NTSE STAGE II 2011-12

SAT PAPER

Solution

1. **(1)**

In anaerobic respiration in muscles lactic acid is produced which causes muscle cromps.

2. **(3)**

Column-I		Column-II	
(I)	Red eyed frog	(D)	Sticky Pad
(II)	Toucan	(C)	Long large beak
(III)	Big cats	(B)	Thick skin and sensitive hearing
(IV)	Polar bear	(A)	Thick skin and strong sense of smell

3. **(4)**

Decrease in sea level is not a reason for shortage of usable water.

4. **(1)**

Asexual reproduction in ginger, potato and onion takes place through stems and underground stem of Ginger is known as rhizome, potato-tuber, Onion-bulb. In bryophyllum. adventitious buds are present on leaves reproduce asexually.

5. **(2)**

In Waste Water Treatment Plant air is pumped into water to support the growth of aerobic bacteria. These bacteria consume waste.

6. **(2)**

In human blood circulation deoxygenated blood from body enters into heart through veins. From heart it goes to lungs for oxygenation through pulmonary artery. From lungs it comes to heart through Pulmonary vein and from heart it goes to body again.

7. **(4)**

Clay particles are heavy as they hold more water and space between sand particles is more.

8. **(4)**

Column-I		Column-II	
(I)	Winnowing	(C)	Separation of grain & chaff
(II)	Threshing	(D)	Separation of seeds & chaff
(III)	Drip system	(A)	Irrigation
(IV)	Weeds	(B)	Hoe

9. **(1)**

Larva/Caterpillar when enter the next stage of its life history called pupa. During this, it swings its head from side to side in the form of the figure of eight. During this movement of the head the caterpillars secrets fibres made of protein which harden to form silk fibres.

10. **(3)**

Red data books provide the information on endangered animals and plants.

11. **(2)**

Due to presence of same genes two sisters looked exactly same.

12. (4)

Baker's yeast is added to aquarium because It provides minerals and metals and absorbs heavy metals present in water and purifies it.

13. (1)

	Column-I		Column-II
(I)	Lohi	(D)	Good quality wool Hosiery
(II)	Nali	(C)	Carpet wool
(III)	Patanwadi	(A)	Hosiery
(IV)	Marwari	(B)	Coarse wool

14. (3)

In frogs change from tadpole to adult is controlled by thyroxin. Thyroxin production requires the presence of iodine in water.

15. (3)

Polycot = Polyster + cotton

16. (1)

Malamine — Flame resistant
Nylon — Appears silk like
Teflon — non sticking cookwares
Cotton — Easily biodegradable

17. (2)

$P_4 + O_2 \longrightarrow P_2O_5$
$P_2O_5 + H_2O \longrightarrow H_3PO_4$ (phosphoric acid)
$6NaOH + P_2O_5 \longrightarrow 2Na_3PO_4 + 3H_2O$

18. (2)

Iron – Deposition of reddish brown layer on exposure to moist air
Copper — Formation of green layer on exposure to moist air
Potassium — Can be cut easily with a knife
Mercury — Liquid at room temperature

19. (1)

Naphtalene obtained from coaltar

20. (1)

Natural gas have main constituent CH_4.
It use to raw material for manufacturing of fertilizer
It also use for the generation of electricity.

21. (4)

head of match stick = antimony trisulphide (Sb_2S_3)+ potassium chlorate ($KClO_3$)

22. (4)

candle flame 1. outermost zone 2. middle zone 3. innermost zone (decreasing order of tempeature)

23. (2)

1. due to greeen house effect radiation trap on earth atmosphere
2. due to green house effect earth temperature rise which known as global warming.

24. (2)

sting- formic acid (HCOOH)
calamine – zinc carbonate ($ZnCO_3$)

25. (4)

fertilizer are acidic in nature (ammonim nitrate) so. soil become acidic when they use for a long time period

Slaked lime also use for treatment of acidic soil.

26. (1)

physical change

1. hammering of red hot iron and make flat sheet
2. formation of ice by cooling water
3. vaporisation of sea water.

27. (3)

chemical change :

1. burning of candle wax
2. passing of CO_2 gas through lime water.

28. (2)

The friction between the tyres of automobile and the road determines maximum acceleration of automobile and its minimum stopping distance. Driving a car on a wet road is difficult because water decreases the friction between the tyres and the road.

29. (1)

(i) Plane mirror always forms virtual image of the same size of a real object

(ii) Concave mirror forms virtual and enlarged image of a real object placed very near to it, so it is used by dentists to examine teeth.

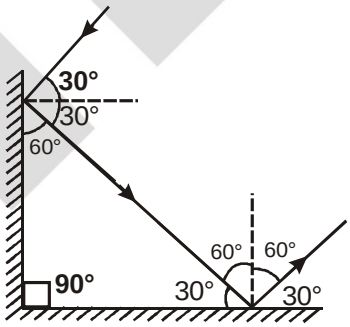
(iii) Convex mirror always forms virtual image of smaller size of a real object.

(iv) Concave lens always form virtual image of smaller size of a real object and it is thinner in the middle.

(v) Convex lens forms virtual and enlarged image of a real object placed near to it, so it is used as reading glass.

30. (3)

This can be understood by looking at the following figure.



31. (2)

Atmospheric pressure in the centre of a tropical cyclone is very low because of rising warm air.

32. (2)

In the given situation if two copper plates are moved further apart from each other then smaller amount of copper will be deposited on the plate connected to negative electrode as ions takes more time to deposit because of large distance.

33. (1)

Under the similar conditions an electromagnet having more number of turn of the wire wrapped will have greater strength.

34. (2)

Magnetic field lines around a current carrying straight conductor are concentric circles (as shown in figure 1) so iron filings settle as circles (as shown in figure 2) in the situation given.

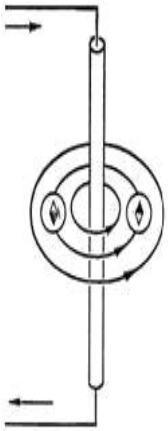


Figure 1

Figure 2

35. (3)

How to locate pole star

Look straight in the direction of the stars situated at the far end of the ladle in **Ursa Major** (stars 1 and 2). The star of medium brightness in the direction of the above stars is the pole star (as shown in figure) The stars 1 and 2 in **ursa major** which point in the direction of the pole star are called **pointer stars**.

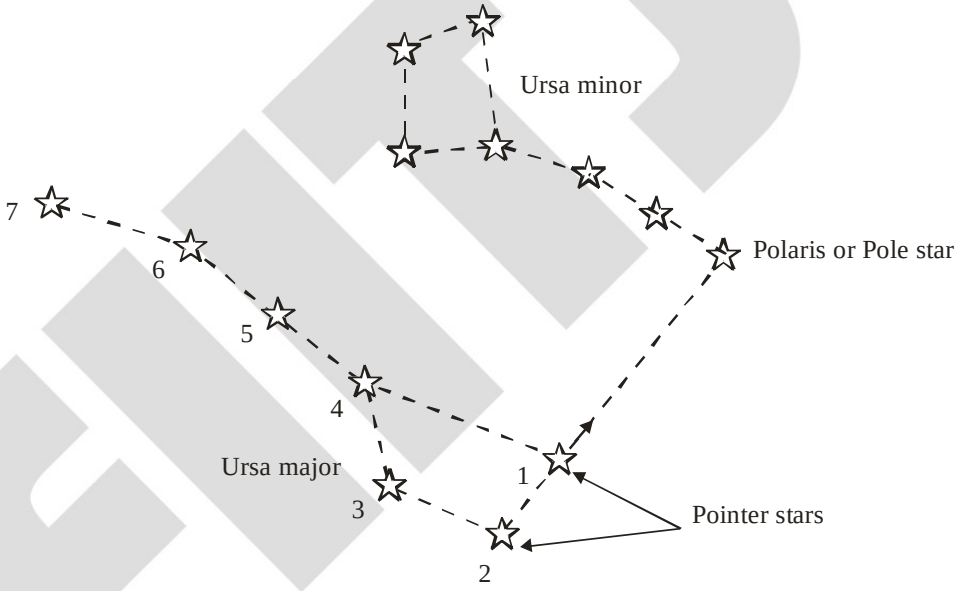


Figure : Relative positions of Ursa Major and Ursa Minor

36. (1)

As we know

$$\frac{C-0}{100-0}=\frac{F-32}{212-32}$$

$$\Rightarrow \quad \frac{25-0}{100-0}=\frac{F-32}{180}$$

$$\Rightarrow \quad F = 77\ ^\circ F$$

37. (1)

When there is lightning and you are in jungle, go under a canopy of small trees and bushes. If you are out in the open, crouch on your feet, do not stand up or lie on the ground.

38. (1)

Slope of distance time graph gives speed and in the given situation slope of distance time graph is constant so speed must be constant.

39. (1)

As we know

Average speed = $\frac{\text{Total distance covered}}{\text{time taken}}$

Average speed $_{(t = 4 \text{ to } t = 20 \text{ min})}$ = $\frac{15-5}{20-4} = \frac{10}{16} = \frac{5}{8}\,\text{km/min}$

40. (3)

We know pressure = $\frac{\text{thrust}}{\text{area}}$ so, cuboid will exert maximum pressure when it is kept in such a way that its contact area is minimum.

41. (2)

Pen $\rightarrow$ Rs. 5 Pencils $\rightarrow$ Rs.1

Pen : Pencils = 2 : 3

Pen = 2x, Pencil = 3x

Total cost of Pen $\rightarrow$ 10 x and Pencils $\rightarrow$ 3x

$$10x \times \frac{112}{100} + 3x \times \frac{110}{120} = 725$$

$$1120\,x + 330\,x = 725 \times 100$$

$$1450\,x = 725 \times 100$$

$$x = 50$$

42. (3)

Let initial Tax = Rs. 100

after decreased by 15% new tax = Rs. 85

Consumption increased by 10% then new revenue = $85 \times \frac{110}{100} = \text{Rs.}93.50$

Then percent decrease in revenue = 6.5%

43. (4)

$3^{1001} \times 7^{1002} \times 13^{1003}$

cyclicity of 3 and 7 are 4

i.e. $3^1 \times 7^2 \times 3^3$

$\Rightarrow$ 3 × 9 × 7

$\Rightarrow$ 9

44. (3)

$6 < \sqrt{x} < 7$

i.e. number lie between 36 and 49.

i.e. cube roots of a number lie between 3 and 4.

45. (2)

Sum of interior angle = (n – 2) × 180°

One angle of regular polygon = $\frac{(n-2)\times 180°}{n}$

i.e. $\frac{(n-2)\times 180°}{n} = 165°$

$$180°\,n - 360° = 165°\,n$$

$$180°\,n - 165°\,n = 360°$$

$$15^\circ n = 360^\circ$$
$$n = 24$$

46. (2)

$$x \propto \frac{1}{y}$$
$$x = \frac{k}{y}$$
$$xy = k$$

i.e. $x_1y_1 = x_2y_2$

Let $x_1 = 100,\ y_1 = 100$

$x_2 = 120,\ y_2 = ?$

Now $100 \times 100 = 120 \times y_2$

$$y_2 = \frac{100\times100}{120} = 83\frac{40}{120} = 83\frac{1}{3}$$

i.e. y decreases by $16\frac{2}{3}\%$

47. (1)

$$\frac{A}{B} = \frac{d}{d-20}$$
$$\frac{B}{C} = \frac{d}{d-10}$$
$$\frac{A}{C} = \frac{d}{d-28}$$
$$\frac{A}{C} = \frac{d}{d-20}\times\frac{d}{d-10}$$
$$\frac{d}{d-28} = \frac{d}{d-20}\times\frac{d}{d-10}$$
$$(d-20)(d-10) = d(d-28)$$
$$d^2 - 30d + 200 = d^2 - 28d$$
$$200 = 2d$$
$$d = 100$$

48. (3)

$$2^{48} - 1 = (2^{24}+1)(2^{24}-1)$$
$$= (2^{24}+1)(2^{12}+1)(2^{12}-1)$$
$$= (2^{24}+1)(2^{12}+1)(2^{6}+1)(2^{6}-1)$$
$$= (2^{24}+1)(2^{12}+1)(2^{6}+1)(2^{3}+1)(2^{3}-1)$$
$$= (2^{24}+1)(2^{12}+1)(2^{6}+1)(9)(7)$$

i.e. x have two factors between 5 and 10.

49. (4)

abcd and dcba are four digit number.

here $abcd = 1000a + 100b + 10c + d$

$dcba = 1000d + 100c + 10b + a$

i.e. $sum = 1001a + 110b + 110c + 1001d$

$= 1001(a + d) + 110(b + c)$

$= 1001 \times 7 + 110 \times 7$

$= 7(1001 + 110) = 7 \times 1111 = 7777$

i.e. number is divisible by 7, 11, 101
but not divisible by 111.

50. (4)

Let Total number of herd = x

$\frac{x}{2}$ are grazing in the fied

$\frac{3}{4}\left(\frac{x}{2}\right)$ are playing

i.e. $\frac{1}{4}\left(\frac{x}{2}\right) = 9$ are drinking water

i.e. $x = 9 \times 8 = 72$

i.e. no. of deer which are grazing field = 36

and no. deer which are playing = 27

difference = 9

i.e. multiple of 9

51. (2)

Let $x + y = 180°$

x is smaller angle

$x = 4(90° - x)$

$x = 360° - 4x$

$5x = 360°$

$x = 72°$

Thus $y = 180° - 72° = 108°$

Now difference $= 108° - 72° = 36°$

52. (3)

$A : B : C : D = 3 : 7 : 6 : 4$

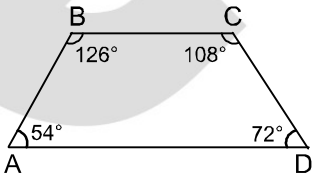
$3x + 7x + 6x + 4x = 360°$

$20x = 360°$

$x = 18°$

$\angle A = 54°,\ \angle B = 126°,\ \angle C = 108°,\ \angle D = 72°$

i.e. ABCD is a trapezium.



53. (4)

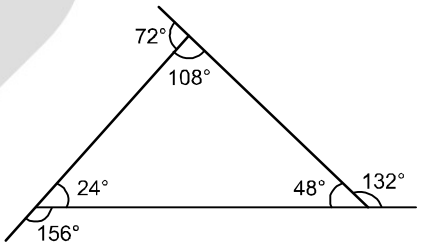
Angle $2x + 4x + 9x = 180°$

$15x = 180° \Rightarrow x = 12°$

i.e. 24°, 48°, 108°

extorior angle one, 156°, 132°, 72°

different between smallest $\rightarrow 132° - 72° = 60°$



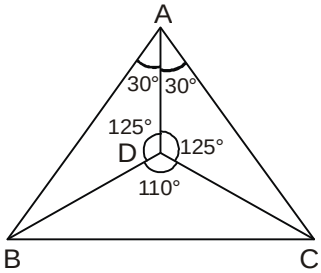
54. (4)

$\Delta ABD \cong \Delta ACD$

$\angle CAD = \angle BAD = 30°$

$\angle ADB = \angle ADC = \frac{1}{2}(360° - 110°) = 125°$

$\angle ABD = 180° - 155° = 25°$



55. (2)

$AD = \sqrt{9 - y^2}$

in ΔABD $16 = x^2 + y^2 + 2xy + 9 - y^2$

$7 = x^2 + 2xy$ ...(1)

in ΔADC $64 = (x - y)^2 + (9 - y^2)$

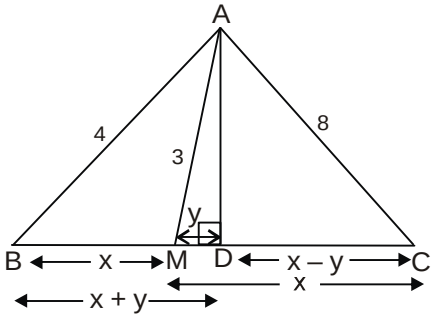
$55 = x^2 - 2xy$ ...(2)

(1) + (2) $62 = 2x^2$

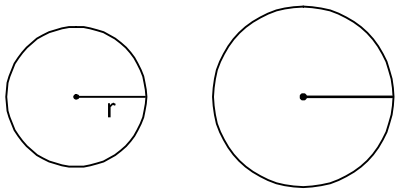
$x2 = 31$

$x = \sqrt{31}$

$BC = 2x = 2\sqrt{31}$cm



56. (3)



$C = 2\pi r$

$A = \pi r^2$

$C' = x.C = x\ 2\pi r$

$A' = 2A = 2\pi r^2$

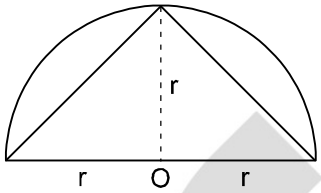
Since area doubles then radius should be $\sqrt{2}$ times

i.e. $r' = \sqrt{2}\,r$

Hence $C' = \sqrt{2}\,(2\pi r)$

So, $x = \sqrt{2}$

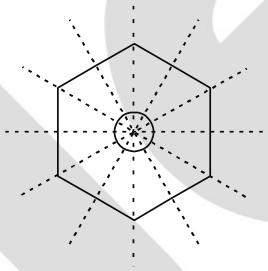
57. (3)



$\frac{1}{2} \times (2r) \times r$

$= \frac{2r^2}{2} = r^2$

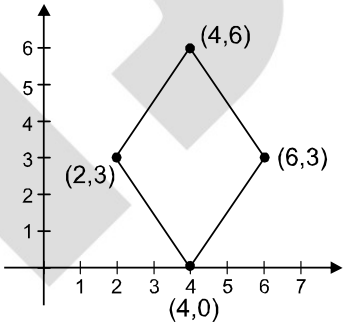
58. (1)



$x = \frac{360°}{12} = 30°$

59. (3)

Rhombus



60. (3)

21, 39, 39, 45, 54, 54, 56, 56, 56, 77, 84, 84

Mode = 56

$\text{Median} = \frac{54+56}{2} = 55$

Range = 84 – 21 = 63

$\therefore \quad \text{Mean} = \frac{56+55+63}{3} = \frac{174}{3} = 58$

61 (4)

Sol. Dhangadeva built Kandariya Mahadeva temple, Rajarajadeva built Rajarajeshvara temple devoting Lord Shiva, Rajendra I built the city of Gangaikondacholapuram to commomerate victory over Ganga valley and Babur followed Chahar Bagh strategy for gardens.

62 (3)

Sol Both A and R are true and R is the correct explanation of A.

63 (1)

Sol. Alvars saints of South India were followers of Lord Vishnu. Nayanars were worshippers of Lord Shiva.

64 (1)

Sol. During Mughal period Bakhshi was responsible for paying salaries to soldiers. Faujdar was army general. Sadr-ur-Sudar was responsible to take care of religious behaviour of people. Kotwal look after the law and order of city.

65 (3)

Sol. Only B option is correct.
(A) British victories in India served as rich material for history painters in Britain
(C) Portrait of Nawab Muhammad Ali Khan of Arcot, was painted by George Willison in 1775.
(D) Johann Zoffany, was born in Germany.

66 (2)

Sol. Kathak word evolved from the word "Katha" (Story tillers), Kathak later developed by Bhakti Saint. Nawab Wajid Ali Shah of Awadh patronaged Kathak and later by Mughals.

67 (4)

Sol. Kanchipuram was the capital of Pallava nearly 1400 years ago. Later Masulipatnam emerged as an important town during Narsimhavarman. Hampi was the capital of Vijayanagara kingdom during Sultanate period. Bombay emerged as an important town during colonial period.

68 (4)

Sol. Garh was divided into Chaurasi, into Barhots and later into smallest unit known as Village.

69 (2)

Sol. Raziya was the only women Sultan during Sultanate period.

70 (4)

Sol. James Mill divided Indian history into Hindu, Muslim and British.

71. (4)

Sol. Option A, B, C are correct. Residents were appointed by Britishers in respect to "Subsidiary Alliance" to look into daily affairs of administration.

72 (3)

Sol. Tagore felt that childhood ought to be a time of self-learning, outside the regid and restricting discipline of the schooling system set up by the British. Tagore wanted to combine elements of modern western civilisation with what he saw as the best within Indian tradition.

73 (2)

Sol. (A) Rashtriya Swayamsevak Sangh – 1920
(B) All India Muslim League – 1906
(C) Indian Association – 1870
(D) Indian National Congress - 1885

74 (4)

Sol. During Shah Jahan's time Delhi was famous for Dargahs, Khanqahs and Idgahs. Open squares, winding lanes quit Cul-de-sacs and water channels. Due to this Mir Taqi Mir said the above statement.

75 (3)

Sol. Both A and R are true and R in the correct explanation of A.

76 (2)

Sol. Energy decreases by 90%

77. (3)

Ionosphere is electrically charged by ions hence radio waves are reflected back.

78. (4)

Westerlies are stronger in Southern hemisphere due to clear water bodies. Winds moves very fast in absence of hurdles. Northern hemisphere is occupied by landmasses.

79. **(4)**
Diagram represent spring tides.

80. **(4)**
National parks are correctly matched with their respective region.

81. **(1)**
Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'

82. **(2)**
Lorraine area in France is significant for coal fields.

83. **(1)**
Indianapolis lies in the United States of America.

84. **(4)**
Figure 'A' show high birth rate and high death rate which is a characteristics of least developed economy. Figure 'B' show high birth rate and high life expectancy rate, a sign developing economy. Figure 'C' shows low birth rate and very high life expectancy rate, a sign of developing economy

85. **(2)**
8 tonnes of coal + 4 tonnes of iron ore + 1 tonne of lime stone = 1 tonne of steel.

86. **(4)**
(1) Shifting cultivation = Rengmas
(2) Pastoralism = Kirghiz
(3) Hunter and food Gatherers = Pygmies
(4) Hunters – Eskimos

87. **(3)**

	Region	Grasslands
1.	Argentina	Pampas
2.	North America	Prarie
3.	South Africa	Velds
4.	Central Asia	Steppes
5.	Australia	Velds

88. **(3)**
Llanos, Selvas, Gran chacos, Pampas.

89. **(4)**
Concept is evaporation i.e. upward movement.
Condensation in upper troposphere and later precipitation i.e. downward movement.

90. **(4)**
Both the currents i.e. D and B are coming from polar areas.

91. **(3)**
In a Republic the head of the state is elected by people.

92. **(4)**
Article 356 allows Governor, to have President rule in the State. If the State Government is not performing to maintain law and order.

93. **(3)**
It comes in advisory jurisdiction of Supreme Court but President is not under obligation to accept the advise.

94. **(4)**
The boundaries of States can be altered by the Indian Parliament.

95. **(3)**
INC was defeated for the first time in 1977.

96. (2)
In capitalist society private entrepreneurs has a prominent place.

97. (3)
Indian and U.S. Constitution.

98. (4)
Lok-Sabha Secretariat function under Speaker.

99. (2)
"International Women Day" is celebrated on 8th March.

100. (3)
Correct sequence is Dr. Rajendra Prasad, Dr. Sarvepalli Radhakrishnan, Dr. Zakir Hussain and Dr. V.V. Giri.

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