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NARENDERA®

DAWN

GUESS PAPER

Strictly as per New Rationalised and Reduced Syllabus issued by JKBOSE

12th Class

SCIENCE

1. English	2. Physics
3. Chemistry	4. Biology
5. Mathematics	6. Physical Education
7. Environmental Science	8. Computer Science
9. Informatic Practices	10. Functional English

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2024

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BIOLOGY

BOTANY

Time: 1½ Hours *Maximum Marks: 35*

SECTION - A

Objective Type Questions

(1×5 = 5 marks)

Q.1. Fruits have:

(a) Pericarp and flesh **(b) Pericarp and seeds**

(c) Pericarp, mesocarp and endocarp **(d) Pericarp and ovule**

Q.2. Incompatibility prevents cross pollination.

(a) Intraspecific **(b) Self** **(c) Interspecific** **(d) Out breeding**

Q.3. Nitrogen base not found in DNA is:

(a) Uracil **(b) Adenine** **(c) Guanine** **(d) Thymine**

Q.4. The term Ecosystem was coined by:

(a) Warming **(b) Odum** **(c) Tansley** **(d) Ernst Haeckel**

Q.5. Conversion of nitrates to nitrogen is called:

(a) Ammonification **(b) Nitrification**

(c) Nitrogen fixation **(d) Denitrification**

* One of the following is a test cross:

(a) Aa × AA (b) Aa × Aa (c) Aa × aa (d) AA × AA

* Rearrange the floral whorls from outer to inner side:

(a) Calyx (b) Androecium (c) Gynoecium (d) Corolla

* RNA that pick up specific amino acid from cellular for protein synthesis is .....

(a) mRNA (b) tRNA (c) rRNA (d) snRNA

* A dihybrid test cross ratio is:

(a) 9 : 3 : 3 : 1 (b) 1 : 1 : 1 : 1 (c) 9 : 7 (d) 9: 6 : 1

* Aquatic fern which is an excellent biofertilizer?

(a) Azolla (b) Salvinia (c) Marsilead (d) Pteridium

* (i) Megasporangium is equivalent to:

(A) Embryo (B) Nucelles (C) Ovule (D) Fruit

* Pollination between flowers of the same plant:

(A) Chasmogamy (B) Atogamy (C) Geitonogamy (D) Cleistogamy

* The number of phenotypes in Mendel's dehybrid cross is:

(a) 2 (b) 3 (c) 4 (d) 16

* Methanogens do not produce:

(a) Oxygen (b) Methane

(c) Hydrogen sulphide (d) Carbon dioxide

* Devine and collego are:

(a) Bioinsecticides (b) Bio fungicides (c) Bioherbicides (d) Rodenticide

* Spirulina is:
(a) Biofertilizer (b) Biopesticide (c) Edible fungus (d) Single cell protein
* SO_2 pollution damages:
(a) Vacuoles (b) Golgi bodies (c) Mitochondria (d) Chloroplast
* Which one is diploid?
(a) Synergids (b) Secondary nucleus (c) Antipodals (d) Egg
* Translation occurs in: -
(a) Nucleus (b) Cytoplasm (c) Both (a) and (b) (d) None of these
* Nucleic acid can be fragmented by the enzyme.
(a) Polymerase (b) Nuclease (c) Protease (d) Ligase
* Septal Nuclei in anthers of many angiosperms are:
(a) Mostly aneuploid (b) Mostly polyploid (c) Mostly haploid (d) Always diploid
* The enzyme that breaks hydrogen bonds in DNA is:-
(a) Helicase (b) Ligase
(c) Topo-isomerase (d) DNA polymerase
* Ubisch Granules are synthesised in:-
(a) Exine (b) Tapetum
(c) Middle layers of microsporangium (d) Endothecium
* Egg apparatus is present at
(a) Chalazal end of ovule. (b) Micropylar end.
(c) In the centre of ovule. (d) Scattered in the body of ovule.
* Edaphic factor refers to:
(a) Water (b) Soil (c) Relative humidity (d) Altitude
* Egg apparatus consists of
(a) Egg and antipodal. (b) Polar nuclei (c) Egg and Synergids. (d) Egg.
* Edible part of Mango is:
(A) Endocarp (B) Receptacle (C) Epicarp (D) Chalazogamy
* An association essential and beneficial to both the partner is:
(A) Mutualism (B) Commensalism (C) Amensalism (D) Colony

SECTION - B

(2×5 = 10 marks)

Q.6. Difference between Autogamy and Geitonogamy.
Q.7. What is pleiotropic gene?
Q.8. What are ecological pyramids? Draw pyramid of energy.
Q.9. Name any two Bio-fertilizers.
Q.10. What is red data book?

* Differentiate between self-pollination and cross pollination.
* What are the applications of Plant breeding?
* What are biofertilizers? Give examples.
* What are Single cell proteins?
* Write briefly advantages of micro-propagation.
* What is Biofortification? Write its two advantages.
* What are Biopesticides? Give some examples.

* Write some applications of tissue culture.
* Write briefly different modes of vegetative propagation in plants.
* What is cellular totipotency?
* Differentiate between biopiracy and biopatent.
* Write a very short note sewage treatment.
* What is cellular totipotency? How does it differ from cellular pluripotency?
* What is Biofortification? Cite any two examples.
* Explain briefly why ecological succession will be faster in a forest devastated by fire than on a bare rock?
* Why is the number of trophic levels limited in food chain?
* Give significance of Seed and Fruit formation.
* Write down the role of microbes in the production of Biogas.
* Differentiate between Endangered and Rare Species.
* Draw an inverted pyramid of number.
* What are the ill-effects of ozone depletion?
* What is the major advantage of producing plants by Micro propagation?
* What do you understand by Green House Effect?
* What does single cell protein mean?
* How is layering different form cutting method of vegetative reproduction?
* Define hybridization method of plant breeding.
* Give any two hazards associated with chemical fertilizers.
* Sequentially explain energy flow in an ecosystem.
* Differentiate between Autogamy and Allogamy.
* Define Mycorrhiza. Differentiate between ectomycorrhiza and endomycorrhiza.
* What is secondary productivity?
* Write a short note on Food Chain.
* Differentiate between Anemophilous and Entomophilous flowers.
* Write a short note on Trophic levels.
* What is net primary productivity?
* Write down one similarity and one difference between Geiotonogamy and Xenogamy.
* Write a short note on Food web.
* What is Gross Primary Productivity?
* Point out the advantages of vegetative propagation in plants. (Any two points)
* Define induced mutations. Give one example.
* What are the advantages of biogas over LPG.
* Bio fertilizers are more desirable than chemical fertilizers. Justify.
* Name any two National Parks and two sanctuaries.
* Write the factors that determine the hotspots.
* Draw a pyramid of biomass in a terrestrial habitat.
* Write a brief note on 'Biopiracy.
* Give the points of difference between National Park and Wild Life Sanctuaries.

SECTION - C

(3×5 = 15 marks)

Q.11. Differentiate between Apomixes and Parthenogenesis.
Q.12. Write a brief account on incomplete dominance.
Q.13. Distinguish between DNA and RNA.
Q.14. What are Bt. Crops? List any two.
Q.15. What are somatic hybrids? Give an example.

* How does the pollen mother cell develop into mature pollen grains? Illustrate with the help of well labelled diagram.
* Define Succession. Differentiate between Primary Succession and Secondary Succession.
* What is the difference between a leading strand and a lagging strand?
* What is GM crop? What are potential hazards of GM crops?
* Write four major factors regulating the size of a population.
* Write the applications of tissue culture.
* What is double fertilisation? Give its significance.
* What is agamospermy? How is agamospermy different from parthenogenesis and parthenocarpy?
* Compare and contrast the advantages and disadvantages of production of genetically modified crops.
* What are agrochemicals? How do they affect soil and water?
* What do you understand by a leading strand and a lagging strand during DNA replication? Why is replication not continuous on both the templated of replicating DNA molecules?
* Snapdragon shows incomplete dominance for flower colour. Work out a cross between a plant with red flowers and another with white flowers up to F_2 generation.
* Give characters of wind pollinated flowers.
* Write a note on Phosphorus Cycle.
* Explain any one genetically modified organism.
* Define double fertilization found in angiosperms. Point out its significance.
* What is central dogma in molecular biology?
* What do you mean by Food Chain? Cite an example to elaborate your answer.
* Give characteristics of insect pollinated flowers.
* Describe the importance of mycorrhiza, cyanobacteria and bacteria as biofertilizers.
* Differentiate between complete linkage and incomplete linkage.
* How do roots take part in vegetative propagation?
* Discuss the significance of vegetative reproduction.
* Give the steps involved in management of solid wastes.
* Write a brief note on micropropagation.
* What is a biosphere reserve? Describe its various zones. Name any two biosphere reserves of India.
* Draw the vertical section of Maize grain and label:-
  (a) Pericarp (b) Scutellum (c) Coleoptile (d) radicle.
* Do you think microbes can also be used as source of energy? If yes, how?
* Distinguish between ectoparasite and endoparasite.
* Define tissue culture. Name any three applications of tissue culture.

* Name the various interactions in a biotic community and describe any one of them.
* Suggest any three measures for controlling pollution of our lakes.
* Write a short note on "Central Dogma of Molecular Biology".
* With the help of a neat and labelled diagram explain the structure of a typical Angiospermic ovule.
* What is Ornithophily? What are the characteristics of ornithophiles flowers?
* What are Biopesticides? Why are they preferred over chemical pesticides?
* With the help of diagrams describe the three possible routes of entry of pollen tube into the ovule.
* What is double fertilization? Give its significance.
* Write down the characteristics of Genetic Code.
* What is Entomophily? What are the characteristics of an entomophilous flower?
* What is a genetically modified crop? What are the potential hazards of Bt-Crops?
* Explain the development of male gametophyte in Angiosperms.
* What is Anemophily? What are the characteristics of Anemophilous Flowers?
* What are Biofertilizers? Why are they preferred over chemical fertilizers?
* Write a short note on Carbon Cycle.

SECTION - D

(5×1 = 5 marks)

Q.16. Define hotspots of biodiversity. Name hotspots found in Indian sub-continent.

Or

Define Ecological pyramid. Explain different types of Pyramids.

* DNA acts as a 'Genetic Material'. Justify the statement with the help of an experimental evidence.
* What are the causes and effects of Air Pollution? Write some control measures for air pollution.
* What is operon? With the help of lac operon explain the idea of operon concept.
* What are the causes and consequences of loss of biodiversity?
* Define Cellular Totipotency. Discuss the various applications of plant tissue culture.
* What is Transgenic Crop? State the advantages of the technique involved in the production of transgenic crop overbreeding activities.
* Define genetic material. How can you prove that DNA is the genetic material on the basis of Hershey and Chase experiment?
* Define cross pollination. Name the contrivances that favour it and describe any two of them.
* Describe the process of double fertilization. What is its significance?
* A true breeding pea plant with green pods and axial flowers as dominant characters is crossed with a recessive homozygous pea plant with yellow pods and terminal flowers. Work out the cross upto F_2 generation giving the phenotypic ratio of the F_2 generation. State the Mendelian Principle which can be derived from such a cross and not from the monohybrid cross.
* What is an 'Inducible Operon'? Explain the regulation of gene expression in prokaryotes with the help of 'Lac-Operon'.

* What is a Dihybrid Cross? State and explain Mendel's Law of Independent Assortment with the help of a dihybrid cross.
* Define semi-conservative mode of DNA replication. Explain various steps that occur during the replication of DNA molecule.
* Define "Multiple Alleles" and "Co-dominance". How does human ABO blood grouping explain both these principles?
* What is a Genetic Material? Give experimental evidence for DNA's role as genetic material.
* What is Incomplete Dominance? Explain it with the help of a cross. How does it differ from complete dominance with respect to the F_2 Phenotypic ratio?
* State the law of independent assortment. Explain it by using Punnet square.
* How did Griffiths and Anergy show experimentally that DNA is the Genetic material?
* State and explain the law of Purity of gametes
* Give a brief account of DNA replication.
* State and explain the phenomenon of Co-dominance.
* Define Anemophily. Point out the main features of anemophilous flowers.
* With the help of neat and labelled diagrams describe various stages of embryo development in a dicot plant.
* Draw a well-labelled diagram of a mature ovule showing its internal structure. Mention the fate of all its components after the event of fertilization.
* Which Medel's law of inheritance is universally accepted and without any exception. State the law with an example.
* Who proposed the concept of lac operon?
* Draw labelled schematic representation of a lac operon.
* Explain how does this operon get switched 'on' and 'off'.
* List the factors which make the species susceptible to extinction.
* Briefly describe various types of extinction of species.
* With the help of diagrams only, depict the process of protein synthesis. (No description needed).
* Briefly explain the various stages of replication of DNA.
* What are Primary Air Pollutants? Describe their effects.
* Name the various types of interactions among different species in a biotic community. Explain only two of them.
* What kind of threats to biodiversity may lead to its loss?
* Explain chromosomal theory of inheritance.
* Name any three deviations from Mentalism and describe any one of them.
* Explain the various steps in semi-conservative DNA replication.
* Define ecological pyramids. Describe the pyramids of number and biomass.
* Define Hydro sere. Describe various succession stages found in it.
* Describe the components of an ecosystem.
* (a) What are hotspots of biodiversity?
  (b) List main four criteria of determining a particular place as a hotspot.

ZOOLOGY

Time: 1½ Hours *Maximum Marks: 35*

SECTION - A

Objective Type Questions

(1×5 = 5 marks)

Q.1. Acrosome in sperm is a modified:

(a) Golgi Complex (b) Endoplasmic reticulum
(c) Mitochondria (d) Vacuoles

Q.2. Turner syndrome is represented by genotype:

(a) 45, XY (b) 45, XO (c) 47, XXY (d) 47, +21

Q.3. Which of the following is known as Bleeder's disease?

(a) Sickle cell anaemia (b) Night Blindness (c) Haemophilia (d) Thalassemia

Q.4. The infective stage of malaria causing parasite in human:

(a) Plasmodium (b) Sporozoite (c) Gametocyte (d) Vermicular

Q.5. Replacement of defective gene with normal one is called:

(a) Gene cloning (b) Gene banking (c) Gene therapy (d) None of these

* Which of the following methods of sex-determination operates in Butterflies and Moths?

(a) ZW – ZZ type (b) XX – XO type (c) ZO – ZZ type

* Trisomic condition is represented as:

(a) $2n + 1$ (b) $2n - 2$ (c) $2n + 2$ (d) None of these

* Failure of brain to develop in infancy, mental retardation are symptoms of

(a) Colour blindness (b) Cystic fibrosis (c) Phenylketonuria (d) None of these

* What is the probability that the son of a colour-blind father would be a colour blind.

(a) 0 (b) ¼ (c) ½ (d) 1

* A sexual reproductive structure of Hydra is:

(a) Gemmule (b) Bud (c) Conidia (d) None of these

* (a) Latex of papaver somniferum (b) Leaves of cannabis sativa
(c) Flowers of Datura (d) Fruit of Erythroxyion coca

* Introduces variations and number of offspring pertains to:

(a) Asexual Reproduction (b) Sexual Reproduction
(c) Parthenogenesis (d) Sporulation

* Tobacco consumption is known to stimulate secretion of Adrenaline and Non-adrenaline. The component causing this should be:

(a) Nicotine (b) Tannic Acid (c) Curamin (d) Catechin

* The process of vaccination was discovered by:

(a) Edward Jenner (b) Robert Koch (c) Louis Pasteur (d) Von-Behring

* The cells that actually produce antibodies are:

(a) Plasma cells (b) Phagocytes (c) Memory cells (d) Helper-T-cells

* Variation at genetic level is called

(a) Gene therapy (b) Gene mutation (c) Genotype (d) Polymorphism.

* Passive immunity was discovered by:
(a) Louis Pasteure (b) Robert Koch (c) Von-Behring (d) Edward Jenner
* Embryo at 16-celled stage is called
(a) Morula (b) Blastula (c) Blastomere (d) Gastrula
* The first human like being the hominid was called
(a) Homoerectus (b) Homohabilis
(c) HomeSapien (d) None of the above
* In 28 day human ovarian cycle, ovulation occurs on:
(a) Day 1 (b) Day 5 (c) Day 14 (d) Day 28
* Site of fertilization in mammals is:
(a) Ovary (b) Uterus (c) Vagina (d) Fallopian tube

SECTION - B

(2×5 = 10 marks)

Q.6. Draw a well labelled diagram of structure of human sperm.

Q.7. What is analogous organ. Give some examples.

Q.8. Write a short note on application of DNA fingerprinting.

Q.9. What is Biopiracy?

Q.10. What do you mean by clone? Give a suitable example of it.

* What do you mean by Assited reproductive technologies?
* What do you mean by 'Cell mediated immunity'?
* Name the causative organism of 'Typhoid'. Which test is prescribed for detection of Typhoid.
* Write down the significance of Dairy farming.
* Write down the need of Birth control methods.
* What do you mean by Humoral Immunity?
* Write down the diagnostic symptoms of Ascariasis.
* What is the significance of Poultry in our day-to-day life?
* Give an elementary idea of Lactation.
* Write down two points of difference between Innate and Acquired Immunity.
* List the causes of Hepatitis.
* What do you mean by the term Apiculture?
* Give the function of Luteinising hormone in human males and females.
* Differentiate between homologous and analogous organs.
* What is the function of chilled ethanol in DNA extraction?
* Write a brief note on Restriction Endonucleases.
* What do you mean by MTP? Give its significance.
* What are Analogous organs? Give one example.
* Give the cause and control of Amoebic Dysentery.
* What is Vaccine? Give its one main benefit in human beings.
* What is the basic concept of "Immunology"?
* What do you mean by "Biosafety issues"?
* What is a "Genome"?

* Write down two characteristics of Adolescence?
* What is Cloning?
* What do you mean by Infertility Control?
* What do you mean by Darwin's finches?
* Enlist the economic importance of Lac.
* What do you mean by the term 'Plasmid'?
* What do you mean by "Amniocenteses"?
* What do you mean by "DNA Recombinant Technology"?
* What are the problems of Haemophilia?
* What is the economic importance of "Silk"
* What is Regeneration?
* What is DNA finger printing?
* Write a note on innate immunity.
* What is the function of Leydig cell?
* Name the pathogen which causes typhoid and amoebiasis.
* What is Vestigial Organ?
* What is vaccination and how are second generation vaccines better than first generation vaccines?
* What is Fragmentation?
* What are main features of Homoerectus?
* Write a note on gene therapy.
* What do you mean by Pregnancy?
* Describe what do you mean by Analogous Organ?
* Define cross-breeding.
* What are restricted enzymes.
* What is lactation?
* Write short note on Vestigial organ.
* What do you mean by transformation?
* Define Strobilation.
* Name the various tests to detect the presence of 'HIV' virus in a person.
* What is Placenta?
* What is Outbreeding?
* What do you understand by Phylogeny?

SECTION - C

(3×5 = 15 marks)

Q.11. Define Polyspermy and differentiate between fast block and slow block polyspermy.

Q.12. Write a brief account on adaptive radiation. Give some suitable examples.

Q.13. What do you mean by survival of the fittest as propounded by Darwin?

Q.14. What are the changes that takes place during the period of adolescence?

Q.15. Name one plant and the addictive drug extracted from its latex. How does this drug affect the human body?

* Write a short note on prevention of STD's (Sexually Transmitted Diseases).
* Write a short note on 'Australopithecus'.
* Write down the significance of Modern Synthetic Theory of Evolution.
* Define Sericulture. Write down the economic importance of Silk-worm.
* Define Cloning. Support your answer with examples.
  What is Gene therapy? Write down its significance.
* Draw a well labelled diagram of T.S. Ovary.
* MOET programmed has helped in increasing the herd size of the desired variety of cattle. List the steps involved in conducting the programme.
* Differentiate between Active immunity and Passive immunity.
* Explain briefly PCR.
* Describe sex determination mechanism in birds.
* Name any three assisted reproductive techniques in human beings and add a note on any one of them.
* What is Adaptive radiation? Give one example in support of your answer.
* Write a short note on drug abuse.
* Write down the application of gene therapy and insulin in human beings.
* Describe barrier methods of contraception.
* Write down the points of difference between Tubectomy and Vasectomy.
* Write a short note on Genetic drift.
* Write down in brief causes and symptoms of Hepatitis?
* What are the causes of Ascariasis?
* Name the products of Recombinant DNA Technology with their functions.
* Write a short note on "MTP".
* Name Mendelian disorders in humans. Explain colour-blindness in human beings.
* What is Filariasis? How is it caused?
* Write a short note on Gene therapy.
* Write a short note on Assisted Reproductive Technologies.
* Write down significance of DNA fingerprinting?
* What are functions of Placenta?
* Describe mode of transmission of AIDS and its prevention.
* Explain recombinant DNA technology.
* What is Fission? Give basic differences between the Fission of Amoeba and Paramecium.
* Describe one example of adaptive radiation.
* Enlist harmful effects of alcohol.
* How is gene therapy helpful in born heredity disease.
* Explain the Genetic drift.
* What is Gene Therapy? Illustrate using example of adenosine deaminase deficiency.
* What are the symptoms of drug addiction?
* Define a vaccine. How can monoclonal antibodies be used in the production of vaccine?
* Precisely present inheritance pattern of colour blindness in human.
* Differentiate innate and acquired immunity.

SECTION - D

(5×1 = 5 marks)

Q.16. Define Gametogenesis. Describe in detail Oogenesis.

Or

Define placentation. Describe the type and role of placenta.

* Define Fertilization. Enlist the events up to the development of Blastocyst.
* Explain in brief the need for Reproductive health. Also add a note on MTP (Medical Termination of Pregnancy).
* Define spermatogenesis. Name the hormones involved in regulation of spermatogenic. Add a short note on spermiation.
* Suggest some methods to infertile couples to have a child.
* Describe Darwin's theory of Natural selection.
* Why 'Human Genome Project' is called a Mega Project. Write down its goals and future implications.
* What are Chromosomal disorders? Explain Down's syndrome in human beings.
* Describe in brief the modern synthetic theory of evolution.
* Describe aspects of reproduction health which need to be given special attention in the present scenario.
* Define fertilization with suitable sketches. Describe the development of Embryo up to blastocyst formation.
* Name the components of Male reproductive system. With a labelled diagram describe them in brief.
* Describe fate of germinal layers.
* Describe menstrual cycle in detail.
* Describe the mechanism of fertilisation and its significance.
* Suggest the various measures of population control.
* Define population density. What are the consequences of high population density?
* Describe human female reproductive system giving a labelled diagram.
* What are foetal membranes? How are they formed and what are their functions?
* Differentiate between Spermatogenesis and Oogenesis.
* Name various methods of "Asexual reproduction". Describe any three of them.
* What do you mean by sexually transmitted diseases? Add a note on contraception and medical termination of pregnancy.
* Define reproduction with suitable sketches. Describe various types of Asexual reproduction.
* What do you understand by population explosion? Explain different types of birth control.
* Define Gametogenesis. Explain in brief with diagrammatic representation the stages of Spermatogenesis.
* With the help of neat and labelled diagram describe in brief human male reproductive system.
* What do you mean by genetic disorders? Describe any two of them.
* What are Mendelian disorders in humans? Name them and explain any two of them.

* Explain Hardy- Weinberg's Principle. Add a note on Adaptive radiation.
* What do you mean by term 'Genome'? Add a brief note on Human Genome Project and its significance?
* Briefly explain modern synthetic theory of evolution.
* Explain the terms: (a) Struggle for existence (b) Variations
* How is Down's syndrome developed? What are its symptoms?
* Explain the terms: (a) Crossing over (b) Chromosomal Aberrations
* Differentiate between Turner's and Kline Felter's syndromes.
* Explain briefly: (a) Hardy-Weinberg Principle (b) Turner's Syndrome
* Explain the inheritance pattern of colour blindness.
* Describe the Mechanism of inheritance of Sex-linked allele for Haemophilia.
* Briefly mention steps involved in DNA finger printing.
* How is sex determined in human beings? Has environment any role in determination, discuss.
* Describe briefly origin and evolution of Man.
* What is adaptive radiation. Explain with one example.
* Describe the factors which affect Hardy-Weinberg equilibrium.
* What is cancer? What are the four main types of cancer?
* Define pisciculture. Explain the economic importance of pisciculture.
* Name two cloning vectors. Describe the features required to facilitate cloning into a vector.
* Briefly explain why are Transgenic animals produced?