

Date: 17/11/2019

Max. Marks: 100

SOLUTIONS

Time allowed: 120 mins

1. Which of the following terms does not represent electrical power in a circuit ?

- (1) $I^2 R$ (2) IR^2 (3) VI (4) V^2 / R

Ans. (2)

Sol. Since $P = I^2 R \therefore P = VI \Rightarrow P = V^2 / R$.

2. For a steady current I , the amount of heat H produced in time t is

- (1) $IR^2 t$ (2) IRt^2 (3) $I^2 R t$ (4) $I^2 R^2 t$

Ans. (3)

Sol. According to Joules law of heating $H = I^2 R t$.

3. What phenomenon of light causes the blue colour of the sky and the redding of the sun at sunrise or A sunset ?

- (1) Reflection (2) Refraction (3) Scattering (4) Total internal reflection

Ans. (3)

Sol. Scattering

4. The power of a lens is $-2.5D$. Its focal length is :

- (1) -2.5 cm (2) $-4D$ (3) -40 cm (4) -66.6 cm

Ans. (3)

Sol. Since $P = 1/f \Rightarrow -2.5D = 1/f \Rightarrow f = -40$ cm

5. At focus F and between F and $2F$, a concave mirror always forms a

- (1) real, inverted and magnified image (2) virtual, erect and mangnified
(3) virtual, inverted and diminished image (4) real, erect and diminished

Ans. (1)

Sol. Property of ray diagram for concave mirror.

6. What is the magnitude of force F on a charge q moving with a velocity v in a perpendicular magnitude field B ?

- (1) $\frac{qB}{v}$ (2) $\frac{vB}{q}$ (3) qvB (4) $\frac{qv}{B}$

Ans. (3)

Sol. $F = qvB \sin \theta \therefore \theta = 90^\circ \therefore F = qvB$

7. Which of the following is most suitable for the core of electromagnets ?

- (1) Air (2) Soft iron (3) Steel (4) Cu-Ni alloy

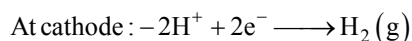
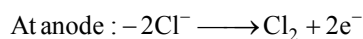
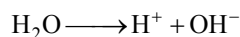
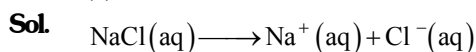
Ans. (2)

8. Magnetic fields do not interact with

- (1) electric charges at rest (2) electric charges in motion
(3) permanent magnets at rest (4) permanent magnets in motion

- (1) Electrolysis (2) Thermal heating (3) Evaporation (4) Electroplating

Ans. (1)



Reduction potential of hydrogen is more than sodium

18. Which of the following metals does not react with dilute hydrochloric acid to liberate hydrogen gas?

- (1) Calcium (2) Zinc (3) Iron (4) Silver

Ans. (4)

Sol. In Reactivity series, silver is present below the hydrogen. So, it is less reactive than hydrogen and don't displace hydrogen from hydrochloric acid.

19. Which of the following reactions is not a redox reaction?

- (1) $\text{Mg} + \text{Cl}_2 \rightarrow \text{MgCl}_2$ (2) $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$
 (3) $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$ (4) $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + 2\text{Cl}_2$

Ans. (3)

Sol. Oxidation number of any elements in reaction don't change in products. So it's not a redox reactions.

20. In Aqua regia the ratio of concentrated HCl to concentrated HNO_3 is :

- (1) 1 : 3 (2) 3 : 1 (3) 1 : 2 (4) 2 : 1

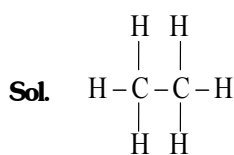
Ans. (2)

Sol. Aqua regia is a chemical which dissolves gold and platinum, It's a solution that contains three parts concentrated HCL and one part HNO_3 .

21. Ethane, with the molecular formula C_2H_6 has :

- (1) 6 covalent bonds (2) 7 covalent bonds (3) 8 covalent bonds (4) 9 covalent bonds

Ans. (2)



22. Glacial acetic acid is :

- (1) an aqueous solution of alcohol (2) vinegar
 (3) an aqueous solution of acetic acid (4) 100% pure ethanoic acid

Ans. (4)

Sol. Glacial acetic acid is 100% pure ethanoic acid that don't contain water .

23. Which of the following is a non-metal and also a solid?

- (1) Iodine (2) Mercury (3) Boron (4) Hydrogen

Ans. (1)

Sol. Iodine is a non metal and it exists in solid state at room temperature.

34. In which part of the alimentary canal digested food is absorbed ?

- (1) Stomach (2) Appendix (3) Large intestine (4) Small Intestine

Ans. (4)

35. Which of the following is a plant hormone

- (1) Insulin (2) Thyroxine (3) Oestrogen (4) Cytokinin

Ans. (4)

36. Pollen grains are produced by

- (1) Ovary (2) Petals (3) Seed (4) anther

Ans. (4)

37. Chromosomes are made up of

- (1) proteins (2) DNA (3) both (1) and (2) (4) RNA

Ans. (3)

38. The non-renewable source of energy amongst the following is

- (1) coal energy (2) nuclear energy (3) wood (4) wind energy

Ans. (1)

39. The structure formed by the union of male and female gametes is termed as

- (1) embryo (2) morula (3) zygote (4) placenta

Ans. (3)

40. The three R's to save the environment are

- (1) Reserve , Reduce, Recycle (2) Reuse , Reserve , Reduce
(3) Reserve, Reuse , Reduce (4) Reduce , Recycle, Reuse

Ans. (4)

41. π is :

- (1) an irrational number (2) a rational number (3) a prime number (4) a composite number

Ans. (1)

Sol. An irrational number

42. The value of $p(x) = x^2 - 3x - 4$ at $x = -1$ is :

- (1) 1 (2) -4 (3) 0 (4) -3

Ans. (3)

Sol. $p(-1) = (-1)^2 - 3(-1) - 4 = 0$

43. The solution of the equations

$$\frac{x}{a} + \frac{y}{b} = 2$$

$$ax - by = a^2 - b^2 \text{ is :}$$

- (1) $x = a, y = b$ (2) $x = -a, y = -b$ (3) $x = a, y = -b$ (4) $x = -a, y = b$

Ans. (1)

Sol. $\frac{x}{a} + \frac{y}{b} = 2 \Rightarrow \{bx + ay = 2ab\} \times a$

$$\{ax - by = a^2 - b^2\} \times b$$

$$\Rightarrow (abx - b^2y) - (abx + a^2y) = (a^2b - b^3) - 2a^2b$$

$$-y(a^2 + b^2) = -a^2b - b^3 \Rightarrow -y(a^2 + b^2) = -b(a^2 + b^2) \Rightarrow y = b \text{ \& } x = a$$

44. The height of an equilateral triangle of side a is :

(1) $\frac{a}{2}$

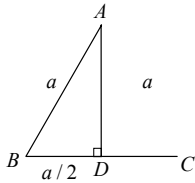
(2) $a\sqrt{3}$

(3) $\frac{a\sqrt{3}}{2}$

(4) $\frac{a\sqrt{3}}{4}$

Ans. (3)

Sol.



In $\triangle ABD$, using pythagoras theorem $AD^2 = a^2 - \frac{a^2}{4}$

$$\therefore AD = \frac{\sqrt{3}a}{2}$$

45. If $\sec\theta + \tan\theta = m$ and $\sec\theta - \tan\theta = n$, then the value of mn is :

(1) 2

(2) 1

(3) ± 1

(4) ± 2

Ans. (2)

Sol. $mn = (\sec\theta + \tan\theta)(\sec\theta - \tan\theta) = \sec^2\theta - \tan^2\theta = 1$

46. The mean of first ten odd natural numbers is :

(1) 5

(2) 10

(3) 20

(4) 19

Ans. (2)

Sol. Mean = $\frac{1+3+5+7+9+11+13+15+17+19}{10} = 10$

47. The solution of the pair of equations

$$x + y = 14$$

$$x - y = 4$$

(1) $x = 9, y = 5$

(2) $x = 5, y = 9$

(3) $x = 9, y = 9$

(4) $x = 5, y = 5$

Ans. (1)

Sol. $(x + y) + (x - y) = 14 + 4 \Rightarrow x = 9 \text{ \& } y = 5$

48. Sum of the first n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \dots$ is :

(1) $\frac{n(n+1)}{2}$ (2) $\sqrt{2}n$ (3) $\frac{n(n+1)}{\sqrt{2}}$ (4) 1

Ans. (3)

Sol. $\sqrt{2} + 2\sqrt{2} + 3\sqrt{2} \dots$

$$S_n = \frac{n}{2}[2a + (n-1)d] = \frac{n}{2}[2\sqrt{2} + (n-1)\sqrt{2}] = \frac{n(n+1)}{\sqrt{2}}$$

49. The area of the triangle whose vertices are $(0, 0)$, $(a, 0)$ and $(0, b)$ is :

(1) ab (2) $\frac{1}{2}ab$ (3) $a+b$ (4) $a^2 + b^2$

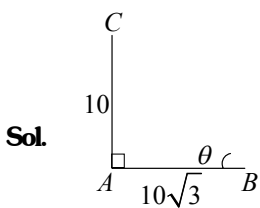
Ans. (2)

Sol. Area = $\frac{1}{2} |0(0-b) + a(b-0) + 0(0-0)| = \frac{1}{2}ab$

50. If the shadow of 10 m high tree is $10\sqrt{3}$ m, then the angle of elevation of sun is :

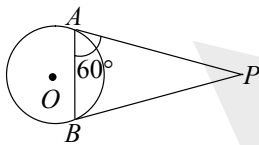
(1) 60° (2) 90° (3) 45° (4) 30°

Ans. (4)



$$\tan \theta = \frac{p}{b} = \frac{10}{10\sqrt{3}} \Rightarrow \theta = 30^\circ$$

51. In the following figure, the measure of $\angle PBA$ is :



(1) 60° (2) 30° (3) 45° (4) none of these

Ans. (1)

Sol. Tangent from external points are equal.

$\therefore \triangle ABP$ is isosceles. $\Rightarrow \angle PBA = \angle PAB = 60^\circ$

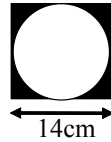
52. A segment AB is divided at a point P such that $\frac{PB}{AB} = \frac{3}{7}$, then the ratio of $AP : PB$ is :

(1) $4 : 7$ (2) $7 : 4$ (3) $7 : 3$ (4) $4 : 3$

Ans. (4)

Sol. $\frac{PB}{AB} = \frac{3}{7} \Rightarrow \frac{AB}{PB} = \frac{7}{3} \Rightarrow \frac{AP+BP}{BP} = \frac{7}{3} \Rightarrow \frac{AP}{PB} + 1 = \frac{7}{3} \Rightarrow \frac{AP}{PB} = \frac{4}{3}$

53. A square is circumscribing a circle. The side of the square is 14 cm. The area of the square not included in the circle is :



- (1) 21 cm² (2) 42 cm² (3) 48 cm² (4) 196 cm²

Ans. (2)

Sol. Required area = area of square - area of circle.

$$\Rightarrow 14^2 - \pi(7)^2 = 42 \text{ cm}^2 .$$

54. By melting a solid sphere of radius 5 cm a solid right circular cone of the same circular base is made. The height of the cone is :

- (1) 20 cm (2) 10 cm (3) 5 cm (4) 12 cm

Ans. (1)

Sol. Volume of sphere = volume of cone.

$$\Rightarrow \frac{4}{3} \pi r^3 = \frac{1}{3} \pi R^2 h \Rightarrow h = 20 \text{ cm}$$

55. Two friends were born in the year 2000. The probability that they have the same birth date is :

- (1) $\frac{1}{2000}$ (2) $\frac{2}{365}$ (3) $\frac{1}{365}$ (4) $\frac{1}{366}$

Ans. (4)

Sol. Year 2000 is a leap year \therefore It consist of 366 days.

$$\Rightarrow n(s) = 366 \text{ and } n(E) = 1.$$

$$P(E) = \frac{n(E)}{n(s)} = \frac{1}{366}$$

56. If $3x + y = 10$ and $y = 4$, then the value of x is :

- (1) 0 (2) 1 (3) 2 (4) 3

Ans. (3)

Sol. $3x + 4 = 10 \Rightarrow x = 2.$

57. $\frac{\sin \theta}{1 + \cos \theta}$ is :

- (1) $\frac{\cos \theta}{1 - \sin \theta}$ (2) $\frac{1 - \cos \theta}{\sin \theta}$ (3) $\frac{1 - \sin \theta}{\cos \theta}$ (4) $\frac{1 - \cos \theta}{1 + \cos \theta}$

Ans. (2)

Sol. $\frac{\sin \theta}{1 + \cos \theta} = \frac{\sin \theta}{1 + \cos \theta} \times \frac{1 - \cos \theta}{1 - \cos \theta} = \frac{\sin \theta (1 - \cos \theta)}{1 - \cos^2 \theta} = \frac{\sin \theta (1 - \cos \theta)}{\sin^2 \theta} = \frac{1 - \cos \theta}{\sin \theta}$.

58. The area swept out by a horse tied in a rectangular grass field with a rope 8 m long is :

- (1) $16\pi^2 \text{ m}^2$ (2) $64\pi \text{ m}^2$ (3) $48\pi \text{ m}^2$ (4) $32\pi \text{ m}^2$

Ans. (1)

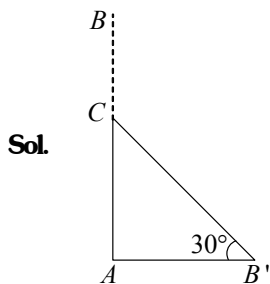


Area swept = area of quadrant = $\frac{1}{4} \pi r^2 = 16\pi \text{ m}^2$

59. A tree breaks into two parts due to heavy wind such that the upper part makes an angle of 30° with the plane. The place where the upper part of the tree touches the ground is at a distance of 10 m from the base point of the tree. The height of the tree is :

- (1) $10\sqrt{3} \text{ m}$ (2) $10\sqrt{2} \text{ m}$ (3) $\frac{10}{\sqrt{3}} \text{ m}$ (4) $5\sqrt{2} \text{ m}$

Ans. (1)



$\tan 30^\circ = \frac{p}{b} \Rightarrow \frac{1}{\sqrt{3}} = \frac{AC}{10} \Rightarrow AC = \frac{10}{\sqrt{3}}$

$\sin 30^\circ = \frac{p}{h} \Rightarrow \frac{1}{2} = \frac{10}{BC\sqrt{3}} \Rightarrow BC = \frac{20}{\sqrt{3}}$

Height = $AC + BC \Rightarrow \frac{10}{\sqrt{3}} + \frac{20}{\sqrt{3}} \Rightarrow 10\sqrt{3} \text{ m}$

60. If the perimeter and the area of a circle equal numerically, then the diameter of the circle is :

- (1) 2 units (2) π units (3) 4 units (4) 7 units

Ans. (1)

Sol. Perimeter of circle = area of circle $\Rightarrow 2\pi r = \pi r^2 \Rightarrow r = 2$ units.

61. Who was responsible for the unification of Germany ?

- (1) Bismarck (2) Garibaldi (3) Cavour (4) Mazzini

Ans. (1)

- Sol.** Bismarck was the architect of unification of Germany with the help of Prussian army.
- 62.** Printing press first came to India with
 (1) the English (2) the French
 (3) the Dutch (4) Portuguese missionaries
- Ans. (4)**
- Sol.** In the mid 16th century by Portuguese in Goa.
- 63.** Champaran Satyagraha (1916) was launched by Gandhiji against
 (1) high revenue demands (2) indigo planters (3) mill owners (4) salt tax
- Ans. (2)**
- 64.** Which of the following emerged as the centre of world trade in the 18th century ?
 (1) Europe (2) India (3) China (4) America
- Ans. (1)**
- Sol.** Due to isolation of China Europe became the centre of world trade.
- 65.** Which of the following ports lost its importance under colonial rule ?
 (1) Calcutta (2) Bombay (3) Surat (4) Madras
- Ans. (3)**
- Sol.** Surat was pre-colonial port.
- 66.** The first Factories Act, to help keep children out of industrial work was passed in
 (1) 1870 (2) 1902 (3) 1906 (4) 1912
- Ans. (2)**
- 67.** For which of the following reasons was the Simon Commission boycotted ?
 (1) It supported the Muslim League (2) It did not recognise Congress as a party
 (3) There was no Indian in the Commission (4) There were differences among the members
- Ans. (3)**
- 68.** Munshi Premchand wrote on which of the following themes ?
 (1) Religious and Mythological (2) Oppression in society
 (3) Historical (4) Detective and mystery
- Ans. (2)**
- 69.** Akbar's court poet was
 (1) Tulsidas (2) Abdur Rahim Khan Khana
 (3) Amir Khusro (4) Tukaram
- Ans. (2)**
- Sol.** Abdur Rahim Khan Khana one of the Navratn or Nine Gems of Akbar's court.
- 70.** Which of the following was the reason for calling off the Non-Cooperation Movement by Gandhiji ?
 (1) High pressure from the British government (2) Round Table Conference
 (3) Gandhiji's arrest (4) The Chauri Chaura incident
- Ans. (4)**
- 71.** Which Sikh guru was executed by Aurangzeb ?
 (1) TeghBahadur (2) Arjun Dev (3) Hargobind (4) Govind Singh
- Ans. (1)**
- 72.** Where was the first Cotton Mill set up in India ?
 (1) Ahmedabad (2) Kanpur (3) Mumbai (4) Madras
- Ans. (3)**

- 73.** Which Mughal king died by a sudden fall from the staircase ?
 (1) Babur (2) Akbar (3) Jahangir (4) Humayun
Ans. (4)
- 74.** Which of the following newspapers was started by Bal Gangadhar Tilak?
 (1) Kesari (2) Jansatta (3) The Statesman (4) Amrita Bazar Patrika
Ans. (1)
- 75.** Which king started the organization of Kumbh . fair at Allahabad ?
 (1) Harshavardhana (2) Dhruvasena II (3) Narsimhavarnam (4) Akbar
Ans. (1)
- 76.** What per cent area of the whole country does mountain occupy ?
 (1) 27% (2) 43% (3) 30% (4) 50%
Ans. (3)
- 77.** Which wildlife is protected by the villagers of Bishnoi village in Rajasthan ?
 (1) Chinkara (2) Elephant (3) Tiger (4) Lion
Ans. (1)
- 78.** The system of agriculture when a single crop is grown on a large area is termed as
 (1) shifting agricukure (2) horticulture
 (3) intensive agriculture (4) plantation agriculture
Ans. (4)
- 79.** Which is called the 'Queen of Arabian Sea' ?
 (1) Venice (2) Kochin (3) Surat (4) Lakshadwip
Ans. (2)
Sol. Due to strategic importance Kochin is called "Queen of Arabian sea".
- 80.** Which one of the following agencies markets steel for the public sector plants ?
 (1) HAIL (2) TATA steel (3) SAIL (4) MNCC
Ans. (3)
Sol. Contour ploughing the correct term not Contour Planning.
- 81.** Which two of the following extreme locations are connected by the east-west corridor ?
 (1) Mumbai and Kolkata (2) Mumbai and Nagpur
 (3) Nagpur and Siliguri (4) Silchar and Porbandar
Ans. (4)
- 82.** Which is not the soil conservation method ?
 (1) Contour planning (2) Strip cropping (3) Terracing of slopes (4) Shelter belts
Ans. (1)
- 83.** Species found in isolated places only are called
 (1) normal species (2) endemic species (3) vulnerable species (4) rare species
Ans. (2)

84. Which of the following is not the purpose that modern dams serve ?

- (1) Generation of hydroelectricity (2) Industrial use
(3) Irrigation (4) Inland navigation

Ans. (NA)

Sol. All option are correct according to NCERT Class 10 Geography book (Water Resources).

85. Rearing of silkworms for production of silk fibre is called

- (1) interculture (2) sericulture (3) horticulture (4) pisciculture

Ans. (2)

86. Which one of the following minerals is formed due to evaporation ?

- (1) Chalk (2) Silica (3) Petroleum (4) Gypsum

Ans. (4)

87. Which one of the following minerals is not used in making “cement” ?

- (1) Coal (2) Silica (3) Aluminium (4) Copper.

Ans. (4)

88. Which one of the following countries imports iron ore from India ?

- (1) USA (2) Japan (3) Russia (4) China

Ans. (2)

89. Which one of the following is a riverine port ?

- (1) Kolkata (2) Mumbai (3) Kandla (4) Vishakhapatnam

Ans. (1)

Sol. Situated on Ganga river so Kolkata is a riverine port.

90. The place of India in respect of rice cultivation is

- (1) first (2) second (3) third (4) fourth

Ans. (2)

Sol. After China India is the second largest producer of rice in the world.

91. Which of the following are the two Ethnic groups in Sri Lanka ?

- (1) Hindus and Muslims (2) Sinhalese and Tamils
(3) Muslims and Cristians (4) Christians and Tamils

Ans. (2)

92. The number of subjects given in Union List is

- (1) 47 (2) 66 (3) 85 (4) 97

Ans. (4)

93. The policy of ‘Apartheid’ was adopted by the government of

- (1) U.S.A. (2) Africa (3) India (4) England

Ans. (2)

94. Untouchability has been abolished in India by which of the following articles of the Constitution of India ?

- (1) Article 14 (2) Article 15 (3) Article 16 (4) Article 17

Ans. (4)

95. Democracy was re-established in Nepal in
(1) 2005 (2) 2006 (3) 2007 (4) 2008

Ans. (4)

Sol. In 2008 Monarchy was abolished and Nepal became a federal democratic republic.

96. Average income is
(1) Total National Income / Population of the country
(2) Per Capita Income / Total National Income
(3) National Wealth / Per person of the country
(4) National Capital / National Budget

Ans. (1)

97. Tertiary Sector has become an important part of Indian economy on account of
(1) development of agriculture and industry (2) rise in levels of income
(3) both (1) and (2) (4) none of these

Ans. (3)

98. The main function of Reserve Bank of India is
(1) providing loans (2) credit control (3) dealing with World bank (4) none of these

Ans. (2)

Sol. Credit control is the function of RBI.

99. MNC is a company
(1) that owns or controls production in more than one nation
(2) that owns or controls production in one nation
(3) that owns or controls production outside the nation
(4) all of these

Ans. (1)

100. Which of the following does not fall under consumer rights ?
(1) Right to be informed (2) Right to choose
(3) Right to seek government help (4) Right to represent in the consumer courts

Ans. (3)

Sol. Right to seek government help is not the consumer right.