

Time : 03 hrs.

MM=70

General Instructions :

1. There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
 2. Section A contains question numbers 1 to 5, multiple-choice questions of one mark each.
 3. Section B contains question numbers 6 to 12, short answer type I questions of two marks each.
 4. Section C contains question numbers 13 to 21, short answer type II questions of three marks each.
 5. Section D contains question number 22 to 24, case-based short answer type questions of three marks each.
 6. Section E contains question numbers 25 to 27, long answer type questions of five marks each.
 7. There is no overall choice in the question paper. However, internal choices are provided in two questions of one mark, one question of two marks, two questions of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.
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SEC-A

1. After forceful inspiration the amount of air that can be breathed out by maximum forced expiration is equal to
 - (a) Inspiratory reserve volume (IRV) + Expiratory reserve volume (ERV) + Tidal volume (TV) + Residual volume (RV).
 - (b) IRV + RV + ERV
 - (c) IRV + TV + ERV
 - (d) TV + RV + ERV
2. With respect to fungal sexual cycle choose the correct sequence of events.
 - (a) Karyogamy, Plasmogamy and Meiosis
 - (b) Meiosis, Plasmogamy and Karyogamy
 - (c) Plasmogamy, Karyogamy and Meiosis
 - (d) Meiosis, Karyogamy and Plasmogamy
3. A bivalent consists of
 - (a) Four chromatids and four centromeres.
 - (b) Four chromatids and two centromere.
 - (c) Two chromatids and two centromeres.
 - (d) Two chromatids and one centromeres.

OR

Vascular bundles are closed ones. What type of tissue is lacking in them?

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- 4 The part of nephron impermeable to Salt but permeable to water is
- (a) Descending Limb of henle's loop
 (b) Ascending Limb of henle's loop
 (c) Distal convoluted tubule
 (d) Collecting duct
- 5 The vein that supplies nutrients from the intestine to the liver is
- (a) Hepatic vein (b) inferior vena cava
 (c) Hepatic portal vein (d) renal portal vein

SEC-B

- 6 What is referred to as satellite chromosome?
- 7 What are histones? What are their functions?
- 8 If a plant shows a symptom which would develop due to deficiency of more than one element, how would you find out experimentally the real deficient mineral element?
- 9 Why are deuteromycetes commonly known as imperfect fungi? Mention two characteristics of mycelium of such fungi.
- 10 What are hydrocolloids? Name two of them and their respective sources.
- 11 What is parthenocarpic fruit and pneumatophores?
- 12 How is a pinnately compound leaf different from a palmately compound leaf? Write examples.

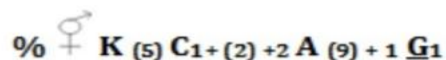
OR

What are secondary medullary rays? Write its functions.

SEC-C

- 13 Mention the ploidy ($n/2n$) of the following:
- a. Protonemal cell of a moss
 b. Primary endosperm nucleus in Dicot
 c. Leaf cell of a Moss
 d. Prothallus cell of a fern
 e. Zygote of a fern
 f. Meristem cell of monocot
- 14 With the help of given floral formula draw floral diagram.

• Floral formula:



- 15 What is periderm? How does periderm formation takes place in the dicot stems?

- 16 A transverse section of a trunk shows alternate concentric rings:
- What are the rings known as?
 - How are these rings formed?
 - What is the significance of these alternate concentric rings?

OR

Which one of the plant growth regulators would you use if you are asked to:

- Induce rooting in a twig.
 - Quickly ripen a fruit.
 - Delay leaf senescence.
 - Induce growth in axillary buds.
 - Induce immediate stomatal closure in leaves.
 - Bolt in rosette plant.
- 17 With the help of diagram explain 9+2 organization of axonemal microtubules?
Write the function of centriole.

OR

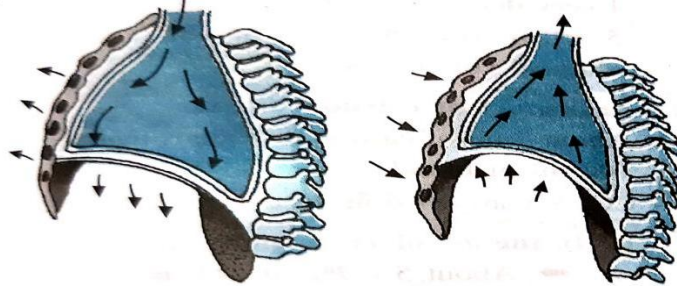
An Rh-negative woman is carrying an Rh-positive foetus for the second time. Describe the consequences of Rh incompatibility in this case.

- 18 (a) Name the leukocytes involved in: (i) Immune response (ii) Allergic reactions
(b) What is meant by auto-excitability of SA node?
- 19 Draw a standard ECG and explain the different segments in it.
- 20 In which phases/sub-phases of meiosis-I are the following formed?
- Synaptonemal complex _____
 - Recombination nodules _____
 - Appearance/Activation of enzyme recombinase _____
 - Terminalisation of chiasmata _____
 - Interkinesis _____
 - Formation of dyad cells _____
- 21 (a) Write the function of leg-haemoglobin.
(b) Differentiate between pulmonary and systemic circulation.
(c) Differentiate between racemose and cymose inflorescence.

SEC-D

- 22 Describe the steps involved in the formation of root nodules in leguminous plants with the help of labelled diagrams only.

- 23 With the help of diagram describe the role played by diaphragm and intercostal muscles in expiration and inspiration.



- 24 (a) What is partial pressure of a gas?
(b) List two factors which affect the rate of diffusion of a gas.
(c) Delhi is highly polluted city and there is a rise in the number of individuals experiencing difficulty in breathing due to inflammation of bronchi and bronchioles name the disorder.

SEC-E

- 25 Describe transpirational pull model of water transport in plants. What are the factors influencing transpiration? How is it useful to plants?

OR

- (a) What is the significance of juxta glomerular apparatus (JGA) in kidney function?
(b) Bring out the effects of sympathetic and parasympathetic nerves on the heart functioning.
(c) What are the major transport mechanism for Carbon dioxide in human? Explain.
- 26 (a) Differentiate glycosuria from ketonuria.
(b) What is heterospory? Briefly comment on its significance. Give two examples.
(c) Give a brief account of the counter current mechanism.

OR

- (a) What is crossing over? Name the enzyme responsible for it.
(b) Explain why pure water has the maximum water potential?
(c) Differentiate between polyps and medusa.
(d) All vertebrates are chordates, but all chordates are not vertebrates. Justify the statement.
(e) What is the difference between bolus and chyme?
- 27 Explain the following processes with suitable diagram:
- Polarisation of the membrane of a nerve fibre
 - Depolarisation of the membrane of a nerve fibre.
 - Conduction of nerve impulse along a nerve fibre
 - Transmission of nerve impulse across a chemical synapse.

OR

Explain the process of secondary growth in the stems of woody angiosperms with the help of schematic diagrams? What is its significance?
