I.F.S. EXAM-2015

C-GEQ-O-CPUB

BOTANY

Paper – II

Time Allowed : Three Hours | *Maximum Marks : 200*

Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions :

*There are **EIGHT** questions in all, out of which **FIVE** are to be attempted.*

*Questions no. **1** and **5** are compulsory. Out of the remaining **SIX** questions, **THREE** are to be attempted selecting at least **ONE** question from each of the two Sections A and B.*

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

*Answers must be written in **ENGLISH** only.*

Neat sketches may be drawn, wherever required.

SECTION A

Q1. Explain each of the following : *8×5=40*

(a) Suggest why prions should not be included among viruses. *8*

(b) Discuss the role of central control system in managing surveillance at check points during cell cycle. *8*

(c) Give two popular examples where genetic differences influence induction of mutation. *8*

(d) Is the genetic code universal ? *8*

(e) Explain Binomial and Poisson distribution. *8*

Q2. (a) Describe nuclear pores and their role in nucleocytoplasmic traffic with suitable diagrams. *10+10=20*

(b) How will you distinguish cytologically between paracentric inversion and pericentric inversion ? *10+10=20*

Q3. (a) $\frac{X}{A}$ ratio is not only a primary sex determining signal but has several major regulatory genes in function. Discuss what role do they play in sex differentiation, with suitable examples. *20*

(b) Describe multigene families with divergent members of globin genes and pseudogenes subject to the difference in expression to the time and space. *5+15=20*

Q4. (a) Why is *Agrobacterium tumefaciens* the most popular and important tool in genetic engineering of plant systems ? Describe the various steps used in T-DNA mediated transfer of foreign genes into plants. *5+15=20*

(b) What are the merits of pedigree methods ? Describe the pedigree-bulk methods developed at CIMMYT, Mexico for wheat breeding. *8+12=20*

SECTION B

Q5. Write brief notes on each of the following : *8×5=40*

(a) "Tricarboxylic acid cycle is an amphibolic process." Explain. *8*

(b) "Phenolic substances are not mere metabolic waste products." Discuss. *8*

(c) What is 'triple response growth' ? How is it induced ? *8*

(d) How does El Niño result in extensive disruption of weather around the world ? *8*

(e) Describe the phenomenon of 'biomagnification' with special reference to chlorinated hydrocarbons. *8*

Q6. (a) In what way does carbon fixation pathway in malate formers differ from that in aspartate formers ? *20*

(b) Trace the physiological changes associated with the process of seed germination. How is the process of germination regulated by phytohormones ? *15+5=20*

Q7. (a) How do seasonal variations in day length conditions influence flowering patterns of plants ? Give a comprehensive account of the structure and mode of action of the photoreceptor involved. *10+10=20*

(b) What are 'carrier proteins' ? Describe the ion uptake mechanism in plants mediated by carrier proteins. *5+15=20*

Q8. (a) Write an account of 'Joint Forest Management Programme' (JFMP). How does people's participation ensure sustainable forest resource management ? *15+5=20*

(b) Discuss the strategies adopted for phytoremediation. Add a critical note on potentialities and limitations of phytoremediation to clean up heavy metal contaminated sites. *10+10=20*