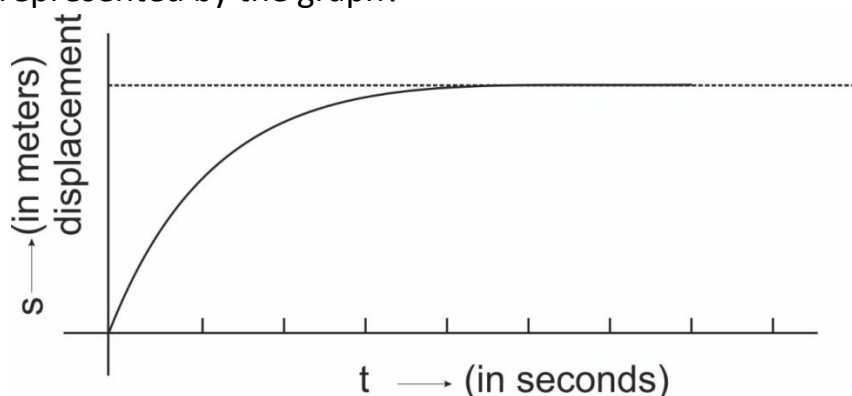


PHYSICS

1. A man has to travel on a straight highway to a certain destination. Going initially for a distance with a speed of 20 km/h; he realized that he has two-third more distance to be covered. Then he traveled with a speed of 40 km/h and reached his destination in time. Then his average speed during the journey must be:
 

A. 30 km/h	B. about 26.7 km/h
C. 24 km/h	D. 48 km/h
2. The displacement of a body as a function of time is shown below in the displacement (s) – time (t) graph. Which of the given four statements describe the motion represented by the graph?



- A. The body starts with a certain velocity which gets retarded with time so that the body finally stops moving.
  - B. The body starts with a certain velocity which gets accelerated over time to finally attain another constant velocity.
  - C. The body moves with a constant acceleration all throughout.
  - D. The velocity of the body is constant throughout.
3. Two bodies of mass  $m$  and  $4m$  are moving with equal kinetic energies. The ratio of their linear momentum is:
 

A. 1:4	B. 4:1
C. 1:2	D. 1:1
  4. An object is placed at a distance of 20 cm from the pole of a convex mirror of focal length 20cm. The image is produced at a distance:
 

A. 10cm	B. 13.3cm
C. 20cm	D. 25cm

5. Which of the following device should be used as a rear view mirror in an auto-mobile car?
- A. convex mirror  
B. plane mirror  
C. concave mirror  
D. parabolic mirror
6. A virtual image larger than the object can be produced by:
- A. Convex mirror  
B. Plane mirror  
C. Concave mirror  
D. None of the above
7. Light travels through a glass plate of thickness 'd' and its refractive index is 'n'. If 'c' is the speed of light in vacuum, the time taken by light to travel this thickness of glass is:
- A.  $\frac{d}{nc}$   
B.  $dnc$   
C.  $\frac{dn}{c}$   
D.  $\frac{dc}{n}$
8. A concave lens has focal length of 15cm. At what distance should the object from the lens be placed so that it forms an erect and virtual image at 10cm distance from the lens:
- A. 30cm  
B. 15cm  
C. 60cm  
D. 10cm
9. The traffic stop signals as well as the danger signals installed on the top of the hills or tall buildings are infact red light signals. This is necessary for viewing it easily from a distances, since red light is
- A. scattered the most by smoke or fog in air.  
B. scattered the least by smoke/ fog or dust particles in the atmosphere.  
C. absorbed the most in the atmosphere.  
D. faster moving in air compared to other colours like blue or yellow.
10. A copper wire of resistance R is drawn to such a point that its length increases to three times its original length. Then its new resistance will
- A. remain the same as R.  
B. increase to 3R.  
C. decrease to R/3.  
D. increase to 9 R.



14. An electric kettle has two thermal coils. When current passes in one of them, water in the kettle boils in 6 minutes. But when current is allowed to pass in the other coil; the same amount of water taken afresh in the kettle boils in 8 minutes. If both the coils are joined in series and current is passed how long would it take for the same amount of water taken again in the kettle to start boiling?
- A. 14 minutes  
B. 7 minutes  
C. 24 minutes  
D. 24/7 minutes
15. Two parallel conducting wires carry current in the same direction. They
- A. do not exert any force on each other.  
B. repel one another.  
C. attract one another.  
D. rotate about each other.

### CHEMISTRY

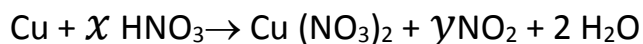
16. A hydrocarbon of 1 mole on combustion with oxygen produces 2 mole of  $\text{CO}_2$  and 3 moles of  $\text{H}_2\text{O}$ . The hydrocarbon is
- A. Methane  
B. Ethane  
C. Propane  
D. Ethene
17. A metal 'X' when exposed to moist air containing  $\text{CO}_2$  produced a green coating 'Y'. 'X' and 'y' are
- A. Cu and CuO  
B. Zn and  $\text{ZnCO}_3$   
C. Cu and  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$   
D. Zn and  $\text{Zn}(\text{OH})_2 \cdot \text{ZnCO}_3$
18. Atomic number and mass number of an element X are 30 and 60 respectively. Then atomic number of  $\text{X}^{2-}$  and  $\text{X}^{2+}$  will be
- A. 30,28  
B. 28,22  
C. 32,28  
D. 30,30
19. The value of X in  $\text{KAl}(\text{SO}_4)_x \cdot 12\text{H}_2\text{O}$  is
- A. 1  
B. 2  
C. 3  
D. 4

20. The electronic configuration of Scandium is  
 A. 2,8,9,2  
 B. 2,8,8,3  
 C. 2,8,10,1  
 D. 2,8,11,8
21. The electronic configuration  $1s^2 2s^2 3s^2 3p^6 3d^9$  represents a  
 A. metal atom  
 B. non-metal atom  
 C. non-metallic ion  
 D. metallic cation
22. The following reaction is used for the preparation of  $O_2$  gas in the laboratory.



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

- A. It is a decomposition reaction and endothermic in nature.  
 B. It is a combination reaction.  
 C. It is a decomposition reaction & accompanied by release of heat.  
 D. It is a photochemical reaction and exothermic in nature.
23. A chemical reaction is given below:



The values of  $x$  and  $y$  are respectively

- A. 3 & 5  
 B. 8 & 6  
 C. 4 & 2  
 D. 7 & 1
24. The aqueous solution of which of the salt has pH close to 7?  
 A.  $(\text{NH}_4)_2 \text{SO}_4$   
 B.  $\text{CH}_3\text{COONa}$   
 C.  $\text{CH}_3\text{COONH}_4$   
 D.  $\text{MgCl}_2$
25. The pH of  $10^{-8}$  M HCl aqueous solution at  $25^\circ \text{C}$  will be  
 A. 8  
 B. 6.98  
 C. 7.02  
 D. 1.0
26. Among the following elements (whose electronic configurations are given below), the one having the highest ionization enthalpy is.  
 A. 2,8,2  
 B. 2,8,8,2  
 C. 2,3  
 D. 2,2

27. Number of covalent bonds present in cyclohexane are  
A. 12  
B. 15  
C. 9  
D. 8
28. 19.7 kg of gold was recovered from a smuggler. The atoms of gold which were recovered are (Atomic mass of Au=197)  
A. 100  
B.  $6.02 \times 10^{23}$   
C.  $6.02 \times 10^{24}$   
D.  $6.02 \times 10^{25}$
29. The metal which reacts with superheated steam to form a mixed oxide and hydrogen gas is  
A. Al  
B. Ca  
C. Fe  
D. Mg
30. The electronic configuration of two elements X and Y are given below  
 $X = [\text{Ar}]4s^2$   $Y = [\text{Kr}]4d^{10} 5s^2 5p^5$   
The chemical bond between X and Y is  
A. Ionic bond  
B. Covalent bond  
C. Coordinate bond  
D. Hydrogen bond

### BIOLOGY

31. Which of the following statement is not correct?  
A. Starch is broken down by salivary amylase.  
B. Digested food in intestine is pushed forward by peristaltic movement.  
C. Pepsin works at pH above 9.  
D. Fat is a complex of fatty acids and glycerol.
32. During fermentation process  
A. Pyruvate is converted to Glucose and oxygen.  
B. Pyruvate is converted to ethyl alcohol and oxygen.  
C. Pyruvate is converted to ethanol and water.  
D. Pyruvate is converted to ethyl alcohol and carbon dioxide.
33. Which one of the following has only three chambered heart?  
A. Pigeon  
B. Street dog  
C. Pond frog  
D. Freshwater fish

34. Xylem cells belong to
- A. Vascular tissues of plants
  - B. Epidermal tissues of plants
  - C. Ground tissues of plants
  - D. Meristematic tissues of plants
35. When a stem of a plant is cut and grown to a plant in a pot, it is an example of
- A. Budding
  - B. Fragmentation
  - C. Regeneration
  - D. Vegetative propagation
36. Pistil is composed of
- A. stigma, style and ovary
  - B. stigma, anther and ovary
  - C. style, anther and filament
  - D. style, filament and ovary
37. Which of the following statement is not correct in case of females?
- A. Eggs are already formed in ovary before birth.
  - B. Fertilization takes place in ovary.
  - C. Implantation of fertilized egg occurs in uterus.
  - D. Placenta provides nutrition to growing embryo.
38. Which one of the following is not a part of male reproductive system in humans?
- A. Testis
  - B. Vas deferens
  - C. Urethra
  - D. Cervix
39. A person has one X chromosome and one Y chromosome in his cells. The person has inherited X chromosome from
- A. his father.
  - B. his mother.
  - C. either from his father or his mother.
  - D. from his paternal grandmother.
40. We should avoid use of plastic plates, cups, bags and other containers because plastic
- A. oxidizes cooked foods and causes them to rot.
  - B. causes toxicity to our body.
  - C. is non-biodegradable material.
  - D. releases toxic materials in soil during its degradation.

41. Abiotic components of environment comprise many factors. Which combination of the following represents correct combinations of abiotic component of environment?
- A. Rainfall, Temperature, Saprophytes, Wind and Soil
  - B. Wind, Temperature, Rainfall, Minerals and Soil
  - C. Soil, Sea, Rivers, Ponds, Forest, Winds and Mountains
  - D. Mines, Forests, Ponds and Rainfall
42. Energy present in sunlight is captured by autotrophs and is converted to chemical energy. This energy flows from primary producers to tertiary consumers in food chain. Which of the following is a correct statement regarding an ecosystem?
- A. More than 50% of the energy of food consumed by primary consumers is available to secondary consumers in trophic level.
  - B. Energy content in an ecosystem decreases as it moves from producers to consumers.
  - C. Energy content in an ecosystem increases as it flows from producers to consumers.
  - D. Numbers of producers are low in comparison to consumers in an ecosystem.
43. Which of the following constitute an ideal food chain?
- A. Frog, Snake and Elephant
  - B. Grass, Goat and Tiger
  - C. Fish, Horse and Tiger
  - D. Goat, Human and Elephant
44. Which of the following is called the suicide bag of cells?
- A. Ribosomes
  - B. Lysosomes
  - C. Nucleolus
  - D. Mitochondria
45. Main function of Golgi body is
- A. Digestion
  - B. Excretion
  - C. Rejection
  - D. Secretion



## MATHEMATICS

46. Write a number which is both rational and irrational.
- A. 0  
B.  $\pi$   
C.  $\frac{3}{5} + \sqrt{2}$   
D. does not exist
47. For what value of K the pair of linear equations  $Kx+2y=3$  and  $3x-y=5$  has no solution.
- A. 4  
B. -6  
C. 6  
D. 8
48. If  $\alpha$ ,  $\beta$  and  $\gamma$  are the zeros of the cubic polynomial  $3x^3-5x+6=0$ , then write the value of  $\alpha + \beta + \gamma$
- A.  $\frac{5}{3}$   
B. -2  
C. 0  
D.  $-\frac{5}{3}$
49. Write the quadratic equation whose one root is  $2+\sqrt{5}$  and sum of the roots is 4.
- A.  $x^2-4x-1=0$   
B.  $x^2-4x+1=0$   
C.  $x^2+4x+1=0$   
D.  $x^2-4x-2=0$
50. The 10<sup>th</sup> term from the last term of the A.P 8,5,2, ....., -49 is
- A. -19  
B. -22  
C. -24  
D. -26
51. An electric pole of height 5m casts a shadow of 3m long on the ground and at the same time a cable tower casts a shadow of 24m long. Write the height of the cable tower.
- A. 28 m  
B. 32m  
C. 38m  
D. 40m
52. How many three-digit numbers greater than 100 and less than 500 are divisible by 5?
- A. 75  
B. 79  
C. 80  
D. 81

53. A man goes 150m due east then 200m due north. How far is he from the standing point?  
 A. 400m  
 B. 350m  
 C. 300m  
 D. 250m
54. The point on the x-axis equidistant from (2,3) and (4,5) is  
 A. (0,7)  
 B. (7,0)  
 C. (6,0)  
 D. (-7,0)
55. When two circles touch each other externally then the number of tangent(s) common to both the circles is  
 A. one  
 B. two  
 C. three  
 D. four
56. If  $\sin \theta = \frac{2mn}{m^2+n^2}$ , then write the value of  $\sec \theta$ .  
 A.  $\frac{2mn}{m^2-n^2}$   
 B.  $\frac{m^2-n^2}{m^2+n^2}$   
 C.  $\frac{m^2-n^2}{2mn}$   
 D.  $\frac{m^2+n^2}{m^2-n^2}$
57. A bag contains 5 black balls, 5 white balls and 4 red balls. A ball is drawn at random from the bag. Write the probability that the ball drawn is not white.  
 A.  $\frac{1}{5}$   
 B.  $\frac{1}{4}$   
 C.  $\frac{3}{4}$   
 D.  $\frac{3}{5}$
58. From the top of a 3m building the angle of elevation of the top of a tower is  $60^\circ$  and the angle of depression of its foot is  $30^\circ$ . Find the height of the tower.  
 A. 10m  
 B. 12m  
 C. 15m  
 D. 18m
59. Write the median of the following data: 31, 28, 27, 28, 36, 25, 35, 40  
 A. 28  
 B. 32  
 C. 33  
 D. 36

60. A solid metallic cone of height 24cm and diameter of the base 12cm is melted and recast in the shape of a sphere. Find the radius of the sphere.

- A. 6cm
- C. 10cm

- B. 8cm
- D. 12cm