Sainik 9th - 2017

Part 'A' – Mathematics (200 Marks)

Section – I

(Each question carries two marks)

Q. 1. Find the reciprocal of $\left(\frac{-3}{8}\right) \times \left(\frac{-7}{13}\right)$

Ans. $\left(\frac{-3}{8}\right) \times \left(\frac{-7}{13}\right) = \frac{21}{104}$

Reciprocal of $\frac{21}{104} = \frac{104}{21}$

Q.2. The volume of a cube is 13·824 cubic metres. Find the side of the cube.

Ans. Volume of the cube = 13·824 m^3

a^3 = 13·824 m^3

$a = \sqrt[3]{13 \cdot 824}$

a = 2·4 meter

Q.3. Find the product of $(x^3 + 2x^2 - 5x + 1)$ and $(x^2 + 7x + 1)$.

Ans. $(x^3 + 2x^2 - 5x + 1) \cdot (x^2 + 7x + 1)$

$= x^5 + 7x^4 + x^3 + 2x^4 + 14x^3 + 2x^2 - 5x^3 - 35x^2 - 5x + x^2 + 7x + 1$

$= x^5 + 9x^4 + 10x^3 - 32x^2 + 2x + 1$

Q.4. Write Pythagorean triplet whose one number is 14.

Ans. Pythagorean triples are numbers in form $2m$, $m^2 + 1$ and $m^2 - 1$

Let $2m = 14$

$m = 7$

Then other two numbers are—

$m^2 + 1 = 50$

and $m^2 - 1 = 48$

The triples are 14, 48, 50.

Q. 5. A worker receives Rs. 11250 as bonus, which is 15% of his annual salary. What is his monthly salary?

Ans. Let annual salary = Rs. x

$\therefore \quad x \times \frac{15}{100} = 11250$

$x = 750 \times 100$

x = Rs. 75,000

Then Monthly salary $= \frac{75,000}{12}$

= Rs. 6250

Q.6. The cost price of 30 chairs is equal to the selling price of 25 chairs. Find the gain per cent.

Ans. Gain % $= \left(\frac{1}{5} \times 100\right)\% = = 20\%$

Q.7. If $x + \frac{1}{x} = 4$, find the value of $x^2 + \frac{1}{x^2}$.

Ans. If $x + \frac{1}{x} = 4$

$\left(x + \frac{1}{x}\right)^2 = 16$

$x^2 + \frac{1}{x^2} + 2 = 16$

$x^2 + \frac{1}{x^2} = 14$

Q.8. Find the length of the longest rod that can be placed in a room 12 m long, 9 m broad and 8 m high.

Ans. Length of the longest rod

$= \sqrt{(12)^2 + (9)^2 + (8)^2}$

$= \sqrt{144 + 81 + 64}$

$= \sqrt{289}$

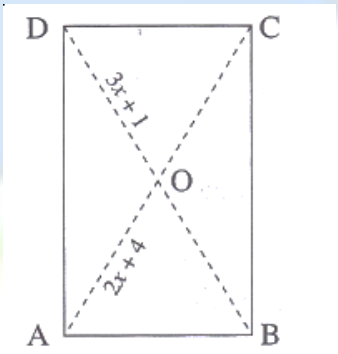
= 17 meter

Q.9. A dice is rolled. What is the probability that the number facing up is a prime number?

Ans. Prime numbers in a dice = 2, 3, 5

Then, Probability $= \frac{3}{6} = \frac{1}{2}$

Q.10. In the given figure, ABCD is a rectangle. Its diagonals meet at O.



Find x if OA = $2x + 4$ and OD = $3x + 1$

Ans. ∵ OA = OD

$2x + 4 = 3x + 1$

$\Rightarrow \quad x = 3$

Q.11.Factorise using identity: $a^4 - 625$.

Ans. $a^4 - 625 = a^4 - (5)^4$

$= (a^2)^2 - (5^2)^2$

$= (a^2 - 5^2)(a^2 + 5^2)$

$= (a^2 + 25)(a + 5)(a - 5)$

Q.12. The class mark of a class is 12·5 and lower limit of the class is 10. Find the upper limit of the class.

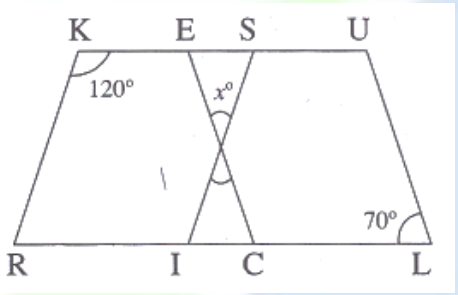
Ans. Class mark $= \frac{1}{2}$ (10 +upper limit)

$\Rightarrow$ $12{\cdot}5 = \frac{1}{2}$ (10 +upper limit)

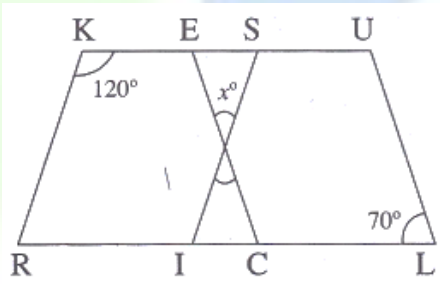
$\Rightarrow$ 25 = 10 + upper limit

$\Rightarrow$ Upper limit = 25 – 10 = 15

Q.13. In the figure, RISK and CLUE are parallelograms. Find the measure of angle x.



Ans.



Since, $\angle ULC = \angle ECR = 70°$

$\angle RKE = \angle USI = 120°$

$\angle ECI = \angle CES = 70°$

$\angle ESI = 180° - 120° = 60°$

Then, $\angle x + \angle CES + \angle ESI = 180°$

$\angle x + 70° + 60° = 180°$

$\angle x = 50°$

Q.14. A polyhedron has 6 faces and 8 vertices. Using, Euler's formula, find the number of edges in the polyhedron and then name the polyhedron.

Ans. By Euler's formula

F + V – E = 2

6 + 8 – E = 2

E = 14 – 2

Edges = 12,

Name = Cube

Q.15. Find the value of n from the expression:

$5^{10} \div 5^8 = (1/5)^n$

Ans. $\frac{5^{10}}{5^8} = \left(\frac{1}{5}\right)^n$

$(5)^2 = \left(\frac{1}{5}\right)^n$

$\left(\frac{1}{5}\right)^{-2} = \left(\frac{1}{5}\right)^n$

Hence, $n = -2$

Q.16. The area of a rhombus is 120 sq. cm. If one diagonal is 20 cm, find the other diagonal.

Ans. Area of rhombus $= \frac{1}{2} \times d_1 \times d_2$

$120 = \frac{1}{2} \times 20 \times d_2$

$d_2 = 12$ cm

Q.17. Find the least perfect square number which is divisible by 3, 4, 5, 6 and 8.

Ans. LCM (3, 4, 5, 6, 8) = 120

$\because$ $120 = \underline{2 \times 2} \times 2 \times 3 \times 5$

To make it a perfect square, multiply by 2, 3 and 5

Then, required number = 120×2×3×5

= 3600

Q.18. By what number should $(-8)^{-1}$ be multiplied so that the product is equal to 10^{-1}?

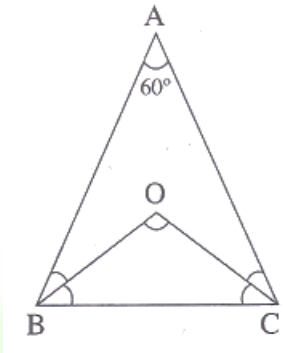
Ans. Let number be multiplied = x

Then, $(-8)^{-1} \times x = (10)^{-1}$

$\frac{-1}{8} \times x = \frac{1}{10}$

$x = \frac{-8}{10}$

Q.19. In the given figure, ∠ABC = 60° BO and CO are the bisectors of∠ABC and ∠ACB. Find ∠BOC.



Ans. $\angle BOC = 90° + \frac{1}{2}\angle BAC$

$= 90° + 30° = 120°$

Q.20. The salary of an officer has been increased by 50%. If his salary is to be restored, what percentage of his salary is to be reduced?

Ans. Reduce percentage $= \frac{50}{150} \times 100$

$= 33{\cdot}33\%$

Section – II

(Each question carries three marks)

Q.21. Divide Rs. 2700 among Asha, Nisha and Vidhi such that Asha gets Rs. 300 less than Nisha and Vidhi gets half of what Asha gets?

Ans. Let Nisha = Rs. x

Asha = Rs. $(x - 300)$

Vidhi = $\frac{(x-300)}{2}$

Then, $x + (x - 300) + \frac{(x-300)}{2} = 2700$

$\frac{5x}{2} - 450 = 2700$

$\frac{5x}{2} = 3150$

$x = 1260$

So, Nisha = Rs. 1260,

Asha = Rs. 960

and Vidhi = Rs. 480

Q.22. If a numerator is 2 less than denominator of a rational number and when 1 is subtracted from numerator and denominator both, the rational number in its simplest from is 1/2. What is the rational number?

Ans. Let rational number $= \frac{x-2}{x}$

Then, $\frac{(x-2)-1}{x-1} = \frac{1}{2}$

$\frac{x-3}{x-1} = \frac{1}{2}$

$2x - 6 = x - 1$

$x = 5$

Rational number $= \frac{3}{5}$

Q.23. The area of the adjacent faces of a cuboid are x, y and z. If the volume is u. Prove that $u^2 = xyz$.

Ans. Let the sides of cuboid $= a, b, c$

Then, $x = ab,$

$y = bc$

and $z = ca$

$xyz = (abc)^2$

$(abc) = \sqrt{xyz}$

Now, $u = abc$

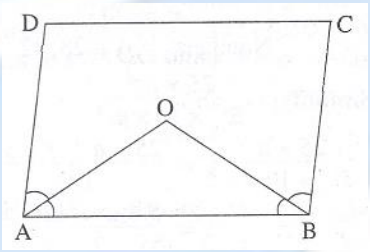
$u = \sqrt{xyz}$

$u^2 = xyz$

Q.24. Find the probability that a leap year selected at random will contain 53 Sundays.

Ans. Required probability $= \frac{2}{7}$

Q.25 In a parallelogram ABCD, the bisectors of ∠A and ∠B meet at O. Find ∠AOB.



Ans. ∠AOB = 90°

Q.26. Evaluate : $9x^2 + \frac{1}{9x^2}$ if $\left(3x - \frac{1}{3x}\right) = \frac{8}{3}$.

Ans. If $\left(3x - \frac{1}{3x}\right) = \frac{8}{3}$

$\left(3x - \frac{1}{3x}\right)^2 = \frac{64}{9}$

$9x^2 + \frac{1}{9x^2} - 2 = \frac{64}{9}$

$9x^2 + \frac{1}{9x^2} = \frac{64+18}{9}$

$9x^2 + \frac{1}{9x^2} = \frac{82}{9}$

Q.27. On Independence Day, the student of a school represented a drill. There

were 2^{x-1} rows of students and in each row there were 2^{x+3} students. If the total number of students who took part in the drill was 1024, find the total number of rows.

Ans. Since $2^{x-1} \cdot 2^{x+3} = 1024$

$$2^{2x+2} = 1024$$
$$2^{2x+2} = 2^{10}$$

Then, $2x + 2 = 10$

$$2x = 8$$
$$x = 4$$

Total number of rows = $2^{x-1} = 8$

Q.28. The value of a flat worth Rs. 5,00,000 is depreciating at the rate of 10% p.a. In how many years will its value be reduced to Rs. 3,64,500.

Ans. Value after n years

$$= 5{,}00{,}000 \left(1 - \frac{10}{100}\right)^n$$

$$3{,}64{,}500 = 5{,}00{,}000 \times \left(\frac{9}{10}\right)^n$$

$$\frac{729}{1000} = \left(\frac{9}{10}\right)^n$$

$$\left(\frac{9}{10}\right)^3 = \left(\frac{9}{10}\right)^n,$$

Hence $n = 3$ years

Q.29. Three numbers are in the ratio 1 : 2 : 3. The sum of their cubes is 98784. Find the numbers.

Ans. Let Numbers = $x, 2x, 3x$

Then, $x^3 + 8x^3 + 27x^3 = 98784$

$$36x^3 = 98784$$
$$x^3 = 2744$$
$$x = 14$$

Numbers = 14, 28, 42

Q.30. Simplify : $\frac{25 \times a^{-4}}{5^{-3} \times 10 \times a^{-8}}$

Ans. $\frac{25 \times a^{-4}}{5^{-3} \times 10 \times a^{-8}} = \frac{25 \times a^{-4+8} \times 5^3}{10}$

$$= \frac{5 \times a^4 \times 125}{2}$$
$$= \frac{625\, a^4}{2}$$

Q.31. Ravi is an illiterate person who sells eggs to earn money. One day he purchased 400 eggs at Rs. 5 each. A tray containing 80 eggs falls down and all 80 eggs are spoiled. Then his daughter Saranshi who studies in class VIII consoles him and tells that he should sell eggs at Rs. x each to get 12% profit. What is the value of x?

Ans. Cost of eggs = 400 × 5 = Rs. 2000

Profit = $2000 \times \frac{12}{100}$ = Rs. 240

Remaining eggs. = 320

Then $x = \frac{(2000+240)}{320} = \frac{2240}{320}$

x = Rs. 7

Q.32. Find all possible values of y for which 4 digit number $51y^3$ is divisible by 9.

Ans. $y = 3$

Q.33. Using the given pattern, find the missing numbers.

$\mathbf{1^2 + 2^2 + 2^2 = 3^2}$

$\mathbf{2^2 + 3^2 + 6^2 = 7^2}$

$\mathbf{3^2 + 4^2 + 12^2 = 13^2}$

$\mathbf{4^2 + 5^2 + \ldots\ldots^2 = 21^2}$

$\mathbf{5^2 + \ldots\ldots^2 + 30^2 = 31^2}$

$\mathbf{6^2 + 7^2 + \ldots\ldots^2 = \ldots\ldots^2}$

Ans. $(4)^2 + (5)^2 + \mathbf{(20)^2} = (21)^2$

$(5)^2 + \mathbf{(6)^2} + (30)^2 = (31)^2$

$(6)^2 + (7)^2 + \mathbf{(42)^2} = \mathbf{(43)^2}$

Q.34. Complete the magic square :

	14		**0**
8		**6**	**11**
4			**5**
	2	**1**	**12**

Ans.

3	14	**11**	0
8	**3**	6	11
4	**9**	**10**	5

13	2	1	12

Q.35. Find each of the following products:

(i) $5a^2b^2 \times (3a^2 - 4ab + 6b^2)$

Ans. $5a^2b^2 \times (3a^2 - 4ab + 6b^2)$

$= 15a^4b^2 - 20a^3b^3 + 30a^2b^4$

(ii) $(-3x^2y) \times (4x^2y - 3xy^2 + 4x - 5y)$

Ans. $(-3x^2y) \times (4x^2y - 3xy^2 + 4x - 5y)$

$= -12x^4y^2 + 9x^3y^3 - 12x^3y + 15x^2y^2$

Q.36. Three consecutive integers are such that when they are taken in increasing order and multiplied by 2, 3 and 4 respectively; they add up to 74. Find these numbers.

Ans. Let the Integers= x,$(x+1)$ and$(x+2)$

Then, $2x + 3(x + 1) + 4(x + 2) = 74$

$2x + 3x + 4x + 11 = 74$

$9x = 63$

$x = 7$

So, numbers = 7, 8, 9

Q.37. If the volume of a room is 792 m^3 and the area of the floor is 132 m^2, find the height of the room.

Ans. Volume of room = $(l \times b) \times h$

$792 = 132 \times h$

$\frac{792}{132} = h$

h = 6 meter

Q.38. A number is such that it is as much greater than 84 as it is less than 108. Find the number.

Ans. Let the number = x

$(x - 84) = (108 - x)$

$2x = 108 + 84$

$2x = 192$

$x = 96$

Q.39. Is 53240 a perfect cube? If not, then by which smallest natural number should 53240 be divided so that the quotient is a perfect cube?

Ans. Since, 53240 $= \underline{2 \times 2 \times 2} \times 5 \times \underline{11 \times 11 \times 11}$

It is not a perfect cube.

To make it a perfect cube, we have to divide by 5.

$\Rightarrow$ $53240 \div 5 = 0648$ [Perfect cube]

Q.40. The radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Find the ratio of their curved surface areas.

Ans. Required ratio $= \frac{2\pi r_1 h_1}{2\pi r_2 h_2}$

$= \left(\frac{2}{3}\right) \cdot \left(\frac{5}{3}\right)$

$= \frac{10}{9} = 10 : 9$

Section – III

(Each question carries Ten marks)

Q. 41. The lateral surface area of a hollow cylinder is 4224 cm^2. It is cut along its height to form a rectangular sheet of width 33 cm. Find the perimeter of rectangular sheet.

Ans. ∵ Area of cylinder

= Area of rectangular sheet

$4224 = 33 \times$ Length

Length $= \frac{4224}{33} = 128$ cm

Perimeter of sheet $= 2(l + b)$

$= 2(128 + 33)$

$= 2(161)$

$= 322$ cm

Q.42. Factorise the expressions and divide them as directed :

(i) $(m^2 - 14m - 32)$ **divided by** $(m + 2)$

Ans. $\frac{m^2-14m-32}{(m+2)} = \frac{m^2-16m+2m-32}{(m+2)}$

$= \frac{m(m-16)+2(m-16)}{(m+2)}$

$= \frac{(m+2)(m-16)}{(m+2)}$

$= (m - 16)$

(ii) $4yz\ (z^2 + 6z - 16)$ **divided by** $2y\ (z + 8)$

Ans. $\frac{4yz\ (z^2+6z-16)}{2y\ (z+8)} = \frac{2z\ [z^2+8z-2z-16]}{(z+8)}$

$= \frac{2z[z(z+8)-2(z+8)}{(z+8)}$

$= \frac{2z\ (z+8)(z-2)}{(z+8)}$

$= 2z\ (z - 2)$

Q.43. Find the compound interest on Rs. 1000 at the rate of 10% p.a. for 18 months when interest is compounded half yearly.

Ans. Amount $= 1000 \times \left(1 + \frac{5}{100}\right)^3$

$= 1000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$

$= \frac{9261}{8} =$ Rs. 1157·625

C.I. = Rs. 1157·625 – 1000

= Rs. 157·625

Q.44. If each edge of a cube is increased by 40% then by how much per cent will the volume of the cube and its surface increase?

Ans. Let the edge = a,

New edge = 1·4 a

Surface area = $6a^2$

Increase surface area

$= \left[\frac{6(1{\cdot}4a)^2 - 6a^2}{6a^2}\right] \times 100$

$= (1{\cdot}96 - 1) \times 100 = 96\%$

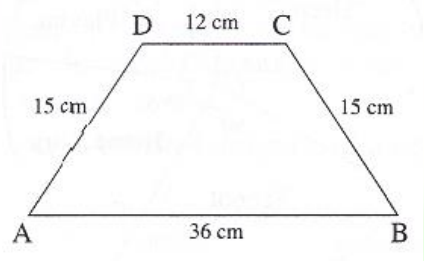
Volume = a^3

Increased volume $= \left[\frac{(1{\cdot}4a)^3 - a^3}{a^3}\right] \times 100$

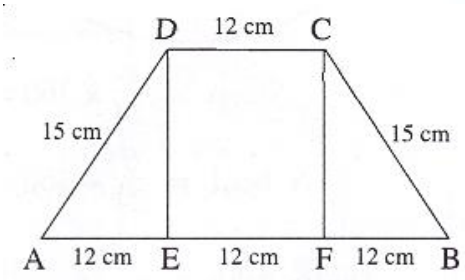
$= (2{\cdot}744 - 1) \times 100$

$= 174{\cdot}4\%$

Q.45. The parallel sides DC and AB of a trapezium are 12 cm and 36 cm respectively. Its non-parallel sides are 15 cm each. Find the area of the trapezium.



Ans.



$AD^2 = AE^2 + DE^2$

$15^2 = 12^2 + DE^2$

$225 - 144 = DE^2$

$\Rightarrow \quad DE^2 = 81$

$DE = 9$ cm

Area of trapezium $= \frac{1}{2}(AB + DC) \times DE$

$= \frac{1}{2}(36 + 12) \times 9$

$= \frac{48}{2} \times 9 = 24 \times 9$

$= 216$ cm^2

Q.46. How much pure Acid is required to be added to 400 ml of a 15% solution to make its strength 32%?

Ans. Let x ml of pure acid to be added.

The quantity of acid present in 400 ml solution of 15%

$= 400 \times \frac{15}{100} = 60$ ml

Then, $\frac{32}{100}(400 + x) = 60 + x$

$128 + \frac{32x}{100} = 60 + x$

$68 = x - \frac{32}{100}x$

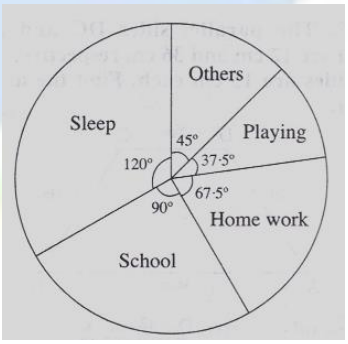
$68 = \frac{68x}{100}$

$x = 100$ ml

Q.47. Draw a Pie chart of the data given below:

Activities	Sleep	School	Home Work	Playing	Others
No. of hrs.	8 hrs.	6 hrs.	$4\frac{1}{2}$ hrs.	$2\frac{1}{2}$ hrs.	3 hrs.

Ans.



Sleep $= \frac{8}{24} \times 360° = 120°$

School $= \frac{6}{24} \times 360° = 90°$

$$\text{Homework} = \frac{9}{2 \times 24} \times 360° = \frac{1080}{16} = 67{\cdot}5°$$

$$\text{Playing} = \frac{5}{2 \times 24} \times 360° = \frac{75}{2} = 37{\cdot}5°$$

$$\text{Others} = \frac{3}{24} \times 360° = 45°$$

Q.48. During a sale, a shop offered a discount of 10% on the marked prices of all items. What is the total amount required to be paid by a customer for a pair of jeans marked at Rs. 1450 and two shirts marked at Rs. 850 each?

Ans. Amount paid by customer

$$= (1450 \times 1700) \times \frac{90}{100}$$

$$= 3150 \times \frac{9}{10}$$

$$= \text{Rs. } 2835$$

Q.49. In laboratory the count of bacteria in a certain experiment was increasing at the rate of 2·5% per hour. Find the bacteria at the end of 2 hours, if the count was initially 506000.

Ans. Bacteria after 2 hours

$$= 506000 \times \frac{105}{100}$$

$$= 5{,}31{,}300$$

Q.50. A bag has 4 red balls and 2 yellow balls. (The balls are identical in all respects other than colour). A ball is drawn from the bag without looking into the bag. What is probability of getting a red ball? Is it more or less than getting an yellow ball?

Ans. $P(\text{Red}) = \frac{4}{6} = \frac{2}{3}$,

$P(\text{Yellow}) = \frac{2}{6} = \frac{1}{3}$

$P(\text{Red}) > P(\text{Yellow})$

Part 'B' – Science

(75 Marks)

Direction- Answer in one word or sentence **(5×1=5)**

Q.1. Name the medicine obtained from micro-organisms such as fungi bacteria, that kills or stops the growth of pathogen.

Ans. Antibiotics

Q.2. Which gas is produced when metal reacts with sodium hydroxide?

Ans. Hydrogen

Q.3. In which direction does friction act when a person is running forward?

Ans. Backward direction

Q.4. Name the product of coal which is tough, porous and black and is used in the manufacturing of steel.

Ans. Coke

Q.5. What is the process through which a tadpole develops into an adult frog?

Ans. Metamorphosis

Fill in the blanks **(5×1=5)**

Q.6. Blue green algae fix ……. directly from air to enhance fertility of soil.

Ans. Nitrogen

Q.7. Incomplete combustion of a fuel gives poisonous……. gas.

Ans. Carbon monoxide (CO)

Q.8. ……species are species which are facing the danger of extinction.

Ans. Threatened

Q.9. The stage of an embryo in which all the body parts are identifiable is called……

Ans. Foetus

Q.10. The planet which is known as the Red planet is……..

Ans. Mars

Choose the correct option from the given choices. **(5×1=5)**

11. The best technique for watering fruit plants, gardens and trees is—

(a) Dhekli

(b) Sprinkler System

(c) Chain group

(d) Drip system

Ans. (b) Sprinkler system

12. Which of the constituents of petroleum is sued as a solvent for dry cleaning?

(a) Kerosene

(b) Petrol

(c) Diesel

(d) Lubricating oil

Ans. (b) Petrol

13. Which of the following is not combustion?

(a) The sun producing heat and light

(b) Forest fire

(c) Explosion of crackers

(d) Burning of magnesium

Ans. (a) The sun producing heat and light

14. When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to—

(a) Pressure of water

(b) Gravity of the earth

(c) Shape of rubber bulb

(d) Atmospheric pressure

Ans. (d) Atmospheric pressure

15. Image formed by a plane mirror is—

(a) Virtual, behind the mirror and enlarged.

(b) Real at the surface of the mirror and enlarged.

(c) Virtual, behind the mirror and of the same size.

(d) Real, behind the mirror and of the same size.

Ans. (c) Virtual, behind the Mirror and of the same size.

Answer the following in 30-40 words

(10×2=20)

Q.16. Why a little curd is added to warm milk to set curd for the next day?

Ans. When curd is added to warm milk it twins acidic. Milk contains lactose sugar. **Lactobacillus** bacteria present in curd help in converting lactose sugar present in the milk to lactic acid by the process of fermentation. This creates an acidic medium needed for casein protein of milk to coagulates to form the curd.

Q.17. If wheat is sown in the kharif season, what would happen?

Ans. Wheat is a Rabi crop which is sown in winter season and needs low temperature and low water to grow. But in Kharif season it is high temperature and rainy season therefore, wheat will not grow well.

Q.18. Why the handles of screw drivers and frying pans are made of plastic?

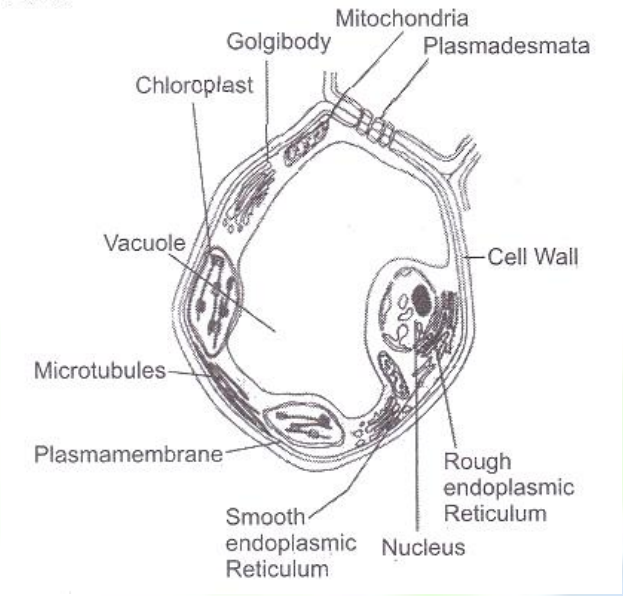
Ans. Handles of screw drivers and frying pans are made of plastic because plastic is a bad conductor of heat and electricity. So on heating frying pans plastic handle will not be heated and also on doing electric work by screw driver current will not pass through plastic handle.

Q.19. Explain why plastic containers are favoured for storing food?

Ans. Plastic does not react with most of the substances. Hence food kept in plastic container remains fresh for longer duration. Due to this, plastic containers are preferred for storing food.

Q.20. Draw a labeled diagram of a plant cell.

Ans.



Q.21. What is prokaryotic cell? How does it differ from eukaryotic cell?

Ans. The cells which do not have a well-organised nucleus due to the absence of nuclear membrane are called prokaryotic cells and the cells having a well organised nulcleus with nuclear membrane are called eukaryotic cells.

Q.22. Explain why the voices of man, woman and children are different.

Ans. The voice of children and woman is shrill as compared to the voice of man. This is because of children and women have short vocal cords which therefore vibrate with a high frequency to produce high pitched shrill voice. Man has large vocal cords which vibrate with a low frequency to produce low pitched grave or flat sound.

Q.23. What is frequency of oscillation? Write the ranges of frequency which is audible to human ear.

Ans. The number of complete – oscillations made by a oscilating body in one second is called frequency. The frequency ranges 20 Hz to 20000 Hz is audible to human ear.

Q.24. Which zone of a flame does a goldsmith use for melting gold and silver and why?

Ans. Goldsmith below the outermost zone of a flame uses with a metallic blowpipe for the melting the pieces of gold and silver into desired shapes to make jewellery. When air is blown through blowpipe into the flame it helps in the rapid combustion of unburnt fuel and hence makes the flame hotter, sufficient to melt gold and silver.

Q.25. What is Red Data Book?

Ans. The data book which keeps a record of all endangered animals, plants and other species is called 'Red data book'. Through this book IUCN is trying to create awareness about endangered species. First 'Red data book' of animals was published in 1991.

Answer the following in 40-50 words.

(10×3=30)

Q.26. Explain why organic manure is considered better than fertilizers.

Ans. The organic manure is considered better than fertilizers. This is because it-

- ✓ Enhance he water holding capacity of the soil.
- ✓ Makes the soil porous, therefore exchange of gases takes place easily.
- ✓ Improves the texture of the soil.
- ✓ Adds humus to the soil.
- ✓ Is not expensive and can be easily prepared from plants and animals wastes in the farm.
- ✓ Does not cause water pollution.

Q.27. Why phosphorus is stored in water?

Ans. Phosphorus is highly destructive in nature. It can catch fire if kept directly in air under room temperature. So in order to stabilize, its reactivity it is kept inside water.

Q.28. How does carbon dioxide extinguish fire?

Ans. Carbon dioxide extinguishes fire by cutting off the supply of oxygen. Carbon dioxide being heavier than air covers the fire and hence does not allow oxygen to come in the contact of flame. Since oxygen is required for the combustion, unavailability of oxygen results in the quenching of fire.

Q.29. Clear and transparent water is always fit for drinking. Comment.

Ans. Clear and transparent water is not always fit for drinking water might appear clean, but it may contain some disease causing micro-organisms and other dissolved impurities. Hence it is advised to purify water before drinking. Purification can be done by water purifying systems or by boiling the water.

Q.30. Why does the increased level of nutrients in water affect the survival of aquatic organisms?

Ans. The increased level of nutrients in the water affects the survival of aquatic organisms because dissolved oxygen is consumed by the plants and algae. Due to this there is deficiency of dissolved oxygen in the animal life.

Q.31. Explain why some fibres are called synthetic?

Ans. There are some fibres that are prepared by man by using chemicals. These are called synthetic fibres. These are made of small units that join together to form long chains. Examples of synthetic fibres are rayon, nylon, polyester, acrylic etc.

Q.32. Explain why the sole of tennis shoes are grooved.

Ans. The sole of tennis shoes are grooved because the grooves increase the friction with the earth. Due to greater friction the shoes get a better grip on the surface which prevents slidding of player.

Q.33. Why chromium is used to electroplate on many objecs such as car parts, bath taps, kitchen gas burners, bicycle handle bars and wheel rim etc?

Ans. Chromium has a shiny appearance, does not corrode and resists scratches. Since chromium is expensive and it may not be economical to make the whole object out of chromium. So the object made from a cheaper metal and only a coating of chromium over it is deposited.

Q.34. State the law of reflection. What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray?

Ans. The two laws of reflection of light are as follows:

(i) The angle of incidence is equal to the angle of reflection.

(ii) The incident ray, the normal at the point of incidence and he reflected ray all lie in the same plane.

$$\angle i + \angle r = 90°$$

But $\angle i = \angle r$

Hence $\angle i + \angle i = 90°$

$$2\angle i = 90°$$

$\therefore$ $\angle i = 45°$

Q.35. What are weeds? How can we control them?

Ans. The unwanted plants which grow along with a cultivated (main) crop in a field are called weeds. We can control them by following methods:

(i) Weeds may be pulled out with hand or through ploughing.

(ii) By spraying weedicides.

(iii) Insects and some other organisms that consume and specifically destroy the

weeds are introduced in the crop fields. This is called biological control of weeds.

Answer the following (2×5=10)

Q.36. Complete the crossword with the help of clues given below.

Across

1. This is necessary for photosynthesis.

3. Name of a component present in the cytoplasm.

6. The living substance in a cell.

8. Units of inheritance present in the chromosomes.

Down

1. Green plastids

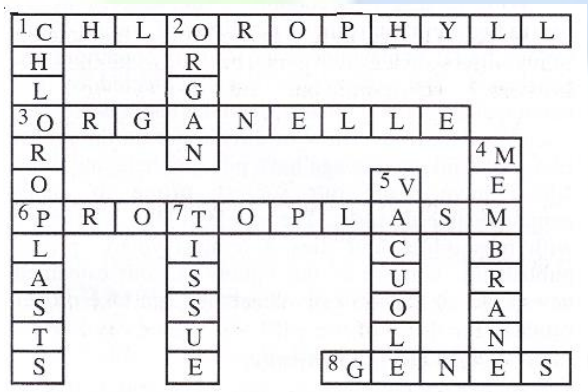
2. Formed by collection of tissues.

4. It separates the contents of the cell from the surrounding medium.

5. Empty structure in a cytoplasm.

7. A group of cells.

Ans.



Q.37. What is a seismic zone? Explain how seismograph measures the magnitude of an earthquake.

Ans. Over millions of years the movements of the tectonic plates have created weak points in the earth's crust called faults Most faults occur along the boundaries of the tectonic plates and these are the zones where earthquakes occur. These weak zones are also known as seismic or fault zone.

An instrument which detects and records the intensity of seismic waves generated by an earthquake is called seismograph. The shock waves travel in all the directions through the earth and also reach the earth's surface. A seismograph detects the shock waves produced by the earthquake and records them on the paper in the form of graph. This instrument is simply a vibrating pendulum.

When earthquake occurs the earth shakes, the base of the seismograph fixed to the earth also shakes. But the freely suspended bob of pendulum does not shake and remains in place. A pen is attached below the pendulum under which is a fixed roller with a graph paper. Since the graph paper on the rotating drum shakes with the shaking earth, the pen attached to suspended bob draw the vibrations produced by earthquake on the graph paper.

Paper – II (Language and Social Studies)

Part 'A' Language : English

(Max. Marks: 100)

Q.1. Read the passage and answer the questions that follow:

Child labour involves the regular working of children between the age of five and fourteen. Children in many developing countries are forced to work hard for full day against their will at very low pay for their survival. They want to go to school, play with their friends and need love and care by their parents like other children of rich families. But unfortunately, they are forced to work against their will.

In developing countries, the rate of child labour is high because of poverty, low level of awareness, less education and poor schooling opportunities. Most of the children of age group 5 to 14 are found to be involved in agriculture with their

parents in the rural areas. Poverty and lack of schools are the primary reasons of child labour in any developing country all across the world.

Childhood is considered as the happiest and vital experience in the life of everyone as it is the most important and friendly period of learning. Children have full right to get proper attention, love and care, proper schooling, guidance, playmates and other happy moments. Child labour is corrupting the lives of many precious children every day. It is the highest level of illegal act for which one should be punished but because of ineffective rules and regulations it continues to flourish.

Nothing much is happening to eradicate child labour from society. Children are too young, cute and innocent to realize the things happening to them at an early age. They are unable to recognise what is wrong and illegal for them. Instead they become happy to get small money for their work. Unknowingly they become interested in earning smaller amounts of money on a daily basis and ruin their whole life and future.

(a) Describe child labour in a few words.

Ans. Child labour can be described as involving the children into regular working between the age of fine and fourteen Child labourers are forced to work hard for full day against their will at very low pay for their survival.

(b) What opportunities a child is deprived of during his or her childhood?

Ans. A child, because of child labour, is deprived of love and care by their parents like other children of rich families. They miss their school and cannot playwith their friends.

(c) What are the main reasons for child labour?

Ans. The main reasons of child labour are poverty, low level of awareness, less education and poor schooling opportunities. Most of the children of age group five to fourteen are found to be involved in agriculture with their parents in the rural areas.

(d) What are the rights of a child described in the passage?

Ans. Children have full right to get proper attention, love and care, proper schooling, guidance, playmates and other happy moments.

(e) Why children fail to recognise what is wrong and illegal for them?

Ans. Children are too young, cute and innocent to realize the disadvantages of child labour. They are unaware that this is illegal. They continue to themselves as child labourers as they become happy in earning small amounts of money on daily basis and as a result ruin their life and future.

Q.2. Write a paragraph in about 100 words on *any one* of the topics.

(a) India's Performance in Rio Olympics.

(b) Swachh Bharat Abhiyan

Ans. Swachh Bharat Abhiyan

Swachh Bharat Abhiyan is a cleanliness drive aimed to cover 4041 statutory cities and towns all over India, in order to clean the streets, roads and other infrastructure. This campaign is run by Indian government and initiated by Honourable Prime Minister, Mr. Narendra Modi. This Campaign involves the construction of latrines, promoting sanitation programmes in the rural areas, cleaning streets, roads and changing the

infrastructure of the country to lead the country ahead.

On 2nd Oct., 2014, the birth anniversary of Mahatma Gandhi. As an Indian citizen it is our duty to support this noble initiative with great fervor and joy so as to make our country clean and healthy.

Q.3. You are Niraj, a resident of 755, Vasant Vihar, Delhi. The surroundings of your colony have fallen into neglect resulting in blocked drains and overflowing garbage that is hazardous to the health of the people. As a resident of the colony, write a letter to the editor of the local daily newspaper drawing the attention of the authorities.

Ans.

To,
The Editor
Dawn News, Delhi

Sub. : Surrounding of Vasant Vihar Colony is in bad shape.

Sir,

With the help of a column in your daily, I would like to highlight the pathetic condition of Vasant Vihar Colony, as far as cleanliness and sanitary conditions are concerned. The colony has been neglected by the municipal corporation officials and the result is blocked drains leading to overflow of dirty water on the roads. Heaps of stinking garbage have piled up here and there which have made our society prone to many communicable diseases. The whole colony is infested with mosquitoes and flies. I request you to please publish this concern of our colony in your esteemed newspaper so that officials concerned can take proper action.

Thanking you in anticipation
Niraj
755, Vasant Vihar Colony, Delhi

Q.4. Fill in the blanks with appropriate prepositions or adverbs given in brackets.

(a) They arrived…….(in/along/at) the railway station just …….(on/it/at) time.

Ans. They arrived **at** the railway station just **in** time.

(b) We waited……. (with/in/from) anxiety for the news ……. (for/of/beside) her safe arrival.

Ans. We waited **with** anxiety for the news **of** her safe arrival.

(c) You must apologize ……. (with/ to/ for) her ……. (at/ from/ for) what you have done.

Ans. You must apologize **to** her **for** what you have done.

(d) She rejoiced not only ……. (along/ to/ in) her own success, but also ……. (in/with/for) mine.

Ans. She rejoiced not only **in** her own success, but also **with** mine.

(e) More things are wrought ……. (into/by/through) prayer than this world dreams ……. (behind/ of/ beyond)

Ans. More things are wrought **by** prayer than this world dreams **of.**

Q.5. Complete the following sentences by choosing the correct phrases from the brackets.

[thanks my stars, for good, talking through his head, by dint of, in a nutshell]

(a) Give the story…….

Ans. Give the story **in a nutshell.**

(b) He won the first prize ……. hard work.

Ans. He won the first prize **by dint of** hard work.

(c) He left his native country …….

Ans. He left his native country **for good.**

(d) He is ……. in his report of the incident.

Ans. He is **talking through his head** in his report of the incident.

(e) I ……. that I escaped unhurt.

Ans. I thank my stars that I escaped unhurt.

Q.6. The following sentences are incorrect. Find out the error and write the sentences correctly.

(a) Each of paintings were completed in a day.

Ans. Each of these paintings **was** completed in a day.

(b) The boy who does his best he will get a prize.

Ans. The boy who does his best will get a prize.

(c) Whoever works hard he will win.

Ans. Whoever works hard will win.

(d) Neither Rajat or Raji came for practice.

Ans. Neither Rajat **nor** Raji came for practice.

(e) One of my friend gave me this pen.

Ans. One of my **friend** gave me this pen.

Q.7. Arrange the following words into meaningful sentences.

(a) was caught/ the thief/ they/ beat/ when/ he

Ans. They beat the theif when he was caught.

(b) should be/ it/ was/ held/ proposed/ that a/ meeting

Ans. It was proposed that a meeting should be held.

(c) before/ that/ tidy/ is/ you/ ensure/ the room/ leave

Ans. Before you leave, ensure that the room is tidy.

(d) the attitude/ i am/ of students/ towards/ pained at/ of natural resources/ unmindful use

Ans. I am pained at the attitude of students towards unmindful use of natural resources.

(e) the picture/ short story/ develop/ a/ given below/ and / look at/

Ans. Look at the picture given below and develop a short story.

Q.8. Write one word for the following group of words.

(a) Story of old time gods or heroes.

Ans. LEGEND

(b) A lady who remains unmarried.

Ans. SPINSTER

(c) One who knows two languages.

Ans. BILINGUAL

(d) Government by the representatives of the people.

Ans. DEMOCRACY

(e) A speech delivered without preparation.

Ans. EXTEMPORE

Q.9. Frame a meaningful sentence for each word.

(a) Imminent, Eminent

Ans. Indian army is ready to face any **imminent** attack from Pakistan. (Imminent- Impending – about to happen)

Eminent : Distinguished

Mahatma Gandhi was an **eminent** figure.

(b) Medal, Meddle

Ans. Medal: Metal disc made to commemorate an event. A silver **medal** was awarded to the second winner.

Meddle : Interfere in something that is not one's concern. Don't **Meddle** in my affairs.

(c) Metal, Mettle

(d) Decent, Descent

Ans. Decent : Of an acceptable standard.
This is a **decent** hotel.
Descent : Moving down
The river is on its **descent** from the hills, to the plains.

(e) Crew, Brew

Ans. Crew : Group of people who work on ship/aircraft
The **crew** assembled at the deck.
Brew: Make by soaking, boiling and fermentation.
They **brew** the beer on the premises.

Q.10. Do as directed:

(a) I said, "He is tall and slim". (Convert into *indirect speech*)

Ans. I said that he is tall and slim.

(b) The crow asked the fox if / whether the grapes were sour. (Convert into *direct speech*)

Ans. The crow said to the fox "Are the grapes sour."

(c) Rex said, "Hurrah ! We have won the match." (Convert into *indirect speech*)

Ans. Rex exclaimed with joy that they had won the match.

(d) She gave Sally a box of chocolates. (Convert into *Passive voice*)

Ans. Sally was given a box of chocolates by her.

(e) Is English spoken in this country? (Convert into *active voice*)

Ans. Do they speak english in this country?

Q.11. You are Aashish, a class IX student; you are pained at the attitude of students towards wasteful and unmindful use of resources like electricity and water. Leaking taps, running fans, lights on in empty classrooms don't seem to affect students. Highlight these issues and write an article for School Magazine on the topic "Importance of Conserving Natural Resources" in about 150 words.

Ans. Natural Resources are priceless and are available to us at no cost by nature. They are useful to us in many ways, but we have become irresponsible towards them. I am really pained to see the attitude of students towards wasteful and unmindful use of resources like electricity and water in our school. Students don't take care of leaking taps, running fans or lights switched on in empty classrooms. This is a sheer wastage of precious resources. These resources can only be produced by conserving it. These resources are limited and if we continue to use it is a wasteful manner, that day is not far when we have to fight for scarce resources or we have to live without them. If we reduce these wastages as mentioned above we will not only save a good amount of money but also these wasted resources can be utilized by somebody else. Hence not only in short term but also in the long run our habit of conserving will benefit us immensely.

Part 'B' – Social Studies

(75 Marks)

Q.1. State True / False (15×1=15)

(a) The Renaissance inspired many people in Europe to think for themselves.

(b) Bengal was divided in the year 1905.

(c) Manufacturing is a tertiary activity.

(d) Ubiquitous resources are found everywhere.

(e) No worship was allowed in the Jama Masjid for five years after 1857.

(f) Nadir Shah was resisted by all the Indian rulers when he invaded India.

(g) Mir-Qasim became the ruler of Bengal after the battle of Plassey.

(h) The English East India Company was the only European company that traded with India.

(i) Ryotwari system was prevalent mostly in southern and western India.

(j) Dadabhai Naoroji was the first President of the Indian National Congress.

(k) Maharaja Ranjit Singh was the ruler of Punjab.

(l) Jamshedpur is famous for iron and steel industry.

(m) Detroit, in USA is known as the automobile capital of the world.

(n) UNICEF is exclusively dedicated to the cause of the aged and the handicapped.

(o) Australia is the largest producer of Bauxite in the world.

Ans.

(a) True
(b) True
(c) True
(d) True
(e) True
(f) False
(g) True
(h) False
(i) True
(j) False
(k) True
(l) True
(m) True
(n) False
(o) True

Q.2. Fill in the blanks. (15×1=15)

(a) Fossil fuels are …….resources.

(b) The fibre known as "golden fibre" is …….

(c) National parks and wildlife……. have been established to protect and conserve wildlife.

(d) The coin "rupia" was first issued by…….

(e) United Nations came into existence in the year……..

(f) The World Food Day is observed on ……. every year.

(g) ……..discovered the sea route to India.

(h) The slogan "Delhi Chalo" was given in …….

(i) The city where atom bomb was first dropped was……..

(j) Fort St. George is located at …….

(k) Agra Fort was built by …….

(l) The court language of Mughals was ……..

(m) Kabir was a disciple of …….

(n) The Champaran Movement was against ……..

(o) ……..is known as the father of the Indian Constitution.

Ans.

(a) Non-renewable energy
(b) Jute
(c) Sanctuary
(d) Sher Shah Suri
(e) 1945
(f) 16th October
(g) Vasco De Gama
(h) Subhash Chandra Bose
(i) Hiroshima
(j) Chennai (Tamil Nadu)
(k) Akbar
(l) Persian
(m) Ramanand
(n) Landlords
(o) Dr. Bhim Rao Ambedkar

Q.3. Write the full form of the following abbreviations: (10×1=10)

(a) VAT **(b) GST**
(c) GPS **(d) FIR**
(e) BPL **(f) ISIS**

(g) NEET **(h) GIS**
(i) AIDS **(j) ASEAN**

Ans. (a) **VAT**- Value Added Tax.
(b) **GST –** Goods and Services Tax.
(c) **GPS –** Global Positioning System.
(d) **FIR**- First Information Report.
(e) **BPL-** Below the Poverty Line.
(f) **ISIS –** Islamic State of Iraq and Syria.
(g) **NEET**- National Eligibility cum Entrance Test.
(h) **GIS –** Geographic Information System.
(i) **AIDS**- Acquired Immune Deficiency Syndrome.
(j) **ASEAN**- Association of South East Asian Nations.

Q.4. Match the following— (10×1=10)

(a) Rousseau	**(i) 1757**
(b) French Revolution	**(ii) 1764**
(c) Sawai Raja Jai Singh	**(iii) 1789**
(d) Baji Rao	**(iv) French Philosopher**
(e) Battle of Plassey	**(v) Ruler of Jaipur**
(f) Battle of Buxar	**(vi) Head of the Office of Peshwa**
(g) Arya Samaj	**(vii) Mahadev Govind Ranade**
(h) Ramakrishna Mission	**(viii) Keshab Chandra Sen**
(i) Brahmo Samaja	**(ix) Swami Vivekananda**
(j) Prarthana Samaj	**(x) Swami Dayanand**

Ans.
(a) iv (b) iii (c) v (d) vi (e) i
(f) ii (g) x (h) ix (i) viii (j) vii

Q.5. Write short notes on any five of the following topics –
(limit 50 words) (5×5=25)
(a) February Revolution of 1917
(b) The Kulaks
(c) The Revolt of 1857
(d) The European Union (EU)
(e) What are the causes for the uneven distribution of population in the world?
(f) What is meant by de-urbanisation?
(g) How did the British succeed in securing the submission of the rebel landowners of Awadh?

Ans. (a) February Revolution of 1917- The **February Revolution** was the first of two Russian revolution in 1917. The revolution centered on Petrograd (now known as St. Petersburg), then the Russian capital, where longstanding discontent with the monarchy erupted into mass protests against food rationing of 8 March (23 February in the Julian Calendar). Revolutionary activity was largely confined to the capital and its vicinity, and lasted about eight days. It involved mass demonstrations and armed clashes with police and gendarmes, the last loyal forces of the Russian monarchy. On 12 March (27 February old style) mutinous Russian

Army forces sided with the revolutionaries. Three days later the result was the abdication of Tsar Nicholas II, the end of the Romanov dynasty, and the end of the Russian Empire. Russian Council of Ministers was replaced by a Russian Provisional Government under Prince Georgy Lvov.

The revolution appeared to break out spontaneously, without any real leadership or formal planning Russian had been suffering from a number of economic and social problems, which were compounded by the impact of World War. I Bread riotes primarily women in bread lines, and industrial strikers were joined on the streets by disaffected soldiers from the city's Garrison. As more and more troops deserted, and with loyal troops away at the Front, the city fell into chaos, leading to the overthrow of the Tsar. In all, over 1,300 people were killed in the protests of February 1917.

(b) The Kulaks- Kulak, in Russian and Soviet history, a wealthy or prosperous peasant, generally characterized as one who owned a relatively large farm and several head of cattle and horses and who was financially capable of employing hired labour and leasing land. Before the Russian Revolution of 1917, the Kulaks were major figures in the peasant villages. They often lent money, provided mortgages and played central roles in the villages' social and administrative affairs.

(c) The Revolt of 1857 – The **Indian Rebellion of 1857** was a major, but ultimately unsuccessful, uprising in India in 1857-58 against the rule of the British East India Company, which functioned as a sovereign power on behalf of the British Crown. The rebellion began on 10 May 1857 in the form of a mutiny of sepoys of the Company's army in the Garrison town of Meerut, 40 miles northeast of Delhi (now Old Delhi). It then erupted into other mutinies and civilian rebellions chiefly in the upper Gangetic plain and central India, though incidents of revolt also occurred farther north and east. The rebellion posed a considerable threat to British power in that region, and was contained only with the rebels' defeat in Gwalior on 20 June 1858. On I November 1858, the British granted amnesty to all rebels not involved in murder, though they did not declare the hostilities formally to have ended until 8 July 1859. The rebellion is known by many names, including the **Sepoy Mutiny,** the **Indian Mutiny,** the **Great Rebellion,** the **Revolt of 1857**, the **Indian Insurrection,** and **India's First War of Independence.**

(d) The European Union (EU)- The European Union is a unique economic and political union between 28 European countries that together cover much of the continent.

The EU was created in the aftermath of the Second World War. The first steps were to foster economic cooperation : The idea being that countries that trade with one another become economically interdependent and so more likely to avoid conflict.

The result was the European Economic Community (EEC), created in 1958, and initially increasing economic cooperation between six countries : Belgium, Germany, France, Italy, Luxemburg and the Netherlands. Since then, a huge single market has been created and countries to develop towards its full potential.

(e) The British also tried to win back people's loyalty. Rewards were announced for loyal landholders. The loyal landlords were allowed to enjoy their traditional rights over the land. The rebels were told that if they submitted to the British, they would remain safe and their claims and rights would not be denied. But there was a condition that they had not killed any white people.