NATIONAL TALENT SEARCH EXAMINATION (NTSE_2020-2021) STAGE -1 [PAPER CODE :] STATE : KERALA PAPER : SAT

Date: 24.01.2021

Max. Marks: 100 | Time allowed: 120 minutes

SOLUTIONS

1. Which of the followig is regarded as a political contrivance intended to reconcile National Unity with the maintenance of State's right ?

(1) Panchyati Raj (2) Secularization (3) Federalism (4) Bicameralism

Ans. 3

Sol. Central Government gives rights to States through federalism

2. Identfy the right bank tributary of River Ganga.

(1) Gomati (2) Gandek (3) Kosi (4) Son

Ans. Right bank of the tributaries of River Ganga is Gomati Gandak, Kosi lies on North means left son lies in south means right side

3. Sort out the wrong statement, on the impact of an increase in the irrigation credit facilities in the agriculture sector.

(1) It can remove the underemployment in the same sector

(2) Can stimulate commericial activities

(3) It can stimulate industries in the urban centres

(4) Can revive small scale village industries.

Ans. 3

Sol. (Stimulate industries in urban areas)

4. Who was Not a member of the States Reorganisation Commision constituted in 1953 ?

(1) H. N. Kunzru (2) K.M. Panicker (3) V.P. Menon (4) Fazl Ali

Ans. 3

Sol. V.P Menon was a not member of SRC in 1953 o

5. HDI is indexed on the basis of :

(1) Health, Education status and GDP.

(2) Per Capita Income, Environment and Health status

(3) Average Income, Health and Educational status

(4) None of the above

Ans. 3

Sol. Human Development Index HDI calculate throw average income, health and educational status

6. The name of some leaders of the Revolt of 1857 and the places where they led the revolt are noted below. Match them correctly

Leaders	Places
a) Nana Sahib	i) Awadh
b) Birjis Qadr	ii) Bareilly
c) Maulavi Ahmadullah	iii) Kanpur
d) Khan Bahadur kha	iv) Faizabad

	(a)	(b)	(c)	(d)
1)	(iii)	(ii)	(iv)	(ii)
2)	(iii)	(iv)	(ii)	(i)
3)	(iv)	(i)	(iii)	(ii)
4)	(iii)	(i)	(iv)	(ii)

Ans. 4

Sol. In 1957 revolt leaders of the regions

Nana sahab $\rightarrow$ Kanpur Maulavi Ahmedullah $\rightarrow$ Faizabad

Birijis Qadr $\rightarrow$ Awadh Khan Bahadur $\rightarrow$ Bareilly

7. Who is th founder of the self Respect Movement ?

(1) C.R Das

(2) E. V. Ramaswami Naicker

(3) Vaikunda Swamikal

(4) Veerasalingam

Ans. 2

Sol. Founder of self Respect movement was E.V.R naiker in Tamilnadu

8. Indian Parliament consists of :

(1) Indian President, Lok Sabha and Rajya Sabha

(2) Lok Sabha, Rajya Sabha and Cabinet Ministers

(3) Indian President, Prime Minister and Lok Sabha

(4) Lok Sabha and Rajya Sabha

Ans. 1

Sol. Parliament means $\rightarrow$ Loksabha + Rajyasabha + President

9. The Net attendance ratio can be obtained when :

(1) The total number of children in the age group of 14-15 years is divided by the total number of children attending school in the same age group

(2) The total number of children attending school in the age group of 14-15 years is divided by the total number of children in the same age group.

(3) The total number of children attending school in the age group of 15-16 years is divided by the total number of children in the same age group.

(4) None of the above

Ans. 2

10. State in India with the lowest density of population as per 2011 census :

(1) Sikkim

(2) Arunachal Pradesh

(3) Rajasthan

(4) Mizoram

Ans. 2

Sol. The lowest density of population state as per 2011 census is Arunachalpradesh

11. Ina topographical map of scale 1 : 50000, each square grid with 2 cm length and 2 cm breadth represents an actural area :

(1) 4 sq. km (2) 16 sq. km (3) 2 sq. km (4) 1 sq. km

Ans. 4

12. Identify the Fourteenth point of the 'Fourteen points' of woodrow Wilson.

(1) Division of Germany

(2) Disarmament of Italy

(3) Creation of the League of Nations

(4) Division of Austria

Ans. 4

Sol. 14 points of Wooden Wilson is Division of Austria

13. The average income of Kerala is less than that of Haryana. But Haryana's social indices are below than Kerala. This can be reasoned on the fact that :

(1) Kerala employ more people in the organised sector

(2) Foreign remittance of Kerala is higher

(3) Private consumption goods are cheaper in Kerala

(4) Collective goods are cheaper in Kerala

Ans. 4

14. Total Geographical area of India is :

(1) 3.28 million sq. km

(2) 32.8 million sq. km

(3) 3.28 lakh sq. km

(4) 328 lakh sq.k m

Ans. 1

15. The typical soil type found in the Deccan trap region in India :

(1) Black soil (2) Red Soil (3) Alluvial soil (4) Laterite soil

Ans. 1

16. The Fundamental Right which B.R. Ambedkar considered as the heart and soul of Indian Constitution

(1) Right to Equality

(2) Right to Freedsom

(3) Right to Constitutional Remidies

(4) Cultural and Educational Rights

Ans. 3

17. Some events that happened after the First World War are given below. Identify the correct chronological order of them.

(a) Attack on Pearl Harbour

(b) D Day

(c) The Munich Pact

(d) The Soviet -German Non-Aggression Pact

(1) (d), (c), (a), (b)

(2) (c), (d), (a), (b)

(3) (c), (a), (d), (b)

(4) (c), (a), (b), (d)

Ans. 2

Sol. Chronological order (W.W.I)

The Munich pact $\rightarrow$ 30th sep 1938

Soviet -German Non-agression pack $\rightarrow$ Aug 23, 1939

Attack on Pearl harbour $\rightarrow$ 7th Dec 1941

D day $\rightarrow$ 6th June 1944

18. Who were 'Dhangars' ?

(1) Zamindars of Bengal

(2) Pastoral community of Maharashtra

(3) Peasants of Bengal

(4) Peasants of Punjab

Ans. 2

Sol. Dhangars are pastoral community of maharashtra

19. Pick out the true pair from the statements on the 'Debt trap' Situation.

(a) Credit pushes a person to the situation in which recovery is not possible

(b) The loan is taken from a village moneylender at exorbitant rate of interest.

(c) Earnings are not enough to cover the repayment

(d) It happens due to heavy crop failures in the current year

(1) (a), (b) (2) (b), (d)

(3) (a), (c) (4) (a), (d)

Ans. 1

20. Which among the following is not a characteristic feature of Hot weather season in India ?

(1) Hot dry winds called Loo

(2) Mangoshowers

(3) Kalbaisakhi

(4) Inflow of temperate cyclones

Ans. 4

21. Identify the capital of the Abbasids

(1) Baghdad (2) Damascus (3) Medina (4) Cairo

Ans. 1

Sol. Capital of the Abbasids was Baghdad

22. Which among the following is the correct pair ?

(1) Bhilai steel Plant - Britain

(2) Rourkela steel plant - Soviet Union

(3) Bokaro Steel plant - Soviet Union

(4) Durgapur Steel plant - West Germany

Ans. 3

Sol. Bokaro steel plant Assisted by 'Sovict Union

23. Evaluate the statements regarding sugarcance cultivation in India and choose the corect statements.

(a) Requires hot and humaid climate

(b) India is the second largest producer

(c) Gujarat is the largest producer in India

(1) (a), (b) and (c) are correct

(2) (a), (b) and (c) are wrong

(3) (a) and (c) are correct but (b) is wrong

(4) (a) and (b) are correct but (c) is wrong

Ans. 4

24. Bhakra dam is built on :

(1) Satluj river

(2) Mahanadi river

(3) Kosi river

(4) Narmada river

Ans. 1

25. Which one of the statements is applicable to Rigid Constitution ?

(1) It contains no provision for amendment

(2) It is easy to make amendments

(3) It must be an unwritten constitution

(4) It requires special procedure for amendments

Ans. 4

26. Pick out the appropriate answer from the statements given, on the nature of employment in the unorganised sector.

(1) Regular empolyment but low paid

(2) Low paid but secured

(3) Better working environment

(4) None of the above

Ans. 1

27. The power of Judicial Review originated in :

(1) Inida (2) Britain (3) U.S.A (4) Switzerland

Ans. 3

28. The southern most hilly ranges of Northern mountains

(1) Karkoram (2) Himadri (3) Shiwaliks (4) Zaskar

Ans. Shiwaliks

29. An important mineral largely obtained from the beach sands of Kerala :

(1) Uranium (2) Dolomite (3) Lignite (4) Monozite

Ans. 4

30. Mandal commision Report is related to :

(1) Reservation to Backward classes

(2) Centre-State reletions

(3) Panchayati Raj

(4) Monozite

Ans. 1

31. The First Lokpal of India :

(1) Justice Y.V. Chandrachud

(2) Justice Pinaki Chandra Ghose

(3) Justice Ranjan Gogoi

(4) Justice Pradip kumar Mohanti

Ans. 2

32. The first Round Table conference was held in :

(1) New Delhi (2) Calcutta (3) Paris (4) London

Ans. 4

33. Which among the following is wrongley related ?

(1) East India association - Dadabhai Naoroji

(2) Forward Bloc - Subhash Chandra Bose

(3) Poona Sarvajanik sabha - Justice Ranade

(4) Ghadar Party - Khan Abdul Gaffer khan

Ans. 4

Sol. Founder of Gadhar party was Hardayal

34. Identify the planetary wind from the given hints.

Hints :

. Blows from sub-trophical hight to sub polar lows

. Known as Roaring forties, Furious fifties or shrieking sixties

(1) Trade winds

(2) Westerlies

(3) Polar winds

(4) Monsoon winds

Ans. 2

35. Which was the first country in Asia to industrialize ?

(1) Japan (2) China

(3) Vietnam (4) Singapore

Ans. 1

36. Pick out the false pair from the statement on the working of SHGS, given below

(a) Provides credit without collateral securities

(b) Concerned of health and family welfare activities.

(c) SHG loans cannot be used for the release of mortgaged land.

(d) No interest rate is charged on loans.

(1) (c), (d) (2) (a), (b)

(3) (a), c) (4) (a), (d)

Ans. 1

37. The finest iron ore with nearly 70% iron content being mined in India

(1) Siderite (2) Hematite (3) Magnetite (4) Limonite

Ans. 3

38. In Saudi Arabia voting right was extended to women in the year :

(a) 2005 (2) 2015 (3) 2016 (4) 2019

Ans. 2

39. The Gross Domestic product of a country is :

(1) The sum total of values of all primary intermediate and final goods and services

(2) The sum total of values of all primary and final goods and services

(3) The sum total of values of all final goods and services produces during the current year

(4) The sum total of values of all goods produces during the current year

ans. 3

40. The loans provided by the Mughal state was known as

(1) Zat (2) Taccavi (3) Sawar (4) Jama

Ans. 2

41. In a hall there are 10 doors in how many ways can a man enter the hall through one door and come out through a different door?

(1) 100 (2) 110 (3) 80 (4) 90

Ans. 4

Sol. $^{10}C_2 \times 2 \Rightarrow \frac{10!}{8!2!} \times 2 \Rightarrow 10 \times 9 \Rightarrow 90$

42. In a parallelogram the length of two sides and one diagonal are 7 cm, $\sqrt{23}$ cm and 6 cm respectively. Find the lenght of the other diagonal.

(1) 8 cm (2) $6\sqrt{3}$ (3) $6\sqrt{2}$ cm (4) $7\sqrt{2}$ cm

Ans. 2

Sol. Let the sides of parallelogram are a, b and diagonals are d_1, d_2.

By using formula

$2(a^2 + b^2) = d_1^2 + d_2^2$

$2\left[7^2 + \left(\sqrt{23}\right)^2\right] = 6^2 + d_2^2$

$2[49 + 23] = 36 + d_2^2$

$144 - 36 = d_2^2$

$d_2^2 = 108$

$d_2 = 6\sqrt{3}$

43. If one root of a quadratic equation is $2+\sqrt{5}$, then the equation is :

(1) $x^2 + 4x + 1 = 0$ (2) $x^2 - 4x - 1 = 0$ (3) $x^2 - 4x + 1 = 0$ (4) $x^2 + 4x - 1 = 0$

Ans. 2

Sol. The roots are $\left(2+\sqrt{5}\right)$ and $\left(2-\sqrt{5}\right)$

Sum of roots = $2+\sqrt{5}+2-\sqrt{5}=4$

Products of roots $=\left(2+\sqrt{5}\right)\left(2-\sqrt{5}\right)=4-5=-1$

$\therefore$ Required equation is $x^2-4x-1=0$

44. The first ten natural numbers are squared, each is then multiplied by 2 and 1 is added to each. Find the average of the resulting number.

(1) 38.5 (2) 78 (3) 78 (4) 39

Ans. 2

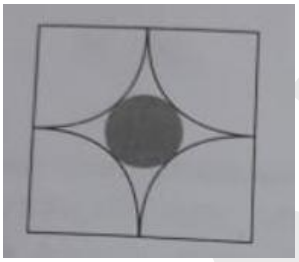
Sol. Sum of squares of first 10 natural number

$$\Rightarrow \frac{n(n+1)(2n+1)}{6} \Rightarrow \frac{10(10+1)(2\times10+1)}{6}$$

$$\Rightarrow \frac{10\times11\times21}{6} \Rightarrow 5\times11\times7 \Rightarrow 385$$

$$\text{Mean} = \frac{2[385]+10}{10} \Rightarrow 78$$

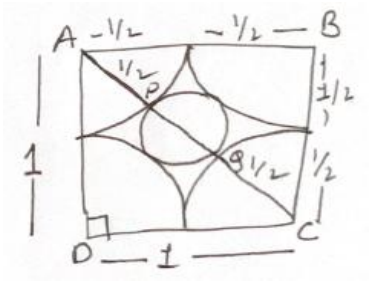
45. The figure given below has a square of 1 unit and equal sector centred at each vertex. What is the diameter of the shaded circle ?



(1) $\sqrt{2}-1$ (2) $\sqrt{3}-1$ (3) 0.41 (4) 0.732

Ans. 1

Sol.



In ΔADC

$AD^2 + DC^2 = AC^2$

$1^2 + 1^2 = AC^2$

$AC = \sqrt{2}$

$AC \Rightarrow AP + PQ + QC = \sqrt{2}$

$\frac{1}{2} + PQ + \frac{1}{2} = \sqrt{2}$

$PQ = \sqrt{2} - 1$

46. The first two digits of a three digit number are 3 and 2 ; and the first two digit of another three digit number are 2 and 5. The sum of the number is 584 and the difference is 66. What is the ratio of the last digits of the numbers ?

(1) 11 : 15 (2) 1 : 1 (3) 7 :11 (4) 5 : 9

Ans. 4

Sol. Numbers are 32x and 25y

So,

300+20+x+200+50+y=584

570+x+y=584

x+y=14

and

(300+20+x)-(200+50+y)=66

(320-250)+x-y=66

x-y=66-70

x-y=66-70

x-y=-4

$x + y = 14$

$x - y = -4$

$2x = 10$

$x = 5$ and $y = 9$

325 and 259

$\frac{x}{y} \Rightarrow \frac{5}{9} \Rightarrow 5:9$

47. Which are the last two digits of the number 7^{2020} ?

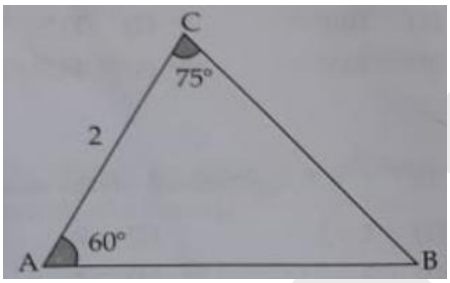
(1) 01 (2) 11 (4) 71 (4) 61

Ans. 1

Sol. $7^{2020} = (7^4)^{505} \Rightarrow (2401)^{505}$

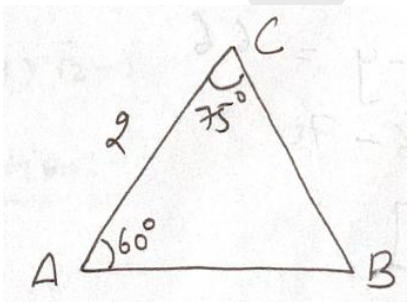
$\Rightarrow$ Last two digits of the number $(2401)^{505}$ is 01

48. The figure show a triangle ABC with AC=2, $\angle A = 60^o$, $\angle C = 75^o$. Find the length of the side BC



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

Ans. 4



Sum of angles property

$\angle A + \angle B + \angle C = 180$

$60 + \angle B + 75 = 180$

$\angle B = 45$

By using $\sin\theta$ rule

$$\frac{\sin B}{AC} = \frac{\sin A}{BC} = \frac{\sin C}{AB}$$

$$\frac{\sin 45}{2} = \frac{\sin 60}{BC}$$

$$\frac{1}{2\sqrt{2}} = \frac{\sqrt{3}}{2BC}$$

$$BC = \sqrt{6}$$

49. If $\frac{2x}{3y} = \frac{1}{2}$, then find the value of $\frac{x-y}{x+y} + \frac{1}{7}$

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

Ans. 3

Sol. 3

$$\frac{2x}{3y} = \frac{1}{2}$$

$$\frac{x}{y} = \frac{3}{4}$$

By using C & D method

$$\frac{x+y}{x-y} = \frac{3+4}{3-4} \Rightarrow \frac{7}{-1}$$

$$\frac{x-y}{x+y} = -\frac{1}{7}$$

$$\frac{x-y}{x+y} + \frac{1}{7} = \frac{-1}{7} + \frac{1}{7} = 0$$

50. A certain amount of money was invested for 3 years paying simple interest. If the rate of interest had been 2% higher. It would have fetched Rs 5,100 more. What was the amount deposited ?

(1) Rs. 75,000 (2) Rs. 60,000 (3) Rs. 85,000 (4) Rs. 62,500

Ans. 3

Sol. $\frac{P(R+2)\times 3}{100}-\frac{PR\times 3}{100}=5100$

$P(R+2)\times 3-PR\times 3=510000$

$6P=510000$

$P=85,000$

51. If $\frac{1}{a}+\frac{1}{b}=1,$ then which of the following can be the quadratic equation whose roots are a and b?

(1) $x^2+4x+4=0$ (2) $x^2-3x-3=0$ (3) $x^2-2x+2=0$ (4) $x^2+5x-10=0$

Ans. 3

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

Given $\frac{1}{a}+\frac{1}{b}=1$

$\Rightarrow a+b=ab$

and if roots are c and b then Quadratic equation is

$x^2-(a+b)x+ab=0$

$a+b=ab=k=2$

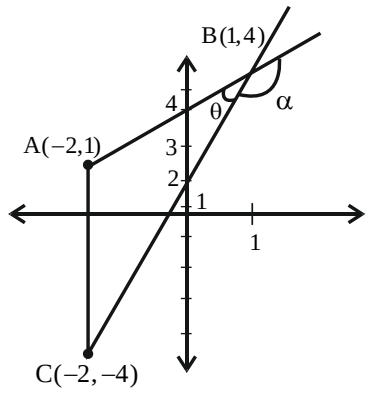
$x^2-kx+k=0 \Rightarrow x^2-2x+2=0$

52. If A(-2,1), B(1,4) and C(-2, -4) are three points, then find the angle between AB and BC.

(1) $100°$ (2) $115°$ (3) $135°$ (4) $145°$

Ans. *

Sol.



Slope of AB, $m_1 = \frac{4-1}{1-(-2)} \Rightarrow \frac{3}{3} \Rightarrow 1$

Slope of BC, $m_2 = \frac{-4-4}{-2-1} \Rightarrow \frac{-8}{-3} \Rightarrow \frac{8}{3}$

$\tan\theta = \left|\frac{m_1 - m_2}{1+m_1m_2}\right|$

$\tan\theta = \left|\frac{1-8/3}{1+8/3}\right|$

$\tan\theta = \left|\frac{-5/3}{11/3}\right|$

$\tan\theta = \left|\frac{-5}{11}\right|$

$\theta = \tan^{-1}\left|\frac{-5}{11}\right|$

$\theta = \tan^{-1}\frac{5}{11}$

$\simeq 25^o$

$\alpha = 180^o - 25^o \simeq 155^o$

$\therefore$ angle between AB & BC are

25^o (approx) and 155^o (approx)

53. Find the remainder of $15^{16^{17^{18}}} \div 7$:

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

Ans. 1

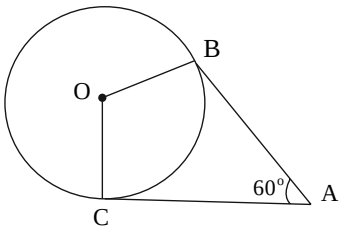
Sol. $\Rightarrow 15^{16^{17^{18}}} \div 7$

$\Rightarrow \frac{(14+1)^{16^{17^{18}}}}{7}$

$\Rightarrow \frac{1^{16^{17^{18}}}}{7}$

$\Rightarrow$ **1** (remainder)

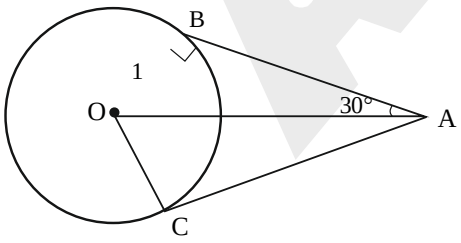
54. The figure shows a unit circle with centre O and AB, AC are tangents. If $\angle A = 60°$, find the area of the quadrilateral ABOC.



(1) $\sqrt{6}$ (2) $2\sqrt{3}-3$ (3) $\sqrt{3}$ (4) $2\sqrt{3}$

Ans. 3

Sol.



In ΔOBA

$\tan 30 = \frac{OB}{AB}$

$$\frac{1}{\sqrt{3}}=\frac{1}{AB}$$

$$AB=\sqrt{3}$$

$$\text{Area of } \Delta ABO=\frac{1}{2}\times 1\times\sqrt{3}=\frac{\sqrt{3}}{2}$$

$$\text{Area of } \square BACO=2\times[\text{Area of } \Delta ABO\ ]$$

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

$$=\sqrt{3}$$

55. The salary of a worker is first increased by 10% and thereafter decreased by 10%. What is the change in his salary?

(1) Increased by 1% (2) Increased by 2% (3) Decreased by 1% (4) Decreased by 2%

Ans. 3

Sol. Let the salary be 100

Increased by 10% $=[100+10\%\text{ of }100]$

$$=100+\frac{10}{100}\times 100$$

110

and then decreased by 10%

$=[110-10\%\text{ of }110]$

$$=110-\frac{10}{100}\times 110$$

$=99$

Change in salary = 100-99

= 1(decrease)

% change in salary = $\frac{1}{100}\times 100$

= 1% (decrease)

56. $6^3+7^3+8^3+9^3+10^3$ is equal to :

(1) 2800 (2) 1925 (3) 2925 (4) 1800

Ans. 1

Sol. $6^3+7^3+8^3+9^3+10^3$

$\Rightarrow 216+373+512+729+1000$

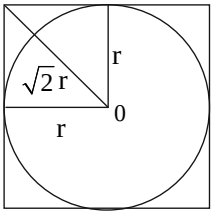
$\Rightarrow 2800$

57. The ratio of the areas of circumcircle and incircle of square is :

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

Ans. 4

Sol.



Let the radius of incircle be r

So, radius of circumcircle be $\sqrt{2}r$

$$\frac{\text{Area}\left(\text{circum circle}\right)}{\text{Area}(\text{In circle})}=\frac{\pi(\sqrt{2}r)^2}{\pi r^2}=\frac{2}{1}$$

58. Find the smallest 3 - digit number, which when divided by 3,4 and 5 leaves the remainder 2.

(1) 115 (2) 122 (3) 124 (4) 134

Ans. 2

Sol. Number which is divisible by 3,4 and 5

=LCM(3,4,5)

=60

Smallest three digit number which gives remainder

$2=60\times 2+2$

$=122$

59. A fruit seller buys lemons at 2 for a rupee and sells them at 5 for three rupees. What is his profit?

(1) 15% (2) 20% (3) 10% (4) 25%

Ans. 2

Sol. Cost price of one lemon = Rs $\frac{1}{2}$

Selling price of one lemon $\Rightarrow$ Rs $\frac{3}{5}$

Profit $\% \Rightarrow \frac{3/5-1/2}{1/2}\times 100$

$\Rightarrow \frac{(6-5)/10}{1/2}\times 100$

$\Rightarrow \frac{1}{10}\times 100\times 2$

$\Rightarrow 20\%$

60. If $777x+666y=1332$ and $666x+777y=111$, then the value of x + y is:

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

Ans. 1

Sol.

$777x+666y=1332$

$666x+777y=111$

$1443x+1443y=1443$

$x+y=1$

61. An object approaches a plane mirror with a speed of 5 m/s. The speed with which the image moves with respect to the object will be:

(1) 5 m/s (2) 2.5 m/s (3) 10 m/s (4) 20 m/s

Ans.

Sol. **3**

$\overset{5m/s}{O\rightarrow}$ $\overset{5m/s}{\leftarrow I}$

$\vec{V}_{IO}=\vec{V}_O-\vec{V}_I$

$=+5-(5)$

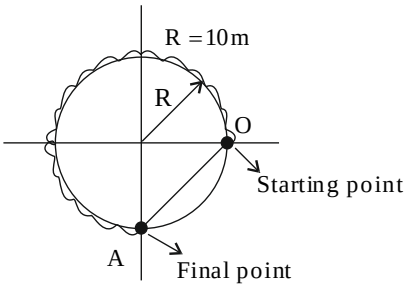
$=10m/s$

62. A car moving on a circular path of radius 10 m completes three - fourth of the circular path. The distance travelled and displacement will be respectively :

(1) 47.1 m and 14.1 m (2) 31.4 m and 10 m (3) 47.1 m and 10 m (4) 31.4 m and 14.1 m

Ans. 1

Sol.



$$\text{Distance} = \frac{3}{4} \times \text{circumference}$$

$$= \frac{3}{4} \times 2\pi r$$

$$= \frac{3}{2} \times \pi r$$

$$= 1.5 \times 3.14 \times 10$$

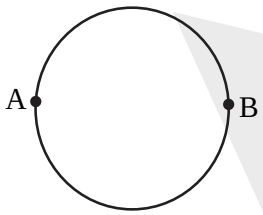
$$= 47.1\text{m}$$

$$\text{Displacement} = OA$$

$$= \sqrt{2}\,R$$

$$= 14.1\text{m}$$

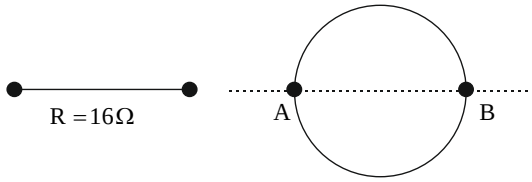
63. A wire of resistance 16Ω is bent in the form of a circle as shown. The effective resistance between the diametrically opposite points A and B will be :



(1) 16Ω (2) 4Ω (3) 32Ω (4) 8Ω

Ans. 2

Sol.



R_U = Resistance of upper wire = 8Ω

R_L = Resistance of lower wire = 8Ω

Now R_U & R_L are in parallel to each other

$$\therefore R_{eq} = \frac{R_U.R_L}{R_U + R_L} = 4\Omega$$

64. The lowest possible temperature, when expressed in Fahrenheit scale is :

(1) –485°F (2) 0°F (3) –273°F (4) –459°F

Ans. 4

Sol. Absoulte zero is lowest possible temperature known as OK or -273°C

$$\frac{T(^oC)}{100} = \frac{T(^oF) - 32}{180} = \frac{T(k) - 273}{100}$$

$$T(^oF) = -459F$$

65. When light enters from one medium to another medium of different optical densities which of the following remains unchanged?

(1) speed (2) wavelength (3) frequency (4) None of these

Ans. 3

Sol. When light enters from one medium to another medium then frequency of light remain unchanged

66. Choose the organism which does not reproduce though fission:

(1) Plasmodium (2) Hydra (3) Amoeba (4) Bacteria

Ans. 2

Sol. Hydra does not reproduce through fission. Generally it shows budding.

67. Which one of the following is not a part of first level defense?

(1) Wax in the ear (2) Keratin in skin

(3) Neutrophils in the blood (4) Lysozyme present in tears

Ans. 3

Sol. Neutrophils in the blood is not a part of first level defense.

68. Which of the following statement is correct?

(1) A concave mirror always produces inverted image

(2) A convex mirror always produces enlarged image

(3) Both convex mirror and concave mirror can produce enlarged image

(4) A concave mirror can produce enlarged image

Ans. 4

Sol. { Property of concave mirror }

69. Identify the ammonotelic organism.

(1) Frog (2) Fish (3) Insect (4) Lizard

Ans. 2

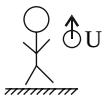
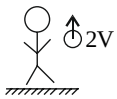
Sol. Ammonotelic organism: Fish

70. Two identical balls are thrown vertically up with velocities υ and 2υ. The ratios of maximum heights reached by them and time taken to reach the maximum heights are respectively:

(1) 1 : 2 and 1 : 2 (2) 1 : 4 and 1 : 2 (3) 1 : 2 and 1 : 4 (4) 1 : 4 and 1 : 4

Ans. 3

Sol.

(Case – I) 	(Case – II) 	
$(h_{max})_1 = \frac{V^2}{2g}$	$(h_{max})_2 = \frac{(2V)^2}{2g} = \frac{4V^2}{2g}$	$\frac{h_1}{h_2} = \frac{1}{4}$
$t_1 = \frac{V}{g}$	$t_2 = \frac{2V}{g}$	$\frac{t_1}{t_2} = \frac{1}{2}$

71. Which among the following does not contain an aluminium atom?

(1) Alumina (2) Bauxite (3) Carnalite (4) Cryolite

Ans. 3

Sol. Carnalite $KCl.MgCl_2.6H_2O$

72. Fountain experiment of HCl gas demonstrates:

(1) The high reactivity of the gas with water (2) The high solubility of the gas in water
(3) The oxidising nature of the gas (4) The reducing nature of the gas

Ans. 2

Sol. Fountain experiment shows us that HCl gas is highly soluble in water

73. Nephrons are involved in :

(1) Digestion (2) Impulse transmission (3) Excretion (4) Transportation

Ans. 3

Sol. Nephrons are involved in Excretion.

74. Choose the statement which is not true about glaucoma.

(1) Reabsorption of aqueous humor does not occur (2) Lens of the eyes become opaque

(3) Can be rectified by lase surgery (4) Pressure inside the eyes increases

Ans. 2

Sol. Lens of the eyes become opaque. It is not true about Glaucoma.

75. Choose the correct statement from the following :

(1) Chloroplast is a single membrane bound organelle.

(2) Vacuoles are absent in plant cell.

(3) Ribosomes are involved in lipid synthesis.

(4) Mitochondrion is a double membrane bound organelle.

Ans. 4

Sol. Mitochondria is a double membrane bound organelle.

76. Lichen is the association between:

(1) Alga and Bacteria (2) Fungus and Roots (3) Fungus and Bacteria (4) Alga and Fungus

Ans. 4

Sol. Lichen is association between Algae and Fungi

77. If the speed of sound in air is 340 m/s, the wavelength range audible to human:

(1) 20 m to 20,000 m (2) 17 mm to 17,000 mm (3) 20 Hz to 20,000 Hz (4) 1.7 m to 170 m

Ans. 2

Sol. Audible range 20 Hz-20,000 Hz

$$\lambda_1 = \frac{v}{f_1} = \frac{340}{20} = 17\text{m} = 17000\text{mm}$$

$$\lambda_2 = \frac{v}{f_2} = \frac{340}{20,000} = 17\times10^{-3}\text{m} = 17\text{mm}$$

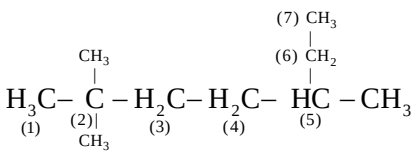
78. The IUPAC name of the alkane $(CH_3)_3C-CH_2-CH_2-CH(C_2H_5)-CH_3$ is:

(1) 2,2,5-trimethylheptane (2) 5-ethyl-2,2-dimethylhexane

(3) 2-ethyl-5,5-dimethylhexane (4) 1,1,1-trimethyl-4-ethyl-pentane

Ans. 1

Sol.



2,2,5- trimethyl heptane

79. The metal present in the ions, CrO_4^{2-}, MnO_4^- and VO_4^{3-}, when arranged in the decreasing order of their oxidation states follows the order:

(1) Mn > Cr > V (2) V > Cr > Mn (3) V > Mn > Cr (4) Mn > V > Cr

Ans. 1

Sol.

$\overset{(+6)}{CrO_4^{2-}}, \overset{(+7)}{MnO_4^-}, \overset{(+5)}{VO_4^{3-}}$

$Mn^{+7} > Cr^{+6} > V^{+5}$

80. Which among the following ion is divalent?

(1) Dichromate (2) Manganate (3) Oxalate (4) All the above

Ans. 4

Sol.

81. Choose the correctly matched pairs from the options given.

(a) Renal artery - Carries blood to the kidney

(b) Aorta - Carries blood to various parts of the body

(c) Axon - Receives impulses from the adjacent neuron

(d) Renal artery - Carries blood to the kidney

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

Ans. 1

Sol. Renal artery – carries blood to the kidney

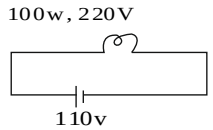
Aorta – carries blood to various parts of the body

82. A bulb marked 100 W, 220 V is connected to a 110 V power supply. The power consumed by the bulb will be:-

(1) 100 W (2) 50 W (3) 25 W (4) 200 W

Ans. 3

Sol.



$(\text{Case} - \text{I})\ P = \frac{V^2}{R}$ at 220V, $P = 100w$

$(\text{Case} - \text{II}) P' = \left(\frac{v}{2}\right)^2 \times \frac{1}{R} = \frac{V^2}{4R} = \frac{P}{4} = 25W$

83. Structurally AC generator and DC generator differ only in:

(1) Shape of field magnets (2) Shape of armature coil

(3) Rings attached to armature coils (4) Carbon brushes

Ans. 3

Sol. AC generatore-slip rings, DC- generators - split rings

84. 60g of sodium hydroxide is dissolved in water and made upto 1000 mL in a standard flask. The molarity of the resultant solution is:

(1) 0.6 M (2) 1.2 M (3) 1.5 M (4) 2 M

Ans. 3

Sol. 60g NaOH is 1000mL (1L)

$$\therefore \text{Molarity} = \frac{\text{mole of NaOH}}{\text{V(L)}} = \frac{60/40}{1} = 1.5\text{M}$$

85. Which gas is liberated calcium carbide reacts with water?

(1) Acetylene (2) Ethane (3) Hydrogen (4) Carbon dioxide

Ans. 1

Sol. $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$

86. The amount of calcium oxide obtained by heating 25 kg of calcium carbonate (80% pure) is:

(1) 14 kg (2) 11.2 kg (3) 7 kg (4) 5.6 kg

Ans. 2

Sol. $CaCO_3 \rightarrow CaO + CO_2$

$\underset{(80\%\ sol^n)}{25kg}$

$= \underset{(\text{pure } CaCO_3)}{20kg}$

$$\therefore \text{Moles of } CaCO3 = \frac{20\times10^3}{100} = \text{Moles of } CaO$$

$$\therefore \text{Wt of } CaO = \frac{20\times10^3}{100}\times 56$$

$= 11200g$

$= 11.2\,kg$

87. In which of the following cases, matter is converted into energy?

(1) Burning of charcoal (2) Burning of kerosene (3) Nuclear reactor (4) All the above

Ans. 3

Sol. During a nuclear reaction, mass is lost. This results in a release of energy.
The lost mass is converted into energy. The energy released is obtained by Einstein's equation, $E=mc^2$

88. Which among the following is an example for physical change?

(1) Burning of candle
(2) Adding water to calcium oxide
(3) Photosynthesis
(4) Sublimation of iodine

Ans. 4

Sol. Sublimation of Iodine is a physical change

89. Which among the following has the maximum number of atoms?

(1) 24g of CH_4 (2) 28g of CO (3) 34g of NH_3 (4) 36g of H_2O

Ans. 3

Sol. $34g\ NH_3 = 2$ mole of NH_3

$= (2\times 4)$mole of atom

$= 8$ moles

$\therefore 8N_A$ no of atoms

90. Certain elements have fractinoal atomic mass. This is due to the:

(1) Difference in atomicity
(2) Formation of ions by the atoms
(3) Existence of isobars of the element
(4) Existence of isotopes of the element

Ans. 4

Sol. Certain element have fractional atomic mass due to existence of Isotopes of element

91. The deficiency of thyroxine during the foetal stage or infancy leads to a condition called:

(1) Goitre (2) Graves disease (3) Cretinism (4) Myxoedema

Ans. 3

Sol. The deficiency of thyroxin during the foetal stage or infancy leads to a condition called Cretinism.

92. A respiratory pigment which has high affinity for oxygen is:

(1) Globulin (2) Haemoglobin (3) Carotene (4) Rhodopsin

Ans. 2

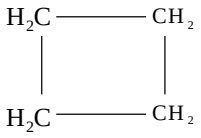
Sol. A respiratory pigment which has high affinity for oxygen is Haemoglobin.

93. The chemical formula of cyclobutane is:

(1) C_4H_4 (2) C_4H_6 (3) C_4H_8 (4) C_4H_{10}

Ans. 3

Sol.



Cyclobutane = C_4H_8

94. Which of the following does not represent the mean distance between the earth and the sun?

(1) 1 angstrom unit (2) 1.5×10^{11} m (3) 1 astronomical unit (4) 500 light second

Ans. 1

Sol. By concept

95. Identify the group which includes water borne diseases.

(1) Cholera and Typhoid (2) Tetanus and Typhoid

(3) Cholera and Malaria (4) Tetanus and Tuberculosis

Ans. 1

Sol. Water borne disease: Cholera and Typhoid.

96. The opening and closing of stomata is regulated by:

(1) Lenticels (2) Chloroplast (3) Complimentary cells (4) Guard cells

Ans. 4

Sol. The opening and closing of stomata is regulated by Guard cells.

97. Choose the correct pathway of impulses in a reflex action.

(1) Stimulus → Sensory neuron → Motor neuron → Interneuron → Receptor → Related muscle

(2) Stimulus → Receptor → Sensory neuron → Interneuron → Motor neuron → Related muscle

(3) Stimulus → Motor neuron → Related muscle → Sensory neuron → Receptor → Interneuron

(4) Stimulus → Related muscle → Sensory neuron → Motor neuron → Interneuron → Receptor

Ans. 2

Sol. Correct pathway of impulses in a reflex action:

Stimulus → Receptor → Sensory neuron → Interneuron → Motor neuron → Related muscle

98. Which one of the following is an example of chemotropism?

(1) Growth of climbers towards a support (2) Growth of stem away from water

(3) Growth of root away from light. (4) Growth of pollen tube towards the ovary

Ans. 4

Sol. Growth of pollen tube towards the ovary is an example of chemotropism.

99. Haber process is associated with the industrial preparation of:

(1) Teflon (2) Ammonia (3) Nitric acid (4) Sulphuric acid

Ans. 2

Sol. Haber's Proces

$$N_2 + 3H_2 \underset{\Delta}{\overset{Fe/Mo}{\rightleftharpoons}} 2NH_3$$

100. A passenger inside a bus throws a stone vertically up. In which of the following situations the stone returns to his own hands?

(a) When the bus is at rest

(b) When the bus is moving with uniform speed in a straight line

(c) When the bus is moving with uniform acceleration

(d) When the bus is moving in a curved path with uniform speed

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

Ans. 2