NATIONAL TALENT SEARCH EXAMINATION (NTSE-2019) STAGE -1 [PAPER CODE : D] STATE : HARYANA

Date: 04-11-2018

Max. Marks: 100 **SOLUTIONS** **Time allowed: 120 minutes**

1. Which of the following does not relate to the Non Cooperation Movement (1919) in India ?

(1) Renouncement of titles.

(2) To quit govt, schools and colleges by the students.

(3) Disobeying govt laws.

(4) Boycott of judicial courts by advocates.

Ans (3)

2. What does the novel 'Sevasadan' by Munshi Premchand mainly relate to ?

(1) Attrocities under colonial rule.

(2) Social problems like child marriage and dowry.

(3) Life of an orphan.

(4) Misries of a poor peasant.

Ans (2)

3. Which the following statements are correct regarding. Liberal Nationalism in 19th century Europe ?

(I) Right of Liberty and Equality

(II) Formation of people's govt

(III)Ownership of private property

(IV)Complete Control of govt, on all public and private property

(1) I, II, III (2) IV, III, I (3) III, IV, II (4) I, II, IV

Ans (1)

4. Which of the following statements are correct on Gandhiji's breaking the salt law to start Civil Disobedience Movements ?

(I) Salt was the need of rich and poor all.

(II) British Govt, levied tax on the salt.

(III) Only govt, agencies were allowed to make salt.

(IV) Lord Irwin abolished tax on salt.

(1) I, II, III (2) II, III, IV (3) III, IV, I (4) I, III, IV

Ans (1)

5. Which of the following statements are correct in relation to the great depression of 1929 in India ? It led to-

(I) Decline in trade

(II) Steep hike in wheat prices

(III) Growth in industrial investment.

(IV) Fall in jute prices.

(1) II, III, IV (2) I, II, III (3) I, III, IV (4) I, II, IV

Ans (3)

Direction : (Q. No. 6 to 9)

Read the statements and select the correct answer from the options given below.

(1) Statement I is true, Statement II is false.

(2) Statement I is false Statement II is true.

(3) Both Statements are true and statement II provides explanation to statement I.

(4) Both Statements are true but statement II does not provide explanation of statement I.

6. ***Statement I :*** Long years of war and the cost of extravagant court of the king drained the financial resources of France.

Statement II : Only the members of the third estate had to pay taxes to the state.

Ans (4)

7. ***Statement I :*** Russia's army lost badly in Germany and Austria in 1914-1916. All able bodied men were called to the war which led to scarcity of bread.

Statement II : Tsarist autocracy collapsed in 1917.

Ans (4)

8. ***Statement I :*** Railways were essential for colonial trade and for the movement of Imperial troops.

Statement II : The forests around. the railway tracks fast started disappearing.

Ans (4)

9. ***Statement I :*** Simon commission was opposed by all the political parties in India.

Statement II : Lord Irwin announced inclusion of 80% Indian members into the Simon Commission.

Ans (1)

10. Arrange the following historical developments in a chronological sequence -

(I) Unification of Germany. (II) Unification of Italy.

(III) The French Revolution. (IV) Treaty of Vienna.

(1) I, II, III, IV (2) III, IV, II, I (3) II, IV, III, I (4) IV, I, III, II

Ans (2)

(I) Unification of Germany (1871) (II) Unification of Italy (1870)

(III) The French Revolution (1789) (IV) Treaty of Vienna (1815)

11. Arrange the following historical developments in a chronological sequence -

(I) Poona Act.

(II) Lahore congress : demand of 'Puma Swaraj'.

(III) Establishment of 'oppressed class Association' by Sh. B. R. Ambedkar.

(IV) Second round table conference.

(1) I, II, III, IV (2) III, IV, II, I (3) II, III, IV, I (4) IV, II, III, I

Ans (3)

(I) Poona Pact (1932)

(II) Lahore congress : demand of 'Puma Swaraj' (1929)

(III) Establishment of 'oppressed class Association' by Sh. B. R. Ambedkar (1930)

(IV) Second round table conference (1931)

12. What does Mahatma Gandhiji's popular image in short dhoti and a spinning wheel depicts ?

(1) Self relience and resistance to use of British mill made cloth.

(2) Easy and convenient way of living.

(3) Living like a poor farmer in India.

(4) Depiction of an indigenous image.

Ans (1)

13. Certain minerals may occur as alluvial deposits in sands of valley floors and the base of hills. By which name these are known ?

(1) Placer deposits (2) Manganese nodules (3) Bromine (4) Malleable

Ans (1)

14. Other than current fallow land is known as -

(1) Left without cultivation for one or less than one agricultural year.

(2) Left uncultivated for the past 1 to 5 agricultural year.

(3) Area sown more than once in an agricultural year.

(4) None of the above.

Ans (2)

15. Which one of the following are not used into rain fed storage structures that allowed the water to stand ?

(1) Khadins (2) Johads (3) Pit (4) Palar Pani

Ans (4)

Palar Pani is the commonly used name for rainfall water in Rajasthan.

16. These are species whose population has declined are know as :

(1) Vulnerable species (2) Endangered species (3) Extinct species (4) None of the above

Ans (2)

17. To which one of the following types of vegetation does rubber belongs to ?

(1) Tundra (2) Himalayan

(3) Mangrove Forests (4) Tropical Evergreen Forests

Ans (4)

18. In which of the following state is the Manas Bio-reserve located ?

(1) Punjab (2) Assam (3) Kerala (4) Orisa

Ans (2)

19. The movement of the plates results in the building up of stresses within the plates and the continental rocks leading to -

(1) Erosion (2) Weathering (3) Folding (4) All above

Ans (3)

20. Which name is given to the periodic development of a warm ocean current along the coast of Peru as a temporary replacement of the cold Peruvian current ?

(1) Kaal Baisakhi (2) El-Nino (3) Monsoon (4) None of the above

Ans (2)

21. Which one of the following statement is not true ?

(1) Coal that has been burried deep and subjected to increases temperatures is bituminous coal.

(2) Large reserves of natural gas have been discovered in the krishana Godavri basin.

(3) The monazite sands of Tamil Nadu is also rich in Thorium.

(4) Photovoltaic technology converts sunlight directly into electricity.

Ans. (3)

The monazite sands of Kerala rich in Thorium.

22. In India this primitive form of cultivation is called by different names. Select the correct answer using the code given below -

(1) Madhya Pradesh	(i) Pama Dabi or Koman
(2) Odisha	(ii) Bewar or Dahiya
(3) In Western Ghats	(iii) Jhumming
(4) North-East region	(iv) Kumari

(1) 1 - ii, 2-i, 3-iv, 4 - iii (2) 1-i, 2—ii, 3—iii, 4-iv

(3) 1-ii, 2—iii, 3-iv, 4-i (4) 1—iii, 2-ii, 3-i, 4-iv

Ans. (1)

23. The following waterways have been declared as the National waterways by the Govt. Select the correct answer using the code given below -

(1) Allahabad and Haldia	(i) National Waterways No. 3
(2) Kottapuram Kollam	(ii) N. W. No.-4
(3) Kakinada-Puduchcrry stretch of canals	(iii) N. W. No.-2
(4) Sadiya and Dhubrt waterways	(iv)N. W No.-l

(1) 1- iv, 2 - i. 3-ii, 4-iii (2) 1-i, 2-ii, 3-iii, 4-iv

(3) 1—ii, 2—iii. 3-iv, 4-i (4) 1-iii. 2-iv, 3-ii, 4-i

Ans. (1)

24. Match the following:

The major iron-one belts in india	States
(1) Odisha-Jharkhand Belt	(i) Karnataka
(2) Durg-Bastar Chanderpur Belt	(ii) Goa and Maharashtra

(3) Ballari Chitradurga Chikkamangluru Turaakuru Belt (iii) Chattishgarh
(4) Maharasthra Goa Belt (iv) Odisa
(1) l-iv,2-iii.3 - ii, 4 - i (2) l-i,2-ii.3 - iii, 4 - iv
(3) l-ii,2-iv.3 - iii, 4 - i (4) l-iv,2-iii.3 - i, 4 - ii

Ans. (4)

25. Choose in correct statement from the following --

(1) Election of Indian president is direct.
(2) Election of the prime-minister is direct.
(3) Ministers are appointed by the President, on the advice of Prime-Minister.
(4) President presides over to cabinet meeting. ..

Ans. (3)

26. Which of the following is not a permanent member of security council ?

(1) Britain (2) U.S.A. (3) China (4) Germany

Ans. (4)

France, China, Russia, United Kingdom, United States are permanent member of security council.

27. Indian parliament's consists of-

(1) President, Vice President and Rajya Sabha (2) President, Lok Sabha and Rajya Sabha
(3) President and Rajya Sabha (4) President, Vice President and Lok Sabha

Ans. (2)

28. Choose the odd pair of personalities from the following -

(1) Mrs. Indira Gandhi and Narendra Modi (2) Balram Jakhar and Shivraj Patil
(3) Narendra Modi and Sumitra Mahajan (4) Dr. Rajendra Prasad and Dr. V. V. Giri

Ans. (3)

Mrs. Indira Gandhi and Narendra Modi - Prime Ministers of India.
Balram Jakhar (M.P.) Shivraj Patil (Punjab and Chandigarh)- Governors of India.
Narendra Modi (P.M.) and Sumitra Mahajan (Speaker of 16th Lok Sabha)

29. Which of the following statement is not correct ?

(1) Telengana is created from Orissa. (2) Uttrakhand is created from U. P.
(3) Jharkhand is created from Bihar. (4) Chattisgarh is created from M. P.

Ans. (1)

Telengana is created from Andhra Pradesh

30. Who presides the Joint session of Parliament ?

(1) President (2) Vice. President
(3) Speaker of Lok Sabha (4) Prime-Minister

Ans (3)

31. Which of the following is not a Political Party ?

(1) INC (2) BJP (3) AAP (4) RSS.

Ans (4)

RSS is the largest voluntary organisation in the world.

32. Which of the following is not a correct match ?

(1) U Thant - Burma (2) Kofi Annan - Ghana
(3) Boutros Boutros Ghali - Iran (4) Kurt Waldheim – Austria

Ans (3)

Boutros Boutros Ghali - was an egyptian Politician.

33. An industrialist Mr. Bajaj has made an investment of Rs. 10 lacs on education, Rs. 10 lacs on training and Rs. 5 lacs on medical care of the employees of his company. His efforts are towards strengthening to-

(1) Working capital (2) Human capital (3) Fixed capital (4) Capital growth

Ans (2)

34. If a. farmer's cost of production to produce one quintal of wheat is Rs. 1800, then Govt, of India has adopted a principle to have at least MSP as below -

(1) Rs. 2700 (2) Rs. 1800 (3) Rs. 3600 (4) Rs. 2000

Ans (1)

35. Assume, there are three families Zlives in a village. In ^ family of Mr. Ramlal Elder son Mr. Anil work on their fields jind younger son Mr. Sunil is lawyer in district r ^ court. In family of Mr. Shayamlal-I only son Mr. Dinesh work in a / nearby factory of making spare I parts of motorcycle as an engineer. In family of Mr. Mohanlal-has two daughters-Elder Monika is a insurance agent and yonger Seema runs her internet cafe.

Thus, what is the ratio of economic sectors in which people of this village are engaged.

(1) Primary-20%, Secondary-60%, Tertiary-20%

(2) Primary-60%, Secondary-20%, Tertiary-20%

(3) Primary-20%, Secondary-20%, Tertiary-60%

(4) Primary-20%, Secondary-20%, Tertiary-40%

Ans (3)

36. XYZ Bank has Rs.10000 crores public deposits and interested to utilize 7500 crores of its funds. In your opinon, which of the following activity do you find more better option for bank -

(1) by renovating all existing branches (2) by deposit it to central bank

(3) by opening many new branches (4) by extending loans

Ans (4)

37. Following are some activities -

(A) Giving seeds and fertilizers subsidy to the farmers

(B) Cultivating wheat

(C) Making atta from wheat

(D) Providing storage facility for the wheat

Out of the above, which activity/activities relates to primary sector -

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

Ans (3)

38. Income alone is not a completely adequate indicator of development of a country. Which one of the following statement is incorrect in this regard ?

(1) Money Cannot ensure a pollution free environment for individual.

(2) Some people earn more than others do.

(3) Money does ensure respect and dignity for individuals.

(4) Money helps us buy material goods and services only.

Ans (3)

39. Match Column I with the statement Column II

Column I	***Column II***
(A) Right to inform	(i) When I buy an electric inform iron and suffered electric shock while using it
(B) Right to choose	(ii) When I parceled a packet Choose from post office but not delivered yet
(C) Right to saftey	(iii) When I buy a shirt ,from Safety company outlet, instructions for washing it was tagged on it
(D) Right to seek redsessal	(iv) When I have taken a gas seek connection, dealer insisted redressal seek redsessal me to buy sieve from them with the connection but I denied

(1) A-i, B-ii, C-iii, D-iv

(2) A-ii, B-iv, C-i, D-iii

(3) A-iv, B-iii, C-ii, D-i

(4) A-iii, B-iv, C-i, D-ii

Ans (4)

40. There are a variety of ways in which__the MNCs are spreading their production and interacting with local producers in various countries across the world.

Which one is not feasible ?

(1) By setting up partnership with local companies

(2) By using the local companies for supplies By imposing restriction on trade of local companies

(3) By imposing restriction on trade of local companies.

(4) By closely competing with local companies or buying them

Ans (3)

41. 25 g of water contain -

1) 12×10^{23} atom of Hydrogen and 6×10^{23} atom of oxygen

(2) 5×10^{24} atoms of Hydrogen and 2.5×10^{24} atoms of oxygen

(3) 2.72×10^{23} atom of Hydrogen and 8.372×10^{23} atoms of oxygen

(4) 16.722×10^{23} atoms of Hydrogen and 8.362×10^{23} atoms of oxygen

Ans. (4)

Sol. No. of moles of water $= \frac{25}{18} = 1.38 \text{ mol}$

No. of water molecules $= \frac{25}{18} \times 6.023 \times 10^{23}$

$= 8.36 \times 10^{23}$ molecules

No. of Oxygen atoms $= 8.36 \times 10^{23}$

No. of Hydrogen atoms $= 2 \times 8.36 \times 10^{23}$

$= 16.72 \times 10^{23}$

42. Which of the following contain five molecule of water of crystallization?

(1) Blue Vitriol (2) White Vitriol (3) Epsom Salt (4) Green Vitriol

Ans. (1)

Sol. Blue Vitriol is $CuSO_4 . 5H_2O$

43. Digestive fluids in stomach has approximate pH of -

(1) 0 (2) 2 (3) 4 (4) 6

Ans. (2)

Sol. Concentration of acid is very high in digestive fluids in stomach. Therefore, approximate pH is 2.

44. When water gas mixed with half its volume of hydrogen and the mixture is compressed to 300 atm. pressure and passed over ZnO-Cr_2O_3 catalyst a colourless liquid is obtained which is used as solvent for paints & Varnishes. The liquid will be -

(1) Methanol (2) Ethanol (3) Ether (4) Acetone

Ans. (1)

Sol. $CO + 2H_2 \xrightarrow[300atm]{ZnO-Cr_2O_3} CH_3OH$

45. Which of the following arrangement represent increasing oxidation number of central atom (Mn, Cr, C*l*)?

(1) $MnO_4^-, CrO_4^{2-}, ClO_3^-, CrO_2^-$ (2) $ClO_3^-, CrO_4^{2-}, MnO_4^-, CrO_2^-$

(3) $CrO_2^-, ClO_3^-, CrO_4^{2-}, MnO_4^-$ (4) $CrO_4^{2-}, MnO_4^-, CrO_2^-, ClO_3^-$

Ans. (3)

Sol. $CrO_2^- < ClO_3^- < CrO_4^{2-} < MnO_4^-$

$Cr=+3< Cl=+5 <Cr=+6 < Mn=+7$

46. Which of the following is an oxide ore?

(1) Calcite (2) Zincite (3) Magnesite (4) Calamine

Ans. ***(2)***

Sol. Zincite is the mineral form of zinc oxide .

47. Which of the following statements are ***incorrect*** regarding Mendeleev's periodic table?

(a) Mendeleev considered compounds formed by element with oxygen and hydrogen.

(b) In the table *Ni* is placed before *Co*.

(c) Eka-silicon in Mendeleev's periodic table is gallium.

(d) The properties of elements are the periodic function of their atomic masses.

(1) Only (b) (2) Only (c) (3) Both (b) & (c) (4) Both (a) & (d)

Ans. ***(3)***

Sol. Ni is placed after Co and Eka-Silicon in Mendeleev's periodic table is Germanium.

48. Consider the two statements below one labelled as Assertion (A) and other as Reason (R). Examine these two statements carefully and decide if Assertion (A) and Reason (R) individually true and if so (R) is a correct explanation of (A) select your answer using the code below:

Assertion (A) : Magnesium imparts characteristic colour to the flame.

Reason (R) : Due to small size and high effective nuclear charge ionization enthalpy of magnesium is high.

(1) Both A & R are true and R is a correct explanation of A.

(2) Both A & R are true but R is not correct explanation of A.

(3) A is true, R is false.

(4) A is false, R is true.

Ans. ***(4)***

Sol. Magnesium does not impart any colour to the flame due to very high ionization energy.

49. ***Incorrect*** statement in regard to halogens is -

$HI>HBr>HCl>HF$

(1) Chlorine has the highest electron affinity in the group.

(2) Ionization energies of halogen are very low.

(3) Except fluorine they show an oxidation sate of –1 or +1.

(4) Acidic strength of hydrogen halides decrease in the order.

Ans. ***(2)***

Sol. Ionization energy of halogens are very high due to small size and high effective nuclear charge.

50. Reaction with sodium hydrogen carbonate can be used to distinguish between -

(1) Ethanoic acid & Methanoic acid

(2) Ethanol and Methanol

(3) Ethanol and Ethanoic acid

(4) Ethylacetate and Ethanol

Ans. ***(3)***

Sol. $C_2H_5OH + NaHCO_3 \rightarrow$ no reaction

$CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2(\uparrow) + H_2O$

In case of ethanoic acid, brisk effervescence of carbon dioxide are evolved.

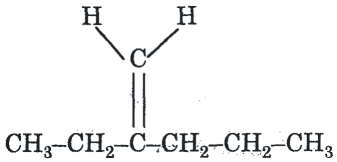
51. Rekha dropped a metal piece A in the solution of another metal B. After some time a new colourless compound C is formed. A,B,C respectively can be -

(1) Cu, $ZnSO_4$,$CuSO_4$ (2) Mg, NaCl, $MgCl_2$ (3) Mg, $CuSO_4$, $MgSO_4$ (4) Fe, $ZnSO_4$, $FeSO_4$

Ans. ***(3)***

Sol. $Mg(s) + CuSO_4(aq) \rightarrow MgSO_4(aq) + Cu(s)$

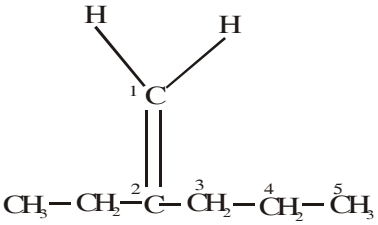
52. IUPAC name of following compound will be:



(1) 3-Methylene hexane (2) 2-Propyle-1-butene (3) 4-Ethyl-4-pentene (4) 2-Ethyl-1-pentene

Ans. ***(4)***

Sol.



53. In balanced chemical equation

a Cu + b HNO_3 (dil) $\longrightarrow$ c Cu $(NO_3)_2$ + dH_2O + *e* NO

Which of the following alternative are ***correct***?

(1) a=1, b=4, c=1, d=2, *e*=2 (2) a=3, b=4, c=3, d=1, *e*=1

(3) a=1, b=4, c=1, d=4, *e*=2 (4) a=3, b=8, c=3, d=4, *e*=2

Ans. ***(4)***

Sol. $3Cu + 8HNO_3\ (dil) \rightarrow 3Cu(NO_3)_2 + 4H_2O + 2NO$

54. A dynamometer D is attached to two masses m_1 = 3kg & m_2= 5 kg Forces of f_1 = 9 N & f_2 = 25 N are applied to the masses as shown: The dynàmometer will read -

(1) 10 N (2) 15 N (3) 14 N (4) 6 N

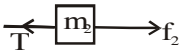
Ans. ***(2)***

Sol. Net force = 25–9 = 16 N

Net mass = m_1+m_2 = 8kg

$$\text{accleration} = \frac{16}{8} = 2\ m/s^2$$

F. B . D of m_2



$f_2 - T = m_2 \times a$.

$25 - T = 5 \times 2$

$T = 25 - 10 = 15$ N

55. A packet of weight W was allowed to fall freely in a water tank with acceleration 'a' (<g). The magntidue of resistance force offered by water is

(1) $w\frac{g}{a}$ (2) $w\frac{a}{g}$ (3) $w\left(1-\frac{a}{g}\right)$ (4) $w\left(1+\frac{a}{g}\right)$

Ans. ***(3)***

Sol. Weight of body = W

Let Resistive force = X

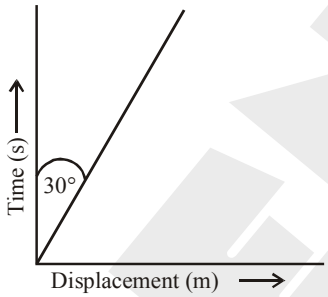
Net force = (W – X)

W – X = ma

W – ma = X

$X = W\left[1-\frac{a}{g}\right]$

56. The displacement time graph of a body in motion is given as below -



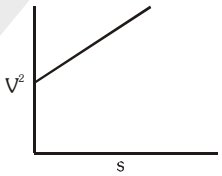
Velocity of body is (in m/s) -

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

Ans. ***(4)***

Sol. $\text{Velocity} = \frac{\text{Disp}}{\text{Time}} = \cot 60^\circ = \frac{1}{\sqrt{3}}$

57. V^2–S graph of moving body in a straight line is as shown in figure. Which one among the following is not true?



(1) Motion is uniformly accelerated. (2) Corresponding s-t graph will be parabola.

(3) Initial velocity of particle is zero (4) Velocity is time varying.

Ans. ***(3)***

58. The velocity of sound wave in a given medium is V when its frequency is v. The velocity, when frequency changes to 5v is -

(1) 5V (2) V/5 (3) 25V (4) V

Ans. ***(4)***

Sol. Velocity depend on elasticity and inertia hence the velocity will not change

59. A small block of material having relative density 1/3 is immersed in liquid & released. The block starts moving upwards with an acceleration, 'a'. The value of 'a' is (g is acceleration due to gravity) -

(1) g (2) 2g (3) 3g (4) 4g

Ans. ***(2)***

Sol. Density of block $= \frac{\rho}{3}$[ρ = Density of liquid]

Weight of block (W) $= \left(\frac{\rho}{3}\right)(v)\ (g)$

Buoyant force (B) $= \rho v g$

Net force $= B - W = \frac{2}{3}\rho v g$

$a = 2g$ (since mass of block $= \frac{\rho}{3} \times v$)

60. A wooden plank of length 'L' rests on a frictionless floor. A boy of mass 'M' now runs over the plank starting from its one end. If mass of wooden plank is M/5, the distance covered by the boy relative to the ground will be

(1) $\frac{L}{6}$ (2) $\frac{5L}{6}$ (3) $\frac{L}{5}$ (4) $\frac{4L}{5}$

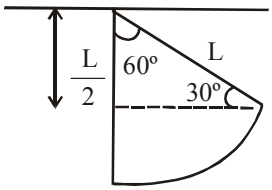
Ans. ***(2)***

Sol. Using concept of com distance covered by the boy relative to ground equal to $\frac{5L}{6}$

61. A rod of length '*l*' and mass 'm' fixed at one end, is hanging vertically. The other end is now raised so that the rod makes an angle 30° with horizontal line. The work done in this process will be -

(1) mg*l* (2) mg*l*/2 (3) mg*l*/3 (4) mg*l*/4

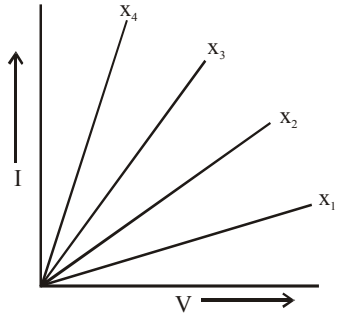
Ans. ***(4)***



Sol. Workdone in moving center of mass of Rod

$$\text{workdone} = \frac{\left[mg\frac{L}{2}\right]}{2} = \frac{mgL}{4}$$

62. Graph shown V-I Characteristics of two resistance their series combination & parallel combination. Identify the resistances values & graphs -



(1) x_1 x_2 x_3 x_4 (2) x_2 x_3 x_4 x_1

(3) x_3 x_2 x_1 x_4 (4) x_4 x_1 x_2 x_3

Ans. ***(3)***

Sol. $X_1 > X_2 > X_3 > X_4$ [For I – V Graph]

X_I = Series

X_4 = Parallel

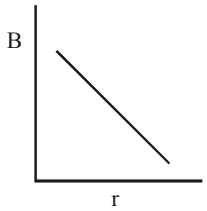
63. Two plane mirrors P & Q are kept are kept at ? with respect to each other. Light falls on P is reflected and then fall on Q and is reflected. The emergent ray is opposite to incident ray direction. The ? is equal to

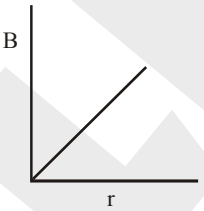
(1) 45° (2) 30° (3) 60° (4) 90°

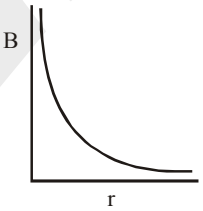
Ans. ***(4)***

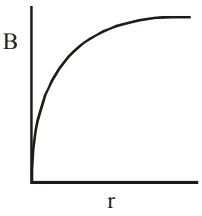
Sol. If angle between plane mirrors = 90° then incident and emergent ray are parallel to one another

64. The magnetic field intensity (B) at distance 'r' from a long straight conductor carrying a steady current varies with 'r' as shown in figure -

(1) 

(2) 

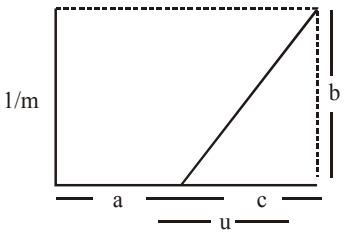
(3) 

(4) 

Ans. ***(3)***

Sol. $B \propto \frac{1}{\text{Distance from wire}}$

65. The graph in figure shown how the inverse of magnification (1/m) produced by a thin convex lens varies with object distance 'u'. The power of lens will be -



(1) b/c (2) b/ca (3) bc/a (4) c/b

Ans. ***(1)***

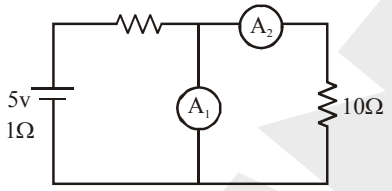
Sol. Power (P) = $\frac{1}{f}$; $\frac{1}{v}-\frac{1}{u}=\frac{1}{f}$; $\frac{1}{v}=\frac{u+f}{fu}$

$\frac{u}{v}=\frac{u+f}{f}$; $\frac{1}{m}=1+up$;

Slope of $\frac{1}{m}$. wrt u = Power (P)

Power (P) $=\frac{b}{c}$

66. In the circuit shown all the measuring instruments are ideal. The reading in ammeter A_2 will be



(1) 1/4A (2) 1A (3) < 1/4A (4) Zero

Ans. **(4)**

Sol. Since A1 and A2 are idial ammeter all current will pass through A_1. Hence no Current through A_2

67. Difference between systolic and diastolic blood pressure is known as

(1) blood pressure (2) cardiac output (3) pulse pressure (4) heartbeat

Ans. **(3)**

Sol. Pulse pressure is difference between systolic and diastolic blood pressure .If resting blood pressure is 120 / 80 mm Hg then pulse pressure is 40 mm Hg

68. About what percentage of living species are in danger of extinction?

(1) 20% (2) 10% (3) 30% (4) 1%

Ans. **(3)**

Sol. About 30% of living species are in danger of extinction.

69 Entry of water into roothairs is an example of

(1) Diffusion (2) Imbibition (3) Osmosis (4) Plasmolysis

Ans. **(3)**

Sol. Water is absorbed by the root hair cells by the process called osmosis.

70. Tendons & ligaments are types of tissue.

(1) muscular tissue (2) epithelial tissue. (3) nervous tissue (4) fibrous tissue

Ans. **(4)**

Sol. Tendons & ligaments are made up of white and yellow fibers.

71. The organ which spider use to prepare web is

(1) Spinnerates (2) Spicules (3) Spiracles (4) Carapace

Ans. **(1)**

Sol. Spider webs are made of silk , and are produced from spinnerets present at the end of spider's abdomen

72. Variations are important as they produce

(1) Adaptations (2) Elimination (3) Evolution (4) Selection

Ans. ***(3)***

Sol. Variations acts as raw material for evolution. Organisms with favourable variations adapt to changing environment and survive.

73. Mode of nutrition in cuscuta is

(1) Saprophytic (2) Autotrophic (3) Parasitic (4) Insectivorous.

Ans. ***(3)***

Sol. Cuscuta is a parasitic plant.

74. Structural and functional unit of kidney is

(1) Nephron (2) Ureter (3) Neuron (4) Urethra

Ans. ***(1)***

Sol. Nephron is the structural and functional unit of kidney.

75. Lateral ventricles are found in

(1) Cerebellum (2) Cerebral hemisphere (3) Diencephalon (4) Medulla oblongata

Ans. ***(2)***

Sol. Lateral ventricles are the cavities of the cerebral hemisphere.

76. Cessation of menstrual cycle is called

(1) Puberty (2) Menarche (3) Pregnancy (4) Menopause

Ans. ***(4)***

Sol. Cessation of menstrual cycle at an age of 45 to 50 years is known as menopause.

77. Exchange of gases in human occurs in

(1) Trachea (2) Pleura (3) Bronchi (4) Alveoli

Ans. ***(4)***

Sol. Exchange of gases in human occurs in alveoli.

78. Which of the following disease is only due to external causes ?

(1) Diabetes (2) Arthritis (3) Jaundice (4) Cataract

Ans. ***(3)***

Sol. Diabetes , Arthritis and Cataract are due to internal factors. Jaundice is caused by infection .

79. High yielding varieties of wheat were initially developed by an Indian scientist by cross breeding the traditional varieties with -

(1) Mexican Varieties (2) European Varieties (3) American Varieties (4) African Varieties

Ans. ***(1)***

Sol. High yielding varieties of wheat were developed by cross breeding the traditional varieties with Mexican varieties.

80. ILS–82 and B–77 breeds are of following -

(1) Cow (2) Fowl (3) Pig (4) Buffalo

Ans. ***(2)***

Sol. ILS-82 and B-77 breeds are of fowl.

81. The line segment joining the points A(2, –2) and B(–7, 4) is trisected at the points P and Q (P is nearer to A). If coordinates of P and Q are (a, o) and (–4, b) respectively, then the values of a and b are respectively -

(1) 1 and 2 (2) –1 and 2 (3) 1 and –2 (4) – 1 and –2

Ans. ***(2)***

Sol. A(2, -2) P(a, 0) Q(-4, b) B(-7, 4)

$$a = \frac{1\times 7 + 2\times 2}{3} = -1$$

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

$\therefore a = -1$ and $b=2$

82. $\frac{\cos\theta - \sin\theta + 1}{\cos\theta + \sin\theta - 1}$ is equal to

(1) $\sec\theta + \tan\theta$ (2) $\sec\theta - \tan\theta$ (3) $\text{cosec}\theta - \cot\theta$ (4) $\text{cosec}\theta + \cot\theta$

Ans. ***(4)***

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

$= \frac{\cot\theta - 1 + \text{cosec}\theta}{\cot\theta + 1 - \text{cosec}\theta}$ (dividing by $\sin\theta$)

$= \frac{\cot\theta + \text{cosec}\theta - (\text{cosec}\theta - \cot\theta)(\cot\theta + \text{cosec}\theta)}{(1 - \text{cosec}\theta + \cot\theta)}$

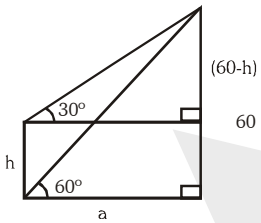
$= \cot\theta + \text{cosec}\theta$

83. From the top of a 60 m high tower, the angles of depression of the top and bottom of pillar are 30° and 60° respectively. Then the height of the pillar is -

(1) 20 m (2) $20\sqrt{3}$ m (3) 40 m (4) $40\sqrt{3}$

Ans. ***(3)***

Sol.



$\frac{60-h}{a} = \tan 30^0 = \frac{1}{\sqrt{3}}$

$\frac{60}{a} = \tan 60^0 = \sqrt{3}$

$\therefore \frac{60-h}{60} = \frac{1}{3}$

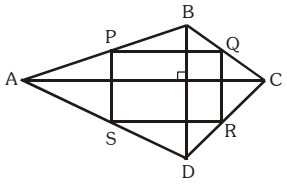
$\therefore h=40$ m

84. The diagonals of a quadrilateral ABCD are perpendicular to each other. Then the quadrilateral formed by joining the mid-points of its sides (in order) is a -

(1) kite (2) reactangle (3) rhombus (4) square

Ans. ***(2)***

Sol.



By Mid - Point Theorem :

PQ || AC and SR||AC

also PS|| BD and QR|| BD.

Also angle between PQ and PS = angle between AC and BD

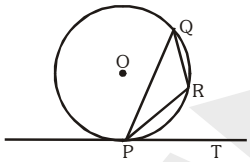
(since angle between lines = angle between their parallels)

$\therefore \angle P = 90^o$

Similarily, $\angle Q = \angle R = \angle S = 90^o$

$\therefore$ PQRS is a rectangle.

85. In figure, PQ is a chord of a circle with centre O and PT is its tangent at P. If $\angle QPT = 60^o$, then $\angle PRQ$ is -



(1) 105^o (2) 115^o (3) 120^o (4) 130^o

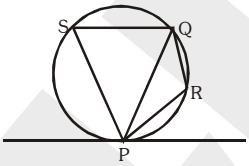
Ans. (3)

Sol. $\angle PSQ = 60^o$ (Alternate Segment Theorem)

$\because$ PRQS is cyclic quad.

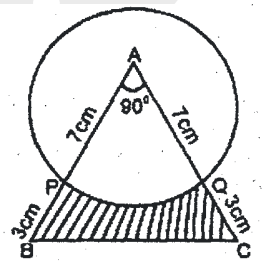
$\therefore \angle S + \angle R = 180^o$

$\therefore \angle PRQ = 120^o$



86. A momento is made as shown in the figure. Its base PBCQ is silver plated from the front side. The silver planted area is (use $\pi = \frac{22}{7}$)

(1) 11 cm^2 (2) 11.5cm^2 (3) 12.5cm^2 (4) 13 cm^2



Ans. (2)

Sol. Area of the shaded region

= area of ΔABC – area of sector

$$= \frac{1}{2} \times 10 \times 10 - \frac{90^o}{360^o} \times \frac{22}{7} \times 7 \times 7 = 11.5 cm^2$$

87. A bucket is in the form of a frustum of a cone and it can holds 28.49 litres of water. The radii, of the top and bottom of the bucket are 28 cm and 21 cm respectively. Then slant height of the bucket is - (use $= \frac{22}{7}$)

(1) 15 cm (2) $\sqrt{246}$cm (3) $\sqrt{253}$cm (4) $\sqrt{274}$cm

Ans. ***(4)***

Sol. ATQ $\frac{\pi}{3}\left(r_1^2 + r_2^2 + r_1 r_2\right)h = 28.49 \times 1000$

$\therefore h = 15\text{cm}$

$\ell^2 = h^2 + (r_1 - r_2)^2$

$\therefore \ell = \sqrt{274}$ cm

88. Two dice are thrown at the same time. The probability that, the sum of two numbers appearing on the top of the dice is greater than 6 but less than 9, is -

(1) $\frac{11}{36}$ (2) $\frac{1}{3}$ (3) $\frac{5}{6}$ (4) $\frac{4}{9}$

Ans. ***(1)***

Sol. sum = 7 or 8

7 = {(1, 6), (2, 5), (3, 4), (4, 3), (5, 2),(6, 1)} = 6 ways

8 = {(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)} = 5 ways

$\therefore$ required probability $= \frac{11}{36}$

89. A person can row a boat at 10 km/h in still water. He takes two and half hours to row from A to B and back. If the distance between A and B is 12 km, then the speed of the stream is -

(1) 3 km/h (2) $2\frac{1}{2}$km/h (3) 2 km/h (4) $1\frac{1}{2}$km/h

Ans. ***(3)***

Sol. x = 10 km/h

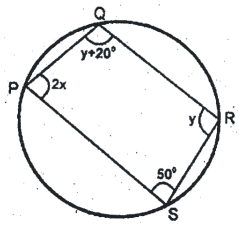
let speed of the stream = y km/h

$\therefore$ ATQ

$$\frac{12}{(x+y)} + \frac{12}{(x-y)} = \frac{5}{2}$$

$\therefore y = 2$ km/h

90. In the figure, points P, Q, R and S lie on a circle. Then the values of x and y are respectively -



(1) 40° and 100° (2) 35° and 110° (3) 50° and 80° (4) 30° and 120°

Ans. ***(2)***

Sol. Opposite angles of a cyclic quadrilatarial are supplementary

$\therefore 2x + y = 180^\circ$

$y + 20 + 50^\circ = 180^\circ$

$\therefore y = 110^\circ$

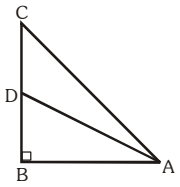
$x = 35^\circ$

91. In $\Delta\angle ABC$, $\angle ABC = 90^\circ$ and $\angle BAC = 60^\circ$. If bisector of $\angle BAC$ meets BC at D, then BD : DC is -

(1) 1 : 2 (2) 1 : $\sqrt{3}$ (3) 1 : $\sqrt{2}$ (4) 1 : 1

Ans. ***(1)***

Sol.



Let AB=a

$\therefore \frac{a}{AC} = \cos 60^\circ$

$\therefore AC = 2a$

$\frac{BC}{2a} = \sin 60^\circ = \frac{\sqrt{3}}{2}$

$BC = \sqrt{3}a$

$\frac{BD}{a} = \tan 30^\circ = \frac{1}{\sqrt{3}} \quad \therefore BD = \frac{a}{\sqrt{3}}$

$\therefore CD = BC - BD = \sqrt{3}\,a - \frac{a}{\sqrt{3}} = \frac{2a}{\sqrt{3}}$

$\frac{BD}{CD} = 1 : 2$

92. a and b are roots of the quadratic equation $x^2 + 5x + d = 0$ and a and c are roots of the quadratic equation $x^2 + 6x + 2d = 0$. If there is only one common root of the above two equations, then the possible value of d is-

(1) 2 (2) –2 (3) 4 (4) –4

Ans. ***(3)***

Sol. ATQ

$a^2 + 5a + d = 0$ .....(1)

$a^2 + 6a + 2d = 0$ .....(2)

subtracting (1) from (2)

$a = -d$

$\therefore (-d)^2 - 5d + d = 0$

$\therefore d = 4$

93. Sum of the lengths of all edges of a cube is x metres. If the surface area of the cube is x sq.metres; then its volume (in cubic metres) is -

(1) x^3 (2) 8 (3) x (4) 2

Ans. ***(2)***

Sol. ATQ $12a = x$

and $6a^2 = x$

$\therefore 6a^2 = 12a$

$\therefore a = 2$

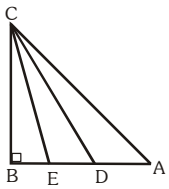
$\therefore V = 8$

94. ABC is a right angled triangle, right angled at $\angle B$. If side AB is divided into three equal parts by points D and E such that D is nearer to A, than $\frac{AC^2 - EC^2}{DC^2 - BC^2}$ is equal to -

(1) 3 (2) $2\frac{1}{2}$ (3) $2\frac{1}{4}$ (4) 2

Ans. ***(4)***

Sol.



Let AD= a and BC = b

$\therefore AC^2 - EC^2 = [b^2 + (3a)^2] - (b^2 + a^2) = 8a^2$

$DC^2 - BC^2 = (4a^2 + b^2) - (b^2) = 4a^2$

$\therefore \frac{AC^2 - EC^2}{DC^2 - BC^2} = \frac{8a^2}{4a^2} = 2$

95. There are 15 APs whose common differences are 1, 2, 3, ..., 15 respectively, the first term of each being 1. Then sum of their 15th terms is-

(1) 1695 (2) 1792 (3) 1800 (4) 1924

Ans. ***(1)***

Sol. a_{15} of 1st AP = $1 + 14\times1$

a_{15} of 2nd AP = $1 + 14\times2$

.

.

.

a_{15} of 15th AP = $1 + 14\times15$

$\therefore$ required Sum $= 1\times15 + 14(1 + 2 + 3+.....+15)$

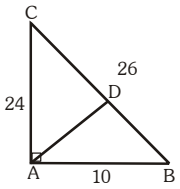
$15 + 14\times \frac{15\times16}{2} = 1695$

96. ABC is a triangle in which AB=10cm, AC=24cm and BC = 26cm. If AD is its median, then length of AD is -

(1) 12 cm (2) 12.5 cm (3) 13 cm (4) 14.75cm

Ans. ***(3)***

Sol.



since the sides (10, 24, 26) are Pythagorean triplet

$\therefore$ triangle ABC is a right angle triangle (angle A = 90^o).

Since , in a right angle triangle median is half of the hypotenuse

$\therefore$ AD = 13 cm

97. The decimal expansion of the number $\frac{14588}{8750}$ will -

(1) terminate after two decimal places
(2) terminate after three decimal places
(3) terminate after four decimal places
(4) not terminate

Ans. ***(3)***

Sol. $\frac{14588}{8750}=\frac{1042}{625}=\frac{1042}{5^4}=\frac{1042\times 2^4}{(5\times 2)^4}$

$\therefore$ the given fraction will terminate after four decimal places.

98. All the zeroes of the polynomial x^3+2x^2+a are also zeroes of the polynomial $x^5-x^4-4x^3+3x^2+3x+b$. Then, the values of a and b are respectively -

(1) –1 and 2 (1) –1 and –2 (2) 1 and –2 (3) 1 and 2
(4)

Ans. ***(2)***

Sol. ATQ (x^3+2x^2+a) will completely divide $x^5-x^4-4x^3+3x^2+3x+b$.

$$x^3+2x^2+a\overline{)x^5-x^4-4x^3+3x^2+3x+b}\ \Big|\ x^2-3x+2$$

$x^5+2x^4+ax^2$
$-\ -\ -$

$-3x^4-4x^3+(3-a)x^2+3x+b$
$-3x^4-6x^3-3ax$
$+\ +\ +$

$2x^3+(3-a)x^2+(3a+3)x+b$
$2x^3+4x^2+2a$
$-\ -\ -$

$-(a+1)x^2+(3a+3)x+b-2a$

since, the remainder is zero, therefore, cofficient of each term will be zero.

$\therefore\ a+1=0 \quad \therefore\ a=-1$

$b-2a=0 \quad \therefore\ b=2a$

$\therefore\ b=-2$

99. Present age of a father is six times his son's age. After four years, the age of the father will be four times his son's age. The present ages (in years) of the father and son are respectively

(1) 24 and 4 (2) 30 and 5 (3) 36 and 6 (4) 28 and 7

Ans. ***(3)***

Sol. ATQ $f = 6s$ ..... (1)

$f + 4 = 4(s+4)$ ..... (2)

from (1) & (2) $f = 36$ years & $s = 6$ years.

100. The largest number which divides 72 and 127 leaving remainders 7 and 10 respectively is -

(1) 845 (2) 458 (3) 65 (4) 13

Ans. ***(4)***

Sol. ATQ $72 = aq_1 + 7$

$127 = aq_2 + 10$

$65 = aq_1$

$117 = aq_2$

$\therefore a =$ HCF (65, 117) = 13