Q.P. Code :20786

[Time: Three Hours] **[Marks:100]**

Please check whether you have got the right question paper.

N.B:
1. All questions are compulsory.
2. Internal choices have been given.
3. Figures to the right indicate marks.
4. Draw flowcharts / diagrams wherever necessary.

Q.1 **A) State true or false.** **04**

i) The recessive characteristic is denoted by small letters.
ii) In test cross, F_1 progeny is crossed with the dominant parent.
iii) The blending of the dominant and recessive trait to produce a third trait occurs in codominance.
iv) Round pea seeds are dominant over the wrinkled pea seeds.

B) Attempt the following. (any three) - **09**

i) Explain the principle of dominance.
ii) A homozygous plant with the genotype PP is crossed with another homozygous plant with the genotype pp. Draw the Punnett square for F_1 generation and give details of the phenotype and genotype of the progeny.
iii) Comment on back cross.
iv) Elaborate on genotype and F_1 generation.
v) Define allele and pure breeding plant.
vi) Write a note on epistasis.

C) Elaborate on (any two) - **12**

i) Reasons for Mendel's success and his experimental setup
ii) Dihybrid cross
iii) Incomplete dominance and codominance
iv) Non–Mendelian inheritance

Q.2 **A) State true or false.** **04**

i) Histones are rich in lysine and asparagine.
ii) The 30 nm fiber is also known as solenoid fiber.
iii) Conjugation is a bidirectional transfer of DNA between two bacteria.
iv) Non–histone proteins are present in prokaryotes.

B) Write short notes on (any three) **09**

i) Cross between F^+ and F^- cell
ii) *Hfr* strain
iii) Mitotic checkpoint
iv) Morphology of chromosome
v) Supercoiling of DNA
vi) Transformation

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C) Elaborate on (any two) - **12**

i) Lytic cycle
ii) Cyclins
iii) Organization of eukaryotic chromosome
iv) Euchromatin and Heterochromatin

Q.3 **A) State true or false.** **04**

i) Active transport is thermodynamically favourable.
ii) Transport of chloride and bicarbonate ions takes place by symport.
iii) The calcium pump of sarcoplasmic reticulum is an antiport transporter.
iv) Ferritin is the storage form of copper.

B) Write short notes on (any three) **09**

i) Metabolic acidosis and alkalosis
ii) Disorders of iron metabolism
iii) Differentiate between carriers and channels
iv) Types of endocytosis
v) Electrochemical gradient
vi) Chloride shift

C) Elaborate on (any two) **12**

i) Na^+-K^+ATPase pump
ii) Transport mechanisms across cell membrane
iii) Dissociation curve of oxyhaemoglobin
iv) Plasma proteins in transport

Q.4 **A) Define the following (any five)** **10**

i) Recessive trait
ii) Wild type
iii) Nucleosome
iv) Satellite DNA
v) Exocytosis
vi) Active transport
vii) Bohr's effect

B) Answer the following : (any three) **15**

i) A homozygous pea plant with the genotype RRYY is crossed with another homozygous pea plant with the genotype rryy. Give the details of the genotype and phenotype of F_2 generation.
ii) Write a note on Law of segregation.
iii) Write a elaborate note on proteins involved in chromosomal structure
iv) Discuss the regulations by CDKs.
v) Describe in detail anitport system with suitable example
vi) Explain with examples lipoproteins

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