் பொருள் யாது?
 ஈ) திசபாலர் - பிரித்து எழுதுக.
 உ) இப்பாடலில் அமைந்துள்ள எதுகை நயத்தை எடுத்தெழுதுக.
- VI. கீழ்க்காணும் வினாக்களுள் எவையேனும் ஒன்றனுக்கு விடையளி: 1x6=6
28. தமிழரின் சொல்வளம் பற்றியும் புதிய சொல்லாக்கத்திற்கான தேவை குறித்தும் தமிழ் மன்றத்தில் பேசுவதற்கான உரைக் குறிப்புகளை எழுதுக.
 29. 'மங்கையராகப் பிறப்பதற்கே' - என்னும் தலைப்பில் இடம் பெற்றுள்ள பெண் சாதனையாளர்களைப் பற்றிக் குறிப்பு எழுதுக.
 30. நும் பாடப் பகுதியில் இடம் பெற்றுள்ள மெய்க்கீர்த்திப் பாடலின் நயத்தை விளக்குக.

I. Choose the correct answer: 6x1=6

1. Photolysis is a decomposition reaction caused by _____.
a) heat b) electricity c) light d) mechanical energy
2. The chemical equation,
 $\text{Na}_2\text{SO}_{4(\text{aq})} + \text{BaCl}_{2(\text{aq})} \rightarrow \text{BaSO}_{4(\text{s})}\downarrow + 2\text{NaCl}_{(\text{aq})}$ represents which of the following types of reaction?
a) Neutralisation b) Combustion
c) Precipitation d) Single displacement
3. $4\text{NaCl} + 2\text{Mg} \rightarrow$ _____.
a) $\text{MgCl}_2 + 4\text{Na}$ b) Does not occur c) NaMgCl_2 d) $\text{Na}(\text{MgCl})_2$
4. Rectified spirit is an aqueous solution which contains about _____ of ethanol.
a) 95.5% b) 75.5% c) 55.5% d) 45.5%
5. $\text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$ is a _____.
a) Reduction of ethanol b) Combustion of ethanol
c) Oxidation of ethanoic acid d) Oxidation of ethanol
6. Benzene is a _____.
a) aromatic compounds b) alicyclic compounds
c) number of moles d) acyclic compounds

II. Answer any five of the following: (Q.No.9 is compulsory) 5x2=10

7. What is photolysis? Write an equation for photolysis.
8. Identify the types of reactions
a) $2\text{KClO}_3 \xrightarrow{\text{MnO}_2} 2\text{KCl} + 3\text{O}_2$
b) $2\text{Na}_{(\text{s})} + \text{Cl}_{2(\text{g})} \rightarrow 2\text{NaCl}_{(\text{s})}$

9. If the pH of a solution is 5.5, what is its pOH?

10. Fill in the blanks:

- i) The ion formed by dissolution of H^+ in water is called _____.
- ii) The value of ionic product of water at 25°C is _____.

11. What are the disadvantages of detergents?

12. Match the following:

Column - A		Column - B
i) Cyclo-butane	-	alkene
ii) Propene	-	alkane
iii) Furan	-	alicyclic compound
iv) Pentane	-	Hetero cyclic compound

13. What is homologous series?

14. Assertion: Alkanes are saturated hydrocarbons

Reason: Hydrocarbons consist of covalent bonds.

- i) A and R are correct, R explains the A.
- ii) A is correct, R is wrong
- iii) A is wrong, R is correct
- iv) A and R are correct, R doesn't explain A

III. Answer any five of the following questions: (Q.No.16 is compulsory) 5x4=20

15. Differentiate between reversible and irreversible reactions.
16. Calculate the pH of 0.001 molar solution of HCl.
17. a) Raise questions when the pH of our mouth saliva falls below 5.5, the enamel gets weathered.
b) To interpret what happens in the given situation:
Non metal oxides dissolve in rain water.

18. Explain the following reactions with examples:

- i) Neutralisation reactions
- ii) Electrolytic decomposition reactions

19. What is saponification of oil?

20. a) How is ethanoic acid prepared from ethanol? Give the chemical equation.

b) Write any two uses of ethanoic acid.

21. An organic compound 'A' is widely used as a preservative and has the molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound 'B'.

- i) Identify the compound 'A'
- ii) Write the chemical equation for its reaction with ethanol to form compound 'B'
- iii) Name the process

22. Complete the following:

Formula	IUPAC Name
i) $CH_3-CO-CH_3$	_____
ii) _____	Propanol
iii) _____	Butanoic acid
iv) $CH_3-CH_2-CH_2-CH=CH_2$	_____

IV. Answer the following:

2x7=14

23. a) What are called thermolysis reactions?

b) Why does the reaction rate of a reaction, increase on raising the temperature?

(or)

24. a) Lemon Juice has a pH2, What is the concentration of H^+ ions?

b) What is universal indicator? What is the use of it?

c) All combustion reactions are oxidations but all oxidations are not combustion. Why?

25. a) How is ethanol manufactured from sugarcane?

b) Write any two uses of ethanol.

(or)

26. a) Write the general characteristics of organic compounds.

b) Give a test to identify the presence of saturated and unsaturated hydrocarbon.