M.Sc.

2015

4th Semester Examination

HUMAN PHYSIOLOGY

PAPER—PHY-403

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.

Special Paper
(Microbiology & Immunology)

(Unit—41)

1. (a) What is meant by genetic material?

(b) Give an experimental evidence in support of RNA as genetic material.

\[ 1 \frac{1}{2} + 3 \frac{1}{2} \]

(Turn Over)
Or

Write notes on: $2\frac{1}{2} + 2\frac{1}{2}$

(i) Hfr cells.

(ii) Transformation.

2. Give a brief account of packaging of chromatin fibres in eukaryotic chromosomes.

Or

(a) Classify the repetitive sequences with brief description of each.

(b) What is meant by DNA Renaturation kinetics?

3. (a) Describe in brief the events of promoter recognition stage in transcription.

(b) How does transcription termination occur by Rho independent mechanism?

(c) What is antitermination?

Or

C/15/M.Sc./4th Seme./PHY-403

(Continued)
(a) Mention the organization of ‘Promoter’ of a gene in eukaryotes including the role played by each element.

(b) Discuss in brief the role of ‘enhancer’ in eukaryotic gene expression.

4. (a) What is siRNA?

(b) Give a brief account of the role played by siRNA in gene silencing.

Or

(a) What is composite transposon?

(b) Discuss the molecular mechanism of transposition.

( Unit—42 )

1. What is inflammation? Describe the probable mechanism of inflammation.

Or

(a) Describe “influenza virus”.

(b) What do you mean by antigenic shift and antigenic drift? Illustrate your answer with suitable diagram.
2. What is anaphylaxis? What are the physiological events of mast cell degranulation? 

Or

Write notes on: 

(i) Myasthenia gravis.

(ii) Type-I Diabetes.

3. (a) Describe the sensitized and effector phase of graft rejection.

(b) Write two immunosuppressive drugs with their mode of action.

Or

(a) What is cross presentation?

(b) Discuss the three types tumor cell based cancer vaccines.

4. (a) Write the immunization schedule for infants and children in India.

(b) What is the difference between “toxoid vaccines” and “live attenuated vaccines”.

C/15/M.Sc./4th Seme./PHY-403 (Continued)
Or

(a) What do you mean by “active” and “passive” immunization in terms of protection against infectious diseases.

(b) Describe the factors that must be kept in mind in designing vaccines for active immunizations.

2\frac{1}{2}+2\frac{1}{2}

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**Special Paper**

*(Ergonomics and sports physiology)*

{(Unit—41 )}

1. What is system design approach? Discuss how an efficient interactive system will depend on understanding between interdependent factor of a system. 2+3

Or

What do you mean by physiological well-being at work? State the key factors that influence physiological well-being. 1+4
2. What is Kinesiology? Discuss the basic movements of hand and wrist joints.  

Or

State briefly different principles of visual information display.

3. What is brightness contrast? Discuss the effects of contrast on visual performance.

Or

What is hand-arm vibration? Discuss briefly different methods for controlling vibration.


What is protective clothing?

Or

State the acute and chronic exposure of chlorine on industrial workers. Mention one safety measure against chlorine toxicity.
1. (a) Which body dimension and percentile value should be considered for placing switch board in the wall?
(b) What is dynamic anthropometry?

Or

(a) "Working table should be arranged in right angle to the windows" — Justify.
(b) "Work station should have both sitting and standing facilities" — Explain.

2. State the principles of designing the back rest of a chair?
What is cervical syndrome?

Or

State the biomechanical principles of adopting good posture.

3. Discuss the factors related to the energy expenditure during manual material handling (MMH). Why static work is a risk factor for MMH?

Or
What is carpal tunnel? State the causes and symptoms of carpal tunnel syndrome.

4. State the importance of training of workers. Write the steps of training process.

Or

What are the adverse consequences of shift work? What should be the length of shift work?

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**Special Paper**

*(Endocrinology, Reproductive Physiology & Family Welfare)*

*(Unit—41)*

1. (a) What is essential hypertension?

   (b) “Renin angiotensin—aldosterone loop is exquisitely sensitive to dietary sodium intake”—Justify the statement.

Or

C/15/M.Sc./4th Seme./PHY-403 (Continued)
(a) "Intramuscular triglyceride level and insulin resistance are strongly correlated" — Explain it.

(b) Why test for glycosylated haemoglobin is important in the diagnosis of diabetes mellitus.

(c) State critically about abnormal endothelial cell functions in type-II diabetes mellitus. $2\frac{1}{2}+1+1\frac{1}{2}$

2. "Leptin is a regulator of excessive energy intake and lipid metabolism" — Justify the statement. 5

Or

Describe the principal mechanism of action of cocaine in the uptake of dopamine. 5

3. Discuss critically the effect of chronic alcohol intake on growth, endocrine system and brain. 1+2+2

Or

(a) What is the implicit theory of aging?

(b) What do you know about "Ovarian aging"?

(c) State the novel markers for the detection of ovarian aging. 1+1+3
4. (a) What is transgenic animal?
   (b) Elaborate sperm – mediated gene transfer process.

Or

(a) Mention the main causes of maternal mortality and morbidity.
   (b) Discuss the steps taken for improving the maternal health.

( Unit—42 )

1. (a) What is acrosome reaction?
   (b) Mention the role of G protein signaling and ion channels in the induction of acrosome reaction.

Or

(a) What is implantation window?
   (b) Describe the role of MUC-1 in the molecular mechanism of implantation.

C/15/M.Sc./4TH Seme./PHY-403 (Continued)
2. (a) “Secretion of hCG differs from that of many of the other placental proteins” — Justify the statement. 5
(b) Why hCG is called a physiological signal?

Or

(a) What is meant by cell-to-cell cross talk in the testis?
(b) State briefly the effect of Leydig cell products on Sertoli cell functions and vice versa. 1+(2+2)

3. (a) Write the composition and mechanism of action of combined oral contraceptive pill (COCP).
(b) How cervical cancer is associated with COCP? 

Or

(a) What are IUDs? Describe the molecular mechanism of action of IUD as contraceptive.
(b) Discuss the morphological and biochemical endometrial change caused by IUD. (1+1½)+2½
4. (a) State the basic cell culture systems.
   (b) Discuss the functional characteristics of cultured cells.

Or

(a) Describe the techniques of embryonic organ culture.
(b) How would you culture pancreatic cells?

2$\frac{1}{2}$ + 2$\frac{1}{2}$

3+2