

Date: 08/11/2015

Max. Marks: 100

SOLUTIONS

Time allowed: 90 mins

1. Which one of the following is not a star?

- (A) Sun (B) Moon (C) Big Bear (D) Libra

Ans. (B)

2. The focal length of a spherical mirror is 20 cm. The radius of curvature of this

- (A) 10cm (B) 20cm (C) 40cm (D) 80cm

Ans. (C)

3. If λ_r and λ_v are wavelengths of light rays of red and violet colours respectively then:

- (A) $\lambda_r < \lambda_v$ (B) $\lambda_r > \lambda_v$ (C) $\lambda_r = \lambda_v$ (D) None of these

Ans. (B)

4. To correct the defect Myopia or near sightedness, we have to use:

- (A) convex lens (B) concave lens (C) plane glass (D) none of the above

Ans. (B)

5. Which of the following colours is not a primary colour?

- (A) White (B) Green (C) Red (D) Blue

Ans. (A)

6. The image of an object in human eye is formed at:

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

Sol. Ans. (D)

7. The work done in carrying a charge of 2 micro coulomb from point A to point B is 6×10^{-4} Joule. The potential difference between these points will be:

- (A) 600 volts (B) 500 volts (C) 300 volts (D) 100 volts

Ans. (C)

Sol. $Q = 2 \mu C$

$$= 2 \times 10^{-6} C$$

$$W = 6 \times 10^{-4} J$$

$$V = \frac{W}{q} = \frac{6 \times 10^{-4}}{2 \times 10^{-6}} = 3 \times 10^2 \text{ volt}$$

$$= 300 \text{ volt}$$

8. A current of 0.2 Ampere is passing through a resistance of 20 ohm. The voltage applied at the ends of resistance is:

- (A) 40 volts (B) 20 volts (C) 10 volts (D) 4 volts

Ans. (D)

Sol. $V = IR = 0.2 \times 20$

$$= 4 \text{ volt}$$

9. Electric motor is a device which converts:

- (A) Electrical energy into thermal energy (B) Electrical energy into mechanical energy
(C) Thermal energy into electrical energy (D) Thermal energy into mechanical energy

Ans. (B)

10. Dynamo works on the principle of

- (A) Electrolysis (B) Thermal Radiation
(C) Electromagnetic Induction (D) None of these

Ans. (C)

11. Four resistances of 4 ohms are connected in parallel. The resultant resistance will be:

- (A) 4 ohms (B) 3 ohms (C) 2 ohms (D) 1 ohm

Ans. (D)

Sol. $\frac{1}{R_p} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{4}{4} = 1\Omega$

12. The frequency of alternating current supplied in India is:

- (A) 50 Hz (B) 60 Hz (C) 100 Hz (D) 220 Hz

Ans. (A)

13. If the current flowing through a fixed resistor is halved, the heat produced in it becomes:

- (A) Double (B) Half (C) One fourth (D) Four times

Ans. (C)

Sol. $H = I^2Rt$

$$H' = \left(\frac{I}{2}\right)^2 Rt$$

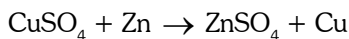
$$H' = \frac{I^2Rt}{4} = \frac{H}{4}$$

14. When in the blue solution of Copper sulphate, zinc strip is dipped, after some time the colour changes to:

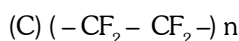
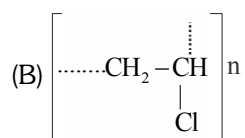
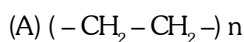
- (A) Pink (B) Green
(C) Colourless (D) Remains blue

Ans. (C)

Sol. $ZnSO_4$ - Colourless



15. Formula of Teflon is:



(D) None of these

Ans. (C)

Sol. Fact

16. In SO_3 , what is the valency of sulphur atom?

- (A) 3 (B) 1 (C) 5 (D) 6

Ans. (D)

Sol. SO_3

$$x + 3 \times (-2) = 0$$

$$x + (-6) = 0$$

$$x = +6$$

17. Proton was discovered by:

- (A) J. J. Thomson (B) Chadwick (C) E. Goldstein (D) Rutherford

Ans. (C)

Sol. Fact

18. What is the electronic configuration of Cl^- ?

- (A) 2, 8, 7 (B) 2, 8, 8 (C) 2, 8, 6 (D) 2, 8, 8, 1

Ans. (B)

Sol. $\text{Cl}^- \rightarrow e^- \rightarrow 18$

2, 8, 8

19. Write the IUPAC name of $\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\text{CH}_3$

- (A) Neo-pentane (B) 2, 2 dimethyl propane
(C) 2 - methyl butane (D) 2, 3 dimethyl propane

Ans. (B)

Sol. $\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{H}_3\text{C}-\text{C}-\text{CH}_3}}$ 2, 2 dimethyl propane

20. Which type of bond is present between carbon-carbon atoms in acetylene?

- (A) Single covalent bond (B) Double covalent bond
(C) Triple covalent bond (D) Electrovalent bond

Ans. (C)

Sol. $\text{H}-\text{C} \equiv \text{C}-\text{H}$

21. What is the electronic configuration of the elements of II group?

- (A) $1s^2, 2s^2 2p^2$ (B) $1s^2, 2s^2 2p^1$ (C) $1s^2, 2s^2 2p^6, 3s^2$ (D) $1s^2, 2s^2 2p^6, 3s^1$

Ans. (C)

Sol. II group : Consists of two electrons in their valence shell

$$\therefore 1s^2 2s^2 2p^6, \underline{3s^2}$$

22. Chemical formula of Gypsum is

- (A) CaSO_4 (B) ZnSO_4 (C) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (D) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$

Ans. (C)

Sol. Fact

23. If there are 12 neutrons in an atom and its atomic number is 11. How many protons are present in it?
 (A) 11 (B) 12 (C) 23 (D) 1

Ans. (A)

Sol. Atomic number: No. of protons


24. Brass contains :

- (A) Cu and Sn (B) Cu and Ni (C) Cu and Zn (D) Mg and Al

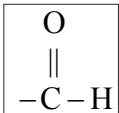
Ans. (C)

Sol. Brass : Cu 70% & Ni 30%

25. What is the structure of aldehyde function group ?

- (A) $-C=O$ (B) $\rightarrow O=C-H$ (C) $-O=C-H$ (D) 

Ans. (C)

Sol. aldehyde group 

26. On passing CO_2 gas in excess in aqueous solution of sodium carbonate, the substance obtained as :
 (A) NaOH (B) $NaHCO_3$ (C) $Na_2CO_3 \cdot 10H_2O$ (D) $Na_2CO_3 \cdot H_2O$

Ans. (B)

Sol. $Na_2CO_3 + H_2O + CO_2 \rightarrow 2NaHCO_3$

27. Number of mitotic divisions required to produce 128 cells from a single cell is -

- (A) 7 (B) 8 (C) 6 (D) 4

Ans. (A)

28. Obelia belongs to -

- (A) Coelenterata (B) Porifera (C) Annelida (D) Arthropoda

Ans. (A)

29. In binomial nomenclature first word indicates

- (A) Species (B) Genus (C) Sub species (D) None of these

Ans. (B)

30. Whale belongs to :

- (A) Mammalia (B) Amphibia (C) Annelida (D) Reptilia

Ans. (A)

31. Deficiency of vitamin 'A' causes -

- (A) Beri-Beri (B) Anaemia (C) Night blindness (D) Scruvy

Ans. (C)

32. Which of the following cannot be considered as a receptor ?

- (A) Muscle (B) Ear (C) Eye (D) Nose

Ans. (A)

33. Chipko andolan is association with :

- (A) Tomatoes (B) Turtles (C) Trees (D) Lions

Ans. (C)

34. Which of the following is not a biodegradable material ?

- (A) Aluminium foil (B) Animal bone (C) Wood (D) Cotton

Ans. (A)

35. The visible characteristics in an organism are known as :

- (A) Penotype (B) Genotype (C) Stereotype (D) Prototype

Ans. (A)

36. Sexually transmitted disease is :

- (A) Malaria (B) Diarrhoea (C) AIDS (D) Hepatitis

Ans. (C)

37. Kreb's Cycle takes place in :

- (A) Cytoplasm (B) Mitochondria (C) Nucleus (D) Ribosome

Ans. (B)

38. Acid Rain is caused by :

- (A) CO (B) SO₂ (C) O₂ (D) All of the above

Ans. (B)

39. Which one of the following is a renewable resource ?

- (A) Coal (B) Oil (C) Forest (D) Petrol

Ans. (C)

40. Botanical name of Margosa (Neem) is :

- (A) Azadirachta indica (B) Pisum sativum (C) Cassia fistula (D) Brassica Compestris

Ans. (A)

41. Which of the following city is not related with Indus civilization ?

- (A) Mohanjodaro (B) Kalibanga (C) Lothal (D) Patliputra

Ans. (D)

Sol. Patliputra is associated with Magadha Mahajanapada.

42. Which of the following was the oldest veda ?

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

Ans. (A)

Sol. The Rigveda is an ancient Indian Collection of Vedic Sanskrit Hymns. The Hymns are dedicated to Rigvedic Deities

43. Founder of Gupta Dynasty was:

- (A) Shree Gupt (B) Kumar Gupt (C) Skand Gupt (D) Samudra Gupt

Ans. (A)

Sol. Shree Gupta was the founder of Gupta dynasty and ruled for the period of 240-280 CE.

44. Huen Tsang came in the period of :

- (A) Rajvardhan (B) Harshvardhan (C) Balivardhan (D) Shrivardhan

Ans. (B)

Sol. Huen Tsang was the celebrated chinese traveller who visited India in ancient times. He was discribed as the 'Prince of Pilgrims'.

45. Which city was established by Harihar - bukka ?

- (A) Bahmani (B) Delhi (C) Vijaynagar (D) Mohammad Nagar

Ans. (C)

Sol. The Vijaynagar empire was founded by Harihar - Bukka, also called Sangama Brothers.

46. Taj Mahal built by :

- (A) Babar (B) Akbar (C) Shahjahan (D) Aurangzeb

Ans. (C)

Sol. Taj Mahal was build by Shahjahan during 1632-1653.

47. Two great Indian Epics are :

- (A) Geeta and Bible (B) Ramayana and Mahabharat
(C) Bible and Irani Avesta (D) Quran and Rigveda

Ans. (B)

48. Who was the last Moghul Emperor ?

- (A) Alamgir II (B) Bahadurshah II (Zafar)
(C) Farrukh Siyar II (D) Shahalam II

Ans. (B)

Sol. Bahadur Shah Zafar was the last Mughal emperor. The son of Mirza Akbar Shah II and Lalbai, who was a Hindu Rajput, Zafar became Mughal Emperor when his father died on 28 September 1837.

49. Who was the first president of Indian National Congress ?

- (A) Bamesh Chandra Banerjee (B) Jawaharlal Nehru
(C) Gandhiji (D) None of the above

Ans. (A)

Sol. Indian National Congress was founded in 1885 by A.O. Hume. Hume assumed office as the General Secretary and Bamesh Chandra Banerjee was elected as President.

50. Non Co-operation movement continued till _____

- (A) 1920-22 (B) 1925-26 (C) 1918-20 (D) 1927-29

Ans. (A)

51. Lala Lajpat Rai led the extremist movement in :

- (A) Punjab (B) Haryana (C) Sindh (D) Awadh

Ans. (A)

Sol. Lala Lajpat Rai, was an Indian Punjabi author and politician who is chiefly remembered as a leader in the Indian Independence movement. He was popularly known as Punjab Kesari.

52. Doctrine of lapse policy is related to

- (A) Lord Dalhousi (B) Lord Hesting (C) William Bentick (D) Sir Thomas Ro

Ans. (A)

Sol. The Doctrine of Lapse was an annexation policy purportedly devised by Lord Dalhousie, who was the Governor General for the East India Company in India between 1848 and 1856.

53. Which city of Madhya Pradesh "Jhanda Satyagrah" was started ?

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

Ans. (C)

Sol. Jhanda Satyagraha was started in Jabalpur and later spreaded to other cities including Nagpur during the period between 1923-24.

54. When was the Rowlatt Act Passed ?

- (A) 1918 (B) 1919 (C) 1920 (D) 1922

Ans. (B)

Sol. Rowlatt Act was hurriedly passed by British Legislature to curb political activities of Indians against British Colonial rule.

55. Who established 'Forward Block' ?

- (A) Bhagat Singh
(C) Rasbihari Bose

- (B) Chandrashekhar Azad
(D) Subhash Chandra Bose

Ans. (D)

Sol. After split from Indian National Congress, Forward Block was founded by Subhash Chandra Bose on 3rd May 1939.

56. 'Tropic of Cancer' passes through how many states of India ?

- (A) Five (B) Six (C) Seven (D) Eight

Ans. (D)

Sol. Tropic of Cancer passes through 8 states (Gujarat, Rajasthan, Madhya Pradesh, Chattisgarh, Jharkhand, West Bengal, Tripura and Mizoram).

57. In which of the following area the ozone hole was observed for the first time in 1985 ?

- (A) South America (B) Western Europe (C) Antarctica (D) Alaska

Ans. (C)

Sol. For nearly a billion years, ozone molecules in the atmosphere have protected life on Earth from the effects of ultraviolet rays. The ozone layer resides in the stratosphere and surrounds the entire Earth.

58. How many islands are there in Andaman and Nicobar Islands ?

- (A) 385 (B) 209 (C) 436 (D) 572

Ans. (D)

Sol. The Andaman & Nicobar Islands are an archipelago in India's Bay of Bengal.

59. Rajasthan receives very little rain because :

- (A) It is too hot.
(B) Due to scarcity of water the winds remain dry.
(C) The winds do not come across any barrier in their path hence are not uplifted to get cool.
(D) Monsoon fails to reach this area.

Ans. (C)

As Aravalli ranges lie parallel to those winds hence do not create a barrier.

60. In which of the following state Black and Regur soil is not found ?

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

Ans. (B)

Sol. Punjab is a part of Northern plain and rich in alluvial soil.

61. Which of the following is the place of origin of Chambal River ?

- (A) Mhow (B) Neemuch (C) Mandsaur (D) Khandwa

Ans. (A)

Sol. Chambal originates from hills of Janapav, near MHOW (MP)

62. In which type of forest mangrove trees are found ?

- (A) Tropical rainforests (B) Temperate forests (C) Tidal forests (D) Thorny forests

Ans. (C)

Sol. Mangrove trees are found in mangrove forest also known as tidal forest specially in the Sunderban Delta region.

63. Hirakund Dam is built on which of the following rivers ?

- (A) Satluj (B) Krishna (C) Mahanadi (D) Ganga

Ans. (C)

Sol. Hirakud Dam is built across the Mahanadi River, about 15 km from Sambalpur in the state of Odisha in India.

64. Which of the following rivers join the sea through an estuary ?

- (A) Ghaghra (B) Son (C) Narmada (D) Gandak

Ans. (C)

Sol. The Narmada also called the Rewa, is a river in central India and the fifth longest river in the Indian subcontinent. It is the fourth longest river that flows entirely within India, after the Ganga, the Godavari, and the Krishna.

65. Which of the following rocks do not contain fossils ?
(A) Marble (B) Igneous (C) Shale (D) Sandstone

Ans. (A)

Sol. Marble and Igneous both doesnot contain fossils (Controversial)

66. "Balaghat" is known for :
(A) Manganese production (B) Religious place
(C) Railway workshop (D) Diamond production

Ans. (A)

Sol. Balaghat lies on the manganese nod of triangular formation of Balaghat - Nagpur - Raipur. In Balaghat, manganese is mined under Manganese Ore India Limited (MOIL)

67. Where is National Geothermal Research Institute situated ?
(A) Mumbai (B) Delhi (C) Hyderabad (D) Ahmedabad

Ans. (C)

Sol. Geothermal researches are conducted under National Geophysical Research Institute, Hyderabad

68. Which of the following is not a kharif crop ?
(A) Rice (B) Pulses
(C) Jowar - Bajra (Sorghum - Pearl millet) (D) Soyabean

Sol. Ans. (D)

All others are Kharif crops whereas Soyabean is not.

Sol. Some pulses as well as Jowar - Bajra can be grown in both Kharif and Rabi seasons (Controversial)

69. Which state has the lowest population density according to 2011 census ?
(A) Himachal Pradesh (B) Arunachal Pradesh (C) Assam (D) Mizoram

Ans. (B)

Sol. Population density of Arunachal Pradesh is approximately 17/km² which is lowest in India.

70. Which of the following is the biggest port in India ?
(A) Paradeep (B) Tuticorin (C) Kandla (D) Mumbai

Ans. (D)

Sol. Jawaharlal Nehru Port, Mumbai is the biggest port in India.

71. Indian Constitution is
(A) Flexible (B) Rigid
(C) Flexible and Rigid both (D) None of the above

Ans. (C)

72. Fundamental Duties are included in the consitution of India in which year ?
(A) 1975 (B) 1976 (C) 1977 (D) 1978

Ans. (B)

Sol. Fundamental duties were added to the Indian Constitution by 42nd amendment in 1976. The Fundamental Duties are contained in Art. 51A of Indian Constitution.

73. How many seats are there in state legislation assembly in Madhya Pradesh ?
(A) 228 (B) 229 (C) 230 (D) 231

Ans. (C)

74. On which date Indian Cosntitution came into effect ?
(A) 26 January 1949 (B) 26 January 1950 (C) 26 November 1949 (D) 26 November 1950

Ans. (B)

Sol. Indian constitution was adopted on 26th November 1949 and came into effect on 26th January 1950.

75. The Chief Election Commissioner of India is appointed by -
(A) President (B) Prime Minister (C) Governor (D) Speaker of Lok Sabha

Ans. (A)

Sol. The President of India based on a recommendation from the Government of India appoints the Election Commissioners. They have tenure of six years, or up to the age of 65 years, whichever is earlier.

76. When was land reform programme introduced in India ?
(A) During Vedic Period (B) During Mughal Period
(C) During British Period (D) After Independence

Ans. (D)

Sol. Land title formalization has been part of India's state policy from the very beginning. [1] Independent India's most revolutionary land policy was perhaps the abolition of the Zamindari system (feudal land holding practices).

77. Which five year plan is continuing in India, at present ?
(A) Fifth (B) Eleventh (C) Sixteenth (D) Twelfth

Ans. (D)

Sol. 12th Five year plan (2012-2017)

78. Who among the following was great exponent of Panchayati Raj System ?
(A) Mahatma Gandhi (B) Jawaharlal Nehru
(C) Shankar Dayal Sharma (D) Lalbahadur Shastri

Ans. (A)

Sol. Mahatma Gandhi emphasized greatly on rural development. The village is the basic unit of Gandhian ideal social order. Gandhi pointed out, "If the village perishes India will perish too".

79. As per development, Madhya Pradesh comes in which category ?
(A) Developed state (B) Under-developed state
(C) Developing state (D) Un-developed state

Ans. (B)

Sol. Despite remarkable achievements in agricultural sector, still M.P. falls in the category of under developed state.

80. 'Education' is included in which of the following sector ?
(A) Primary sector (B) Secondary sector (C) Tertiary sector (D) None of the above

Ans. (C)

Sol. Educational field is providing services and placed in tertiary sector.

81. If U is any universal set and A is the subset of U, then $A \cup A'$ =
(A) U (B) ϕ (C) A (D) A'

Ans. (A)

Sol. $A \cup A' = U$

82. In a two digit number, the number of ten's place is double of the number of unit's place. If we exchange the numbers mutually then the number decreases by 18, then the number is -
(A) 24 (B) 36 (C) 39 (D) 42

Ans. (D)

Sol. $(10x + y) - (10y + x) = 18$ (1)

$x = 2y$ (2)

$x - y = 2, x = 2y \Rightarrow y = 2, x = 4$

$\therefore 42$

83. If in a right angled triangle ABC $\tan B = \sqrt{3}$, then value of $\sin B$ and $\cos B$ is :

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

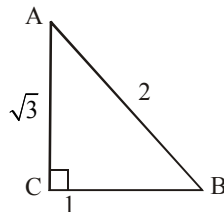
Ans. (D)

Sol. $AB = 2$ (Hypotenous)

$$\tan B = \frac{\sqrt{3}}{1}$$

$$\sin B = \frac{AC}{AB} = \frac{\sqrt{3}}{2}$$

$$\cos B = \frac{BC}{AB} = \frac{1}{2}$$



84. The cost price of a horse is Rs. 27,000 = 00 and transportation charges are Rs. 2,400 = 00. If horse is sold in Rs. 33,810=00. The percentage of profit will be :

- (A) 5% (B) 10% (C) 15% (D) 20%

Ans. (C)

Sol. C.P. + Over head expenses = Actual CP

$$27000 + 2400 = 29400$$

$$\begin{array}{r} \text{S.P.} = 33810/-, \text{ Profit} = \quad 33810/- \\ \quad \quad \quad \quad \quad \quad \quad \quad -29400/- \\ \quad \quad \quad \quad \quad \quad \quad \quad \text{-----} \\ \quad \quad \quad \quad \quad \quad \quad \quad 4410/- \end{array}$$

$$P\% = \frac{P}{CP} \times 100 = \frac{4410}{2940} \times 100 = 15\%$$

85. Two coins are tossed simultaneously, the probability of getting at least one head is -

- (A) $\frac{3}{4}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{3}{5}$

Ans. (A)

Sol. Sample space = {HH, HT, TH, TT} = 4

favourable = {HH, HT, TH} = 3

$$P(F_2) = \frac{\text{Fav}}{\text{Total}} = \frac{3}{4}$$

86. The volume of a cube is 2744 cm³. Its surface area is -

- (A) 196 cm² (B) 1176 cm² (C) 784 cm² (D) 588 cm²

Ans. (B)

Sol. Volume of cube = (side)³ = 2744

$$\Rightarrow \text{side} = 2744^{\frac{1}{3}}$$

$$\text{side} = 14$$

$$\text{S.A.} = 6a^2 = 6(\text{side})^2 = 6(14)^2 = 6 \times 196 = 1176 \text{ cm}^2$$

87. The height of an equilibrium triangle is $\sqrt{6}$ cm. Its area is -

- (A) $2\sqrt{2}$ cm² (B) $6\sqrt{2}$ cm² (C) $2\sqrt{3}$ cm² (D) $3\sqrt{3}$ cm²

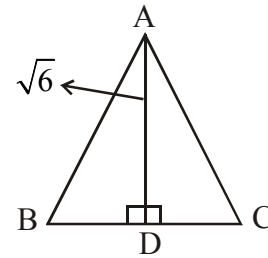
Ans. (C)

Sol. Height of equilateral $\Delta = \frac{\sqrt{3}}{2}a$

$$\sqrt{6} = \frac{\sqrt{3}}{2}a$$

$$a = 2\sqrt{2}$$

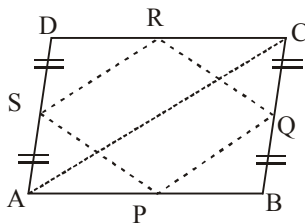
$$\text{Area of } \Delta = \frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times (2\sqrt{2})^2 = \frac{\sqrt{3}}{4} \times 4 \times 2 = 2\sqrt{3} \text{ cm}^2$$



88. The line segment joining the mid-points of the adjacent sides of a quadrilateral -

- (A) Parallelogram (B) Square (C) Rhombus (D) Rectangle

Ans. (A)



Sol.

$\Delta ABC \text{ PQ} \parallel AC$ (mid point theorem)

ΔADC

$RS \parallel AC$ (mid point theorem)

$\therefore PQ \parallel RS$, similarly $PS \parallel RQ$.

$\therefore PQRS$ is a Parallelogram

89. In a rhombus of side 10 cm, one of the diagonal is 12 cm long, the length of second diagonal will be-

- (A) 4 cm (B) 8 cm (C) 12 cm (D) 16 cm

Ans. (D)

Sol. $AB \perp DC$ (Diagonal of parallelogram bisects each other at 90°)

$$\therefore AO = OC = 6 \text{ cm}$$

& $OB = OD$

$$\text{In } \Delta COB \Rightarrow OD^2 + OC^2 = DC^2$$

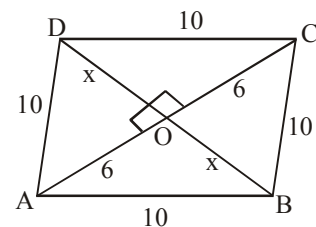
$$CD^2 = 6^2 + 10^2$$

$$OD^2 = 64$$

$$OD = 8$$

& $OB = 8$

$$\therefore BD = 16 \text{ cm}$$



90. If the vertices of a triangle ABC are (0, 6), (-5, 3) and (3, 1) respectively. Then triangle is -
 (A) Isosceles (B) Equilateral (C) Right angled (D) None of these

Ans. (A OR C)

Sol. $AB = \sqrt{25+9} = \sqrt{34}$

$BC = \sqrt{64+4} = \sqrt{68}$

$AC = \sqrt{9+25} = \sqrt{34}$

$\therefore AB = AC$

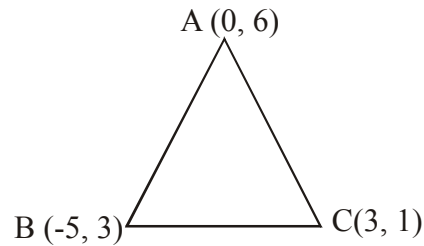
Isosceles Δ

$m_1 = \frac{6-3}{0+5} = +\frac{3}{5}$

$m_2 = \frac{6-1}{0-3} = -\frac{5}{3}$

$\therefore m_1 m_2 = -1$

\therefore right angle isosceles triangle



91. y-axis divides the line joining the points P(-4, 2) and Q(8, 3) in the ratio :

- (A) 3 : 1 (B) 1 : 3 (C) 2 : 1 (D) 1 : 2

Ans. (D)

Sol. $\frac{A \quad K P \quad B}{(-4, 2) \quad (0, y) \quad (8, 3)}$

$\frac{8K - 4}{K + 1} = 0$

$K = \frac{1}{2} \therefore 1 : 2$

92. $\cos^4 x - \sin^4 x =$

- (A) $2 \sin^2 x - 1$ (B) $1 - 2 \cos^2 x$ (C) $\sin^2 x - \cos^2 x$ (D) None of these

Ans. (D)

Sol. $\cos^4 x - \sin^4 x = (\cos^2 x + \sin^2 x)(\cos^2 x - \sin^2 x)$

$= \cos^2 x - \sin^2 x$

93. $\sqrt{\frac{1+\sin \theta}{1-\sin \theta}} + \sqrt{\frac{1-\sin \theta}{1+\sin \theta}} =$

- (A) $\frac{2}{\sin \theta}$ (B) $\frac{2}{\cos \theta}$ (C) $\frac{2}{\tan \theta}$ (D) $\frac{2}{\cot \theta}$

Ans. (B)

Sol. $\sqrt{\frac{1+\sin \theta}{1-\sin \theta}} + \sqrt{\frac{1-\sin \theta}{1+\sin \theta}} = \frac{1+\sin \theta}{\cos \theta} + \frac{1-\sin \theta}{\cos \theta}$

$= \frac{2}{\cos \theta}$

94. If $\sin(A + B) = 1$ and $\cos(A - B) = \frac{\sqrt{3}}{2}$, then the values of A and B are :

- (A) $45^\circ, 45^\circ$ (B) $30^\circ, 45^\circ$ (C) $60^\circ, 30^\circ$ (D) $0^\circ, 90^\circ$

Ans. (C)

Sol. $\sin(A + B) = 1 \Rightarrow A + B = 90^\circ$

$$\cos(A - B) = \frac{\sqrt{3}}{2} \Rightarrow A - B = 30^\circ$$

$$\Rightarrow A = 60^\circ, B = 30^\circ$$

95. The roots of the equation $3x^2 - 4\sqrt{3}x + 4 = 0$ are :

- (A) Real and unequal (B) Real and equal (C) Imaginary (D) Real and Imaginary both

Ans. (B)

Sol. $3x^2 - 4\sqrt{3}x + 4 = 0$

$$(\sqrt{3}x - 2)^2 = 0$$

Real and equal

96. The perimeter of a rectangular field is 82 meters and area is 400 meter² ? Then the breadth of the field is :

- (A) 9 meter (B) 12 meter (C) 16 meter (D) 25 meter

Ans. (C)

Sol. $2(x + y) = 82, \quad x + y = 41$

$$xy = 400$$

$$x(41 - x) = 400$$

$$\Rightarrow x = 16 \text{ or } 25$$

$$\therefore \text{length} = 25, \text{ breath} = 16 \text{ m}$$

97. The difference of the squares of two numbers is 180. The square of the smaller number is 8 times the larger number.

The two numbers are

- (A) 32, 4 (B) 24, 8 (C) 16, 2 (D) 18, 12

Ans. (D)

Sol. $x^2 - y^2 = 180$

$$y^2 = 8x$$

$$\Rightarrow x^2 - 8x - 180 = 0$$

$$(x - 18)(x + 10) = 0$$

$$x = 18 \text{ or } -10$$

$$\therefore x = 18, y = 12$$

- 98.** The sum of squares of the two consecutive natural numbers is 421, the numbers are :
 (A) 14, 15 (B) 21, 22 (C) 9, 10 (D) 17, 18

Ans. (A)

Sol. $x^2 + (x + 1)^2 = 421$

$$2x^2 + 2x = 420$$

$$x^2 + x - 210 = 0$$

$$x^2 + 15x - 14x - 210 = 0$$

$$(x + 15) (x - 14) = 0$$

$$x = 14$$

∴ Numbers are 14, 15

- 99.** The system of equations -

$$x + 2y = 6, 3x + 6y = 18$$

(A) is inconsistent

(B) Has a unique solution

(C) Has an infinite numbers of solutions

(D) None of these

Ans. (C)

Sol. $x + 2y = 6$

$$3x + 6y = 18$$

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} = \frac{1}{3}$$

∴ Infinite solution

- 100.** If r is the radius of the base of a cylinder and h is the height of cylinder, then total surface area will be :

(A) $2\pi rh$

(B) $2\pi rh + 2\pi r^2$

(C) $\pi r^2 h$

(D) None of these

Ans. (B)

Sol. Total SA = $2\pi rh + 2\pi r^2$