

Date: 13/12/2020**Max. Marks: 100****SOLUTIONS****Time allowed: 120 mins**

1. Which of the following term does not represent electric power (P) in electric circuit ?

(A) $\frac{V^2}{R}$

(B) IR^2

(C) I^2R

(D) VI

Ans. (B)

Sol. Power (P) = VI
= I^2R

$$= \frac{V^2}{R}$$

2. S.I. unit of magnetic field B is :

(A) Newton/Ampere $\times$ metre

(B) Newton/Ampere

(C) Ampere $\times$ metre

(D) Ampere $\times$ Coulomb

Ans. (A)

Sol. Newton/(Ampere $\times$ Metre)

$$\therefore F = BIl$$

$$\Rightarrow B = \frac{F}{Il} \Rightarrow [B] = \text{NA}^{-1}\text{m}^{-1}$$

3. Which of the following is an equation for position- Time relation ?

(A) $v = u + at$

(B) $2as = v^2 - u^2$

(C) $E = mc^2$

(D) $S = ut + \frac{1}{2}at^2$

Ans. (D)

Sol. $S = ut + \frac{1}{2}at^2$

Out of three equations of motion, IInd equation of motion is called position - time relation.

$$\therefore S = ut + \frac{1}{2}at^2$$

4. Value of 1 eV is :

- (A) $1.602 \times 10^{-15} \text{ J}$ (B) $1.602 \times 10^{-19} \text{ J}$ (C) $1.602 \times 10^{-16} \text{ C}$ (D) $1.602 \times 10^{23} \text{ Ergs}$

Ans. (B)

Sol. Numerically, $1\text{eV} = 1.602 \times 10^{-19} \text{ J}$

5. The least distance of distinct vision for healthy eyes is

- (A) 25 km (B) 25 m (C) 25 cm (D) 25 mm

Ans. (C)

Sol. The least distance of distinct vision is 25 cm, for normal or healthy eye.

6. Where does image form in the human eye ?

- (A) Cornea (B) Pupil (C) Iris (D) Retina

Ans. (D)

Sol. The image is formed on retina.

7. An object of mass 15 kg is moving with uniform velocity of 4 ms^{-1} . What is the kinetic energy possessed by the object?

- (A) 15 kg m^2 (B) $120 \text{ kg m}^2/\text{s}^2$ (C) 120 J/s (D) 240 J

Ans. (B)

Sol. $120 \text{ kg m}^2 / \text{s}^2$

$$m = 15 \text{ kg}; \quad v = 4 \text{ m/s}$$

$$\therefore \text{K.E.} = \frac{1}{2}mv^2$$

$$\Rightarrow \text{K.E.} = \frac{1}{2} \times 15 \times 4 \times 4$$

$$= 120 \text{ J or } 120 \text{ kg m}^2/\text{s}^2 \left\{ \because 1 \text{ J} = 1 \text{ kg m}^2 / \text{s}^2 \right\}$$

8. The acronym 'SONAR' stand for

- (A) Sound Navigation and Ranging (B) Solar Navigation and Ranging
(C) Sound Navigation and Nuclear Reaction (D) Sound Navigation and Rectification

Ans. (A)

Sol. SONAR - Sound Navigation and Ranging

9. Equivalent resistance in parallel combination of resistance is :

(A) $R = R_1 + R_2 + R_3 + \dots$

(B) $\frac{1}{R} = R_1 + R_2 + R_3 + \dots$

(C) $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

(D) $R = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$

Ans. (C)

Sol. In parallel, equivalent resistance is determined by -

$$\left[\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots \right]$$

10. Focal length of thin lens is given by :

(A) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ (B) $f = u + v$ (C) $f^2 = \frac{1}{v} - \frac{1}{u}$ (D) $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

Ans. (A)

Sol. According to lens formula, focal length of thin lens is given by -

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

11. The device/machine to produce electric current is :

- (A) Generator (B) Motor (C) Galvanometer (D) Ammeter

Ans. (A)

Sol. "Generator" is the device which is used to produce electric current.

12. Which of the following is used to make Solar panel ?

- (A) Cobalt (B) Silicon (C) Nickel (D) Manganese

Ans. (B)

Sol. "Silicon" is a semiconductor used to make solar panel.

13. Which of the following is a major constituent of Bio-gas

- (A) Ethane (B) Oxygen (C) Carbon dioxide (D) Methane

Ans. (D)

Sol. Methane is a major constituent of Biogas.

14. Fatty, foods become rancid due to process of-

- (A) Oxidation (B) Corrosion (C) Reduction (D) Hydrogenation

Ans. (A)

Sol. Oxidation of fats and oils is known as Rancidity.

15. Which of the following are physical changes ?

- (a) Melting of iron metal (b) Rusting of iron
(c) Bending of an iron rod (d) Drawing a wire of iron metal
(A) a+b+c (B) a+b+d (C) a+c+d (D) b+c+d

Ans. (C)

Sol. Melting of iron metal, Bending of an iron rod and drawing a wire of iron metal are examples of physical changes because. No new substance is formed.

16. Milk is the example of the following type of colloid -

- (A) Sol (B) Emulsion (C) Aerosol (D) Foam

Ans. (B)

Sol. Milk is an emulsion, a type of colloid in which both dispersed phase and dispersion medium are liquid states.

17. The nucleus of an atom contains -

- (A) Protons (B) Electrons (C) Protons and neutrons (D) Neutrons

Ans. (C)

Sol. The nucleus of an atom contains positively charged particle protons and electrically neutral neutrons.

18. By whom was neutron discovered ?

- (A) Bohr (B) Chadwick (C) Rutherford (D) Dalton

Ans. (B)

Sol. The neutral particle, neutron was discovered by. James chadwick in 1932.

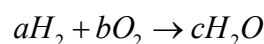
19. A chemical equation is said to be balanced if number of-

- (A) compounds are same in both side.
(B) molecules are same in both side.
(C) number of atoms are same in both side
(D) number of electrons are same in both side

Ans. (C)

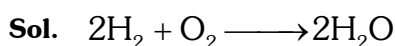
Sol. A balanced chemical equation contains equal number of atoms on both sides of equation.

20. Write values of a,b and c so that following chemical equation is balanced-



- (A) a = 2, b = 1, c = 2 (B) a = 1, b = 1, c = 2 (C) a = 1, b = 2, c = 1 (D) a = 2, b = 2, c = 1

Ans. (A)



21. Name the element which is common to all acids ?

- (A) Sulphur (B) Chlorine (C) Nitrogen (D) Hydrogen

Ans. (D)

Sol. According to Arrhenious concept acids are those substances which gives H^+ ion in the solution

22. A solution turns red litmus into blue, its pH is likely to be-

- (A) 1 (B) 4 (C) 5 (D) 10

Ans. (D)

Sol. A solution which turns red litmus in to blue must be a base. Therefor its PH is always more than seven.

23. Dilution is the process of -

- (A) Mixing acid with water (B) Mixing strong acid with strong base
(C) Mixing acid or base with water (D) Mixing strong acid with weak base

Ans. (C)

Sol. Mixing of acid or base with water is known as dilution.

24. What type of reaction takes place when an acid is dissolved in water ?

- (A) Exothermic (B) Endothermic (C) Substitution (D) Elimination

Ans. (A)

Sol. When an acid is dissolved in water, a lot of amount of energy is released therefore dilution of acid is exothermic.

25. The ability of metal to be drawn into thin wire is known as :

- (A) Ductility (B) malleability (C) Sonority (D) Conductivity

Ans. (A)

Sol. The ability of metals to be drawn into wire is known as ductility.

26. Which of the following non-metal is good conductor of electricity ?

- (A) Graphite (B) Phosphorus (C) Hydrogen (D) Bromine

Ans. (A)

Sol. Graphite is a crystalline allotrope of carbon, which have free electrons and therefore it is good conductor of electricity.

27. Synthesis of Bile Juice take place in which of the following part of Body ?

- (A) Gall Bladder (B) Liver (C) Nephron (D) Hypothalamus

Ans. (B)

Sol. Bile juice synthesis in liver & store in gall bladder.

28. Which is Phytohormone ?

- (A) Auxin (B) Gibberellin (C) Cytokinin (D) All of the above

Ans. (D)

Sol. Phytohormone means plant hormone, Auxin, Cytokinin, Gibberellin, ABA, Ethylene.

29. pH of which of the following is acidic in nature ?

- (A) Gastric Juice (B) Bile Juice
(C) Pancreatic Juice (D) Intestinal Juice

Ans. (A)

Sol. Acidic pH means less than 7. gastric juice contain HCl.

30. Which of the following have Naked Seed ?

- (A) Algae (B) Bryophyta (C) Gymnosperm (D) Angiosperm

Ans. (C)

Sol. Gymnosperm are non flowering plants, no ovary, no fruit.

31. Kreb's cycle found on which part of cell ?

- (A) Mitochondria (B) Cell Membrane (C) Golgi body (D) Nucleus

Ans. (A)

Sol. Kreb's cycle takes place in mitochondria.

32. Which of the following is not found in Prokaryotes except ?

- (A) Endoplasmic reticulum (B) Mitochondria (C) Ribosome (D) Golgi body

Ans. (C)

Sol. Prokaryotes not consist membrane bound cell organelle. Ribosome membrane less organelle.

33. Which of the following characters are found in mammals ?

- (A) Hair (B) Mammary gland (C) Air-sack (D) Both (A) and (B)

Ans. (D)

Sol. Mammals have hair & mammary gland.

34. DNA of Eukaryotes have -

- (A) Fatty acid (B) Cholesterol (C) Histone (D) All of the above

Ans. (C)

Sol. In Eukaryotes DNA have histone protein.

35. Which of the following is monocotyledon ?

- (A) Wheat (B) Maize (C) Banana (D) All

Ans. (D)

Sol. Monocotyledons have only one cotyledon ex. Wheat, maize, Banana.

36. Deficiency of which hormone causes diabetes mellitus ?

- (A) Thyroid (B) Insulin (C) Relaxin (D) Parthormone

Ans. (B)

Sol. Pancreas secrete insuline which convert blood glucose into glycogen.

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

- (A) Synthesis of urea takes place in liver (B) Eukaryotes have mitochondria
(C) Virus is prokaryote (D) Both (A) and (B)

Ans. (D)

Sol. Synthesis of urea takes place in liver by ornithine cycle & eukaryotes have membrane bounded cell organelles like mitochondria.

38. Which of the following is responsible for Green house effect ?

- (A) O₂ (B) H₂ (C) CO₂ (D) All

Ans. (C)

Sol. CO₂, CH₄ responsible for green house effect.

39. Tracheal ring in Human consist of following.

- (A) Hyaline Cartilage (B) Fibrous Cartilage (C) Bone (D) Muscle

Ans. (A)

Sol. Trachea is surrounded by 16-20 rings of hyaline cartilage.

40. Human Evolution was suppose to take place in-

- (A) America (B) Asia (C) Africa (D) Australia

Ans. (C)

Sol. First human evolution take place in Africa.

41. Which is the oldest "Veda" ?

- (A) Rigveda (B) Samveda (C) Yajurveda (D) Atharvaveda

Ans. (A)

Sol. Vedic period is divided into two parts. The Early Rigvedic period is believed to have extended from 1500 B.C. to 1000 B.C. Rigveda belong to this period. The rest of the three vedas were composed in the later vedic period.

42. "Tripatika" is related to -

- (A) Jainism (B) Vaishya (C) Sanantan (D) Buddhism

Ans. (D)

Sol. It contains the sermons of Buddha. It was compiled by his disciples.

43. Which dynasty started coins with the Veena emblem ?

- (A) Maurya dynasty (B) Gupta dynasty (C) Vardhan dynasty (D) Rajput dynasty

Ans. (B)

Sol. Samundra Gupta was an accomplished Veena player. In order to keep this memory alive he got coins minted showing him playing the Veena.

44. "Prayag Prashasti" was written by -

- (A) Aryabhata (B) Vishnu Sharma (C) Harishen (D) Kalidas

Ans. (C)

Sol. It describes Samundra Gupta's victory over Arya Vrata and Dakshinapath. It is Allahabad pillar inscription by Harisena.

45. Who wrote Padmavat ?

- (A) Kalidas (B) Prithviraj (C) Malik Mohammad Jayasi (D) Dhananand

Ans. (C)

Sol. It is a poem describing the story of the historic siege of Chittorgarh by Alauddin Khilji.

46. Battle of Haldighati was fought in -

- (A) 1576 AD (B) 1580 AD (C) 1528 AD (D) 1572 AD

Ans. (A)

Sol. It was fought between Akbar and Rana Pratap.

47. Who was Shivaji's mother ?

- (A) Jija Bai (B) Kamla Bai (C) Putli Bai (D) Durga Devi

Ans. (A)

Sol. Shivaji's mother's name was Jeejabai and father's name was Shahji Bhonsle.

48. Which ruler's reign is called Golden Age of Mughal Painting ?

- (A) Babur (B) Jahangir (C) Aurangzeb (D) Shahjahan

Ans. (B)

Sol. Jahangir himself was a painter. He established a painting school under the guidance of famous painter Agarizh.

49. British East India Company was established in -

- (A) 1600 AD (B) 1540 AD (C) 1650 AD (D) 1700 AD

Ans. (A)

Sol. On 31.12.1600 East India Company was formed.

50. Who was the last Mughal King ?

- (A) Shershah (B) Aurangzeb
(C) Bahadur Shah Zafar-II (D) None of the above

Ans. (C)

Sol. After suppressing the revolt of 1857, British arrested Bahadurshah and exiled him to Rangoon where he died in 1862.

51. Which Governor General started Subsidiary Alliance?

- (A) Lord Cornwallis (B) Lord Rippon (C) Lord Wellesely (D) Lord Curzon

Ans. (C)

Sol. Subsidiary Alliance was started by Governor General Lord Wellesely who was in the post from 1798-1805.

52. Anand Math was written by-

- (A) Swami Vivekanand (B) Deenbandhu Mishra
(C) Bankimchandra Chatterjee (D) Ravindranath Tagore

Ans. (C)

Sol. 'Anand Math' was written by Bankim Chandra Chatterjee. It depicted the political and economic shortcomings of British rule.

53. Who established the Khalsa Organisation?

- (A) Guru Nanak Dev (B) Guru Kripal Singh (C) Guru Govind Singh (D) None of these

Ans. (C)

Sol. Guru Govind Singh organised Sikhs into a military organisation to fight against the Mughal armies in 1699 A.D.

54. Who was the president of first session / conference of Congress?

- (A) Dadabhai Naoroji (B) Arvind Ghosh
(C) Gopal Krishna Gokhle (D) Vyomesh Chandra Banerjee

Ans. (D)

Sol. The first convention was held at Mumbai. On 28.12.1885 in Gokuldas Tejpal Sanskrit College.

55. Founder of 'Satya Shodhak Samaj' was -

- (A) Swami Vivekanand (B) Atmaram (C) Jyotiba Phule (D) Mahatma Gandhi

Ans. (C)

Sol. It was set up in 1873.

56. Unit of measuring noise is-

- (A) Centimeter (B) Decibel (C) Celsius (D) Millibar

Ans. (B)

Sol. 66-75 decibel sound is considered as a normal noise.

57. Chipko Movement was started in-

- (A) Karnataka (B) North-East India (C) Uttarakhand (D) Kerala

Ans. (C)

Sol. It was started in 1974.

58. The standard time of India is calculated from-

- (A) 72° East Longitude (B) 80° 30' East Longitude
(C) 82°30' East Longitude (D) 85° East Longitude

Ans. (C)

Sol. 82°3' East longitude. The standard time for the country is calculated as per it. It passes through Mirzapur.

59. The Tropic of Cancer does not pass through which state of India?

- (A) Gujarat (B) Maharashtra (C) Chhattisgarh (D) Madhya Pradesh

Ans. (B)

Sol. Tropic of Cancer passes through 8 states. They are Gujarat, Rajasthan, M.P., Chhattisgarh, Jharkhand, W.B., Tripura, Mizoram.

60. Which of the following river is known as Ganga of South India?

- (A) Narmada river (B) Krishna river (C) Kaveri river (D) Godavari river

Ans. (D)

Sol. Godavari is the longest peninsular river and it has many tributaries and largest drainage basin.

61. State with the minimum forest area in India is-

- (A) Assam (B) Rajasthan (C) Jharkhand (D) Haryana

Ans. (D)

Sol. Lowest forest area is in Haryana i.e., only 1.2% of the total area.

62. According to 2011 census which is the most densely populated state?

- (A) Uttar Pradesh (B) Bihar (C) Kerala (D) West Bengal

Ans. (B)

Sol. Bihar is the most densely populated state with population density of 1106 person per sq. km area.

63. Conventional signs are certified by

- (A) Central Information Department (B) Indian Constitution
(C) Survey Department (D) Parliament of India

Ans. (C)

Sol. A list of conventional signs is released by the Survey Department.

64. Keoladeo Ghana Bird Sanctuary is located in-

- (A) Kerala (B) Rajasthan (C) West Bengal (D) Madhya Pradesh

Ans. (B)

Sol. Keoladeo Ghana Bird Sanctuary is located in Rajasthan. This sanctuary is famous for migratory birds.

65. The cheapest means of transport is-

- (A) Road Transport (B) Rail Transport (C) Water Transport (D) Air Transport

Ans. (C)

Sol. The cheapest means of transport is water transport, mainly used for international trade.

66. The main gas pipeline is-

- (A) Barauni - Haldia (B) Barauni - Jalandhar (C) Naharkatia - Barauni (D) Hajira - Jagdishpur

Ans. (D)

Sol. The main gas pipeline is Hajira-Vijaypur-Jagdishpur natural gas pipeline.

67. The longest railway route of the world is-

- (A) Trans Siberian Railway (B) Canadian Pacific Railway (C) Trans Indian Railway (D) All of the above

Ans. (A)

Sol. The longest railway route of the world is Trans-Siberian Railway, spanning a length of 9,289 km, is the longest and one of the busiest railway lines in the world.

68. Weather maps are published in India-

- (A) Kolkata (B) Delhi (C) Pune (D) Hyderabad

Ans. (C)

Sol. In India, publication of weather maps started from the year 1875. Presently the maps are published from Pune.

69. Name the area of India where earthquakes often occur (high incidence zones)-

- (A) Kutch (B) Aravali mountain (C) Orissa (D) Goa

Ans. (A)

Sol. The area of India where earthquakes often occurs in Kutch. It lies in high incidence zone.

70. Name the most flood affected State-

- (A) Bihar (B) Punjab (C) Rajasthan (D) Madhya Pradesh

Ans. (A)

Sol. Bihar is one of the most flood affected state. Every year monsoon brings devastating floods in this region.

71. In a democracy Sovereignty resides in the -

- (A) President (B) Parliament (C) Prime Minister (D) People

Ans. (D)

Sol. In a democracy, sovereignty resides in the people. Democracy is of the people, for the people and by the people.

72. The Chief Election Commissioner of India is appointed by-

- (A) President (B) Prime Minister (C) Governor (D) Deputy Prime Minister

Ans. (A)

Sol. In India, Chief Election Commissioner of India is appointed by President. Apart from CEC, other Commissions are also appointed by President.

73. According to which article untouchability has been abolished by the Constitution of India?

- (A) Article - 14 (B) Article - 15 (C) Article -16 (D) Article - 17

Ans. (D)

Sol. Article 17 of Indian Constitution abolished untouchability so as to establish equality.

74. The term of Lok Sabha is -

- (A) 3 Years (B) 4 Years (C) 5 Years (D) 6 Years

Ans. (C)

Sol. The term of Lok Sabha is 5 years, though it can be dissolved before in certain conditions.

75. Where is the High Court of Madhya Pradesh state situated?

- (A) Bhopal (B) Indore (C) Jabalpur (D) Gwalior

Ans. (C)

Sol. The High Court of M.P. is situated at Jabalpur with two benches at Indore and Gwalior respectively.

76. The State having maximum population of poor, in India is-

- (A) Meghalaya (B) Assam (C) Bihar (D) Madhya Pradesh

Ans. (C)

Sol. Bihar has maximum concentration of poor as per population in India.

77. Which of the following scheme provides 100 days of employment ?

- (A) National Rural Employment Guarantee Scheme (B) National Rural Health Mission
(C) National Rural Livelihood Mission Scheme (D) Prime Minister Jan Dhan Scheme

Ans. (A)

Sol. National Rural Employment Guarantee Scheme provides 100 days of employment. It was launched in 2005.

78. Main function of money is -

- (A) Medium of exchange (B) Mode of payment (C) Price holding (D) All of the above

Ans. (D)

Sol. Money acts as medium of exchange, mode of payment as well as shows price holding features.

79. Which bank is known as Central Bank of India?

- (A) Reserve Bank of India (B) State Bank of India (C) Foreign Exchange Bank (D) International Bank

Ans. (A)

Sol. The Central Bank of India is Reserve Bank of India. It was established in 1935.

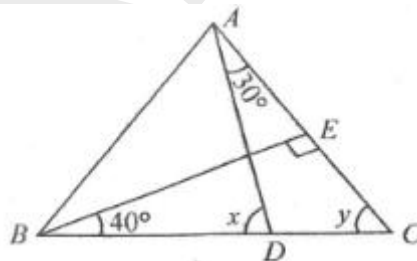
80. Producers can be arbitrary with respect to the quality and price of goods in -

- (A) Competitive market (B) Monopoly (C) Agricultural product (D) None of the above

Ans. (B)

Sol. Producers can be arbitrary with respect to the quality and price of goods in monopoly. The system also ends competitiveness.

81. In the given figure, if $BE \perp AC$, $\angle EBC = 40^\circ$ and $\angle DAC = 30^\circ$ then the value of $\angle x$ and $\angle y$ are:



- (A) 80° and 30° (B) 80° and 50° (C) 40° and 50° (D) 70° and 40°

Ans. (B)

Sol. In $\triangle BEC$, $\angle B + \angle E + \angle y = 180^\circ$ (Angle sum property)

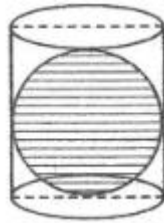
$$\angle y = 180 - 90 - 40$$

$$\Rightarrow \angle y = 50$$

In $\triangle ADC$

$$\angle x = 30 + 50 = 80 \text{ (Angle sum property)}$$

82. A right circular cylinder is just enclosed a sphere of radius r , then:



(A) Surface area of the sphere is equal to the curved surface area of the cylinder

(B) Surface area of sphere is equal tot he total surface area of the cylinder.

(C) Surface area of the sphere is less than the curved surface area of the cylinder.

(D) Surface area of sphere is greater than the curved surface area of the cylinder.

Ans. (A)

Sol. S.A. of sphere = $4\pi r^2$

C.S.A. of cylinder = $2\pi rh$

$$= 2\pi r(2r)$$

$$= 4\pi r^2$$

83. Zeros of polynomial $x^2 - 2x$ are:

(A) only 2

(B) 0, 2

(C) 2, 2

(D) 0, 0

Ans. (B)

Sol. $f(x) = x^2 - 2x$

$$x^2 - 2x = 0$$

$$x(x - 2) = 0$$

$$x = 0, 2$$

84. The median and mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18 are:

- (A) 18 and 14 (B) 17 and 18 (C) 18.5 and 14 (D) 18 and 18.5

Ans. (A)

Sol. 14, 14, 14, 14, 17, 18, 18, 18, 22, 23, 29, 28

$$\text{Median} = \frac{18 + 18}{2} = 18$$

$$\text{Mode} = 14$$

85. Largest chord of the circle is :

- (A) Radius (B) Diameter (C) Both (A) and (B) (D) None of these

Ans. (B)

Sol. Largest chord in a circle is Diameter.

86. In Euclid's division lemma, for given positive integer a and b, there exist unique integer's q and r satisfying $a = bq + r$, here:

- (A) $r \neq 0$ (B) $0 \leq r < b$ (C) $r > b$ (D) $r = q$

Ans. (B)

Sol. $0 \leq r < b$

87. If 3, -1, $-\frac{1}{3}$ are zoers of cubic polynomial p(x), where p(x) is:

- (A) $3x^3 + 5x^2 - 11x - 3$ (B) $3x^3 - 5x^2 - 11x + 3$ (C) $3x^3 - 5x^2 - 11x - 3$ (D) $3x^3 + 5x^2 + 11x + 3$

Ans. (C)

Sol. $f(x) = ax^3 + bx^2 + cx + d$

$$\alpha + \beta + \gamma = 3 - 1 - \frac{1}{3} = 2 - \frac{1}{3} = \frac{5}{3} = -\frac{b}{a}$$

$$\alpha\beta + \beta\gamma + \gamma\alpha = (3)(-1) + (-1)\left(\frac{-1}{3}\right) + \left(\frac{-1}{3}\right)(3)$$

$$= -3 + \frac{1}{3} - 1$$

$$= -\frac{11}{3} = \frac{c}{a}$$

$$\alpha\beta\gamma = (3)(-1)\left(-\frac{1}{3}\right) = 1 = -\frac{d}{a}$$

$$-\frac{b}{a} = \frac{5}{3}; \frac{c}{a} = -\frac{11}{3}; -\frac{d}{a} = \frac{3}{3}$$

$$\Rightarrow a = 3, b = -5, c = -11, d = -3$$

$$f(x) = 3x^2 - 5x - 11x - 3$$

88. The value of p for which pair of equations $4x + py + 8 = 0$, $2x + 2y + 2 = 0$, have unique solution is:

- (A) $p = 4$ (B) $p = 8$ (C) $p \neq 4$ (D) $p \neq 2$

Ans. (C)

Sol. For unique solution

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

$$\Rightarrow \frac{4}{2} \neq \frac{p}{2}$$

$$\Rightarrow p \neq 4$$

89. Which of the following is not a quadratic equation?

- (A) $(x - 2)^2 + 1 = 2x - 3$ (B) $x(x + 1) + 8 = (x + 2)(x - 2)$
 (C) $x(2x + 3) = x^2 + 1$ (D) $(x + 2)^3 = x^3 + 4$

Ans. (B)

Sol. $x(x + 1) + 8 = (x + 2)(x - 2)$

$$x^2 + x + 8 = x^2 - 4$$

$$x = -12$$

(Its linear, not quadratic)

90. How many two digit numbers are there which are divisible by 3?

- (A) 29 (B) 30 (C) 33 (D) 35

Ans. (B)

Sol. 12, 15,, 99

$$T_n = a + (n - 1)d$$

$$99 = 12 + (n - 1)3$$

$$\Rightarrow \frac{87}{3} = n - 1$$

$$\Rightarrow n = 29 + 1 = 30$$

91. The sum of first n - positive integers is:

(A) $\frac{(n^2 + 1)}{2}$

(B) $\frac{(n+1)(n+2)}{2}$

(C) $\frac{n(n+1)}{2}$

(D) $2n$

Ans. (C)

Sol. We need to find sum of first n -positive integer.

Now, $1 + 2 + 3 + \dots + n$

$$a = 1, d = 1$$

$$s_n = \frac{n}{2}[a + l]$$

$$s_n = \frac{n}{2}[1 + n] = \frac{n(n+1)}{2}$$

92. The point $(7, 3)$ divides the line segment joining the points $(4, -3)$ and $(8, 5)$ internally in ratio:

(A) $2 : 3$

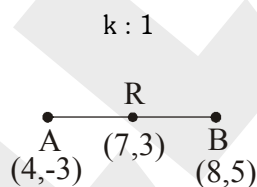
(B) $7 : 4$

(C) $3 : 2$

(D) $3 : 1$

Ans. (D)

Sol. We have given.



now,
$$x = \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}$$

$$\frac{7}{1} = \frac{k \times 8 + 1 \times 4}{k + 1}; \quad \frac{7}{1} = \frac{8k + 4}{k + 1}$$

$$7k + 7 = 8k + 4$$

$$3 = k$$

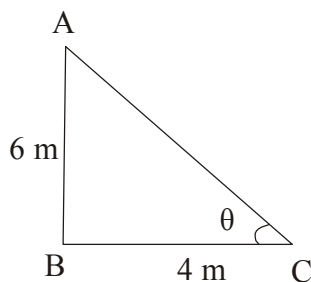
$$k = 3, \quad k : 1 = 3 : 1$$

93. A verticle pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long, then the height of the tower is:

- (A) 28 m (B) 48 m (C) 53 m (D) 42 m

Ans. (d)

Sol. According to the question length of pole 6m. and its shadow 4m, so



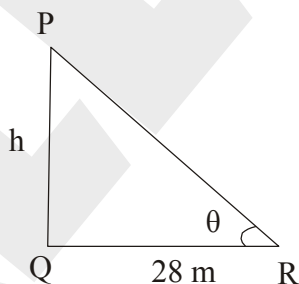
now,

$$\tan \theta = \frac{P}{B} = \frac{6}{4} \quad ; \quad \tan \theta = \frac{3}{2} \dots\dots\dots (i)$$

now let the height of the tower is h m and its lenght of shadow is 28m. so

now,

$$\tan \theta = \frac{P}{B} = \frac{h}{28} \dots\dots\dots (ii)$$



now time is same so angle of elevation of sun is also same.

so, from (i) & (ii) we have

$$\frac{3}{2} = \frac{h}{28} \quad ; \quad h = \frac{3 \times 28}{2} = 42 \text{ m.}$$

94. The length of a arc of a sector of angle θ of circle with radius r is:

- (A) $\frac{\theta}{180} \times \pi r^2$ (B) $\frac{\theta}{360} \times \pi r^2$ (C) $\frac{\theta}{180} \times \pi r$ (D) $\frac{\theta}{360} \times \pi r$

Ans. (C)

Sol. $\frac{\theta}{180} \times \pi r$.

95. The value of $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$ is:

- (A) 0 (B) $\frac{\sqrt{3}}{2}$ (C) 1 (D) $\sqrt{3}$

Ans. (C)

Sol. $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$

$$\tan(90 - 42^\circ) \times \tan(90 - 67^\circ) \times \tan 42^\circ \times \tan 67^\circ$$

$$\cot 42^\circ \times \cot 67^\circ \times \tan 42^\circ \times \tan 67^\circ$$

$$\cot 42^\circ \times \tan 42^\circ \times \cot 67^\circ \times \tan 67^\circ$$

$$1 \times 1 = 1$$

96. An iron of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness, then the radius of the wire will be:

- (A) $\frac{1}{30} \text{ cm}$ (B) $\frac{1}{900} \text{ cm}$ (C) $\frac{1}{3} \text{ cm}$ (D) 3 cm

Ans. (A)

Sol. Diameter of iron Rod = 1 cm

$$r = \frac{1}{2} \text{ cm}$$

length of iron rod = $l = 8 \text{ cm}$

and let the length of the wire $L = 18 \text{ m}$

$$L = 18 \times 100 \text{ cm}$$

radius = $R = ?$

Now according to the question volume of both objects should be same.

$$V_1 = V_2$$

$$\pi r^2 l = \pi R^2 L$$

$$\left(\frac{1}{2}\right)^2 \times 8 = R^2 \times 1800$$

$$\frac{1}{4} \times 8 = R^2 \times 1800$$

$$R^2 = \frac{1}{900}$$

$$R = \frac{1}{30} \text{ cm}$$

97. Number of terms in A.P.

23, 21, 19,, 5 are:

(A) 11

(B) 10

(C) 9

(D) 8

Ans. (B)

Sol. A.P. is given

23, 21, 19,5

So, first term $a = 23$

$$d = -2$$

and last term 5.

$$a_n = a + (n - 1) d$$

$$5 = 23 + (n - 1) \times -2$$

$$-18 = (n - 1) \times -2$$

$$\frac{-18}{-2} = n - 1$$

$$9 = n - 1$$

$$n = 10$$

98. One card is drawn from a well shuffled deck of 52 cards, the probability that the card drawn is not an ace.

(A) 12/13

(B) 1/13

(C) 1/52

(D) 4/13

Ans. (A)

Sol. We have 4 ace in pack of 52 cards.

So, probability that the card drawn is not an ace.

$$P(\text{not an ace}) = \frac{\text{favourable outcome}}{\text{Total outcome}}$$

$$= \frac{48}{52} = \frac{12}{13}$$

99. If $3x^2 - x^3 + 5x - 2$ is divided by $x - 1 + x^2$, then the remainder is:

(A) -3

(B) 2

(C) 3

(D) -2

Ans. (B)

Sol.

$$\begin{array}{r}
 \overline{) -x^3 + 3x^2 + 5x - 2} \\
 \underline{-x^3 - x^2 + x} \\
 4x^2 + 4x - 2 \\
 \underline{4x^2 + 4x - 4} \\
 2
 \end{array}$$

Remainder r is 2.

100. Which of the following statemetns is true?

(A) Every whole number is natural number

(B) Every integer is a ratinal number

(C) Every rational number is an integer

(D) None of these

Ans. (B)

Sol. Every integer is a rational number.