NATIONAL TALENT SEARCH EXAMINATION (NTSE-2021) STAGE -1
STATE : HIMACHAL PAPER : SAT

Date: 21/02/2021

Max. Marks: 100 **NTSE STATE-1** Time allowed: 120 mins

1. Select the odd one out:

(1) The movement of water across a semi permeable membrane is affected by the amount of substances dissolved in it

(2) Membrane arc made of organic molecules such as proteins and lipids.

(3) Molecules soluble in organic solvents can easily pass through the membrane.

(4) Plasma membranes contain chitin sugar in plants.

Ans. *(4)*

Sol. Cell wall contains chitin sugar in fungi.

2. Match the contents of column I, II, & III.

Column 1	*Column II*	*Column III*
A) Column Epithelium	a) Ground Substance	i) dendrites
B) Neuron	b) Strength	ii) Flbroblast
C) Collenchyma	c) Axon	iv) Secretion
D) Areolar	d) Absorption	iv) Flexibility
Connective tissue		

(1) A-d-iii, B-c-iv, C-a-i, D-b-ii (2) A-d-iii, B-c-i, C-b-iv, D-a-ii

(3) A-b-ii, B-d-i, C-a-iii, D-c-iv (4) A-b-iv, B-a-iii, C-d-ii, D-c-i

Ans. *(2)*

Sol. Columnar epithelium, absorption, secretion

Neuron, Axon, dendrites

Collenchyma, strength, Flexibility

Areolar connective tissue ground substance, fibroblasts

3. Most Paramecium move with the help of _____

(1) Villi (2) Oral groove (3) Cilia (4) Flagellum

Ans. *(3)*

Sol. Paramoecium move with the help of cilia

4. Which one of the following groups of animals is correctly matched with it's one characteristic feature without even a single exception ?

(1) Mammalia : Give Birth to young ones.

(2) Reptilia : Possess 3-chambered heart with incompletely divided ventricles

(3) Chordata : Possess mouth provided with an upper and a lower jaw

(4) Coelenterata : Body form is radially symmetrical

Ans. *(4)*

Sol. In coelentrata, the body form is radially symmetrical .

5. Which of the following statements are wrong?

(A) Leucocytes disintegrate in the spleen and aver

(B) RBC, WBC and blood platelets are produced by bone marrow

(C) Neutrophils bring about destruction and detoxification of toxins of protein origin

(D) The important function of lymphocytes is to produce antibodies

(1) A & B (2) A & D (3) A & C *(4) B & C

Ans. *(3)*

Sol. Leucocytes do not disintegrate is spleen & liver, neutrophils have phagocytic function.

6. Mendel found that the reciprocal crosses yielded identical results. From that he concluded that.....

(1) There is independent assortment of traits (2) Sex plays a role in deciding the dominance of traits

(3) There is no dominance of traits (4) Sex has no influence on the dominance of traits

Ans. *(4)*

Sol. By reciprocal cross, it is indicated that sex has no influence on the dominance of traits

7. A wound making a hole through a person's chest leading them to difficulty in breathing mainly because

(1) It would damage the nerves to the diaphragm

(2) The negative pressure caused by action of the diaphragm would be lost through the hole

(3) Air would enter the lungs through the hole instead of the normal route through trachea and bronchi

(4) The expansion of the thoracic cavity would suck air in through the hole rather than expanding the lungs.

Ans. *(2)*

Sol. The negative pressure caused by the action of the diaphragm would be lost through the hole

8. Transpiration is best defined as

(1) Loss of water by the plant

(2) Evaporation of water from the aerial surfaces of a plant

(3) Loss of water, as water vapour, by a plant

(4) Release of water by a plant into the atmosphere

Ans. *(2)*

Sol. Transpiration is loss of water in the form of vapour from the aerial parts of the plants

9. Which of the following is a correct chronological order for enzyme activity of enzymes taking part in protein digestion?

(1) Pepsin $\rightarrow$ trypsin $\rightarrow$ peptidase (2) Pepsin $\rightarrow$ peptidase $\rightarrow$ trypsin

(3) Trypsin $\rightarrow$ pepsin $\rightarrow$ peptidase (4) Peptidase $\rightarrow$ trypsin $\rightarrow$ pepsin

Ans. *(1)*

Sol. During protein digestion, first pepsin works then trypsin & at last peptidase work on them.

10. During dark reactions of photosynthesis

(1) CO_2 is reduced to organic compounds (2) Chlorophyll is activated

(3) 6C Sugar is broken down into 3C sugar (4) Photolysis Occurs

Ans. *(1)*

Sol. During dark reaction CO_2 is reduced to form glucose.

11. Suppose that a strange alien virus arrives on earth, this virus causes damage to the nervous system by attacking the structures of neurons. Which of the following structures would be immune from attack?

(1) Axon (2) Dendrite

(3) neuroglia (4) All of these would be attacked by the virus

Ans. *(4)*

Sol. All the structure are part of nervous system thus would be equally prone to virus

12. 12. Which of the following is false ?

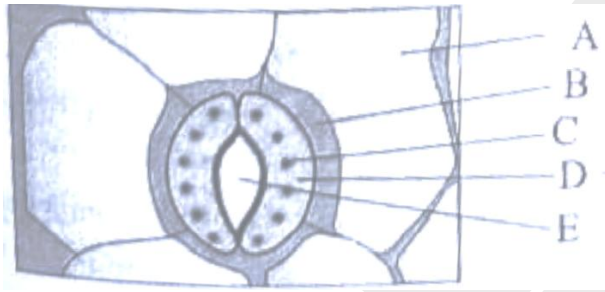
(1) Placenta produces certain hormones (2) Amniotic fluid serves to provide oxygen

(3) Mothers blood flows into the foetus through placenta (4) Foetus inside the mother's uterus breathe

Ans. *(Bonus)*

Sol. 2, 3 & 4 All these statements are false

13. Which of the following diagram of stomatal apparatus of dicot and monocot leaves and choose the correct option accordingly:



(1) A- Subsidiary cells B - Epidermal cells
C - Chloroplast D - Stomatal aperture
E - Guard cells

(2) A - Epidermal cells B - Subsidiary cells
C - Chloroplast D - Guard cells
E - Stomatal aperture

(3) A - Epidermal cells B - Guard cells
C - Chloroplast D - Subsidiary cells
E - Stomatal aperture

(4) A - Epidermal cells
B - Subsidiary cells C - Chloroplast
D - Stomatal aperture E - Guard cells

Ans. *(2)*

Sol. A- Epidermal cells, B- subsidiary cells, C chloroplast, D-guard cells, E- Stomatal aperture

14. Patients suffering from cholera, tuberculosis, typhoid and polio were kept in the same room. Drinking water and food were sterilized before consumption. Which of these diseases is likely to be communicated to others?

(1) Typhoid (2) Cholera (3) Tuberculosis (4) Polio

Ans. *(3)*

Sol. Tuberculosis spreads through air

15. The number of moles of H_2 in 224 cm^3 of hydrogen gas at STP is

(1)1 (2) 0.1 (3) 0.01 (4) 0.001

Ans. *(3)*

Sol. Value of H_2 = 224 cm^3 or 224 ml

(1 cm^3 = 1ml)

$$\text{Mole} = \frac{\text{V of gas at STP in ml}}{22400\text{ml}} = \frac{224}{22400} = \frac{1}{100} = 0.01$$

16. The electronic configuration of an element used in Galvanisation is :

(1) 2, 8, 1 (2) 2, 8, 8, 2 (3) 2, 8, 18, 2 (4)2, 8, 14, 2

Ans. *(3)*

Sol. The element used in galvanisation in Zn

$_{30}$Zn- 2, 8, 18, 2

17. Nuclear charge increases both in period and group. But effective nuclear charge increases in a period and decreases in a group. Identify the correct reverse trend.

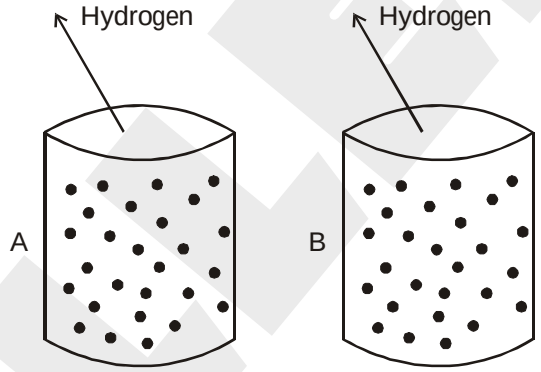
(1) Reverse trend of atomic size. (2) Role of screening effect

(3) Reverse trend of metallic character (4) Role of inter electronic repulsion

Ans. *(1)*

Sol. Atomic size has reversed trend of effective nuclear charge.

18. Which will be your observation from the following figure?



(1) Fizzing will be more in test tube A (2) Fizzing will be more in test tube B

(3) Fizzing will occur at same rate in both the test tubes. (4) It depends on the quantity of zinc added.

Ans. *(1)*

Sol. Strength of HC*l* is more than CH_3COOH

19. Which of the following gases can be used for storage of fresh sample of an oil for a longer time?

(1) Carbon dioxide or Oxygen (2) Nitrogen or Oxygen

(3) Carbon dioxide or Helium (4) Helium or Nitrogen

Ans. *(4)*

Sol. He and N_2 prevent rancidity and act as blanket for oily food.

20. There is a mixture of three solid compounds A, B & C. Out of these compounds A & C are soluble in water and compound C is sublimable also. In what sequence the following techniques can be used for their effective separation?

(I) Filtration (II) Sublimation

(III) Crystallisation from Water extract (IV) Dissolution in water

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

Ans. *(3)*

Sol. A - Water soluble

B - Water insoluble

C - Water soluble (sublimable)

Sublimation

↓

Dissolution in water

↓

Filtration

↓

Crystallisation

21. Complete the following reaction by putting appropriate products from the list given below:

$$2Al + 2NaOH + 2H_2O \rightarrow A + B$$

In the above reaction A & B are respectively.

(1) $2NaAlO_2 + 2H_2$ (2) $2NaAlO_2 + 3H_2$ (3) $2NaAlO_2 + H_2O$ (4) $2NaAlO_3 + H_2$

Ans. *(2)*

Sol. $2\,Al + 2NaOH + 2H_2O \rightarrow \underset{(A)}{2Na\,AlO_2} + \underset{(B)}{3H_2}$

22. The bond length of C ≡ C, C = C and C– C are in increasing order. Predict the order of bond length of C–H bonds attached to these carbon atoms.

(1) to C ≡ C > to C = to C – C

(2) to C – C > to C = C > to C ≡ C

(3) All bonds will have equal bond lengths

*(4) C—H bond lengths are independent of C—C bond lengths.

Ans. *(4)*

Sol. The C—H bond lenghts are independent of C—C bond lengths

23. Most favourable condition for alcoholic fermentation of sugar is

(1) High concentration of sugar solution, low temperature and plenty of air supply

(2) Low concentration of sugar solution, high temperature, plenty of air supply

(3) Low concentration of sugar solution, low temperature, absence of air

(4) None of these

Ans. *(3)*

Sol. Low concentration of sugar solution, low temperature, absence of air.

24. If a compound formed between a metallic element X and a non-metallic element Y is melted and an electric current is passed through the molten compound then Y will be obtained at

(1) Anode (2) Cathode (3) In the solution (4) None of the above

Ans. *(1)*

Sol. X- metallic element from cation

Y- non-metallic element form anion

Cathode-Connected to negative terminal

Anode-Connected to positive (+ve) terminal

So Y move towards anode

25. Match the following:

Column A	*Column B*
A. substance that turns moist starch paper blue	a. Ammonium sulphate
B. a solution of this compound gives a dirty green precipitate with sodium hydroxide	b. Lead carbonate
C. A compound which on heating with sodium hydroxide produces a gas which forms dense white fumes with hydrogen chloride.	c. Chlorine
D. A white solid which gives a yellow residue on heating	d. Copper nitrate

(1) A-b, B-c, C-a, D-d (2) A-c, B-d, C-a, D-b (3) A-c, B-a, C-d, D-d (4) A-b, B-a, C-d, D-c

Ans. *(2)*

Sol. *(A-c)*

Reason : Because the iodide ions on the starch paper are oxidised to iodine.

(B-d)

Reason : $Cu(NO_3)_2 + 2NaOH \rightarrow Cu(OH)_2 (\downarrow) + 2NaNO_3$

(C-a) bluish green solid

Reason : $NA_2SO_4 + 2NaOH \rightarrow NaSO_4 + 2NH_4OH$

NH_4OH is a weak base so it decompose into NH_3 & H_2O

$NH_4OH \rightarrow NH_3 (\uparrow) + H_2O$

$NH_3 + HCl \rightarrow NH_4Cl$

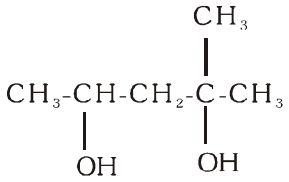
(white fumes)

(D-b)

Reason : $PbCO_3 \xrightarrow{\Delta} PbO + CO_2$

white yellow ppt

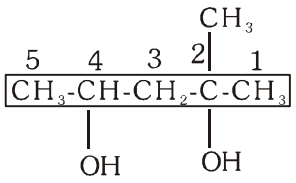
26. The IUPAC name



(1) 1, 1-Dimethyl- l, 3-butanediol (2) 1, 3, 3-Trimethyl-l, 3-propanediol

(3) 4-methyl-2, 4-pentanediol (4) 2-methyl 2, 4-pentanediol

Ans. *(4)*

Sol. 

2-methyl- 2, 4- pentanediol or 2- methylpentan-2, 4-diol

27. Which element is always present with iron in mild steel?

(1) Chromium (2) Nickel (3) Carbon (4) None of these

Ans. *(3)*

Sol. Carbon is always present with iron in mild steel

28. A body covers 12m in the 2nd second and 20m in 4th second. How much distance it covers in total after 9 seconds of start?

(1) 235 m (2) 216m (3) 200 m (4) 203.5 m

Ans. *(2)*

Sol. $s = u + \frac{a}{2}(2n-1)$

$12 = u + \frac{a}{2}(2\times 2-1)$

$12 = 4 + \frac{3a}{2} - (i)$

$20 = 4 + \frac{7a}{2} - (ii)$

(ii) – (i)

$8 = 2a$

$a = 4 m/s^2$

$u = 6$ m/s

$s = 6 \times (9) + \frac{1}{2}(4)(9)^2$

$= 54 + 162 = 216m$

29. A man of mass 60 kg and a boy of mass 30 kg are standing together on frictionless surface. If they push each other apart, man moves with a velocity of 0.4 m/s. After 5 seconds, they will be away from each other by

(1) 3m (2) 6m (3) 9m (4) 12m

Ans. *(2)*

Sol. MV = mv

$60 \times (0.4) = 30 \times v$

$v = 0.8$ m/s

$S = (V + v) \times t$

$= (0.8 + 0.4) \times 5$

$S = 6$m

30. A ball is dropped from a height of 10 m. If the energy of the ball is reduced by 40% after striking the ground. How much high can the ball bounce back?

(1) 3m (2) 4m (3) 5m (4) 6m

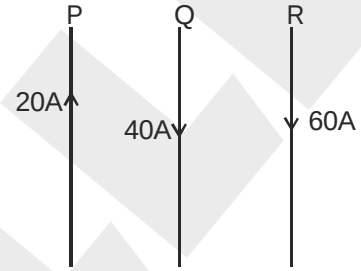
Ans. *(4)*

Sol. $mgh = \frac{60}{100} \times mgH$

$h = 0.6 \times H$

$0.6 \times 10 = 6$m

31. P Q, R are long parallel straight wires in air carrying currents as shown. What is direction of resultant force on Q ?

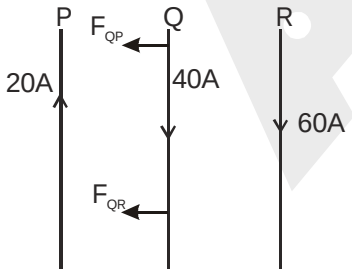


(1) To left (2) To right

(3) $\perp$ to this (4) Same as that of current in Q ?

Ans. *(1)*

Sol.



Net force on 'Q' is towards left

32. At what height above the earth's surface the value of 'g' is half of its value on earth's surface, R = 6400 km?

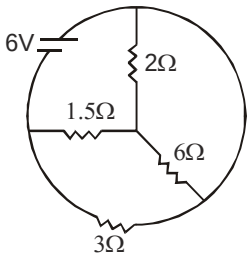
(1) 1600 km (2) 2469.6 km (3) 2738. 9km (4) 3200 km

Ans. *(2)*

Sol. $g' = \frac{g}{\left(1+\frac{h}{R}\right)^2}$ $\frac{g}{2} = \frac{g}{\left(1+\frac{h}{R}\right)^2}$ $h = (\sqrt{2}-1)R$

$= 2469.6\text{km}$

33. In the following circuit current supplied by the battery is



(1) 2.5 A (2) 2 A (3) 4 A (4) 4. 5 A

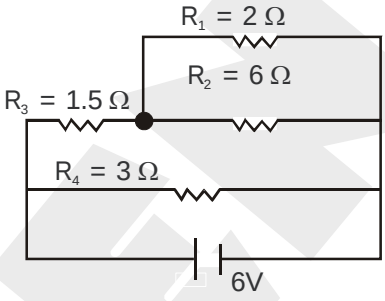
Ans. *(3)*

Sol. $R_{12} = \frac{12}{8} = \frac{3}{2} = 1.5\ \Omega$

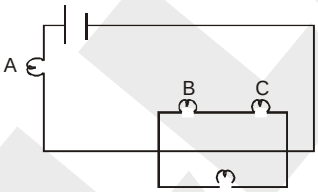
$R_{123} = 1.5 + 1.5 = 3\ \Omega$

$R_{1234} = 1.5\ \Omega$

$i = \frac{6}{1.5} = 4A$



34. Given below are four identical bulbs pined together as shown. Which bulb shines more brighthy when tee current passes through the circuit



(1) A (2) B (3) D (4) (4) All bulbs shine equally

Ans. *(1)*

Sol. $\text{Req} = \frac{2R}{3} + R = \frac{5}{3}R$

$i_A = \frac{3v}{5r} = i$, $i_D = \frac{2R}{3R} \times \frac{3V}{5R}$, $i_D = \frac{6}{15}\frac{V}{R}$, $i_B = i_C = \frac{3V}{15R}$ For Same 'R'

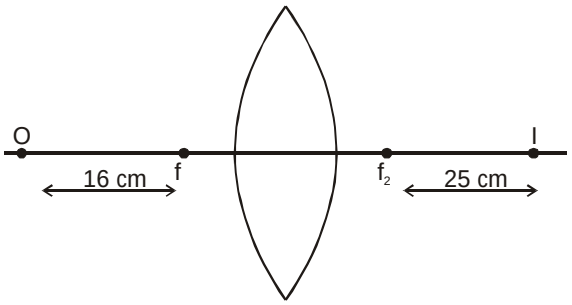
$P \propto (i^2)$

So Bulb 'A'

Shines more brightly

$\frac{3v}{5R} - \frac{6v}{15R} = \frac{3v}{15R}$

35. The medium on both sides of lens is air. The distance of object 'O', image 'I' from first and second foeii are as shown in figure. What is the focal length of the lens?



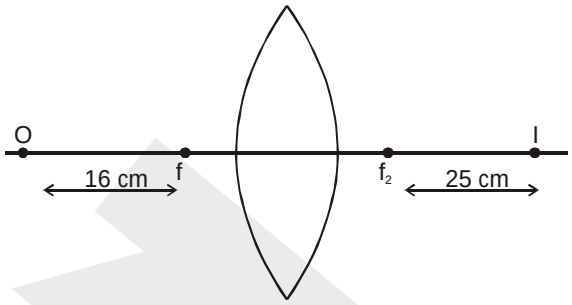
(1) 20 cm (2) 10 cm (3) 15 cm (4) 9.5 cm

Ans. *(1)*

Sol. $\Rightarrow \frac{1}{f+25}-\frac{1}{(-f+16)}=\frac{1}{6}$

$\Rightarrow f\,[f+16] + (f + 25)] = (f + 25)(f + 16)$

$\Rightarrow f^2\ 16f + f^2 + 25 = f^2 + 25f + 16\,f + 25$



$f^2 = 25 \times 16$

$f = 20$ cm

36. A point object is placed at a distance of 10 cm and its real image is formed at a distance of 20 cm from a concave mirror. When the object is moved by 0.1 cm towards the mirror, then the image will be moved by about

(1) 0.4 cm away from the mirror (2) 0.4 cm towards the mirror

(3) 0.8 cm away from the mirror (4) 0.8 cm towards the mirror

Ans. *(1)*

Sol. $\frac{dv}{dt}=-\frac{v^2}{u^2}\frac{du}{dt}$

$= -\left(\frac{20}{10}\right)^2 \times 0.1 = -0.4$ cm away from the minor

37. A block of wood floats on water with 2/5 of its volume above the surface. If it is made to float in brine solution of Relative density 1.20, what fraction of wood is below surface of brine solution?

(1) 25% (2) 30% (3) 40% (4) 50%

Ans. *(4)*

Sol. $\frac{3}{5}vS_w \times g = V\rho_B g$

$\rho_B = \frac{3}{5}\rho_w$

$V^1 \times \rho_{sol} \times g = v \times \frac{3}{5}\rho w \times g$

$V^1 \times 1.2 \times \rho_w \times g = v \times \frac{3}{5}\rho w \times g$

$V^1 \times \frac{1}{2}V$

50 % outside water

38. A simple pendulum has a period T inside a lift when it is stationary. The lift is accelerated upwards with constant acceleration V. The Time period:-

(1) decreases

(2) increases

(3) remains same

(4) sometimes increases and sometimes decreases

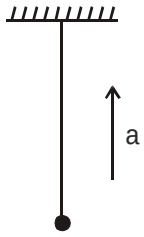
Ans. *(1)*

Sol. When lift is moving up with accleration 'a'

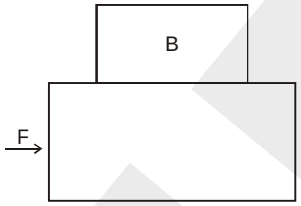
$$T = 2\pi\sqrt{\frac{l}{geff}}$$

$$T = 2\pi\sqrt{\frac{l}{(g+a)}}$$

$$T = 2\pi\sqrt{\frac{l}{g}} \quad T' < T$$



39. Friction opposes motion. All surfaces are rough in the figure. If A is pushed by a force F, from left to right, What is direction of frictional force acting on A and B.



(1) Towards left for both A & B

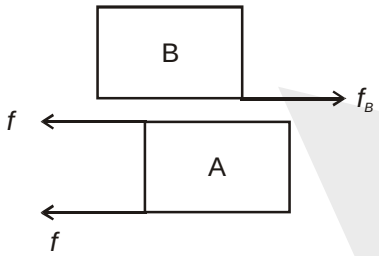
(2) Towards left for A and right for B

(3) Towards right for A and left for B

(4) Can't predict from the given details.

Ans. *(2)*

Sol.



40. Sound takes some time to travel from one place to another. It will be maximum:

(1) at night (2) during winter (3) during summer (4) at the time same

Ans. (2) $v \times \sqrt{T}$ as in winter temperature decrease, v decrease

Time increase

41. Given two A.P.'s

2, 5, 8, 11, ..., T_{60} and

3, 5, 7, 9, ..., T_{50}

Find number of terms which are identical in both the series.

(1) 15 (2) 16 (3) 17 (4) 18

Ans. (3)

Sol. Given two A.P.'

2, 5, 8, 11, ... (T_{60} = 179)

3, 5, 7, 9, 11, ... (T_{50} = 101)

Common terms $\underset{6}{\underbrace{5, 11}}$,.....; 101

a = 5, d = 6

T_n = a + (n –1)d

= 5 + (n – 1) × 6 ≤ 101

(n – 1) × 6 ≤ 101 – 5

(n – 1) × 6 ≤ 96

n ≤ 17

42. If the expression $ax^4 + bx^3 - x^2 + 2x + 3$ has remainder 4x + 3 when divided by $x^2 + x - 2$, find the value of a and b

(1) a = 2, b = 1 (2) a = 1, b = 2 (3) a = 2, b = 3 (4) a = 3, b = 2

Ans. (2)

Sol. As $x^2 + x - 2 = (x + 2)(x - 1)$

Let $f(x) = ax^4 + bx^3 - x^2 + 2x + 3$

$= (x^2 + x - 2)\,Q(x) + (4x + 3)$

Then

$f(-2) = a(-2)^4 + b(-2)^3 - (2)^2 + 2(-2) + 3 = 4(-2) + 3$

$\Rightarrow 2a - b = 0$ ...(i)

$f(1) = a + b - 1 + 2 + 3 = 4(1) + 3$

$\Rightarrow a + b = 3$ ...(ii)

on solving (i) and (ii)

a = 1, b = 2

43. Find the probability that a leap year will have 53 Fridays or 53 Saturdays.

(1) 1/7 (2) 2/7 (3) 4/7 (4) 3/7

Ans. (4)

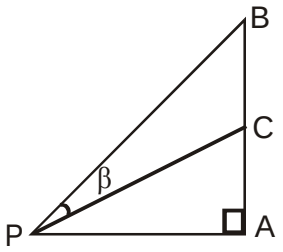
Sol. No. of week $= \frac{366}{7}$ = 52 week 2 days.

{(S, M), (M, T), (T, W), (W, Th), (Th, F), (F, Sat), (Sat, Sun)}

n(S) = 7

P(53 Friday or Saturday) = $\frac{3}{7}$

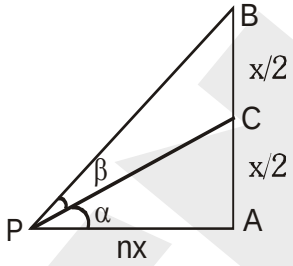
44. AB is a vertical pole. End A is on level ground, C is middle point of AB. P is a point on level ground. The portion BC subtends an angle β at P. If AP = nAB. Then find $\tan\beta$. [Given $\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$]



(1) $\frac{n}{2n^2+1}$ (2) $\frac{n}{n^2+1}$ (3) $\frac{n}{n+1}$ (4) $\frac{n}{2}$

Ans. (1)

Sol. Let AB = x, $AC = \frac{x}{2}$, AP = nx.



$\angle APC = \alpha$

$\tan\alpha = \frac{x/2}{nx} = \frac{1}{2n}$

using $\tan(x+y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$, $\tan(\alpha+\beta) = \frac{\tan\alpha + \tan\beta}{1 - \tan\alpha\tan\beta}$

$\frac{1}{n} = \left(\frac{\tan\beta + 1/2n}{1 - \tan\beta.1/2n}\right)$

on solving , $\tan\beta = \frac{n}{2n^2+1}$

45. What is the minimum value of $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2$?

(1) 7 (2) 9 (3) 8 (4) 10

Ans. (2)

Sol. $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2$

$= \sin^2\theta + \text{cosec}\,\theta + 2\sin\theta\,\text{cosec}\theta + \cos^2\theta + \sec^2\theta + 2\sec\theta\,\text{cosec}\theta$

$= 1 + 2 + 2 + \text{cosec}^2\theta + \sec^2\theta$

$= 5 + \frac{1}{\sin^2\theta} + \frac{1}{\cos^2\theta}$ $= 5 + \frac{\cos^2\theta + \sin^2\theta}{\sin^2\theta\cos^2\theta}$

$= 5 + \frac{1}{(\sin\theta\cos\theta)^2}$ $= 5 + \frac{4}{(2\sin\theta\cos\theta)^2} == 5 + \frac{4}{\sin^2 2\theta}$ = 5 + 4 $\text{cosec}^2 2\theta$

For minimum value ($\because$ $\text{cosec}^2\theta\ 1 \geq$)

= 5 + 4 = 9

46. A point P whose coordinates are (–3, 6) is in XY plane. If the origin is shifted to (5, 8) then what will be the coordinates of the point P with respect to new origin ?

(1) (+8, 2) (2) (2, 14) (3) (–8, –2) (4) (2, 2)

Ans. (3)

Sol. New co-ordinates when origin shifted to (x, y) are.

$(x_{new}, y_{new}) = (x_{old} - x, y_{old} - y)$

$(x_{new}, y_{new}) = (-3-5, 6-8)$

$= (-8, -2)$

47. A number when divided successively by 4 and 5 leaves remainder as 1 & 4 respectively. When it is successively divided by 5 & 4 then the respective remainders will be

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

Ans. (2)

Sol. Let the number be = X

When you divided X by 4 it gives remainder 1.

Let $X = 4Y + 1$ ....(i)

When you divide 4 by 5 it gives 4 as remainder.

$Y = 5 \times 1 + 4 = 9$ ...(ii)

$X = 4 \times 9 + 1 = 37$

Now, 37 divide by 5 and 4, respectively it gives 2 and 3 as remainders.

48. $\left(1-\frac{1}{y}\right)\left(1-\frac{1}{y+1}\right)\left(1-\frac{1}{y+2}\right)...\left(1-\frac{1}{y+y}\right)$ on simplification gives

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

Ans. (3)

Sol. $\left(1-\frac{1}{y}\right)\left(1-\frac{1}{y+1}\right)\left(1-\frac{1}{y+2}\right)...\left(1-\frac{1}{y+y}\right)$

$\left(\frac{y-1}{y}\right)\left(\frac{y+1-1}{y+1}\right)\left(\frac{y+2-1}{y+2}\right)...\left(\frac{y+y-1}{y+y}\right)$

$\frac{y-1}{2y}$

49. If A & B work together they will complete a job in 7.5 days. However if A works alone and completes half the job and then B takes over and completes the remaining half alone, they will be able to complete the job in 20 day. How long will B alone take to do the job if A is more efficient than B.

(1) 20 days (2) 30 days (3) 36 days (4) 40 days

Ans. (2)

Sol. A and B complete the job = 7.5 day.

Total days to complete the work = 20 day.

Total work = 20 × 7.5 = 150

Since A is more efficient than B.

Randomly we consider A is doing 15 day and B is doing 5.

A can do half job = $\frac{75}{15}$ = 5 days

B can do half job = $\frac{75}{5}$ = 15 days

So B can do entire job in $\frac{150}{5}$ = 30 days.

50. Simplify: $\frac{3+\sqrt{6}}{\sqrt{75}-\sqrt{48}-\sqrt{32}+\sqrt{50}}$

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

Ans. (2)

Sol. $\frac{3+\sqrt{6}}{\sqrt{25\times3}-\sqrt{16\times3}-\sqrt{16\times2}+\sqrt{25\times2}}$

$= \frac{3+\sqrt{6}}{5\sqrt{3}-4\sqrt{3}-4\sqrt{2}+5\sqrt{2}}$

$= \frac{3+\sqrt{6}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

$= \frac{3\sqrt{3}+3\sqrt{2}-3\sqrt{2}-2\sqrt{3}}{\left(\sqrt{3}\right)^2-\left(\sqrt{2}\right)^2} = \sqrt{3}$

51. A vessel in shape of inverted cone is surmounted by a cylinder has a common radius of 7 cm. It was filled with liquid till it covered 1/3rd the height of the cylinder. If the height of each part is 9 cm and the vessel is now turned upside down. Find upto what height the liquid will reach in the cylindrical part ?

(1) 3 cm (2) 5 cm (3) 4.5 cm (4) 6 cm

Ans. (4)

Sol. radius = 7 cm

height of cone = height cylinder = h = 9 cm

volume of fluid $= \frac{1}{3}\pi r^2 \times 9 + \pi r^2 \times (3)$

$= \frac{1}{3}\pi r^2 \times 9 + \pi r^2 \times (3)$

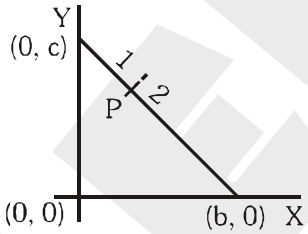
$= 6\pi r^2 = 6 \times \frac{22}{7} \times 7 \times 7 = 924 \text{ cm}^3$

Now volume of cylindrical part

height h_2 = volume of liquid = $\pi r^2 h_2 = 924$

$\frac{22}{7} \times (7)^2 \times h_2 = 924$ $154 \times h_2 = 926$ $h_2 = 6$ cm

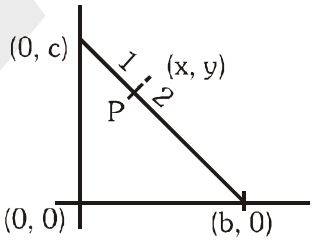
52. The ends of a rod of length '*l*' move on two mutually perpendicular lines. A point P divides the rod in ratio 1 : 2 as shown in the figure. Then point P moves on the curve ?



(1) $x^2 + y^2 = \frac{\ell^2}{9}$ (2) $x^2 + \frac{y^2}{4} = \frac{\ell^2}{9}$ (3) $y^2 + \frac{x^2}{4} = \frac{\ell^2}{18}$ (4) $y^2 + \frac{x^2}{3} = \frac{\ell^2}{4}$

Ans. (2)

Sol. $x = \frac{1 \times b + 2 \times 0}{3}$



$b = 3x$ ...(i)

$y = \frac{1 \times 0 + 2 \times c}{3}$

$c = \frac{3y}{2}$ ...(ii)

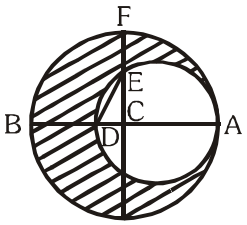
From (i) and (ii)

$c^2 + b^2 = \ell^2$

$\left(\frac{3y}{2}\right)^2 + (3n)^2 = \ell^2$

$9y^2 + 36x^2 = 4\ell^2$ $x^2 + \frac{y^2}{4} = \frac{\ell^2}{9}$

53. In the following figure a crescent is formed by two circles which touch at A. C is the centre of the larger circle. The width ol the crescent at BD is 9 cm and at EF is 5 cm. Find the area of the shaded region.



(1) 621.76 cm^2 (2) 642.91 cm^2 (3) 702.68 cm^2 (4) 597.76 cm^2

Ans. (2)

Sol. Let the radii of the large and smaller circle R and r respectively then BD = 9 cm.

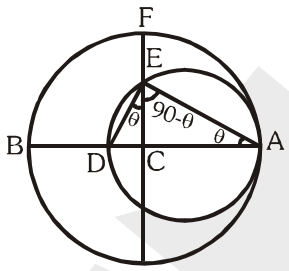
$2R - 2r = 9 \Rightarrow R - r = 4.5$

Let $\angle CAE = \theta$, then $\angle AEC = 90° - \theta$

$\angle AED = 90° \Rightarrow \angle AEC + \angle DEC = 90°$

$\angle DEC = 90° - (90 - \theta) = \theta$

$\Delta ACE \sim \Delta ECD$ (AA criteria)



$$\frac{AC}{EC} = \frac{CE}{CD}$$

$$\frac{R}{R-5} = \frac{R-5}{R-9}$$

$\Rightarrow R = 25$ cm

$r = 20.5$ cm

Area of shaded region $= \pi(25)^2 - \pi(20.5)^2$

$= 3.14 \times [625 - 420.25]$

$= 642.915\ cm^2$

54. Pipe A fills a tank of 700 liters capacity at the rate of 40 liters a minute. Another pipe B fills the same tank at rate of 30 litters a minute. A pipe 'C' at the bottom of the tank drains the tank at the rate of 20 liters a minute If pipe A is kept open for a minute and then closed and pipe B is kept open for a minute and then close and then pipe C is kept open for a minute and closed and cycle is repeated, how long will it take for empty tank to overflow.

(1) 42 Minute 18 sec (2) 14 Minute (3) 39 Minute 45 sec (4) 40 Minute 20 sec

Ans. (4)

Sol. In 3 minutes volume supplied

$\Rightarrow 40\ L + 30L - 20\ L = 50$

So, In 1 minute volume supplied will be = 50L / 3

If each of them is kept open for a minute in the order A + B–C, then the tank will have 50 liters of water at the end of 3 minutes.

It will take $13 \times 3 = 39$ minutes for the 13 cycles to be completed.

i.e. total 650 litres of water.

Now at the end of the 28th minutes, Pipe C will be closed and pipe a will be opened.

So, at the end of the 40th minute, total water is 690 litres.

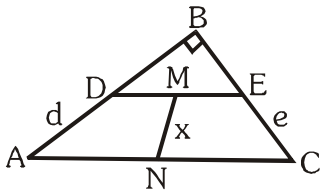
at the end of the 40th minutes, Pipe A will be closed and pipe B will be opened.

So, at the end of the 41st minute, total water is 720 litres.

So, total time taken for the tank to overflow is 40 minutes + 1/3 of a minutes

i.e. 40 Minute 20 sec.

55. In the figure below, let ABC be a right triangle. M and N are the midpoints of DE and AC respectively. If AD = d, CE = e and MN = x then



(1) $x = \frac{1}{3}\sqrt{d^2 + e^2}$ (2) $x = \frac{1}{3}\sqrt{d^2 - e^2}$ (3) $x = \frac{1}{2}\sqrt{d^2 - e^2}$ (4) $x = \frac{1}{2}\sqrt{d^2 + e^2}$

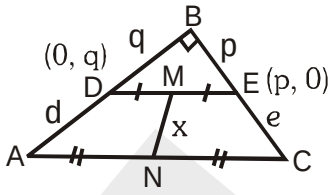
Ans. (4)

Sol. Let B be (0, 0)

BC the y–axis and BA the yaxis

Letv BE = p, BD = q

E(p, 0); C(p + e, 0), D (0, q), A(0, d + q)



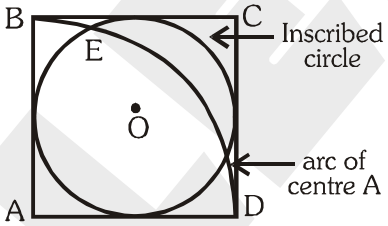
Thus $N\left(\frac{p+e}{2}, \frac{q+d}{2}\right), M\left(\frac{p}{2}, \frac{q}{2}\right)$

By distance formula

$MN^2 = x^2 = \frac{1}{4} \times (d^2 + e^2)$

$x = \frac{1}{2}\sqrt{d^2 + e^2}$

56. In the figure below, ABCD is a square, the inscribed circle O and the arc BD of centre A meet at E. Then



(1) CE is one third of the diagonal to the square (2) BC is one half of the diagonal of the square

(3) CE is twice of the diagonal of the square (4) CE is one half of the diagonal of the square

Ans. (4)

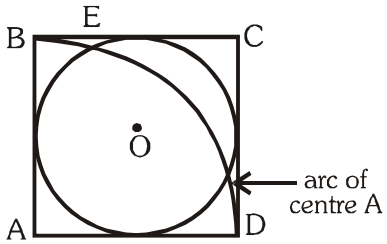
Sol. ΔAEC, using Apollonious theorem, Let the side = 2a, then

$AE^2 + CE^2 = 2(OE^2 + OC^2)$

$(2a)^2 + CE^2 = 2(a^2 + 2a^2)$

$CE^2 = 6a^2 - 4a^2 = 2a^2$

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

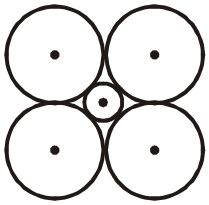


$CE^2 = a\sqrt{2}$

$= \frac{1}{2}(AC)$

$= \frac{1}{2}$ diagonal

57. In the given figure, what will be the radius of the inner circle if the outer circles are of radii m units ?



(1) $\left(\sqrt{2}-1\right)$m (2) $\frac{1}{\sqrt{2}}$m (3) $\sqrt{2}$m (4) $\frac{2}{\sqrt{2}+1}$m

Ans. (1)

Sol. Let the m is same radii of all four circle

Join the centre of four circle

Length of side = 2xm = 2m

Length of diagonal = m + 2R + m = 2(R + m)

$\because$ R is the radius of inner circle

Therefore 2(R + m) = $2m\sqrt{2} \Rightarrow R = m(\sqrt{2}-1)$

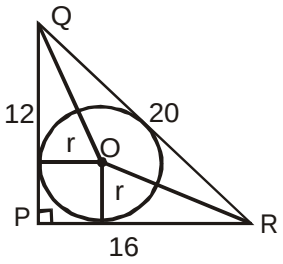
is the repaired inner radius of circle

58. PQR is a right angled triangle, right angled at P. A circle is inscribed in it and the lengths of the two sides containing the right angle are 12 cm and 16 cm. Find the area of the circle.

(1) 25.56 cm^2 (2) 50.28 cm^2 (3) 75.65 cm^2 (4) 20.34 cm^2

Ans. (2)

Sol.



$PQ^2 + PR^2 = QR^2$

$12^2 + 16^2 = QR^2$

QR = 20m

Ar. of (ΔPQR) = Ar(ΔPOR) + Ar(ΔPOQ) + (ΔROQ)

$$\frac{1}{2}\times 12\times 16 = \frac{1}{2}\times r\times 16 + \frac{1}{2}\times r\times 12 + \frac{1}{2}\times r\times 20$$

r = 4 cm

A = πr^2 = 50.28 cm^2

59. If the mean of n observations ax_1, ax_2, ax_3, ... ax_n is $\overline{ax}$, then $(ax_1 - a\bar{x}) + (ax_2 - a\bar{x}) + ...(ax_n - a\bar{x}) = ?$

(1) $a\bar{x}$ (2) $-a\bar{x}$ (3) 0 (4) $ax_1 + ax_n$

Ans. (3)

Sol. $a\bar{x} = \left(\frac{ax_1 + ax_2 + ... + ax_n}{n}\right)$

$n(a\bar{x}) = ax_1 + ax_2 + ... + ax_n$

$(ax_1 - a\bar{x}) + (ax_2 - a\bar{x}) + ... + (ax_n - a\bar{x}) = 0$

60. For what values of 'm' is y = 0 if $y = x^2 + (2m + 1)x + m^2 - 1$. Given x is a real number.

(1) m = –2 (2) m < 0 (3) m = 0 (4) m > –1.25

Ans. (4)

Sol. $y = x^2 + (2m + 1)x + m^2 - 1$

$b^2 - 4ac \geq 0$

$(2m + 1)^2 - 4(m^2 - 1) \geq 0$

$4m + 5 \geq 0$

$m \geq -1.25$

$m > -1.25$

61. Arrange the following names in the order of the year they received Bharat Ratna :

(i) Sachin Tendulkar (ii) Bhupen Hazarika (iii) Lata Mangeshkar (iv) Madan Mohan Malviya

(1) (ii), (iv), (iii) & (i) (2) (ii), (iii), (i) & (iv) (3) (iii), (i), (iv) & (ii) (4) (iv), (iii), (ii) & (i)

Ans. *(3)*

Sol. Lata Mangeshkar-2001.S.Tendulkar- 2013 .M.M. Malviya-2014 .B. Hazarika-2019

62. Who was the first Prime Minister of Pakistan?

(1) Mohd. Aii Zinnah (2) Liaquat Ali Khan (3) Iskander Mirza (4) Ayub Khan

Ans. *(2)*

Sol. Liaquat Ali Khan, served as first Prime Minister of Pakistan after independence (1947-1951).

63. What were the racist and antisematic laws, that were enacted in Nazi Germany on 15th Sept. 1935, called ?

(1) Bamberg laws of Citizenship (2) Wurzburg law of Citizenship

(3) Hamburg law of Citizenship (4) Nuremberg law of Citizenship

Ans. *(4)*

Sol. The Nuremberg Laws were antisemitic and racist laws that were enacted in Nazi Germany on 15 September 1935, at a special meeting of the Reichstag convened during the annual Nuremberg Rally of the Nazi Party.

64. Match the names of shifting cultivation with their correct region.

I. Milpa	A. South cast Asia
II Lading	B. Africa
III. Chena	C. Sri Lanka
IV. Tavy	D. Central America

(1) (I) - B, (II) - A, (III) - D, (IV) - C (2) (I) - D, (II) - A, (III) - C, (IV) - B

(3) I) - A, (II) - C, (III) - B, (IV) - D (4) (I) - C, (II) - B, (III) - D, (IV) - A

Ans. *(2)*

Sol. Milpa-Central America.Lading-South East Asia.Chena-Sri Lanka.Tavy-Africa

65. Which of the following are incorrect?

(A) Serengeti National Park is in Kenya (B) Samburu National Park, is in Tanzania

(C) 'Maa-Sai' means 'my land my country' (4) 'Maa-Sai' originated from the lower Nile Velley

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

Ans. *(3)*

Sol. Serengeti National Park is located in Tanzania.Samburu National park is located in kenya. Maa-Sai means my people.Only (D) is correct

66. What was the language that was predominantly spoken by the Aristocracy in Galicia during mid eighteenth century?

(1) Magyar (2) German (3) Italian (4) Polish

Ans. *(4)*

Sol. Language that was predominantly spoken by the aristocracy in Galicia during mid 18th century was Polish.

67. Who wrote 'Istri Dharam Vichar' ?

(1) Raja Ram Mohan Roy (2) Periyar

(3) Ram Chaddha (4) Rash Sundari Debi

Ans. *(3)*

Sol. Istri Dharam Vichar was written by Ram Chaddha

68. Arrange in chronological order :

(A) Elgin Mill started in Kanpur

(B) First Indian Juite Mill comes up in Calcutta

(C) First Iron and Steel Industry comes up in Jamshedpur

(D) First spinning & weaving mill of Madras began production

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

Ans. *(1)*

Sol. Elgin Mill started in Kanpur-1864.First spinning and weaving mill of Madras began production -1874 .First iron and steel industry-1907. First Indian Jute mill comes up in india-1917

69. Invasion of which country by Germany started the World War II?

(1) France (2) Japan (3) Poland (4) Italy

Ans. *(3)*

Sol. On September 1, 1939, German forces under the control of Adolf Hitler bombard Poland on land and from the air. World War II had begun.

70. Who were Jadidists?

(1) Christian Reformer within Russian Empire (2) Communists in Russian Empire

(3) Muslim Reformers in Russian Empire (4) Leaders Socialist Revolutionary Party

Ans. *(3)*

Sol. The Jadids were Muslim modernist reformers within the Russian Empire in the late 19th and early 20th century

71. Who started we Dews paper L' Ami du people (The friend of the people) ?

(1) Jacques Louis David (2) O1ympe De Gouges (3) Montesquieu (4) Jean Paul Marat

Ans. *(4)*

Sol. L'Ami du peuple (, The Friend of the People) was a newspaper written by Jean-Paul Marat during the French Revolution

72. Which Governor General asked the Indians to remove their shoes as a mark of respect before him ?

(1) Ripon (2) Hastings (3) Amherst (4) Wellesley.

Ans. *(3)*

Sol. Hastings asked Indians to remove their shoes as a mark of respect before him.

73. 'Economic Survey' is published annually by the

(1) Ministry of Statistics and Planning (2) National Sample Survey Organisation

(3) Central Statistical Organisation (4) Ministry of Finance

Ans. *(4)*

Sol. The Economic Survey is prepared by the Economics Division of the Department of Economic Affairs in the Finance Ministry under the overall guidance of the chief economic adviser and is released after it is approved by the finance minister.

74. Choose the odd one out :

(1) Hindustan Petroleum Corporation Limited (2) Fertilizer Corporation of India Ltd.

(3) Hindustan Unilever Ltd. (4) Bharat Heavy Electricals Ltd.

Ans. *(3)*

Sol. Hindustan Unilever Ltd.- Private sector .HPCL,BHEL,Fertliser Corporation of India Ltd-Public sector

75. "Globalisation and Competition among producers has been of advantage to the consumers." Which of the following argument does not support this statement?

(1) There is a greater choice available to the consumers in goods

(2) The quality of goods has been improved

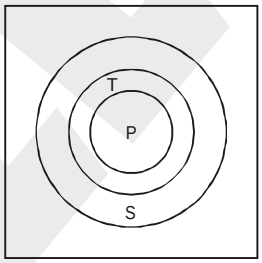
(3) Prices of goods are high

(4) Consumers are able to enjoy a better life

Ans. *(3)*

Sol. Prices of goods are high is wrong statement. Globalisation and Competition result in cheap prices of goods.

76. The graph shows distribution of employment in concentric circles :



P-Primary Sector Employment

S-Secondary Sector Employment

T-Tertiary Sector Employment

Which among the following state in India is compatible with this graph if the size of circle represents the size of the respective sector ?

(1) Bihar (2) Gujrat (3) Jharkhand Chhattisgarh

Ans. *(2)*

Sol. Gujarat Manufacturing accounts for largest share of employment in Gujarat.

77. A cotton farmer sells his weekly output of cotton to a weaver for Rs. 12800. He weaves cloth out of this and sells it to the cloth trader for Rs. 13500. The trader sells part of this cloth to a shirt maker for Rs. 13000 and the remaining cloth to a retailer at Rs. 12500. The shirt maker makes 50 shirts, each selling for Rs. 150. The cloth retailer sells his cloth to final customers for Rs. 14000. Calculate the value of final goods (which will become part of the GDP) in the case given above.

(1) Rs. 13, 000 (2) Rs. 79,500 (3) Rs. 11.500 (4) Rs. 19,700

Ans. *(3)*

Sol. GDP-Final price of goods and services- 50*150 + 4000 = 11,500

78. Suknya had to attend an official meeting at Delhi. She booked a train ticket in one of the super-fast trains. The train was delayed for long hours without any reason. In this situation

(1) She cannot approach consumer court as train delays can happen sometimes.

(2) She can file a complaint in Railway Office and claim refund of her ticket amount.

(3) She can approach consumer court for deficiency in service and claim refund of super-fast charges as damage.

(4) She can cancel her ticket without paying cancellation charges to Railways.

Ans. *(3)*

Sol. She can approach consumer court for deficiency in service and claim refund of super fast charges as damage under CONSUMER RIGHT PROTECTION ACT.

79. For the year 2000, the poverty line for a person was fixed at :

(1) Rs. 328 per month for rural areas and Rs. 554 for urban areas

(2) Rs. 328 per month for rural areas and Rs. 454 for urban areas

(3) Rs. 428 per month for rural areas and Rs. 454 for urban areas

(4) None of the above

Ans. *(2)*

Sol. In 2000 poverty line for a person was 328 per month for rural areas and 554 for urban areas

80. The Bank rate is the rate at which

(1) A bank lends to the public

(2) RBI lends to the public

(3) RBI gives credit to the commercial bank

(4)The Government of India lends to other countries

Ans. *(3)*

Sol. A bank rate is the interest rate at which a nation's central bank lends money to domestic banks,

81. In order to be recognized as an official opposition group in the Parliament, how many scats should it have?

(1) One third of the total strength (2) One fourth of the total strength

(3) 1/6th of the total strength (4) 1/10th of the total strength

Ans. *(4)*

Sol. In order to get formal opposition group recognition in either upper or lower houses, the concerned party must have at least 10% of the total strength of the house. A single party has to meet the 10% seat criterion, not an alliance.

82. Who is incumbent Chief Election Commissioner of India ?

(1) Rajiv Kumar (2) Rajiv Tandon (3) N.K. Singh (4) Sunil Arora

Ans. *(4)*

Sol. Sunil Arora is the CEC of India

83. Right to Information and Right to Education acts were enacted by Government of India respectively in which year?

(1) 2005, 2008 (2) 2006, 2009 (3) 2006, 2008 (4) 2005, 2009

Ans. *(4)*

Sol. RTI Act-2005 RTE Act-2009

84. Who of the following wanted our constitution should be like the following description:

"I shall strive for a constitution which will release India from all thraldom and patronage-I shall work for an India in which the poorest shall feel that it is their country in whose making they have an effective voice. An India in which there shall be no high class and low class of people.....

(1) Dr. Rajender Prasad (2) B.R. Ambcdkar (3) J.L. Nehru (4) Mahatma Gandhi

Ans. *(4)*

Sol. These lines were said by Mahatma Gandhi

85. Who among the following is a legal advisor General to a State Government?

(1) Advocate Government (2) Attorny General (3) Solicitor General (4) Public Prosecutor

Ans. *(1)*

Sol. An advocate general of a state is a senior officer of the law. In some common law and hybrid jurisdictions the officer performs the function of a legal advisor to the government,

86. Which of the following is the 'Third Wave' country that had won democracy in 1990 ?

(1) Bolivia (2) Belgium (3) Bangladesh (4) Nepal

Ans. *(4)*

Sol. The 'Third Wave' country that won democracy in 1990 was Nepal.

87. What is the result of political expression of gender division ?

(1) Has helped to improve women's role in Public life.

(2) Has provided superior status to women.

(3) The position of women is deteriorated in society.

(4) The position remains the same, as it was.

Ans. *(1)*

Sol. Political expression of gender division and political mobilisation have helped in improving women's condition in political sphere

88. Under which of the following circumstances, can the President declare an emergency ?

(A) External aggression (B) Internal disturbances

(C) Failure of the constitutional machinery in states (D) Financial Crisis.

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

Ans. *(2)*

Sol. National Emergency (Article 352):-External aggression. President's Rule in a State Emergency (Article: 356)-Failure of constitutional machinery in states. Financial Emergency (Article 360)-Financial Crisis

89. Which one of the following National Parks has a climate that varies from tropical to subtropical, temperate and arctic ?

(1) Kanchanjangha National Park (2) Nandadevi National Park

(3) Neora Valley National Park (4) Namdapha National Park

Ans. *(4)*

Sol. Namdapha National Park is the largest protected area in the Eastern Himalaya biodiversity hotspot and is located in Arunachal Pradesh in Northeast India. The habitat changes with increasing altitude from tropical moist forests to Montane forests, temperate forests and at the higher elevations, to Alpine meadows and perennial snow. The park has extensive bamboo forests and secondary forests in addition to the primary forests.

90. A farmer grows the following crops:

(i) Cotton (ii) Groundnut (iii) Rice (iv) Wheat

Which of these are Kharif crops ?

(1) (i) and (iv) (2) (ii) and (iii) (3) (i), (ii) & (iii) (4) (ii), (iii) & (iv)

Ans. *(3)*

Sol. Wheat-Rabi Crop.Groundnut,Rice,Cotton-Kharif

91. Which of the following factors influence the ocean currents ?

(i) Rotation of the Earth (ii) Air pressure and wind

(iii) Density of ocean water (iv) Revolution of the Earth

(1) (i) & (ii) (2) (i), (ii) & (iii) (3) (i) & (iv) (4) (ii) (iii) and (iv)

Ans. *(2)*

Sol. The Rotation of Earth (Coriolis Force), forces acting via winds, temperature and salinity(density) differences influence the ocean currents.

92. Consider these pairs :

I Cardamom Hills. Coromandel Coast II- Kaimur Hills, Konkan Coast

III Mahadco Hills, Central India IV. Mikir Hills. North-East/India

Which of the above pairs are correctly matched ?

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

Ans. *(3)*

Sol. Kaimur hills-M.P,U.P, Bihar. Cardemom hills-Part of Western Ghats and not located in Coromandal Coast

93. The lower Gangetic plain is characterized by humid climate with high temperature throughout the year. Which one among the following pairs of crops is most suitable for this region?

(1) Paddy and Cotton (2) Wheat and Jute (3) Paddy and Jute (4) Wheat and Cotton

Ans. *(3)*

Sol. Paddy and Jute are the main crops of lower Gangetic plains(e.g West Bengal)

94. In the context of the global climate change, which of the following agricultural practices helps/help in carbon sequestration/storage in the soil?

(1) I and II (2) III only (3) I, II and III (4) None of them

Ans. *(3)*

Sol. All help in carbon sequestration

95. There are 50 tiger reserves in India which are governed by Project Tiger and administered by NTCA. Which of the following are Tiger Reserves ?

(I) Bandipur (II) Bhitarkanika (III) Manas (IV) Sunderbans

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

Ans. *(1)*

Sol. Bhitarkanika National Park is not a Tiger reserve

96. A particular State in India has the following characteristics :

I It is located on the same latitude which passes through northern Rajashtan.

II It has over 80% of its area under forest cover.

III Over 12% of forest cover constitutes Protected Area Network in this State.

The state having all the above characteristics is

(1) Arunanchal Pradesh (2) Assam (3) Himachal Pradesh (4) Uttarakhand

Ans. *(1)*

Sol. In terms of area, Madhya Pradesh has the largest forest cover in the country followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra. In terms of forest cover as a percentage of their total geographical area, the top five states are Mizoram (85.41 percent), Arunachal Pradesh (79.63 percent), Meghalaya (76.33 percent), Manipur (75.46 percent) and Nagaland (75.31 percent)

97. The, peninsular part of India experiences peak summers earlier than northern India.

(1) Due to apparent northward movement of Sun, the global heat belts shift northwards.

(2) Cold waves from Central Asia sweep through the northern planes during that time.

(3) There is less rainfall in Peninsular India daring that time.

(4) Clouds do not form in those months.

Ans. *(1)*

Sol. Peninsular India experience peak summers earlier when compare to north India due to the apparent northward movement of the sun, the global heat belt shifts northward. In March, the highest temperature is about 38° Celsius, recorded on the Deccan plateau

98. Identify the state of India which has all the following characteristics:

(i) Its annual rainfall is 200-400 cm. (ii) Most of the area is covered with alluvial soil.

(iii) Rice is the predominant crop this state.

(1) Punjab (2) Orissa (3) Assam (4) Tamilnadu

Ans. *(3)*

Sol. All the given conditions fulfill by the state Assam. Aeverage rainfall-200-400 cm,Main crop-Rice,Soil-Alluvial

99. The National Highways Authority of India (NHAI) has signed a Memorandum of Understanding (MOU) for use of spatial technology for monitoring and managing National Highway with.....

(1) IIT-Bombay & ISRO (2) NRSC and NECTAR (3) HTUT-Delhi and MITE (4) NASA and IIT-Delhi

Ans. *(2)*

Sol. NHAI has signed MoU with NRSC(branch of ISRO) and NECTAR for use of spatial technology for monitoring and managing National Highways.

100. Which of the following is known as the Manchester of Uttar Pradesh ?

(1) Agra (2) Allahabad (3) Kanpur (4) Lucknow

Ans. *(3)*

Sol. Kanpur, one of the industrial capitals of India is also known as the Manchester of Uttar Pradesh.