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**SOF NATIONAL SCIENCE
OLYMPIAD 2025-26**

QUESTION
PAPER SET

C

CLASS

10

Total Questions : 50

Time : 1 hr.

Guidelines for the Candidate

- You will get additional ten minutes to fill up information about yourself on the OMR Sheet, before the start of the exam.
- Write your **Name, School Code, Class, Section, Roll No.** and **Mobile Number** clearly on the **OMR Sheet** and do not forget to sign it. We will share your marks / result and other information related to SOF exams on your mobile number.
- The Question Paper comprises three sections:
Logical Reasoning (10 Questions), **Science** (35 Questions) and **Achievers Section** (5 Questions)
Each question in Achievers Section carries 3 marks, whereas all other questions carry 1 mark each.
- All questions are compulsory. There is no negative marking. Use of calculator is not permitted.
- There is only ONE correct answer. Choose only ONE option for an answer.
- To mark your choice of answers by darkening the circles on the OMR Sheet, use **HB Pencil** or **Blue / Black ball point pen** only.
E.g.
Q.16: If a mixture can be separated by magnetic separation, one of the constituents must be
A. Ferrous B. Non-ferrous C. Precious D. Non-metallic.
As the correct answer is option A, you must darken the circle corresponding to option A on the OMR Sheet.
- Rough work should be done in the blank space provided in the booklet.
- Return the OMR Sheet to the invigilator at the end of the exam.
- Please fill in your personal details in the space provided before attempting the paper.
- Participate in SOF-Techfest IIT Bombay Innovation Challenge. Open for class 8, 9 and 10. For details and to participate, please turn to last page.**

16. ● B C D



Name:.....

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1. In a family of nine members. K is daughter-in-law of T, who is husband of M. N is son of J and father of S and R. P is only brother-in-law of L, who is daughter-in-law of K. N is grandson of T. How is P related to S?
 A. Father B. Paternal uncle
 C. Maternal uncle D. Data Inadequate

2. A word arrangement machine when given an input line of words rearranges them following a particular rule in each step. The following is an illustration of input and steps of rearrangement.

Input : would you like to create question

Step I : to would you like create question

Step II : to you would like create question

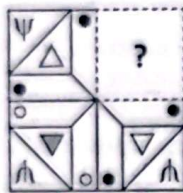
Step III : to you like would create question

And step III is the last step of the above input.

As per the rule followed in the above steps, which of the following is the second last step for the given input?

Input : sure about answers i am giving

- A. i am sure about giving answers
 B. i am sure about answers giving
 C. i am sure answers about giving
 D. i am about sure answers giving
3. Which of the following options would complete the given figure pattern?

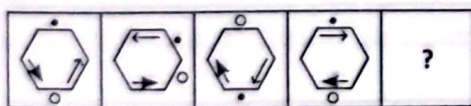


- A. B. C. D.

4. Which of the following interchanges in signs and numbers would make the given expression correct?

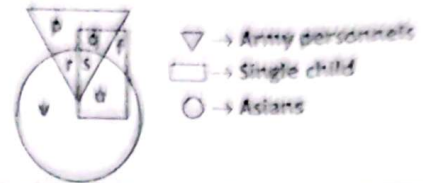
$$7 - 60 \times 42 \div 12 + 53 = 319$$

- A. 12 and 7; + and - B. 12 and 7; ÷ and ×
 C. 7 and 53; + and - D. 7 and 53; ÷ and ×
5. Select a figure from the options which will continue the given figure series.



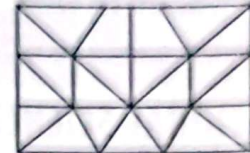
- A. B. C. D.

6. Study the given Venn diagram carefully and answer the following question.

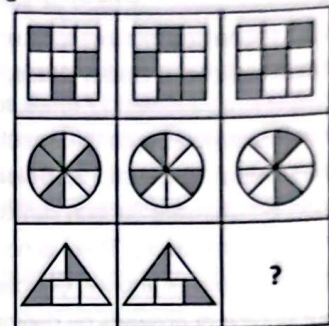


Which of the following letters represents Asians and personnels which does not have any sibling?

- A. s B. q C. r D. v
7. Find the number of triangles formed in the given figure.



- A. 24 B. 23
 C. 22 D. More than 24
8. Select a figure from the options which will complete the given figure matrix.

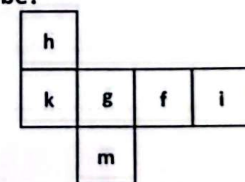


- A. B. C. D.

9. There is a certain relationship between the pair of terms on the either side of ::. Identify the relationship between the given pair and find the missing term.

$$HC : 91 :: NB : ?$$

- A. 415 B. 296 C. 286 D. 204
10. Which of the following letters lie on the face opposite to the face having letter 'f', when the given net is folded to form a cube?



- A. m B. h C. k D. g

SCIENCE

11. A deep sea diver is looking out of the water sees the outside world contained in a circular horizon. Find the radius of this circle if the refractive index of water is $\frac{5}{3}$

and the diver is 15 cm below the surface under water.

- A. 10.52 cm B. 11.25 cm
 C. 9.12 cm D. 12 cm

12. A lady, who cannot see objects nearer than 0.75 m from her eyes, wants to read a book placed at a distance of 15 cm clearly. The nature and the power of lens required by her are

Nature of the lens	Power of the lens
A. Convex	+5.3 D
B. Concave	-5.3 D
C. Convex	+2.7 D
D. Concave	-2.7 D

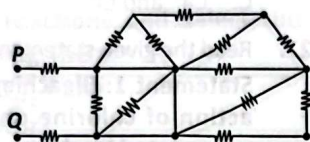
13. Read the given statements and select the correct option.

Statement I : The average velocity of a particle moving along a circular path can be zero in a time interval. It is possible that the instantaneous speed is never zero in that interval.

Statement II : A body having acceleration can move with constant speed.

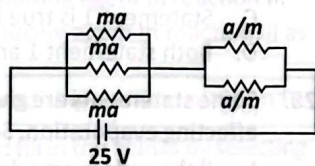
- A. Both statement I and statement II are true.
 B. Both statement I and statement II are false.
 C. Statement I is true but statement II is false.
 D. Statement I is false but statement II is true.

14. Find the equivalent resistance between points P and Q in the circuit shown in figure where each resistor is of resistance R.



- A. $2R$ B. $4R$ C. $\frac{R}{2}$ D. $6R$

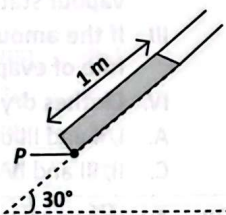
15. In the given circuit $m = 6$, is an arbitrary constant. The value of a for which the current in the circuit



is $\left(\frac{4}{3}\right)$ A, is

- A. 4 B. 9 C. 8 D. 10

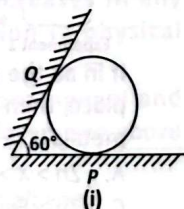
16. The given figure shows a narrow tube filled with mercury to a depth of 1 m. The tube is then inclined at 30° to the horizontal.



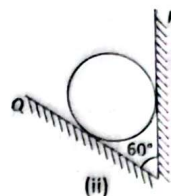
If the atmospheric pressure is 76 cm of Hg, what is the pressure at point P?

- A. 50 cm of Hg B. 126 cm of Hg
 C. 101 cm of Hg D. 25 cm of Hg

17. An iron sphere weighing 10 N rests on a V shaped smooth trough whose sides form an angle of 60° as shown in the given figures (i) and (ii). Which of the following statements is/are incorrect?

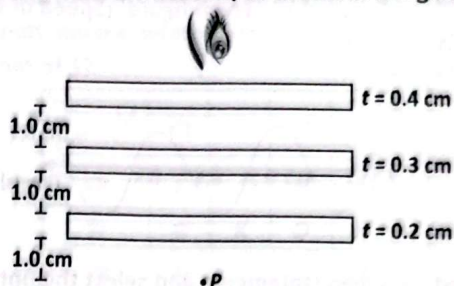


- I. The reaction force on the sphere due to side P is 10 N and due to side Q (in fig. (i)) is zero.
 II. Reaction force on sphere will not change if side P is changed from horizontal to vertical (in fig. (ii)).



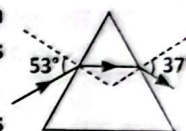
- A. II only B. I only
 C. I and II D. None of these

18. Locate the image of the point P as seen by the eye through the slabs of refractive index ($\mu = 1.2, 1.3, 1.4$ respectively starting from the bottom) as shown in the given figure.



- A. Approx. 0.4 cm below point P.
 B. Approx. 0.2 cm above point P.
 C. Approx. 0.5 cm above point P.
 D. Approx. 0.7 cm above point P.

19. A ray incident at an angle 53° on a prism emerges at an angle 37° as shown in figure.



Which of the following statements is/are correct?

- I. If angle of incidence is made 50° then angle of emergence will be less than 40° .
 II. The angle of emergence does not depend on angle of incidence.
 A. I only B. II only
 C. I and II D. None of these

20. A ball is allowed to roll along an undulating plane as shown in the given figure 1 and another ball is released from rest from one side of a smooth curved path as shown in figure 2.

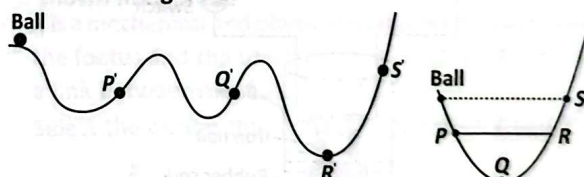


Figure 1

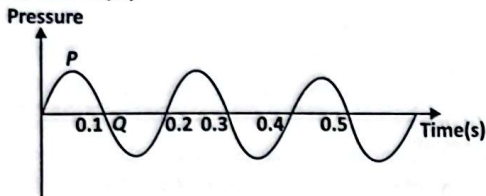
Figure 2

Which of the given statements is/are incorrect?

- I. In figure 1, kinetic energy at P' is equal to kinetic energy at Q'.
 II. In figure 2, the ball would not rise to the level higher than point S.
 III. The total energy is higher at point S and S' in both figures.
 A. I only B. II and III only
 C. III only D. I and III only

21. A circular loop is kept in that vertical plane which contains the North-south direction. It carries a current that is towards North at the topmost point. Let P be a point on the axis of the circle to the East of it and Q is a point on this axis to the West of it. The magnetic field due to the loop
- Is towards East at point P and towards West at point Q.
 - Is towards West at point P and towards East at point Q.
 - Is towards East at both points P and Q.
 - Is towards West at both points P and Q.

22. The pressure variation of the air around a vibrating string is shown in the given figure. (Speed of sound in air is 320 m/s)



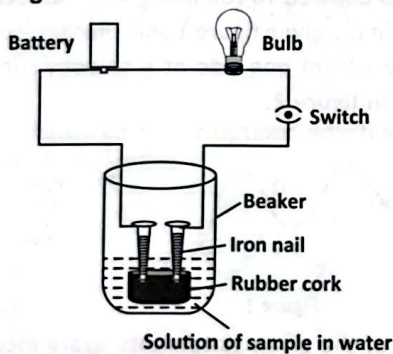
Read the given statements and select the option that correctly identifies them as true (T) and false (F) ones.

- Point Q shows the region of compression.
- The wavelength of sound produced by vibrating string is 64 m.
- This sound is audible to human ear.
- The velocity of sound depends on the medium of its propagation.

	(I)	(II)	(III)	(IV)
A.	T	F	T	F
B.	T	T	F	T
C.	F	T	F	T
D.	F	T	T	F

23. The following apparatus was set up to study the electrical properties of different solutions given below:

- | | |
|--------------|-----------------------|
| I. Glucose | II. Hydrochloric acid |
| III. Ethanol | IV. Sodium hydroxide |
| V. Vinegar | VI. Distilled water |



The bulb will glow in case of

- | | |
|--------------------------|----------------------|
| A. I, III and VI only | B. III and V only |
| C. II, IV, V and VI only | D. II, IV and V only |

Consider the given compounds :

- | | |
|-------------|--------------|
| I. H_2O | II. CH_3OH |
| III. CO_2 | IV. H_2O_2 |

The increasing order of percentage of oxygen by mass in these compounds is

- | | |
|------------------------|------------------------|
| A. $II < III < I < IV$ | B. $III < IV < II < I$ |
| C. $I < II < III < IV$ | D. $IV < I < II < III$ |

25. Match column-I with column-II and select the correct option.

Column-I	Column-II
P. A metal that reacts violently with cold water	(i) Mn
Q. A metal that reacts with very dilute nitric acid to evolve hydrogen gas	(ii) Ag
R. A metal which can displace hydrogen from steam only	(iii) K
S. A metal that does not react with air even at high temperature	(iv) Zn

- | | |
|-----------------------------------|-----------------------------------|
| A. P-(ii), Q-(i), R-(iii), S-(iv) | B. P-(iii), Q-(i), R-(iv), S-(ii) |
| C. P-(iv), Q-(ii), R-(iii), S-(i) | D. P-(iii), Q-(ii), R-(i), S-(iv) |

26. In which of the following pairs, both the species do not have same number of electrons?

- | | |
|-------------------------|------------------------|
| A. Mg^{2+} and Na^+ | B. Al^{3+} and F^- |
| C. Ca^{2+} and Cl^- | D. O^{2-} and Ar |

27. Read the given statements and select the correct option.
Statement 1: Bleaching powder is produced by the action of chlorine on quick lime and it is simply represented by chemical formula CaO_2Cl_2 .

Statement 2: Bleaching powder acts as a reducing agent in many chemical industries.

- Both statement 1 and statement 2 are true.
- Statement 1 is false but statement 2 is true.
- Statement 1 is true but statement 2 is false.
- Both statement 1 and statement 2 are false.

28. Some statements are given below regarding the factors affecting evaporation. Select the incorrect statements.

- If the surface area decreases then rate of evaporation increases.
- On increasing temperature, more number of particles get enough kinetic energy to go into the vapour state.
- If the amount of water in air is already high then rate of evaporation is high.
- Clothes dry faster on a windy day.

- | | |
|------------------------|-------------------|
| A. I, II and III only | B. I and III only |
| C. II, III and IV only | D. II and IV only |

29. Ayush has arranged the following sets of experiments to observe the reactivity of different metals.



If in all the experiments, displacement reaction takes place, then the decreasing order of reactivity of given metals is

- | | |
|-----------------------|-----------------------|
| A. $Zn > X > Fe > Ag$ | B. $X > Zn > Fe > Ag$ |
| C. $Zn > Fe > X > Ag$ | D. $Zn > Fe > Ag > X$ |

30. An element 'X' has two naturally occurring isotopes, isotope P with mass number 35 and isotope Q with mass number 37. The average atomic mass of element 'X' is 35.5 u. The percentage abundance of isotopes P and Q are respectively
- A. 75, 25 B. 80, 20
C. 70, 30 D. 65, 35

31. Refer to the given table and fill in the blanks by selecting the correct option.

S.No.	Dispersed phase	Dispersion medium	Example
1.	Liquid	(i)	Milk
2.	(ii)	Gas	Mist
3.	Solid	(iii)	Milky glass
4.	Gas	Solid	(iv)

- (i) (ii) (iii) (iv)
- A. Liquid Solid Liquid Foam
B. Gas Liquid Gas Shaving cream
C. Liquid Liquid Solid Rubber
D. Liquid Gas Solid Milk of magnesia
32. Study the given redox reactions and select the correct statement regarding them.
- I. $\text{Cu} + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$
II. $2\text{AgBr} + \text{Cl}_2 \rightarrow 2\text{AgCl} + \text{Br}_2$
III. $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow 2\text{Fe} + \text{Al}_2\text{O}_3$
IV. $\text{Zn} + \text{CuSO}_4 \rightarrow \text{Cu} + \text{ZnSO}_4$
- A. Cu gets reduced in reaction I and CuSO_4 gets oxidised in reaction IV.
B. AgBr is acting as an oxidising agent in reaction II.
C. Fe_2O_3 is acting as a reducing agent in reaction III as it is getting reduced.
D. CuSO_4 is acting as an oxidising agent in reaction IV.

33. Read the given passage and fill in the blanks by selecting the correct option.

Alloy is a (i) mixture of two or more metals. The electrical conductivity and melting point of an alloy is generally (ii) than that of pure metals. Solder is an alloy of (iii) and (iv).

- (i) (ii) (iii) (iv)
- A. Heterogeneous More Zn Cu
B. Homogeneous Less Pb Sn
C. Heterogeneous Less Fe Pb
D. Homogeneous More Cu Sn
34. Read the following statements carefully and select the option that correctly identifies them as true (T) and false (F) ones.
- I. When the molecular mass increases in any homologous series, a gradation in physical properties is observed.
II. In the structure of graphite, pentagonal and heptagonal arrays are placed in layers one above the other.
III. C_4H_{10} is an alkene while C_5H_8 is an alkane.

- IV. Reaction of ethanol with hot and concentrated sulphuric acid results in the evolution of hydrogen gas.

	I	II	III	IV
A.	F	T	F	T
B.	F	T	T	F
C.	T	F	F	F
D.	T	T	F	F

35. In a pea plant, yellow (Y) seed colour is dominant over green (y) seed colour and round (R) seed shape is dominant over wrinkled (r) seed shape. In the following Punnett square, which plant has the same genotype as that of S?

♀ \ ♂	YR	Yr	yR	yr
YR	F	J	N	R
Yr	G	K	O	S
yR	H	L	P	T
yr	I	M	Q	U

- A. N B. M C. K D. G
36. Enzyme ptyalin is secreted by the _____.
- A. Salivary glands B. Gastric glands
C. Pancreas D. Intestinal glands
37. Select the option that correctly identifies the difference between phagocytosis (P) and pinocytosis (Q).
- | (P) | (Q) |
|--|--|
| A. It is a type of exocytosis. | It is a type of endocytosis. |
| B. It is also known as 'cell eating'. | It is also known as 'cell vomiting'. |
| C. It is a nutritive process. | It is a nutritive and defensive process. |
| D. It involves the intake of extracellular food particles. | It involves the intake of extracellular fluid particles. |

38. Read the given paragraph.
- X is a mechanical and physiological connection between the foetus and the uterine wall of mother. Y serves as a link between the foetus and X.
- Select the option that correctly identifies X and Y.

X	Y
A. Placenta	Umbilical cord
B. Umbilical cord	Placenta
C. Placenta	Oviduct
D. Umbilical cord	Fimbriae

39. The corrosion of metal structures and the discoloration or yellowing of buildings and statues in an area indicate the effect of which environmental problem?
- A. Acid rain B. Global warming
C. Ozone depletion D. Greenhouse effect

40. Select the incorrect match.

Cell Organelle	Function
A. Golgi Apparatus	– Metamorphosis in frog
B. Vacuole	– Osmoregulation
C. Chromoplast	– Provides colour to flowers and fruits
D. Cell wall	– Provides protection and structural support

41. Match the columns and select the correct option.

Column I (Crop variety)	Column II (Characteristics)
a. Pusa Sadabahar	(i) Resistant to white rust
b. Himgiri	(ii) Resistant to fruit and shoot borer
c. Pusa Swarnim	(iii) Resistant to chilli mosaic virus
d. Pusa Sawani	(iv) Resistant to leaf and stripe rust

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

42. Read the given statements and select the option that correctly fills the blanks in any two of them.

- I. In a _____, a hybrid is crossed with one of its parents.
 - II. In a _____, an individual of unknown genotype showing a dominant trait is crossed with the recessive parent.
 - III. Eye colour is an example of _____ trait.
- A. I-Back cross, III-Acquired
 B. II-Test cross, III-Inherited
 C. I-Test cross, II-Back cross
 D. I-Reciprocal cross, III-Acquired

43. Read the given statements and select the option that correctly identifies them as true (T) or false (F) ones.

- (i) Atrio-ventricular node is present in the left atrium near the opening of superior vena cava.

- (ii) The pulmonary vein carries deoxygenated blood while pulmonary artery carries oxygenated blood.
 (iii) Systemic circulation is the flow of oxygenated blood from left ventricle to all body parts and deoxygenated blood from the body parts to the right atrium.
 (iv) Bicuspid valve is present between the left atrium and left ventricle while the tricuspid valve is present between right atrium and right ventricle.

	(i)	(ii)	(iii)	(iv)
A.	T	F	T	T
B.	F	F	T	T
C.	F	T	F	F
D.	T	T	F	F

44. Read the given statements and select the correct option.
 Statement 1 : Capture fishery is the practice of obtaining fish from natural resources without raising them.

Statement 2 : Marine fishery is the practice of obtaining fish from saline water resources like seas or oceans.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
 B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true but statement 2 is false.
 D. Statement 1 is false but statement 2 is true.

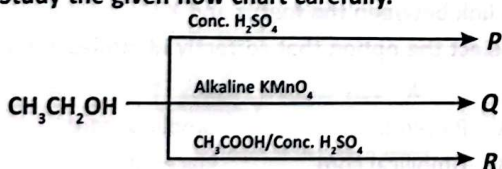
45. Read the given statements and select the correct ones.

- (i) Haversian system is the fundamental functional unit of compact bone and consists of Haversian canal, lamellae, osteocytes and matrix.
- (ii) Plasma is slightly acidic and forms 55% of the total volume of blood.
- (iii) Bipolar neurons have one axon and no dendrites.
- (iv) Areolar tissue is commonly known as the packaging tissue of the body.
- (v) The process of formation of red blood cells (RBCs) is called haemolysis.

- A. (ii), (iii) and (v) only B. (i) and (iv) only
 C. (iii) and (iv) only D. (i), (iii) and (v) only

ACHIEVERS SECTION

46. Study the given flow chart carefully.



Which of the following statements are correct regarding P, Q and R?

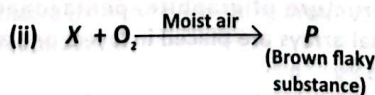
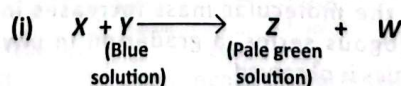
- I. The next higher homologue of P is propane.
- II. Same gas is produced when ethanol and Q separately reacts with sodium metal.
- III. R contains $\text{—}\overset{\text{O}}{\parallel}{\text{C}}\text{—H}$ functional group.

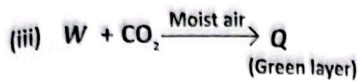
IV. P reacts with sodium hydrogen carbonate to produce CO_2 gas.

V. In all the three compounds P, Q and R, the valency of carbon is four.

- A. II, III and IV only B. II and V only
 C. II and IV only D. I, III and V only

47. Consider the following chemical reactions.





Select the correct statement(s) regarding the given chemical reactions.

- I. The reaction given in (i) is a redox reaction where X is reduced and Y is oxidised.
 - II. X is iron and Y is copper sulphate and the reaction indicates that copper is more reactive than iron.
 - III. W is copper metal, which forms a green layer of basic copper carbonate Q on its surface in the presence of moist air and CO_2 .
 - IV. The brown flaky substance P is hydrated iron(III) oxide, formed due to rusting of iron in moist air.
- A. I, II and IV only B. II and III only
C. IV only D. III and IV only

48. Refer to the given table regarding certain hormones, their source and one major effect of each on the human body.

Hormone	Source	Effect on the human body
P	Pineal	Regulates sleep-wake cycle
Glucagon	Q	Stimulates conversion of stored glycogen into glucose
Cortisol	R	Stimulates RBC production
S	Parathyroid	Maintains calcium homeostasis

Select the option that correctly identifies P, Q, R and S.

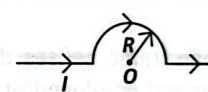
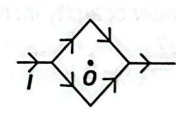
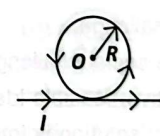
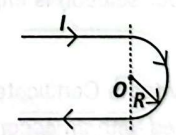
- | | P | Q | R | S |
|----|--------------|---|-------------------|---------------------|
| A. | Calcitonin | Posterior pituitary | Hypothalamus | Thyroid calcitonin |
| B. | Testosterone | Liver | Parathyroid gland | Calcitonin |
| C. | Melatonin | α -cells of islets of Langerhans | Adrenal gland | Parathyroid hormone |
| D. | FSH | Anterior pituitary | Thyroid | Parathyroid hormone |

49. Read the given paragraph where few words have been italicised and select the correct option regarding them. After pollination, only *one* pollen tube passes through the style. Two *motile* male gametes are formed inside the tube during its growth through style. After reaching

the ovary, pollen tube enters the ovule through the *micropylar* end. After penetration, tip of the pollen tube ruptures, releasing the male gametes into the embryo sac. The mature embryo sac consists of an egg apparatus, *three* polar nuclei and *two* antipodal cells. During fertilisation, one male gamete fuses with the egg to form *haploid* zygote and this process is called *vegetative* fertilisation. The other male gamete fuses with polar nuclei to form primary endosperm nucleus and this process is called *syngamy*.

- A. *One* should be changed to *two* whereas *motile* should not be changed as it is mentioned correctly.
- B. *Style* should not be changed whereas *micropylar* should be changed to *chalazal* as it is mentioned incorrectly.
- C. The positions of *three* and *two* should be interchanged whereas *haploid* should be changed to *diploid* as it is mentioned incorrectly.
- D. *Vegetative* should be changed to *double* whereas *syngamy* should not be changed as it is mentioned correctly.

50. Column I shows various configurations of current carrying wires and column II gives the magnetic field at centre O due to these configurations. Match column I with column II and select the correct option from the given codes.

Column I	Column II
P. 	(i) $\frac{\mu_0 I}{2R} \left(1 + \frac{1}{\pi}\right)$
Q. 	(ii) $\frac{\mu_0 I}{2R} \left(\frac{1}{\pi} + \frac{1}{2}\right)$
R. 	(iii) $\frac{\mu_0 I}{4R}$
S. 	(iv) Zero

- A. P-(iii), Q-(iv), R-(ii), S-(i)
- B. P-(iii), Q-(ii), R-(i), S-(iv)
- C. P-(iv), Q-(iii), R-(i), S-(ii)
- D. P-(iii), Q-(iv), R-(i), S-(ii)

SPACE FOR ROUGH WORK