

2009**M.Sc.****4th Semester Examination****HUMAN PHYSIOLOGY****PAPER—XXI****Full Marks : 40****Time : 2 Hours**

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Write the answers to the questions of each Unit in separate books.

[MICROBIOLOGY AND IMMUNOLOGY]**UNIT—41**

Answer any two questions.

1. Give a brief account of the role of Attenuation in Gene Expression with reference to Tryptophan Operon. 10
2. (a) What do you understand by Genetic recombination ?
(b) What is conjugation ? What are Hfr cells ?
(c) Mention the mechanism of Transformation.
2+(3+2)+3
3. (a) What do you mean by DNA renaturation kinetics ?
(b) Discuss in brief the organization of Promoter structures in prokaryotes. What is meant by Promoter Consensus ?
3+(5+2)

(Turn Over)

4. (a) Differentiate Lytic and Lysogenic phages.
 (b) Describe the regulatory mechanism in the establishment of Lysogeny.
 (c) "All lytic phages are not generalized transducing phages"—explain. 2+6+2

UNIT—42

Answer any *two* questions.

1. (a) Draw a schematic diagram of HIV-I indicating the position of genes.
 (b) Describe briefly the replication cycle of HIV-I.
 (c) Comment on the statement "Some peoples are exposed but not infected with HIV-I". 2+5+3
2. (a) Define inflammation.
 (b) What are the different types of cell-adhesion molecules present in the neutrophil and endothelial cells.
 (c) Write the probable mechanism of inflammation. 1+4+5
3. Describe the role of oncogene, protooncogene and the tumor suppressor genes in cancer induction. 3+3+4
4. Write brief notes on the following : 4×2 $\frac{1}{2}$
 (a) Graft rejection;
 (b) Myasthenia gravis;
 (c) Tumor antigen;
 (d) ELISA.

[ERGONOMICS AND SPORTS PHYSIOLOGY]

UNIT—41

Answer any two questions.

1. (a) Which percentile value and body dimension will you accept to determine the height of a cupboard in a kitchen? Justify your answer.
(b) "Work in a strong bend posture for a long time may lead to slip disk"—Justify.
(c) How can you find relationship between poor posture and location of complaint in the human body?
(d) "Fitting the man to the task and fitting the task to man"—explain. $2\frac{1}{2} \times 4$

2. (a) What types of work method and design intervention are needed to develop work tools which may improve working condition and productivity.
(b) Discuss the principle of coading of controls. 5+5

3. (a) Discuss the factors related to the energy expenditure during manual material handling.
(b) Mention the risk factors of manual material handling. 8+2

4. What is attitude? Show how the employee's attitude towards management affect productivity. 3+7

UNIT—42

Answer any *two* questions.

1. (a) What do you mean by day light factor (DF) ?
- (b) Calculate the noise dose when a person is exposed to 110 dB noise for 5 hours in a work shift.
- (c) When input vibration is amplified in human body ?
- (d) Calculate the rest period if a worker spends 0.5 hour to perform a task at an O₂ uptake of 2.64 lit./min. and the standard is taken to be 1 lit./min.

$$2\frac{1}{2} \times 4$$

2. (a) Discuss the relationship between light intensity and visual performance with reference to contrast and object size.
- (b) How glare can be avoided in a computer work station by changing light source placement and intensity.

$$7+3$$

3. Elucidate the preselection of workers according to sex variation before recruitment in an industry what is the physiological basis of such selection ?

$$2+8$$

4. What is repeated motion injury (RMI). Discuss the causes, symptoms and preventive measures of carpal Tunnel Syndrome.

$$3+7$$

**[ENDOCRINOLOGY, REPRODUCTIVE PHYSIOLOGY AND
FAMILY WELFARE]**

UNIT—41

Answer any *two* questions.

1. (a) State briefly the components of renin-angiotensin system.
(b) How renin-angiotensin-aldosterone axis is regulated?
5+5
2. (a) What is glucose memory test? Why this test is more sensitive for the screening of diabetes mellitus over the blood glucose monitoring?
(b) "In diabetes mellitus oxidative stress is noted"—justify the statement.
(3+2)+5
3. (a) Elaborate the role of growth hormone and IGF-I during aging.
(b) Comment on the merits and demerits of growth hormone replacement therapy in elderly individuals.
5+5
4. (a) Mention the types of pedigree. Describe the different parts of pedigree.
(b) What do you mean by MCH/care package? Discuss the impact of MCH care package in community development.
(2+3)+(1½+3½)

UNIT—42

Answer any two questions.

1. (a) Elaborate the role of prostaglandin and uterine agglutinin in implantation.
(b) What is implantation window? (4+4)+2

2. (a) Discuss the different methods of gene transfer.
(b) Write a note on 'Experimental transgenic mice'.
6+4

3. (a) Mention the different types of pills used for female contraception.
(b) Discuss the mechanism of action of female contraceptive pills.
(c) What is LNG-20? 4+5+1

4. (a) Distinguish between 'anchorage dependent and 'anchorage independent' cell lines.
(b) What is 'Balanced salt medium'?
(c) How are adherent cell lines maintained? 3+2+5

[NEUROPHYSIOLOGY]

UNIT—41

Answer any two questions.

1. (a) Discuss the transmission tonic mode and bursting oscillatory mode of firing of thalamocortical neurons.
(b) What do you mean by REM-on cells and PGO-on cells? Discuss the role of different nuclei of brain stem regulating REM sleep. 5+5

2. (a) What do you mean by categorical hemisphere and representational hemisphere? Describe the functional asymmetries of cerebral hemispheres.
(b) Write briefly on the anatomical asymmetries of brain. (2+5)+3

3. (a) Explain neuronal basis of memory and differentiate between short-term and long-term memory.
(b) Briefly discuss the role of limbic-systems in emotional processing. (4+2)+4

4. (a) Describe the feed back neural circuitry through the components of basal ganglia.
(b) Write briefly on the neural basis of identifying the location of sound source in space. 5+5

UNIT—42

Answer any *two* questions.

1. (a) What do you mean by implicit memory and working memory?
(b) Discuss molecular basis of long-term sensitization. 4+6
 2. (a) What is MPTP? Mention different environmental agents causing Parkinson's disease.
(b) Discuss the molecular mechanism of α -synuclein and parkin on the onset of Parkinson's disease. (1+4)+(3+2)
 3. (a) What are meant by "centrencephalic" hypothesis and "diffuse cortical hyper-excitability" hypothesis of generalized seizures?
(b) Discuss the molecular mechanism of generalized seizures.
(c) Write briefly on the manifestation of generalized toxic-clonic seizures. 2+5+3
 4. (a) Discuss the structural and chemical changes and the associated disfunctions that take place in aging human brains.
(b) What are the neurotoxic effects of arsenic? 7+3
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