



## (English Version)

### Instructions :

1. The question paper consists of four Parts A, B, C and D.
2. Part-A consists of I & II and Part-D consists of Section I and Section II.
3. All the Parts are compulsory.
4. Draw diagrams wherever necessary, unlabelled diagrams or illustrations do not attract any marks.
5. For Part-A questions, only the first written answers will be considered for evaluation.

## PART - A

I. Select the correct alternative from the choices given below : (15 × 1 = 15)

- 1) The function of Tapetum in microsporangium is
  - a) It nourishes the developing pollen grains
  - b) Helps in dehiscence of anther to release the pollen
  - c) Helps in protection
  - d) Helps in division
- 2) Which pollination brings genetically different types of pollen grains to the stigma?
  - a) Geitonogamy
  - b) Xenogamy
  - c) Autogamy
  - d) Both a) and b)
- 3) The corpus luteum secretes large amounts of progesterone, which is essential for maintenance of
  - a) Perimetrium
  - b) Myometrium
  - c) Endometrium
  - d) Cervical canal



- 4) The secondary spermatocytes undergo the second meiotic division to produce four equal, haploid
- a) Spermatogonium                      b) Spermatids
  - c) Primary spermatocyte              d) Secondary spermatocyte
- 5) In female sterilisation     A     is removed or tied. This process is called     B    .
- a) A – Cervix                      B – Vasectomy
  - b) A – Fallopian tube              B – Tubectomy
  - c) A – Cervix                      B – Tubectomy
  - d) A – Fallopian tube              B – Vasectomy
- 6) Statement I – Progesterone alone or in combination with estrogen can also be used by females as injections or implants under the skin.
- Statement II – Mode of action of injections or implants is similar to that of pills and their effective periods are much longer.
- a) Both Statement I and II are correct
  - b) Statement I is correct and Statement II is incorrect
  - c) Statement I is incorrect and Statement II is correct
  - d) Both Statement I and II are incorrect
- 7) In human males XY type of sex determination is
- a) Homogametic                      b) Heterogametic
  - c) Both a) and b)                      d) Isogametic
- 8) In Griffith's experiment, mice infected with the     A     die from pneumonia infection, but mice infected with     B     don't develop pneumonia.
- a) A → S-Strain; B → S-Strain
  - b) A → S-Strain; B → R-Strain
  - c) A → R-Strain; B → S-Strain
  - d) A → R-Strain; B → R-Strain



- 9) Which is the correct statement regarding Founder effect?
- a) Named after the scientist John founder
  - b) No large change in frequency
  - c) The original drifted population become founders
  - d) Formation of no species
- 10) Large group of Lymphoid tissue in respiratory, digestive and urogenital tract are collectively called,
- a) MALT
  - b) Peyer's Patches
  - c) Lymph nodes
  - d) Alpha globulins
- 11) Which micro-organism is useful in production of citric acid?
- a) Acetobacter aceti
  - b) Penicillium notatum
  - c) Aspergillus niger
  - d) Clostridium butylicum
- 12) Which of the following statements are correct for the enzyme Taq polymerase?
- I. Taq polymerase is thermally unstable.
  - II. It requires primers for carrying out the process of polymerisation.
  - III. Taq polymerase is thermally stable.
- Choose the correct option.
- a) I and II
  - b) I and III
  - c) II and III
  - d) I, II and III



- 13) Population density increases as
- a) Natality and Emigration increases
  - b) Mortality and Emigration increases
  - c) Natality and immigration decreases
  - d) Natality and immigration increases

- 14) Net Primary Productivity (NPP) is equal to
- a) GPP
  - b)  $GPP + R$
  - c)  $\frac{GPP}{R}$
  - d)  $GPP - R$

- 15) The species confined to a particular region and not found anywhere else are called as

- a) Sacred species
- b) Endemic
- c) Extinct
- d) Vulnerable

- II. Fill in the blanks by choosing the appropriate word/words from those given below : (5 × 1 = 5)

(Oxytocin, Lichen, Ectoparasite, Polyembryony, Honey bee, Endoparasite)

- 16) If more than one embryo occurs in a seed then it is known as \_\_\_\_\_.
- 17) The hormone which helps in Parturition is \_\_\_\_\_.
- 18) Haploid-diploid sex determination system is seen in \_\_\_\_\_.
- 19) Natural indicator of Industrial Pollution is \_\_\_\_\_.
- 20) Parasites that feed on the external surface of the host organism are called \_\_\_\_\_.





**PART – B**

III. Answer **any five** of the following questions in **3 - 5** sentences wherever applicable : (5 × 2 = 10)

- 21) What is Aminocentesis? Write any one significance.
- 22) Write the karyotype and symptoms of Klinefelter's syndrome.
- 23) When does medical termination of pregnancy become essential?
- 24) List the characteristics of Neanderthal man.
- 25) Name the two chemicals secreted by Mast cells during allergic reactions in the body.
- 26) Define BOD. Mention its significance.
- 27) Differentiate between Exonuclease and Endonuclease.
- 28) What is meant by Decomposition and Detritus?

**PART – C**

IV. Answer **any five** of the following questions in **40 - 80** words **each**, wherever applicable : (5 × 3 = 15)

- 29) a) Differentiate between false fruit and true fruit. (2)  
b) What is meant by Parthenocarpic fruit? (1)
- 30) What is Placenta? Mention any four hormones secreted by Placenta.



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- 31) Write any three criteria, that a molecule has to fulfill to act as a genetic material.
- 32) List the difference between Homologous and Analogous organs. Write one example for each in animals.
- 33) Mention any three uses of genetically modified plants.
- 34) Write the three critical research areas of Biotechnology.
- 35) Construct an upright pyramid of biomass.
- 36) What is Alien species invasion? Give two examples.

#### PART – D

#### Section – I

- V. Answer **any four** of the following questions in about **200 - 250** words **each**,  
wherever applicable : **(4 × 5 = 20)**

37) Draw a neat labelled diagram of Human female reproductive system.

38) What is Incomplete dominance? Mention one example, write the schematic representation of the same.



- 39) Write the scientific name of the organism responsible to cause following diseases.
- a) Typhoid
  - b) Pneumonia
  - c) Common cold
  - d) Malaria
  - e) Amoebiasis
- 40) List any five salient features of Human Genome Project.
- 41) a) Draw the schematic structure of a transcription unit. (3)
- b) Write the difference between point mutation and frame shift mutation. (2)
- 42) Describe the 'Role of Microbes as Biofertilisers'.
- 43) Read the following statement and write one appropriate term for each.
- a) Autonomously replicating circular extrachromosomal DNA.
  - b) Method to introduce recombinant DNA in animal cells.
  - c) Method to introduce recombinant DNA in plant cells.
  - d) Specific DNA sequence responsible for initiating replication.
  - e) Enzyme used to join the DNA fragments.
- 44) What is Mutualism? Mention any four examples of Mutualism.

**Section – II**

VI. Answer **any one** of the following questions in about 200 - 250 words each, (1 × 5 = 5) wherever applicable :

- 45) Pollen-Pistil interaction is a dynamic process involving pollen recognition followed by promotion or inhibition - Explain.
- 46) Name the genetic disorder in which clotting of blood is affected. Write the features of this genetic disorder.
- 47) With the help of schematic representation illustrate how an infected animal cell can survive while viruses are being replicated and released.
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