2017

BOTANY

(Major)

Paper : 2·1

(Gymnosperm, Paleobotany and Plant Anatomy)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following : 1×7=7

(a) What is spur?

(b) What is quiescent centre?

(c) Name the chief organization of India with its location involved in paleobotanical study.

(d) What is pavement tissue?

(e) What do you mean by *Pteris* and Dendron with regards to fossil study?

(f) Mention the function of periderm.

(g) Write the name of best known fossil plant of carboniferous period.

2. Answer the following : 2×4=8

(a) Mention the xerophytic characters found in *Pinus* needle.

(b) What do you mean by secondary medullary rays?

(c) Write on the infiltration theory of fossil formation.

(d) Draw a chart diagram of the life cycle of *Thuja*.

3. Answer any *three* from the following : 5×3=15

(a) Write on the morphology of the ovuliferous scale of *Pinus*.

(b) Write on the structure of sieve tubes and their functions.

(c) Briefly describe the process of fossilization.

(d) Write the differences between heartwood and sapwood.

(e) "*Ginkgo* is a living fossil." Justify the statement.

(Continued)

4. Answer the following questions : 10×3=30

(a) "*Gnetum* form a connecting bridge in between gymnosperms and angiosperms" to support this comment, put forward yours views. 10

Or

Give an illustrated account of male and female gametophytes of *Cycas*. 5+5=10

(b) With diagrammatic sketch, describe the formation of cambium ring and secondary tissue in dicotyledonous stem. What is annual ring? 8+2=10

Or

Classify the meristematic tissue on the basis of their position in the plant body. Give proper sketch. With the help of diagram, describe the Korper-Kappe theory of root meristem. 7+3=10

(c) Give an illustrated account of the vegetative and reproductive structures of *Rhynia*. 5+5=10

Or

Write about the general characters of Cycadofilicales. Give an example of fossil plant belonging to Bennettitales. 9+1=10

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2017

BOTANY

(Major)

Paper : 2.2

(Theory)

(Cell Biology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following : 1×7=7

(a) What are nucleoporins?

(b) Point out at least one primary feature of a typical collagen molecule.

(c) In the absence of a nucleus, will the ribosomes translate newly transcribed mRNA resulting in functional proteins?

(d) What are lysosomes?

(e) Define symmetric karyotype.

(f) What are Okazaki fragments?

(g) What is the function of Cdks (Cyclin-dependent kinase) in cell cycle?

2. Differentiate between the following : 2×4=8

(a) Active transport and Passive transport

(b) Transporters and Channels

(c) Exocytosis and Endocytosis

(d) Peripheral membrane proteins and Integral membrane proteins

3. Answer any *three* of the following : 5×3=15

(a) State the properties that distinguish ion channels from aqueous pores.

(b) Discuss the ultrastructure and function of mitochondria.

(c) Mention the activities that take place during the interphase stage of mitotic cell cycle.

(d) Briefly describe the fluid mosaic model of the plasma membrane.

(e) What are enzyme coupled receptors? Describe the different classes of enzyme coupled receptors.

4. Answer any *three* of the following :

(a) Describe the molecular components that make up the cell membrane. 10

(b) What are intracellular signaling proteins? Explain how these intracellular signaling proteins function as molecular switches. 2+8=10

(c) Who discovered the double-helical structure of DNA? Enumerate the detailed features of DNA double helix. Point out the differences between A-DNA and C-DNA. 1+6+3=10

(d) With the help of neat labelled diagrams, discuss the structure and function of giant chromosomes. 10

(e) Give an account of the mechanism involved in ER Ca^{++} pump called SERCA (Sarco Endoplasmic Reticulum Ca^{++}-ATPase). 10

(f) Describe the three different types of secretory vesicles depending on the signal sequence. 10

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