

Date: 08/11/2015

Max. Marks: 100

SOLUTIONS

Time allowed: 90 mins

1. A stone is dropped from the tip of a tower with zero initial velocity. It reaches the ground in 4 second. Then the height of the tower is ($g = 9.8 \text{ ms}^{-2}$)
 (1) 176.4m (2) 78.4 m (3) 39.2 m (4) 384.1 m

Ans. (2)

Sol. $h = ut + \frac{1}{2}gt^2$

$h = 0 + 9.8 \times 8 = 78.4 \text{ m}$

2. The weight of the body is 19.6 N, the mass of the same body is ($g = 9.8 \text{ ms}^{-2}$)
 (1) 19.6 kg (2) 9.8 kg (3) 4 kg (4) 2 kg

Ans. (4)

Sol. $w = mg$

$m = \frac{19.6}{9.8} = 2 \text{ kg}$

3. A monkey is sitting in the pan of a spring balance kept in an elevator. The reading of the spring balance is maximum when the elevator
 (1) is in stationary (2) accelerate upwards (3) falls freely (4) accelerate downwards

Ans. (2)

Sol. When the lift is moving with uniform acceleration upwards, net force on it is $F_{\text{net}} = R' - mg$ [$R' = \text{apparent weight}$]
 $R' = ma + mg = m(a + g)$

4. Which one of the following body is having highest potential energy at a fixed point ?
 (1) a body of mass 2 kg is placed at a height of 6m (2) a body of mass 3 kg is placed at a height of 5m
 (3) a body of mass 4 kg is placed at a height of 4 m (4) a body of mass 5 kg is placed at a height of 3m

Ans. (3)

Sol. In option (3) $W = 16g \text{ J}$ which is maximum

5. The property of Anomalous Expansion water happens between the temperature
 (1) $0^\circ\text{C} - 4^\circ\text{C}$ (2) $0^\circ\text{F} - 4^\circ\text{F}$ (3) $0\text{K} - 4\text{K}$ (4) $0^\circ\text{C} - (-4^\circ\text{C})$

Ans. (1)

Sol. As the temperature increase from 0°C to 4°C , water contracts and thus its density increases. This is anomalous expansion of water.

6. An object is placed at a distance of 20 cm in front of a concave mirror of focal length 20 cm. The image formed is
 (1) Virtual and inverted (2) Real, inverted and diminished
 (3) Real and erect (4) Real, inverted and same size as the object

Ans. N/A

Sol. The object is placed at the focus of the concave mirror. The image formed is real, inverted and highly enlarged.

7. Which of the following factor does not affect the velocity of sound ?
 (1) Elasticity of the medium (2) Density of the medium
 (3) Pressure of the medium (4) Humidity of the medium

Ans. (3)

Sol. Pressure of the medium does not affect the velocity of sound in the medium.

8. The direction of magnetic field lines produced in a current carrying conductor can be determined by
 (1) Right hand thumb (grip) rule (2) Fleming's left hand rule
 (3) Fleming's right hand rule (4) Faraday's laws

Ans. (1)

Sol. Right hand thumb rule gives the direction of the magnetic field lines produced in the current carrying conductor.

9. Two bodies of masses 1 kg and 2kg are separated by a distance of 1m on the surface of the earth, then the gravitational force between these two bodies is
 (1) $1 \times 6.673 \times 10^{-11}$ N (2) $2 \times 6.673 \times 10^{-11}$ N (3) $3 \times 6.673 \times 10^{-11}$ N (4) $4 \times 6.673 \times 10^{-11}$ N

Ans. (2)

Sol. $F = \frac{GM_1M_2}{r^2} = \frac{6.67 \times 10^{-11} \times 1 \times 2}{1} = 2 \times 6.67 \times 10^{-11}$ N

10. A celestial object having huge amount of matter compressed into a very small region with intense gravitational field is
 (1) Black hole (2) Neutron star (3) Pulsars (4) Quasars

Ans. (1)

Sol. A celestial object having huge amount of matter compressed into a very small region with intense gravitational field is black hole.

11. The resistance of a wire of unit length and unit area of cross section is
 (1) Reactance (2) Conductance (3) Conductivity (4) Resistivity

Ans. (4)

Sol. $R = \rho \frac{\ell}{A}$

$R = \rho \frac{1}{1} = R = \rho$

12. An electric motor requires 220 V of alternating current to run but the supplied alternating voltage is 110 V. Then the device used to run the motor is
 (1) Diode (2) Transistor (3) Transformer (4) Capacitor

Ans. (3)

Sol. A transformer is a device that can increase or decrease the voltage [step up or step down]. Hence, transformer will be used.

13. A scientist wants to measure the value of acceleration due to gravity at a place, then the device selected by the scientist is
 (1) Dynamo (2) Radar (3) Simple pendulum (4) Transducer

Ans. (3)

Sol. For a simple pendulum,

$T = 2\pi \sqrt{\frac{\ell}{g}}$

If the length and time period of a simple pendulum is known, then g can be calculated from it.

14. The substance which is chemically resistant and can hold aqua regia
 (1) Ceramics (2) Glass (3) Fibre (4) Thermosetting plastic

Ans. (2)

Sol. Always keep aqua regia in glass container. Plastic containers or metal ones are not appropriate because they can react with this solution.

15. China dish is
 (1) Brittle and heat resistant (2) Durable and heat resistant
 (3) Brittle and corrosive (4) Durable and non-corrosive

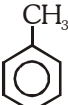
Ans. (2)

Sol. China dish is used for heating of solution so, it should be durable and heat resistant.

16. The structure of Toluene is represented by



Ans. (2)

Sol. The structure of toluene is 

17. In saponification process, the fatty acid present in the oils is neutralised by adding

- (1) Sodium hydroxide (2) Aluminium hydroxide (3) Calcium hydroxide (4) Magnesium hydroxide

Ans. (1)

Sol. In saponification reaction fatty acid are present in oil neutralised with alkali i.e. sodium hydroxide.

18. Diabetic patients sometimes use this artificial sweeteners

- (1) Glycerol (2) Cane Sugar (3) Brown Sugar (4) Molasses

Ans. (1)

Sol. Glycerol is an unusual sugar alcohol. It has only 40% of the sweetness of sugar and is safe to use for diabetic patients.

19. The technique through which Gold and Silver are refined ?

- (1) Electrolytic refining (2) Vacuum melting (3) Liquation process (4) Zone refining

Ans. (2)

Sol. Gold & Silver are refined by vacuum melting.

20. Identify the correctly matched set.

1. Football inflated inside and then taken outside on a winter day shrinks slightly a. Diffusion
2. Deep sea fish die when brought to law of the surface b. Graham's law of diffusion
3. A balloon filled with helium will deflate a little bit everyday c. Charle's law
4. $r \propto \frac{1}{\sqrt{d}}$ d. Boyle's law
- 1) 1 -b, 2-c, 3-a, 4-d 2) 1-d, 2-c, 3-b, 4-a 3) 1 -c, 2 - d, 3-a, 4 - b 4) 1-c. 2-d, 3-b, 4-a

Ans. (3)

Sol. Charle's law : $V \propto T$ (P = constant)

Boyle's law : $P \propto \frac{1}{V}$

Graham's law of diffusion

Rate of diffusion (r) $\propto \frac{1}{\sqrt{\text{density}} \sqrt{d}}$

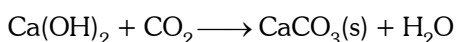
Intermixing of gas is called diffusion.

21. The shining finish is given to the walls is given by

- (1) Calcium oxide (2) Calcium Carbonate (3) Calcium hydroxide (4) Carbon-di-oxide

Ans. (2)

Sol. Calcium carbonate is formed after two or three days of white washing and gives a shiny finish to the walls.



22. This does not possess water of crystallisation.
(1) Potassium nitrate (2) Gypsum (3) Copper sulphate (4) Cobalt chloride

Ans. (1)

Sol. Potassium nitrate - KNO_3
Gypsum = $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
Copper sulphate - $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
Cobalt chloride - $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$

23. Identify the wrong statement.

- (1) Higher the hydronium ion concentration, lower is the pH value
- (2) Universal indicator is used to judge how strong a given acid or base is
- (3) As the pH value increases from 7 to 14, it represents Increase in H^+ ion concentration in the solution
- (4) Values less than 7 on the pH scale represent an acidic solution

Ans. (3)

Sol. As the pH value increases from 7 to 14, OH^- ion concentration increases and it leads to the basic nature of solution.

24. This is not true regarding the micelle.

- (1) The micelle stay in solution as a colloid
- (2) Micelle will not come together to precipitate
- (3) There is ion-ion repulsion
- (4) The dirt suspended in the micelles is very difficult to get rinsed off

Ans. (4)

Sol. The soap micelles help in dissolving the dirt in water and we can wash out clothes easily.

25. This is not a characteristic of members of a homologous series.

- (1) They possess varying chemical properties
- (2) Their properties vary in regular and predictable manner
- (3) Their formulae fit the general molecular formula.
- (4) Adjacent members differ by one carbon and two hydrogen atoms

Ans. (1)

Sol. All the members of homologous series show similar chemical properties e.g. substitution reaction is shown by all alkanes.

26. The electronic configuration of copper can be represented in this/these way/ways

1. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$
2. $[\text{Ar}] 3d^{10} 4s^1$
3. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$

- (1) Only 1 & 2 are correct (2) Only 2 is correct (3) Only 2 and 3 are correct (4) Only 1 and 3 are correct

Ans. (1)

Sol. Electronic configuration of Cu - $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$.

or

$[\text{Ar}] 3d^{10} 4s^1$

Due to stability of fulfilled orbitals.

27. Which one of the following is correct matched set?

- | | |
|--------------|--------------------|
| A | B |
| a. Hemp | I. Medicinal Plant |
| b. Cocoa | II. Oil Plant |
| c. Leucas | III. Fodder Plant |
| d. Fenugreek | IV. Beverage Plant |
| e. Palm | V. Fibre Plant |
| | VI. Spice Plant |

- (1) a-V, b-IV, c-I, d-VI, e-II (2) a-VI, b-III, c-II, d-I, e-IV
(3) a-IV, b-II, c-VI, d-III, e-I (4) a-III, b-V, c-VI, d-II, e-I

Ans. (1)

Sol. a-V, b-IV, c-I, d-VI, e-II

28. Inflammatory reactions in allergy is brought about by
 (1) macrophages (2) plasma cells (3) adipose tissue (4) mast cells

Ans. (4)

Sol. In Inflammatory allergy reaction, mast cells release histamin, which allow more blood to the site.

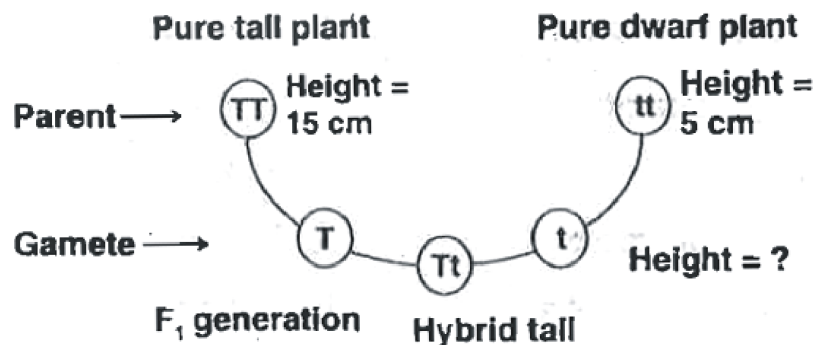
29. Assertion (A): Medulla oblongata controls involuntary activities like vomiting, coughing and sneezing.
 Reason (R): It has many nerve cells which control automatic reflexes.

- (1) 'A' is incorrect and 'R' is correct 'R' is not the correct explanation of 'A'
 (2) Both 'A' and 'R' are correct & 'R' explains 'A'
 (3) 'A' is correct and 'R' is incorrect 'R' is the correct, explanation of 'A'
 (4) Both 'A' and 'R' are incorrect 'R' is not the correct explanation of 'A'

Ans. (2)

Sol. Medulla oblongata controls involuntary action, it also has nerves of automatic reflexes.

30. Find out the height of hybrid tall plant (Tt).



- (1) 15 cm (2) 10 cm (3) 5 cm (4) Can't say

Ans. (1)

Sol. If height of tall plant is 15 cm then hybrid tall will also be 15 cm as per law of dominance

31. The animals which belong to class pisces

- A. Jellyfish B. Cow fish C. Starfish D. Flying fish
 (1) Both 'A' and 'C' (2) Both 'B' and 'D' (3) Both 'A' and 'D' (4) Both 'B' and 'C'

Ans. (2)

Sol. Both cow fish and flying fish belong to class pisces.

32. Which statement is not true about Thyroxin ?

- (1) Iron is very essential for the synthesis of Thyroxin
 (2) It regulates carbohydrates, proteins and fat metabolism in the body .
 (3) Thyroid gland requires iodine to synthesize thyroxin
 (4) Thyroxin is also called Thyroid hormone

Ans. (1)

Sol. Iron is not essential for thyroxine synthesis

33. World AIDS Day is held on this day every year to increase awareness about it

- (1) December 10th (2) December 21st (3) December 1st (4) December 31st

Ans. (3)

Sol. 1st december is known as world AIDS day.

34. When a doctor is recording pulse he/she is pressing on wrist exactly on a

- (1) Vein (2) Capillary (3) Artery (4) Arteriole

Ans. (3)

Sol. Pulse is the recording on the surface of artery.

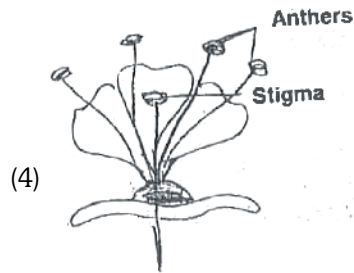
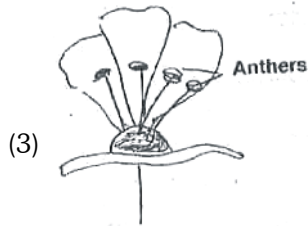
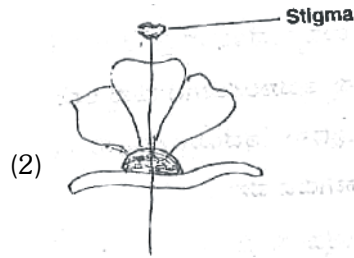
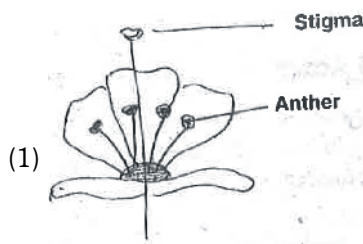
35. Living cells of Xylem tissue

- (1) Xylem parenchyma (2) Xylem fibres (3) Xylem vessels (4) Tracheids

Ans. (1)

Sol. Xylem parenchyma is living

36. Identify the flower which will self pollinate.



Ans. (4)

Sol. Both another and stigma are at the same height.

37. A pure tall plant can be identified from hybrid tall plant

- (1) by measuring the length of plant
- (2) by spraying Gibberellins
- (3) if all plants are tall after self pollination
- (4) if all plants are dwarf after self pollination

Ans. (3)

Sol. If all tall plants are tall after self pollination then it will be pure tall

38. An example for exotic breed of cow

- (1) Frieswal
- (2) Friesian
- (3) Gir
- (4) Sahiwal

Ans. (2)

Sol. Friesian is an exotic cow breed.

39. In a food industry, food containing oil is prepared and wants to avoid development of foul smell. The substance that need to be added

- (1) Antioxidants
- (2) Preservatives
- (3) Colourants
- (4) Flavourants

Ans. (1)

Sol. By adding antioxidants we can avoid foul smell.

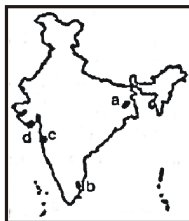
40. Sudden heritable change

- (1) Recombination
- (2) Mutation
- (3) Natural selection
- (4) Segregation

Ans. (2)

Sol. Mutation is the sudden heritable change.

41. Locations of trading centres of the Portuguese (P), the English (E), the Dutch (D) and the French (F) are shown in the map given below :



Which one of the following sets, represents the locations in the DPEF order ?

- (1) b, c, d, a
- (2) a, b, c, d
- (3) b, d, c, a
- (4) c, d, a, b

Ans. (4)

Sol. Puducherry was controlled by French while Bengal was controlled by English.

42. The map of unified Karnataka is given below :
Identify the shaded territory.



- (1) Old Mysore State (2) Mumbai Karnataka (3) Madras Karnataka (4) Hyderabad Karnataka

Ans. (N.A)

Sol. Period has not been mentioned in the question.

43. Assertion (A) : Trade capitalism flourished in European countries in 17 & 18th centuries.

Reason (R) : Indian economy was immensely benefitted by Industrial Revolution in England.

- (1) A is true but 'R' is false
(2) A is false but 'R' is true
(3) Both 'A' and 'R' are true, but 'R' is not the correct explanation of 'A'
(4) Both 'A' and 'R' are true, and 'R' is the correct explanation of 'A'

Ans. (1)

Sol. Indian economy was not benefitted by Industrial Revolution in England.

44. Identify the right set from the following :

Leaders

- (A) Rajaram Mohan Roy
(B) Dayanand Saraswathi
(C) Jyothiba Phule
(D) Mrs. Annie Besant

Important reforms

- (i) Universal brotherhood
(ii) Protest against untouchability
(iii) Blend of Indian and western thoughts
(iv) Prohibition of Sati
(v) Purification movement

- (1) A → v ; B → iii ; C → ii ; D → iv
(3) A → iv ; B → v ; C → ii ; D → i

- (2) A → iii ; B → iv ; C → i ; D → ii
(4) A → ii → ; B → (i) ; C → iii ; D → iv

Ans. (3)

Sol. Purification movement is associated with Dayanand Saraswati while prohibition of Sati is linked with Raja Rammohan Roy.

45. Pick out the wrong statement, with reference to the effects of the revolt of 1857.

- (1) The company administration came to an end in India
(2) India was made a colony of the British Empire
(3) India was granted 'Dominion Status', within the empire
(4) Queen Victoria's Declaration, assured Indian's of religious freedom

Ans. (3)

Sol. India was not granted Dominion Status in 1857.

46. Which of the following are correct, regarding the English education system in India ?

- (a) The Western science and technology were introduced in India
(b) The study of Western literature and history charged Indians with the spirit of nationalism
(c) Sanskrit and Persian educational institutions were fully patronised by the English
(d) English became the link language and promoted unity of Indians

- (1) a, b and d (2) c and d (3) a, c and d (4) b and c

Ans. (3)

Sol. Sanskrit and Persian was not patronised by English, British promoted English language.

47. Read the following statements :

- (a) promoting the use of indigenously produced goods in India
- (b) boycott of foreign goods
- (c) establishment of national educational institutions

Which one of the following movements represents the above mentioned characteristics ?

- (1) Home Rule (2) Swadeshi (3) Khilafat (4) Quit India

Ans. (2)

Sol. Swadeshi Movement emphasized on boycott of foreign goods and promotion of Indian made goods.

48. **Assertion (A) :** The Congress leaders boycotted the Simon Commission.

Reason (R) : Lala Lajpath Rai died due to police caning.

- (1) Both 'A' and 'R' are true, but 'R' is not the correct explanation of 'A'
- (2) 'A' is true but 'R' is false
- (3) 'A' is false but 'R' is true
- (4) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'

Ans. (1)

Sol. Simon Commission was boycotted because it was an all White Commission and no Indian was included.

49. Consider the statement given below and select the correct explanation from the responses given thereafter:

The National Conference Leader and Raja Hari Singh merged Kashmir into the Indian Union, in 1947.

- (1) Pakistan had communist Government
- (2) India was not a member of the American Block
- (3) India had a Democratic Republican Constitution
- (4) Pakistan was neutral in power politics

Ans. (2)

Sol. India was a part of Non Aligned Movement.

50. Which of the following statements are correct regarding the fall of the Soviet Union in 1991 ?

- (A) Rise of the U.S. A. as the lone super power
 - (B) The Commonwealth of Independent States (CIS) became a strong rival of the U.S.A.
 - (C) End of the cold war
 - (D) The CIS overpowered the U.S.A. in the field of space technology
- (1) A and B only (2) A and C only (3) B and D only (4) A and D only

Ans. (2)

Sol. After the fall of USSR, era of Cold War ended and USA became the lone Super Power.

51. The course of rise of modern China is depicted in the following flow diagram. Identify the correct sequence.



- (a) The Rise of People's Republic
 - (b) The Great Leap Forward
 - (c) The Long March
 - (d) Democratic Revolution under Sun-Yat-Sen
- (1) 1c, 2b, 3a, 4d (2) 1d, 2c, 3a, 4b (3) 1b, 2d, 3c, 4a (4) 1a, 2b, 3d, 4c

Ans. (2)

Sol. 1- Democratic Revolution under Sun-yat Sen

2- The Long March

3- The Rise of People's Republic

4- The Great Leap Forward

52. Assertion (A) : The RBI is called the Mother of Banks.

Reason (R) : The RBI formulates the monetary policy which should be followed by all other banks.

- (1) 'A' and 'R' are true and 'R' is the correct explanation of 'A'
- (2) 'A' and 'R' are true, but 'R' is not the correct explanation of 'A'
- (3) 'A' is true but 'R' is false
- (4) 'R' is true but 'A' is false

Ans. (1)

Sol. RBI frames the rules and regulations which are followed by all banks.

53. Which one of the following is not a feature of General Insurance?

- (1) risk is uncertain
- (2) law of indemnity is applicable
- (3) lumpsum payment of premium
- (4) it's for a long period

Ans. (4)

Sol. General Insurance is for a short period.

54. Consider the following list of business organisations of India :

- (a) Tata Consultancy Services
- (b) Iron and Steel Industry at Rourkela
- (c) Thermal Power Station at Raichur
- (d) Ashok Leyland Company
- (e) Karnataka Silk Industries Corporation
- (f) MTR Chain of Shops and Restaurants
- (g) SAM Tours and Travels
- (h) The ONGC (Oil and Natural Gas Commission)

Which of these are the outcome of entrepreneurship ?

- (1) a, c, f, g
- (2) c, d, g, h
- (3) a, d, f, g
- (4) b, d, f, h

Ans. (3)

Sol. B, C, E & H are government owned companies.

55. Which of the following are associated with globalisation ?

- (a) UNESCO
 - (b) INTELSAT
 - (c) I.L.O.
 - (d) W.T.O.
 - (e) BRICS
 - (f) W.I.P.O.
 - (g) I.M.F.
 - (h) M.N.C.'s
- (1) d, a, e, g
 - (2) d, f, g, h
 - (3) a, c, e, g
 - (4) b, c, e, h

Ans. (2)

Sol. IMF, WTO, MNCs and W.I.P.O. are meant for the promotion of international trade and hence are associated with globalisation.

56. Match column-I and column-II and identify the correct answer :

Column-I

Column-II

- (A) Udhampur
 - (B) Ranlkhet
 - (C) Burzil
 - (D) Ladakh
- (i) Hill Station
 - (ii) Plateau
 - (iii) Dune
 - (iv) Mountain Pass

- (1) (A) → (iv) ; (B) → (ii) ; (C) → (iii) ; (D) → (i)
- (2) (A) → (iii) ; (B) → (i) ; (C) → (iv) ; (D) → (ii)
- (3) (A) → (ii) ; (B) → (iii) ; (C) → (iv) ; (D) → (i)
- (4) (A) → (i) ; (B) → (iv) ; (C) → (ii) ; (D) → (iii)

Ans. (2)

Sol.

Column-I

Column-II

- Udhampur
 - Ranlkhet
 - Burzil
 - Ladakh
- Dune
 - Hill Station
 - Mountain Pass
 - Plateau

57. The highest peak in the Eastern Ghats is

- (1) Anaimudi
- (2) Mt. Gurushikar
- (3) Astamba Dhongar
- (4) Arnakonda

Ans. (4)

Sol. Highest peak in Eastern Ghats is Arnakonda.

58. Identify the correct matching :

- | | |
|-------------------|----------------------------|
| (A) Kandla | Tidal Port of India |
| (B) Vishakapatnam | Deepest Port of India |
| (C) Paradeep | Substitute Port of Kolkata |
| (D) Karwar | Seabird Naval Port |

- (1) A B and D (2) A,C and D (3) A Band C (4) B and D

Ans. (1)

Sol. Kandla- Tidal Port, Vishakhapatnam - Deepest Port, Karwar - Sea Bird Naval Port

59. Circar Coast is

- | | |
|---|---|
| (1) Northern part of West Coastal plain | (2) Southern part of East Coastal plain |
| (3) Northern part of East Coastal plain | (4) Southern part of West Coastal plain |

Ans. (3)

Sol. Northern part of Eastern Coastal Plain is Circar, southern part is Coromondal.

60. The place which experiences minimum and maximum temperature of -28.3°C and 15°C respectively is

- | | | | |
|--------------|---------|-----------|----------|
| (1) Srinagar | (2) Leh | (3) Simla | (4) Kulu |
|--------------|---------|-----------|----------|

Ans. (2)

Sol. Leh

61. Match the lakes on the map of India (I, II, III, IV) with their respective names;



- | | | | |
|--|--|-------------|---------|
| (A) Sambhar | (B) Chilka | (C) Kolleru | (D) Nal |
| (1) A \rightarrow II, B \rightarrow IV, C \rightarrow III, D \rightarrow I | (2) A \rightarrow IV, B \rightarrow III, C \rightarrow I, D \rightarrow II | | |
| (3) A \rightarrow II, B \rightarrow III, C \rightarrow IV, D \rightarrow I | (4) A \rightarrow I, B \rightarrow II, C \rightarrow III, D \rightarrow IV | | |

Ans. (1)

Sol. Sambhar Lake - Rajasthan
Chillka Lake - Odisha
Kolleru Lake - Tamil Nadu
Nal - Gujarat

62. Column-I is the list of States and Column-II is the names of rainfall during April and May. Match it

- | Column-I | Column-II |
|--|--|
| (A) Kerala | (i) Andhis |
| (B) Karnataka | (ii) Kalabaisakhl |
| (C) Uttar Pradesh | (iii) Coffee blossoms |
| (D) West Bengal | (iv) Mango Showers |
| (1) A \rightarrow (iii), B \rightarrow (iv), C \rightarrow (ii), D \rightarrow (i) | (2) A \rightarrow (i), B \rightarrow (ii), C \rightarrow (iii), D \rightarrow (iv) |
| (3) A \rightarrow (iv), B \rightarrow (iii), C \rightarrow (i), D \rightarrow (ii) | (4) A \rightarrow (ii), B \rightarrow (i), C \rightarrow (iv), D \rightarrow (iii) |

Ans. (3)

Sol. Kerala - Mango Showers
Karnataka - Coffee Blossoms
U.P. - Aandhi
West Bengal - Kaal Baisakhi

63. Read these statements and Identify the type of forests.

- (i) They are seen in 75-250 cm of rainfall areas
- (ii) They covered 66% of the total area of forests in India
- (iii) Teak, Sal, Rosewood and Sandalwood are important trees

(1) Evergreen Vegetation (2) Tropical Grassland (3) Alpine forests (4) Tropical Deciduous forests

Ans. (4)

Sol. All the characteristics are of Tropical Deciduous Forests.

64. Assertion : (A) Tank Irrigation is practised in Tamil Nadu.

Reason : (R) The slope of the terrain does not permit canal irrigation.

- (1) Both 'A' and 'R' are true and 'R' explanation of 'A'
- (2) Both 'A' and 'R' are true but 'R' does not explain of 'A'
- (3) 'A' is true but 'R' is false
- (4) 'A' is false but 'R' is true

Ans. (3)

Sol. Tamil Nadu lacks in rainfall. Perennial rivers are not present hence Tank Irrigation is practised.

65. Column-I is the list of States and Column-II is the mineral production.

Match it.

Column-I

Column-II

- | | |
|--------------------|-------------|
| (A) Jharkhand | (1) Mica |
| (B) Odisha | (2) Coal |
| (C) Andhra Pradesh | (3) Thorium |
| (D) Kerala | (4) Bauxite |

(1) A - 2, B - 4, C - 1, D - 3

(2) A - 3, B - 1, C - 4, D - 2

(3) A - 3, B - 4, C - 2, D - 1

(4) A - 1, B - 2, C - 3, D - 4

Ans. (1)

Sol. Jharkhand - Coal

Odisha - Bauxite

Andhra Pradesh - Mica

Kerala - Thorium

66. 'Slash and burn' primitive form of cultivation in Jharkhand is called

- (1) Bewar (2) Podu (3) Waltre (4) Kuruwa

Ans. (4)

Sol. Slash and Burn Agriculture is called "Kuruwa" in Jharkhand.

67. The practice of untouchability is dying down because of the gradual increase in

- (1) Income (2) Social status (3) Occupation (4) Literacy

Ans. (4)

Sol. Literacy levels are rising.

68. Read the statements and identify the correct answer:

- (i) It leads to sufficient expertise
- (ii) Training and skill
- (iii) Helped to earn economic benefits
- (iv) it creates economic strata

(1) Discrimination in Labour

(2) Division of Glass

(3) Division of Labour

(4) Unemployment

Ans. (3)

Sol. All the characteristics define the Division of Labour.

69. Organized and directed towards specific goal its aims to bring about social change is called
(1) Movement (2) Mobs (3) Riots (4) Group Clashes

Ans. (1)

Sol. Movements aim to bring about social change.

70. Industrialists will have to mandatorily contribute Rs. 20,000 per child labour to the welfare fund who violate the law of

- (1) Rehabilitation Welfare Fund of Child Labours
- (2) Child Labour Prohibition and Control Act, 1986
- (3) National Child Labour Project, 1983
- (4) Child Labour Eradication and Rehabilitation Act, 2006

Ans. (2)

Sol. Child Labour Prohibition and Control Act, 1986 has the following provision.

71. "This World in arms is not spending money alone ; It is spending the sweat of its Labourers, genius of its scientists, the hopes of its children" - This statement is given by

- (1) Mahatma Gandhiji (2) Eisenhower (3) Nelson Mandela (4) Jawaharlal Nehru

Ans. (2)

Sol. Eisenhower said these lines.

72. India is facing intense Economic inequality. The main reasons for it

- (A) Operation of multinational companies (B) High Salary Syndrome
- (C) Principle of Progressive Taxation (D) White collar jobs
- (E) Reservation Facilities

Which of the above statements are True ?

- (1) A, B and E (2) B, D and E (3) A, B and D (4) C, D and E

Ans. (3)

Sol. *

73. Column–A is the list of Agencies of UNO, Column–B is the list of years of establishment and Column–C is the list of Head Quarters.

Column–A	Column–B	Column–C
A. FAO	E. 1948	I. Paris
B. WHO	F. 1947	J. Rome
C. UNESCO	G. 1945	K. Washington
D. IBRD	H. 1946	L. Geneva

Which one of the following correctly matched set ?

- (1) AEL, BGK, CFJ, DHI (2) AGJ, BEL, CHI, DFK (3) AHI, BFJ, CGK, DEL (4) AHK, BEI, CFJ, DGL

Ans. (4)

Sol. FAO - formed in 1945, HQ at Rome

WHO - formed in 1948. HQ at Geneva

74. Which one of the following is correctly matched?

- A Kargil War – India and Pakistan
- B. Panchasheela – India and China
- C. LTTE – India and Nepal
- D. Twenty Years Treaty of Co-operation – India and Russia

Choices:

- (1) A, B and C only (2) A, C and D only (3) B, C and D only (4) A, B and D only

Ans. (4)

Sol. LTTE - Between India and Sri Lanka

- 75.** Read the following.
- A. It divided the World into two power blocs after II world war
 - B. America and Russia took the leadership of these blocs
 - C. Polarization of power took place under the concepts of Democracy and Communism
 - D. India was neutral in it

Which one of the following represents the above characteristics?

- (1) Colonialism (2) Disarmament (3) Terrorism (4) Cold War

Ans. (4)

Sol. All the features describe Cold War.

- 76.** Identify the correct combination of statements related to 'NITI' Ayoga.

- A. Substitute Institution of National Planning Commission
- B. Established on 01 January 2015
- C. Finance Minister of Govt. of India is a Chairman of this Institute
- D. Sindhushree Khullar appointed as the Chief Executive Officer of this institute

- (1) A, B and D only (2) A and B only (3) B, C and D only (4) A, B and C only

Ans. (2)

Sol. Prime Minister head of the NITI Aayog.

- 77.** Identify the correct choice of matched Items in Column-'A' with those of Column-B

Column-A

Column-B

- | | |
|----------------------|-----------------------------------|
| A. White Revolution | i. Production of Eggs |
| B. Silver Revolution | ii. Production of Oil seeds |
| C. Golden Revolution | iii. Production of Milk |
| D. Red Revolution | iv. Production of Meat |
| | v. Production of Flowers / Fruits |

Choices :

- (1) A – i, B – iii, C – v, D – ii (2) A – iii, B – iv, C – i, D – ii
 (3) A – i, B – iii, C – v, D – iv (4) A – iii, B – i, C – v, D – iv

Ans. (4)

Sol. White Revolution - Milk Production

Silver Revolution - Production of Eggs

- 78.** The main objective of 'PURA' project is

- (1) to provide shelter for shelterless people in Urban areas
- (2) to eliminate rural poverty and unemployment
- (3) to provide Urban amenities in rural areas
- (4) expansion and modernization of Urban areas

Ans. (3)

Sol. "PURA" aims to provide Urban Amenities in rural areas.

- 79.** Choose the correct sequence to indicate the following statements as True (T) or False (F).

- A. In Public Finance Government calculates their income before hand and then spend it accordingly
- B. Public Financial transactions are kept confidential
- C. In Public Finance, when government saves money, growth is stunted

Choices:

- (1) TTF (2) FFT (3) T F T (4) F T F

Ans. (3)

80. The following is the list of taxes imposed by government

- A. Excise duty
- B. Income Tax
- C. Corporate Tax
- D. Stamp Duty
- E. Service Tax
- F. Import-Export Tax

Which one of the following groups indicates direct and indirect Taxes respectively ?

- (1) ADE and BCF (2) BEF and ACD (3) BCD and AEF (4) ABF and CDE

Ans. (3)

Sol. Direct Taxes - Income Tax and Corporate Tax

Indirect Taxes - Excise Duty and Service Tax

81. If m and n are the roots of $x^2 - px + q = 0$ then the value of $p^3 - 3pq$ is

- (1) $m^3 + n^3$ (2) $m^3 - n^3$ (3) $m^3 + n^3 + mn$ (4) $m^3 - n^3 + mn$

Ans. (1)

Sol. $x^2 - px + q = 0$

Let m, n are the roots.

$$\therefore m + n = p$$

$$mn = q$$

$$\begin{aligned} \therefore p^3 - 3pq &= (m + n)^3 - 3(m + n)(mn) \\ &= m^3 + n^3 \end{aligned}$$

82. There are 10 points in a plane of which 4 are collinear, the maximum number of straight line that can be drawn from these points will be

- (1) 40 (2) 45 (3) 46 (4) 36

Ans. (1)

Sol. Maximum number of straight line = ${}^{10}C_2 - {}^4C_2 + 1$

$$= \frac{10 \times 9}{2} - \frac{4 \times 3}{2} + 1$$

$$= 45 - 6 + 1 = 40$$

83. $\sqrt{8 + 2\sqrt{15}} - \sqrt{8 - 2\sqrt{15}}$ is

- (1) $2\sqrt{5}$ (2) $\sqrt{8}$ (3) $\sqrt{12}$ (4) $\sqrt{5}$

Ans. (3)

Sol. $\sqrt{(\sqrt{5} + \sqrt{3})^2} - \sqrt{(\sqrt{5} - \sqrt{3})^2}$

$$\sqrt{5} + \sqrt{3} - \sqrt{5} + \sqrt{3} = 2\sqrt{3} = \sqrt{12}$$

84. 'O' is a point in the ΔABC , OA, OB and OC are jointly and produced to meet BC, CA and AB at D, E and F

respectively, then the value of $\frac{OD}{AB} + \frac{OE}{BE} + \frac{OF}{CF}$ is

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

Ans. (NA)

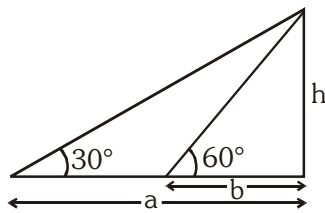
Sol. In this question the answer will come out when AD is given in the question in the place of AB. So none of the given option is correct.

85. The angle of elevation of the top of a tower from two points distant a and b ($a > b$) from its foot and in the same straight line from it are 30° and 60° . The height of the tower is

- (1) $a + b$ (2) \sqrt{ab} (3) $\sqrt{a - b}$ (4) ab

Ans. (2)

Sol.



$$\tan 60^\circ = \sqrt{3} = \frac{h}{b}$$

$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{h}{a}$$

$$h = \sqrt{3} b \quad \dots(1)$$

$$h = \frac{a}{\sqrt{3}} \quad \dots(2)$$

On multiplying eq. (1) & (2) we get,

$$h^2 = \sqrt{3} b \cdot \frac{a}{\sqrt{3}} = ab$$

$$\Rightarrow h = \sqrt{ab}$$

86. $\sin A = \frac{1}{2}$ then $(\sin 2A - \cos A)$ is

- (1) $\frac{\sqrt{3}}{2}$ (2) $\frac{1}{2}$ (3) 1 (4) 0

Ans. (4)

Sol. As $\sin A = \frac{1}{2} = \frac{P}{H}$,

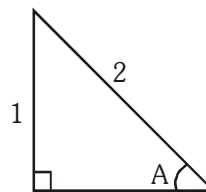
then using pythagoras theorem, we get

$$B = \sqrt{H^2 - P^2} = \sqrt{2^2 - 1^2} = \sqrt{3}$$

Then $\sin 2A - \cos A = 2\sin A \cos A - \cos A$

$$= 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2}$$

$$= \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} = 0$$



87. In an AP, the common difference is double the first term. If first term is 'a' then the n^{th} term is

- (1) $2an$ (2) $(2n + 1)a$ (3) $(2n-1)a$ (4) $2(n + 1)a$

Ans. (3)

Sol. $d = 2a$

$$n^{\text{th}} \text{ term} = a + (n - 1)d = a + (n - 1) 2a$$

$$= 2an - a$$

$$= (2n - 1)a$$

(Taking 'a' common from both term).

88. If the roots of the equation $x^2 - 2bx + 8 = 0$ are real, then 'b' must be

(1) $> 2\sqrt{2}$

(2) $< 2\sqrt{2}$

(3) > 0

(4) < 0

Ans. (1)

Sol. As roots are real

So $D > 0$

$b^2 - 4ac > 0$

$(-2b)^2 - 4 \times 1 \times 8 > 0$

$\Rightarrow 4b^2 - 32 > 0$

$\Rightarrow b^2 - 8 > 0$

$\Rightarrow (b + \sqrt{8})(b - \sqrt{8}) > 0$

$\Rightarrow \begin{array}{ccc} \oplus & \ominus & \oplus \\ | & | & | \\ -\sqrt{8} & & -\sqrt{8} \end{array} \Rightarrow b > \sqrt{8} \text{ or } b < -\sqrt{8} \Rightarrow b > 2\sqrt{2} \text{ and } b < -2\sqrt{2}$

So option '1' is correct.

89. Sum of the squares of two consecutive odd numbers added by 6 is always divisible by

(1) 5

(2) 6

(3) 8

(4) 9

Ans. (3)

Sol. $(2n - 1)$ & $(2n + 1)$ be

two consecutive odd integers.

$(2n - 1)^2 + (2n + 1)^2 + 6$

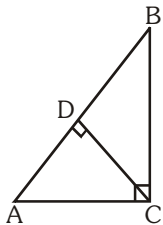
$= 4n^2 - 4n + 1 + 4n^2 + 4n + 1 + 6$

$\Rightarrow 8n^2 + 8$

$\Rightarrow 8(n^2 + 1)$

or this is divisible by 8.

90.



In $\triangle ABC$, $\angle ACB = 90^\circ$, $AC = 4$ and $BC = 3$ then the value of $CD \times AB$ is

(1) 20

(2) 15

(3) 12

(4) 10

Ans. (3)

Sol. Given : $\angle ACB = 90^\circ$

$AC = 4, BC = 3$

Using pythagoras theorem,

We get, $AB = 5$

Now $\triangle ACD \sim \triangle ABC$

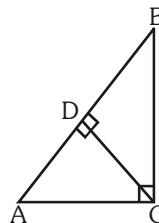
$\frac{AC}{AB} = \frac{CD}{BC} = \frac{DA}{AC}$

$\Rightarrow \frac{4}{5} = \frac{CD}{3}$

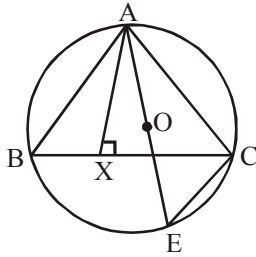
$\Rightarrow CD = \frac{12}{5}$

So, $AB \times CD = \frac{12}{5} \times 5 = 12$

Option '3' is correct.



91.



In the given figure 'O' is the centre of circle. If $AB = 6$ and $AC = 5$ then the product of AO and AX is

- (1) 15 (2) 20 (3) 25 (4) 30

Ans. (1)

Sol. As 'O' is centre, so AE is diameter

$$\Rightarrow \angle ACE = 90^\circ,$$

Also given $\angle AXB = 90^\circ$

Also, $\angle ABX = \angle AEC$ (angle subtended by same arc)

$\triangle ABX \sim \triangle AEC$ (by AA similarity)

$$\frac{AB}{AE} = \frac{BX}{EC} = \frac{AX}{AC}$$

As 'O' is centre, $AE = 2AO$

$$\frac{AB}{2AO} = \frac{BX}{EC} = \frac{AX}{AC}$$

$$2AO \times AX = AC \times AB$$

$$2 \times AO \times AX = 5 \times 6$$

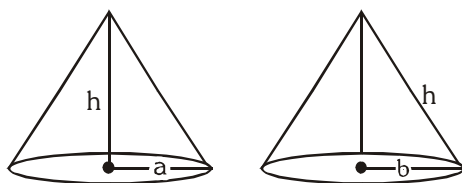
$$\Rightarrow AO \times AX = 15$$

92. Two solid right circular cones have the same height. The radii of their bases are a and b . They are melted and recast into a cylinder of same height. The radius of the base of the cylinder is

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

Ans. (4)

Sol.



$$\text{Volume of cones is} = \frac{1}{3} \pi [a^2 + b^2] h$$

$$\text{Volume of cylinder} = \pi r^2 h$$

(r is the radius of cylinder)

$$\frac{1}{3} \pi [a^2 + b^2] h = \pi r^2 h$$

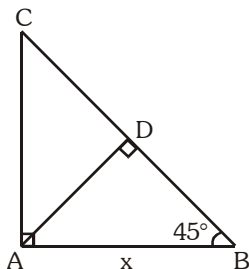
$$\sqrt{\frac{a^2 + b^2}{3}} = r$$

93. In $\triangle ABC$, $\angle BAC = 90^\circ$, $AD \perp BC$ and $\angle B = 45^\circ$, $AB = x$ then AD is

- (1) $\sqrt{2}x$ (2) x (3) $\frac{x}{2}$ (4) $\frac{x}{\sqrt{2}}$

Ans. (4)

Sol.



In $\triangle ADB$,
 $AD = BD$ ($\angle DAB = \angle DBA = 45^\circ$)
 So, $AD^2 + BD^2 = x^2$ (Pythagoras theorem)
 $\Rightarrow AD^2 + AD^2 = x^2$
 $\Rightarrow 2AD^2 = x^2$

$$AD = \sqrt{\frac{x^2}{2}} = \frac{x}{\sqrt{2}}$$

94. Bhavana is one among 7 Badminton player. The probability of selecting Bhavana as player in 5 players team is

- (1) $\frac{1}{7}$ (2) $\frac{2}{7}$ (3) $\frac{4}{7}$ (4) $\frac{5}{7}$

Ans. (4)

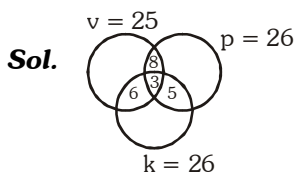
Sol. No. of favourable outcomes = 6C_4
 No. of total outcomes = 7C_5

$$\therefore \text{Probability} = \frac{{}^6C_4}{{}^7C_5} = \frac{5}{7}$$

95. In a survey of 60 people it was found that 25 people read newspaper 'V', 26 read news paper 'P', 26 read newspaper 'K', Nine of them read both 'V' and 'K', 11 read both 'V' and 'P', Eight read both 'P' and 'K', Three read all three newspapers. The number of people who read exactly one newspaper is

- (1) 22 (2) 30 (3) 52 (4) 77

Ans. (2)



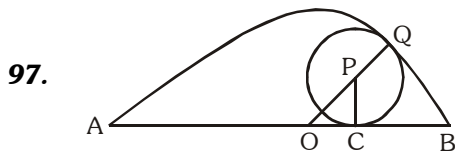
Sol.

$n(V \cap K) = 9$
 $n(V \cap P) = 11$
 $n(P \cap K) = 8$
 $n(V \cap K \cap P) = 3$
 So, $n(\text{exactly } v) = 25 - 8 - 6 - 3 = 8$
 $n(\text{exactly } p) = 26 - 8 - 3 - 5 = 10$
 $n(\text{exactly } k) = 26 - 6 - 3 - 5 = 12$
 so, $n(\text{exactly one}) = 8 + 10 + 12 = 30$

96. The Quotient obtained on dividing $(8x^4 - 2x^2 + 6x - 7)$ by $(2x + 1)$ is $(4x^2 + px^2 - qx + 3)$. The value of $(q - p)$ is
 (1) 0 (2) -2 (3) 2 (4) 4

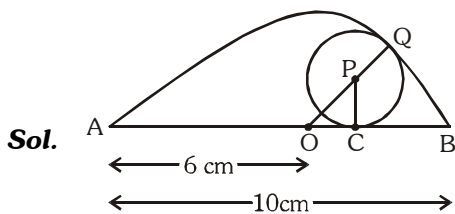
Ans. (NA)

Sol. Answer will come when $4x^3$ will be at place of $4x^2$ so according to question, none of the option is correct.



In the above figure O and P are centres of circles $AB = 10$ cm and $AC = 6$ cm then diameter of smaller circle is
 (1) 8 cm (2) 4.8 cm (3) 4 cm (4) 2 cm

Ans. (2)



So, $BC = AB - AC$
 $= 10 - 6 = 4$ cm

$OB = 5$ cm

$\therefore OC = 5 - 4 = 1$ cm

So, In $\triangle OPC$

$PC = r,$ $OC = 1$ cm

$OP = OQ - PQ = 5 - r$

$\therefore (5 - r)^2 = r^2 + 1^2$

$25 + r^2 - 10r = r^2 + 1$

$24 = 10r$

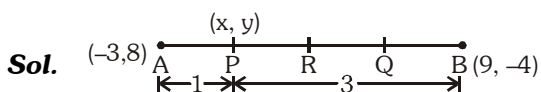
$r = 2.4$ cm

So, diameter = 4.8 cm

98. The points P, R and Q divide the line joining of $A(-3, 8)$ and $B(9, -4)$ into four equal parts. If 'P' is nearer to 'A', then 'P' is

- (1) $(6, -1)$ (2) $(3, 5)$ (3) $(0, 5)$ (4) $(-3, 5)$

Ans. (3)



so, $AP : PB = 1 : 3$

$\frac{9 - 3(-3)}{4} = x, x = 0; y = \frac{-4 - 24}{4} = -5$

99. A cone and a hemisphere have equal bases and equal volumes the ratio of the heights of cone and hemisphere is

(1) $1 : \sqrt{4}$

(2) $2 : 1$

(3) $4 : 1$

(4) $\sqrt{2} : 1$

Ans. (2)

Sol.
$$\frac{V_{\text{cone}}}{V_{\text{Hemisphere}}} = \frac{\frac{1}{3}\pi r^2 h}{\frac{2}{3}\pi r^3} = \frac{h}{2r}$$

Height of hemisphere \neq Height of cone

So, $1 = \frac{h}{2r}$

$h = 2r$

So, $\frac{h}{r} = \frac{2}{1}$ or $2 : 1$

100. The mean and variance of eight observations are 9 and 6.25 respectively. The standard deviation of these scores is

(1) 3

(2) 2.5

(3) 6.25

(4) 9

Ans. (2)

Sol. $\sqrt{\text{variance}} = \text{S.D}$

$\Rightarrow \text{S.D.} = \sqrt{6.25} = 2.5$